

THE PRAIRIE GARDEN . . . 1967

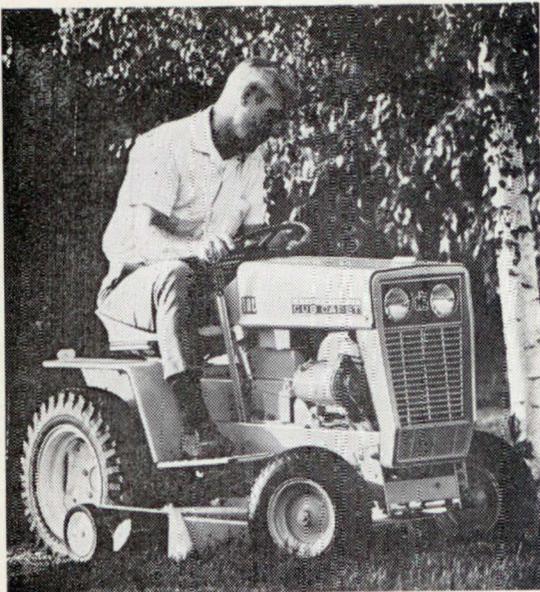


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The 1967 **PRAIRIE GARDEN**  
*Western Canada's Foremost Horticultural Annual*  
PUBLISHED BY WINNIPEG HORTICULTURAL SOCIETY



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## August Is the Month . . .

By the Winnipeg International Flower Show Board

AUGUST is the month in which the prairie horticultural societies hold their annual flower shows. AUGUST is the month towards which societies, directors and members in general, bend all their energies towards showing to full advantage the choicest gatherings from their splendid gardens.

During the months from January onwards plans are in the making for the coming season's big opportunity. Various committees are set up and have started to work. Committee chairmen settle on the show dates; the place where the show is to be staged is booked. Prize list details are once more studied.

The duties seem endless, but not to the show committees who tackle them with enthusiasm and happiness, and make light of their work. Then too the judges and their clerks must be appointed; also the clerks who will receive the countless entries and write them in their respective books; and the society secretary will require help in making up records and issuing the winners' cheques.

Flower growers and fruit and vegetable growers are specially favored on the Canadian prairies. The days of sunshine are long and generally dry; summer's light is intense and skies mostly are clear. The weather is nigh ideal for the best in flowers, fruit and vegetables; there seems no end to variety.

The chief prairie garden shows are the Winnipeg International and the Brandon in Manitoba; the Regina and the Saskatoon in Saskatchewan; and the Edmonton and the Calgary in Alberta. All are outstanding. The Winnipeg International is a joint undertaking by the Winnipeg Horticultural and the Winnipeg Gladiolus Societies now in its twelfth year.

The Flower Arrangements divisions in the prize lists nowadays bring in the widest range of entries, and call for imagination and originality in presenting perfect flowers. The judges' choice will have a pleasing and eye-catching overall design, with good balance, color harmony, and a focal point of interest. Simplicity in line and form mostly qualifies for the high awards. An arrangement usually is better when it has few flowers and few varieties, in harmonious blend of color.

Canada's Centenary celebration has called for arrangements that rise to the special occasion. For the Winnipeg International, the Province of Manitoba offers a distinctive trophy to the exhibitor entering the best arrangement commemorating the Centenary. Other shows also offer unique recognition to their centennial "bests."

So many new roses have been introduced lately that the prize list divisions for the Queen of the Flowers need constant revision. The Canadian Rose Society has set up standards for judges, and gives special medals for certain classes. The beauty of the gladiolus has made it a universal favorite. Dahlias undoubtedly grow in popularity and number of entries; and are judged according to the American Dahlia Society staging rules. African Violets also are in a class of their own and demand the utmost from their judges. In summary, all flowers, fruits and vegetables have achieved qualities that call out for "excellence only" from exhibitors, and meticulous attention on the part of the judges. Prairie gardens reach these heights, and horticultural societies lead the way to the summit.

So the best of luck to all marvelous flower growers, to all champion fruit men, to all memorable vegetable lovers. May fortune favor you mightily, and "firsts" in abundance be your just rewards. The month of AUGUST.

# The Prairie Garden

WESTERN CANADA'S FOREMOST HORTICULTURAL ANNUAL

Published by

WINNIPEG HORTICULTURAL SOCIETY  
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A non-profit publication dedicated to the advancement of Horticulture  
in our Northern Great Plains area.

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## The Prairie Garden, 1967

The passing of the century since Confederation, celebrated by the Centennial, has seen the development of the western prairies from native grassland to cultivated land, permanent homestead and established cities and towns.

Horticulture has kept pace with agriculture, and due to the foresight and persistence of dedicated researchers, we now enjoy trees and flowers, fruits and vegetables, unknown and unthought of in the early years.

What does the next century hold for our western plains? The wider use of shelter-belts, the availability of water, the possibilities of large scale irrigation, and the ever-increasing tempo due to already established standards, will result in developments almost beyond our imaginations.

THE PRAIRIE GARDEN is now in its 24th year of production. We hope that throughout the years it will play an important part in the new century of western development.

Limited numbers of copies of THE PRAIRIE GARDEN for the years 1964, 1965 and 1966 are available. They may be obtained at the reduced price of 75¢ per copy, postpaid.

Why not make a gift to your gardening friends, or have them on hand as additions to your gardening library? The information contained is always timely. Write: THE PRAIRIE GARDEN, c/o Mr. Wm. Tanner, 133 Willowdale Place, Winnipeg 16, Man.

We are pleased to announce that Mr. G. S. Reycraft will resume the editorship of THE PRAIRIE GARDEN for 1968. With his wide experience and background of interest in the development of this publication we are assured of a continuing service to western horticulture. Address: Mr. G. S. Reycraft, 92 Queenston Street, Winnipeg 9, Man.

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COVER PICTURE—"Miss Canada Rose"—Courtesy Patmore Nurseries Ltd.

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# Community Improvement in the Spirit of the Centennial

A report by JUDGE C. C. SPARLING  
Chairman, Centennial Beautification Committee,  
to the Manitoba Centennial Corporation, November 17, 1966

Pride in Country and Pride in Community dictate that our country and our communities should be well dressed and groomed for this momentous occasion, Canada's centennial celebration. At a birthday party one must look his best. Our campaign then is "Make Canada Beautiful," and I could not begin to list all the means and the methods that can be taken to encompass the campaign.

Each organization, each community, each municipality may have a different objective but the net result of all should be to achieve beauty and improvement. I am talking now about the physical beautification of property. The Arts, the Sciences, Music, Literature and Poetry are well looked after. Let us not forget to dress up that which we can see. Here are a few of the things that may be done:

1. Encourage the painting of homes, barns, schools, churches, fences, light poles, street signs, etc.
2. Strive for the eradication of unsightly signs.
3. Grow beautiful Centennial gardens.
4. Pretty up your parks.
5. Preserve and re-incarnate the natural beauties of Canada, our trees, river banks, and artificial lakes and streams.
6. Restore historic buildings, museums, churches, schools.
7. Institute your own tree-planting campaign.
8. Back your horticultural and agricultural shows.
9. Decorate your community throughout the year suitable to the various seasons of the year.
10. Hold competitions in community improvement and award merit prizes.
11. Clean up empty lots; and so on, *ad infinitum*.

Who can participate in this? Well, the field is without limit. Governments at all levels, municipal councils, service clubs, churches, schools, youth organizations, scouts, cadets, women's organizations.

Our Province is rich in lore, history and sentiment. Our resources are mighty and unlimited. Forest and prairie and mountain combine to produce a mixture of beauty unsurpassed except in very few places. We have all of this to exploit. We have 365 days to do it in.

Everyone knows that when a neighbor paints his fence, cleans up his lane or grows a lovely garden, his neighbor is inspired to do the same. A municipality pretties up and the adjoining one follows suit, a chain reaction sets in. The result for Canada will be a greatly beautified country. We owe it to Canada to make her beautiful for her birthday! We owe it as true citizens to our birthright. Let us show Canada to the nations as a clean, wholesome country in which no visitor to our shores would be anything but proud to adopt, or to bring up his children.

Every person and every organization has the capacity and the duty to do his or its part in furthering this aspect of OUR CENTENNIAL. Let us make our land a BEAUTIFUL GARDEN FOR MARVELLOUS CANADIANS!

# Backyard Millionaires

By REV. C. EARLE GORDON, D.D., Winnipeg, Manitoba

A recent estimate puts the number of people on the North American Continent who engage in some form of gardening at over 30 million. That's a lot of people and their number grows. This interest is not restricted to any particular group, or sex or age, or class or creed. A housewife on the tenth floor of a high-rise apartment building may be just as enthusiastic about her window boxes filled with red geraniums as the big operator on several acres of land.

What is there about gardening that keeps attracting more enthusiasts each year? Why do we clutter up the house with seed and nursery catalogues, and spend precious time poring over their multi-colored pages while the snow still lies thick on the lawn, and the frost decorates the windowpane? Why do we spend money on seeds and bulbs and tubers, and fertilizers, and insecticides and fungicides and herbicides, and tillers and portable hothouses, and tools and equipment of all kinds? Why do we spend hours of back-breaking toil at the first sign of spring, and in the sweltering heat of summer, and long after the last leaf has been raked and consigned to the compost heap?

And why do we forget so quickly the disasters of late and early frosts, and the devastations wrought by bugs and slugs, pets and pests, mildew and viruses, to say nothing of the neighbors' kids, and come back next year and do it all over again? Why are we such suckers? Certainly not because it pays, financially! The money we invest with such abandon on seeds and shrubs, and dusts and sprays, and canners and deep freezers, would buy all the vegetables we need and supply fresh bouquets of flowers for the house for a whole year, and then some! But few people take up gardening because it is financially rewarding.

## Then why do we do it?

Isn't it for the very enjoyable by-products gardening provides? The physical and the mental relaxation, for example. This is a tense age. Life has become full and furious and complex. As Wordsworth once put it:

*The world is too much with us, soon and late,  
Getting and spending, we lay waste our powers.*

We need a change of pace from time to time. We need to do something different from what we normally do the most of the time. And gardening provides us with an opportunity. To get into some old clothes, and plunge our hands up to the elbows into the warm earth; to scatter the good seed into the receptive soil; to plan a border or to prune a hedge; or to tend a lawn or to spray a shrub, these are good therapy. And many of us retain our sanity by retreating to the garden for such a change of interest and pace.

Then there are the sheer delight we gain from having some part in the whole creative process; the pleasure that comes with gazing upon the results of our planning and toil; the enjoyment that is ours from sharing the beauty and the produce of our garden with friends and neighbors. What enjoyment can match the pride that swells within us when success rewards our efforts, and family and friends admire with us the beauty and the bounty of our garden?

And of course there is the fresh knowledge we acquire. Every alert gardener is forever learning, or he doesn't remain a gardener for long. He may think he knows it all in his chosen vocation or profession, but no gardener ever is so arrogant as to think his neighbor across the fence may not give him a

new idea or show him a better technique. And because there is always something new in gardening, learning never ends. And the gardener who keeps his eyes and ears open, and has an inquiring mind, is the wiser for his hobby. And of course there are the friends, the old ones we would never have known were it not for our common interest, and the new ones we are forever making.

There is no price tag you can put on these and the other fringe benefits that come with gardening. They can be yours whether you grow glads or roses, petunias or tomatoes, violets or radishes. That is why we count the days until spring. Come January and the day the mailman delivers the first seed catalogue, and we will be up to our ears in dreams and plans for next summer's garden. The wintry winds may howl, but already we can see in our mind's eye the literal reproductions of all the exotic pictures that adorn the pages of that first harbinger of spring.

So we keep on gardening because there is no other venture that pays such rich dividends in health, and relaxation, and pleasures untold. Who cares if the flowers and vegetables do not pay their way? We are still backyard millionaires, rich in the only wealth that really counts — happiness!

## Centennial Plant Introductions

LILAC—*Syringa* “*Miss Canada*”—(*Syringa josiflexa* ‘Redwine’ x *S. Prestoniae* ‘Hiawatha’). The brightest and clearest pink of the 56 cultivars of late flowering hybrid lilacs tested at Morden. To date, the bush is slow growing and more of a dwarf than other cultivars of this group. Flowers are borne freely, in narrow upright spikes, china-rose in color.

“*Miss Canada*” is to be introduced in Canada's Centennial year as a tribute to the Canadian plant breeders who originated the late flowering group of lilacs. It combines the breeding work carried out, almost simultaneously in the early 1920s, by the late Isabel Preston of Ottawa and Dr. F. L. Skinner of Dropmore, Manitoba.

*Weigela* “*Centennial*”: (*Weigela* ‘Dropmore Pink’ x *W.* ‘Profusion’). A compact upright shrub to three meters in height. Many branches and chancels; bark on the older stems: light gray, on the branches: tawny brown. Leaves: small except on vigorous shoots, medium green. Flowers densely clustered in umbels containing two to five short-stemmed flowers; funnel-form in shape; erythrite-red in color, base of the throat of the corolla usually yellow; anthers cream colored.

The mother parent “*Dropmore Pink*” was secured in seed form by Dr. F. L. Skinner from Manchuria. In the 12 years it has been under trial the new introduction “*Centennial*” has never failed to bloom profusely all over the bush. So now, thanks to the Morden station, the public soon will be able to add this reliable, beautiful shrub to the landscape.

Courtesy Dr. W. R. Leslie

*No occupation is so delightful to me as the cultivation of the garden. Such a variety of subjects, some one always coming to perfection, the failure of one thing repaired by the success of another, and instead of one harvest a continued one throughout the year. But though an old man I am but a young gardener.*

Thomas Jefferson.

*What a man needs in gardening is a cast iron back, with a hinge in it.*

C. D. Warner.

# The Unfolding of Spring

By BARABARA TUFTY

(Reprinted by permission of the Editor, *Science News*, published by *Science News Inc.*, Washington, D.C.)

The First Day of Spring arrives officially at 3:05 p.m. EST, Saturday, March 20, but spring actually has been creeping up the Northern Hemisphere for more than a month, subtly melting streams, awakening insects from winter sleep, putting strange new vigor in human and animal spirits, and changing the voice of the cardinal from a cold, dry cry into a sudden burst of melody.

Spring comes with the first haze of green showing on a field of grass, even though snow still lies across the ground in thin patches, like pieces of blown paper. It comes in the early months of the year with a yellow-orange flush of color shooting through branches of weeping willows or creeping into buds of maple trees. Spring comes as early as December, when shafts of warm sunlight make a marsh muddy for a few days; and in a melting pond floats a real sign of awakening life, the cold, jellylike clusters of frogs' eggs, life in a simple, primitive form.

The beginning weeks of spring are filled with starts and stops, as snow flurries and cold, windy skies follow warm days pregnant with hints of warmth and renewed life. The edges of a pond that one day are melting, may be frozen tightly again the next day, and some mornings there are caps of snow on the grey pussy willow catkins or on the waxen pink buds of a magnolia tree. Spring showers suddenly fall, caused by violent temperature changes in the clouds. Yet each day, spring grows stronger as it moves another 15 miles up from the south in its inevitable journey that changes all living things. Perhaps it is the soil that feels spring first, when enough warmth from the sun and water from melted snow and fragrant rains permeate into the frozen ground to permit earthworms to stir, and seeds to germinate and start to rise toward the light.

One of the first awakeners of spring is the skunk cabbage which dares early to push its purple or yellow, hooded spathes through the snow, creating its own snug world of warmth and life. Another early riser is the snowdrop, which blends white against white as its fragile green-tipped white blossoms blend toward the snow covered earth.

As spring advances, more flowers begin to push their pointed leaves from the moist soil and unfold their buds. Many early spring flowers have pale delicate colors of white, yellow or fragile pink and blue — the wind anemones, pink spring beauties, red-veined wild geraniums, and light blue scillas with tiny belled flowers. Later, as spring becomes more sure of herself, the colors deepen and the land is bright with scarlet tulips, deep purple hyacinths, and bright yellow daffodils. Higher, above ground, the bushes burst into flame — redbuds of the eastern woods, paper-thin petals of the thorny Japanese quince and sunlit yellow drops of jasmine and forsythia.

Tips of trees also unfold as the syrupy carbohydrate-enriched sap is forced by root pressure from below ground and drawn by transpiration and evaporation of water from the tree tops above. Many trees bloom in spring before their leaves appear, so quietly and subtly that most people do not realize the life-producing drama going on above their heads. From trees such as hazels and oaks, alders, poplars and willows, hang catkins, those slender streamers of tiny male flowers filled with pollen. On a warm breezy day, clouds of this golden dust drift through the air to fertilize the more

obscure compact female flowers. Most of these fertilized seeds stay safe on the parent trees until autumn, but some fall to earth in spring.

Oval elm seeds with side wings like a halo cover the ground and fill the gutters with what looks like oatmeal flakes. The paired-winged maple seeds gyrate to earth like miniature helicopters. There they immediately start to germinate — unless a small boy catches one to split the seed and stick it on his nose like a beak.

#### Insects Awaken

Another kind of spring awakening goes on with these tiny six-legged creatures, the insects, which begin now to awaken from sycamore bark, apple tree twigs, holes in the ground or cracks under your back porch. Here they have been slumbering through the cold winter half light in all the insects' natural forms, as eggs, or wormlike larvae, cocoonlike pupae or as mature adults.

Now the overlapping eggs of the katydids, lined all winter along a tree twig, begin to open; the woolly bears, which are the caterpillars of the Isabella Tiger moth, uncurl from beneath old boards and logs; a drop of trickling water loosens the soil where the sleeping mosquito lies; and the aquatic larvae of black flies and midges stir to life as ice of ponds and streams melts away.

Honeybees, which have been keeping themselves warm all winter long by dancing and fanning their wings in great buzzing balls inside hollow trees, now take short forays into the softening air to find sources of nectar. The pregnant bumblebee queen, sole survivor of last summer's colony of bees, flies low over the fragrant soft earth, investigating holes and crevices for a possible nest where she can lay her eggs and start this year's new colony. Some of the more spectacular ceremonies of spring occur in the bird kingdom, where the returning bright sun and warm air bring about changes in feathers, voices and behavior. Like young boys whose voices crack and change, cardinals, thrushes and other songbirds suddenly have a change of voice from the dry cry of winter to a rich song.

This is the season when woodpeckers start to drum on trees, cock pheasants to strut in colorful spring feathers and puff out their necks, and cranes to prance an awkward but effective minuet of courtship. Even the ubiquitous pigeon, seemingly undisturbed by encroaching civilization with noisy cities, cars and people, wakes up to spring in his own way, pursuing the female over concrete sidewalks and streets, puffing up his chest, spreading his tail, and turning around and around in pigeon-toed strutting.

#### Pituitary Activity

As days grow longer and sunlight stronger, a small gland called the pituitary, at the base of a bird's brain, becomes more active, secreting a chemical hormone that sets off a chain of events changing the colors of feathers, starting birds on long migrating journeys, and stimulating the female to produce eggs in her body and the male to produce sperm.

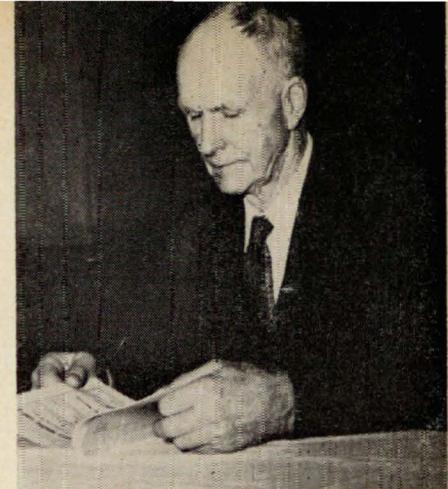
Clouds of returning birds fly thousands of miles northward to familiar nesting areas in forests, fields and pieces of land they have known year after year. The male bird usually arrives first and takes his stand on a particular piece of ground that may be a willow patch just a few feet long, or may extend for several miles beside a running stream or along a field.

Spring comes to human beings as well, causing a drowsy feeling known as "spring fever," which makes one wish to put aside work and go for a walk in the woods or dream under the sun on a park bench.

## Let's Talk about Trees

By F. L. SKINNER, M.B.E., LL.D., F.R.H.S.,

Dropmore, Manitoba



Though Canada as a whole is blessed with a wealth of trees, many fine conifers among them, still there are places on the prairies where trees are much appreciated for their shelter in winter, their shade for both man and animals in the heat of summer, and their beauty as ornamentals around our homes.

Conifers have a special appeal to many people, not only for their commercial value and beauty of outline but what more musical sound could one wish to hear than the soft sighing of the wind among the branches of conifers on a summer day. One of the finest of our native conifers and one that has held a special appeal for me since I first saw it in the Canadian Rockies 53 years ago, is the Douglas fir. This tree, common all along the west coast of Canada, extends also to the east slope of the Rockies from Jasper south to the United States border.

In the hope of finding forms of this fine tree that would thrive in the rigorous climate of Manitoba, I have collected seeds or plants of the Douglas fir all the way from Jasper, Alta., south as far as Colorado, U.S.A., and over the years have gathered some interesting information regarding the hardiness of geographical forms of Douglas fir. The form that has given best results at Dropmore is one that was grown from seed collected on the high, dry buttes of South Dakota, U.S.A. Trees of this form are now over 30 feet tall, have never been injured by winter, and this year (1964) have ripened a crop of seed from which we will be able to grow seedlings of proved hardiness. It is interesting to note that seedlings from Jasper have not proved nearly so hardy. Trees from this source, though of the same age as the South Dakota strain, are less than half the height and have suffered from the severity of our winters on several occasions.

This variation in hardiness and adaptability to our trying conditions is met in geographical varieties of trees of many species. The Finnish form of the Norway spruce, the Finnish and north Swedish forms of the Scotch pine, the high alpine form of the European larch and the Silver and Sugar maples from northwestern Minnesota have all proved hardier and more adaptable to our conditions than the same species secured from ordinary commercial sources.

Then, too, hybrids of many of our common trees are being raised that are much better suited for our conditions than the parent species. Hybrids of the Norway spruce are much hardier and better suited to our soil and climatic conditions than the ordinary species. The hybrid basswoods raised at Dropmore grow much faster than either parent species, are better adapted to our dry

upland soil, and a large percentage are immune to leaf mites that so disfigure the American basswood.

Many of the hybrid poplars raised at Dropmore have proved immune to canker as well as being very fast-growing trees. One such hybrid planted as a cutting 18 years ago is now over 40 feet tall and stout enough to make a log over 12 inches in diameter; and though growing within 8 feet of a Korean poplar that has had canker for many years, shows no sign of any disease. Some hybrid larches also are very fast-growing trees; one such hybrid now 27 years old is 18 inches in diameter at the butt and well over 50 feet tall. Many of these hybrid trees have withstood drought conditions much better than our native poplars, maples or even white spruce.

Many new varieties of trees have been tested on the prairies during the past 50 years and a number have proved adapted to our conditions. My work in raising hybrids has shown that much more can be done in raising trees better suited for our conditions than would have been deemed possible at the beginning of the century.

### Book Review . . .

## HORTICULTURAL HORIZONS

DR. F. L. SKINNER, M.B.E., LL.D., F.R.H.S

Available early in 1967 from Economics and Publications Branch, Manitoba Department of Agriculture, 711 Norquay Building, Winnipeg 1, Manitoba at \$4.00 - 150 pages, 48 colored illustrations.

In "Horticultural Horizons," Dr. Frank Skinner gives an account of his experience in collecting, breeding, and producing hardy, horticultural plants for the Prairies. Over seventy years of his life in Canada has been spent in collecting plants from other areas in the world and evaluating them on their performance in Manitoba. His plant breeding program consisted of a study of the requirements for plants and making numerous crosses in obtaining plants to fill these needs. The reader shares with Dr. Skinner many disappointments, frustrations and setbacks, but also celebrates with him in the many, many successes he has achieved.

In "Horticultural Horizons," research workers and plant breeders will find much detailed information on problems encountered in the breeding of specific plants. The home gardener will find "Horticultural Horizons," a worthwhile addition to his garden bookshelf. The average individual who may not be so interested in horticulture, will enjoy reading this book of adventures in collecting and plant breeding.

The author has been honored by many organizations for his work. In 1932, he received the Stevenson Memorial Gold Medal from the Manitoba Horticultural Association. This medal was awarded for "Conspicuous Achievements in the Field of Practical Horticulture." In 1964, he received a citation from the American Horticulture Council and there have been many more such recognitions.

Dr. Skinner has made a valuable contribution to horticulture on the Canadian Prairies, in fact, on the entire continent. Succeeding generations of North Americans will continue to benefit from the accomplishments of this outstanding citizen of our time.

F. J. WEIR, Provincial Horticulturist, Winnipeg.



## The STEVENSON MEMORIAL GOLD MEDAL

By T. A. SANDERCOCK

(On February 9th, 1967, in the Royal Alexandra Hotel, Winnipeg, His Honor, Richard S. Bowles, Q.C., Lieutenant Governor, Province of Manitoba, on behalf of the Manitoba Horticultural Association, gave the Stevenson Memorial Gold Medal to Dr. Charles Walkof in recognition of his outstanding contribution in the field of practical horticulture. The

citation was prepared by Mr. T. A. Sandercock, Manitoba Department of Agriculture and Conservation, who also presented Dr. Walkof to Mr. Bowles.)

The Stevenson Memorial Gold Medal is a highly esteemed award presented periodically by the Manitoba Horticultural Association to persons who have made outstanding contributions in the field of practical horticulture. It is indeed a great pleasure for me to introduce Dr. Charles Walkof as the recipient of this Stevenson Memorial Gold Medal tonight.

I have not only known Dr. Walkof and enjoyed his personal acquaintance for a good many years, but I have also had the opportunity to reap directly the benefits from the efforts of the late Mr. A. P. Stevenson in whose memory this presentation is made. I was raised just across the fence from his original plantings of fruit trees and temptations were not always ignored.

Dr. Walkof, better known as Charlie to his friends, is a native son of Manitoba, with his birthplace in Winkler. He obtained his Bachelor of Science degree in Agriculture from the University of Manitoba in 1933. The next ten years were spent as horticulturist at the Canada Department of Agriculture Range Experimental Station in Manyberries, Alta., and the Canada Department of Agriculture Experimental Farm at Lethbridge, Alta. During this time he advanced his studies and received his Master of Science degree in 1942. Following further studies, the University of Minnesota awarded him the Doctor of Philosophy degree in 1954.

In 1945 Dr. Walkof transferred to the Canada Department of Agriculture Morden Experimental Station where he took charge of the vegetable crop research section. At the present time his responsibilities include that of Acting Director in the absence of Dr. Eric D. Putt, and head of the vegetable crop research section which includes the supervision of the work of five research officers and supporting staff of six technicians and potmen.

Dr. Walkof's major field has been plant breeding, in the development of vegetable varieties that would grow and produce in spite of the extremes of temperature and moisture experienced in our prairie summers. To date he has named some twenty varieties of vegetables for prairie gardens which can

be found listed in most of our prairie seed catalogues. Examples are the bush tomato varieties, Monarch, Meteor, Mustang, Manitoba, Starfire and Morden Yellow. The introduction of the baseball series of dwarf cabbage, Pee Wee, Little Leaguer and Junior, is an example of the progress that Dr. Walkof has been able to attain in the isolation of the various genetic factors involved in plant development.

His search for improved varieties of vegetables has not only been of benefit to the prairie gardener, but also has supplied valuable parent stock for breeding programs now under way in other areas of Canada as well as in areas of the United States, Holland, Germany and Sweden. The Morden system of tomato planting developed by Dr. Walkof which is the practice of moving seedlings into the field early and protecting them with Hotkaps, has made it possible for gardeners throughout the west to enjoy their tomato crop much earlier in the year and with less risk from frost. The canning industry in the Pembina Triangle also has looked to him for counsel and guidance in its production program. His enthusiastic and practical approach to problems encountered has certainly been a factor in the successful development of this industry to date.

Work done by Dr. Walkof at the Morden Experimental Station has been of great value also to the commercial market gardener. Besides having the benefits of the new varieties, the growers have obtained solutions to many of their post-harvest problems of perishable crops concerning the retention of quality during the marketing period. His close relationship with the farmers indicates that he is a man of the land as well as a scientist. Dr. Walkof has written thirteen scientific papers that have been published in various scientific journals throughout the world. He has also written eight bulletins that have outlined the practical application of scientific knowledge obtained from his research projects.

His contribution to science has made Dr. Walkof prominent internationally. He is on the Steering Committee of the Tomato Breeders Round Table Conference, a world organization. He is a member of the International Committee on Horticulture Nomenclature. Presently he holds the position of secretary of the Great Plains Society of Horticulture. He is on the membership committee of the American Society of Horticultural Science. He is a past president of the Western Canadian Society for Horticulture, the Canadian Society of Horticultural Science, and the Morden Branch of the Agricultural Institute of Canada. Dr. Walkof was a member of the Canadian delegation which attended the International Congress in Holland in 1955.

I'd like to add at this time that Dr. Walkof, with his wealth of knowledge and great enthusiasm for his work, not only has supplied information for the industry as a whole, but also has been a real inspiration to those that have worked with him. There are notable accounts of young men who are making outstanding contributions to horticulture, who started their career under him at the Morden Experimental Station.

Dr. Walkof is active in community affairs and takes church work seriously. He was chairman of the Morden Town Planning Commission for a number of years. In 1954 a life membership in the association of Kinsman Clubs of Canada was conferred on him for outstanding service to his community's greatest need. He also is a family man, having two daughters, Jean, a Business Administration Graduate of the Anderson College, Indiana, and Shirley, the wife of Dr. J. H. Voth, University of Missouri, Columbia, Missouri. It might also be said that he has two grandchildren of whom he is justly proud.

Dr. Walkof has not had too much time for relaxation, but he does take great delight in amateur photography. I understand from his good wife that

his dark room, situated in a remote corner of his home, is the most frequented spot in leisure hours.

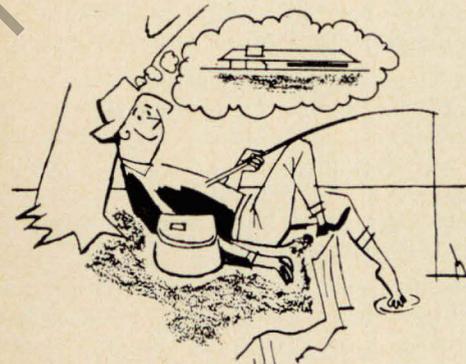
In ending this introduction, I would like to read a short poem:

Isn't it strange that princes and kings  
And clowns that caper in sawdust rings,  
And common folk like you and me,  
Are builders of eternity?  
And each is given a bag of tools,  
A shapeless mass and a set of rules  
And each must make, ere life goes on,  
A stumbling block or a stepping stone.

I'm sure you'll agree with me that the stepping stone that Dr. Walkof is shaping will serve mankind indefinitely.

From "Daffodils"  
By William Wordsworth

For oft, when on my couch I lie  
In vacant or in pensive mood,  
They flash upon that inward eye  
Which is the bliss of solitude;  
And then my heart with pleasure fills,  
And dances with the daffodils.



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# Spring-Flowering Bulbs

By H. F. HARP

In prairie gardens, where the first signs of spring are eagerly awaited, flowering bulbs provide early patches of color soon after the snow has gone and a fairly wide selection of flowering bulbs is available now.

Most are suitable for prairie gardens; some are better adapted than others but none are more useful than the tulips. The daffodils and hyacinths are not long-lived in prairie gardens; in fact they often fail to survive a second winter unless covered by a deep blanket of snow.

There are many varieties of tulips, ranging from the true species with miniature blooms on slender stems to the giant Darwin and Cottage tulips which are the mainstay for garden decoration. Besides the Darwins and related sorts there are the Breeder tulips with unusual shades of purple, burnt orange and the darkest red. There are Rembrandt tulips with petals blotched and feathered, in a wide range of colors; and for those who favor the bizarre there are Parrot tulips with petals fringed and waved, some greenish yellow and others in splendid shades of red. The Single Early and the Double Early tulips flower a week to 10 days ahead of the Darwins. They are not so tall nor quite so large, but the color range is much the same as the Darwins and the Cottage tulips.

All tulips do best in sandy loam that is well drained and where the snow tends to pile high. The soil should be made rich with humus and plant food by digging in a 2- or 3-inch layer of rotted barnyard manure, well decomposed and thoroughly mixed with the soil, adding a dressing of sand if the soil is heavy. Granulated peat may be substituted for the manure, spreading a thin layer on the soil then digging it in. By raking in the 11-48-0 fertilizer at the rate of 4 ounces to the square yard nutrient will be available to make healthy leaves and to build up strong bulbs for the next year's bloom.

The main causes of failure with spring-flowering bulbs in prairie gardens are inferior bulbs and late planting. The deadline for planting is around the first week of October but this may be extended a week if the weather stays mild and the bulbs are watered well and protected with a deep cover of straw. The soil must be moist enough at planting time to start the bulbs rooting; if planted in dry soil they simply mark time until the rains come or the soil is moistened with water from the garden hose.

A trowel is a good tool for planting. First set the bulbs out on the raked surface of the soil; then dig a hole about 6 inches deep for each bulb, spacing them about the same distance apart. When the planting is done, firm the soil by treading before raking the surface level and covering the area with a foot of flax straw, or similar material, to hold the snow. The covering material should be removed in the spring as soon as the shoots appear, setting it to one side for use in case of a late spring frost.

The hardy Species tulips, which bloom a bit earlier than the others, are best planted in the rock garden or at the front of the perennial border. Tarda is one of the hardiest and most reliable with starry flowers of yellow edged with cream. The Waterlily tulip has larger blooms in an assortment of bright colors. The plants are dwarf with broad leaves and the flowers open in early May.

The daffodils and the hyacinths stand the best chance of winter survival when planted on the east side of the house and covered with a thick layer of

flax straw. Like the tulips, they should be watered well if the soil is dry when the bulbs are planted so that a strong root system develops before the ground freezes.

Snowdrops and crocuses are possible in well sheltered prairie gardens but both will have a short life except where deep snow gives extra winter protection. The bulbs are small so plant them in colonies of several dozen, spacing them 2 or 3 inches apart and 4 inches deep.

The Grape Hyacinths are hardier and much easier to grow than the snowdrops and crocuses and, like the dwarf Species tulips, are best planted in the rock garden or at the edge of the perennial border. In May you can look for their slender stems of rich blue bells which last for weeks if the weather is cool and damp. Another hardy bulb is the Siberian Squill with nodding bells of the bluest blue flowers on slender, 6-inch stems. It is one of the first flowers of spring, often opening its buds before all the snow has gone. The Siberian Squills look best when planted in the shadow of a flowering shrub where they soon establish a colony to flower year after year with little or no attention.

The tulips present a bit of a problem when they occupy space which is to be planted with annuals later on but there are two ways of coping with it. One is to inter-plant fast-growing annuals as soon as the tulips are done; the other is to lift the plants, with roots and tops intact, and replant them in a 6-inch trench. Choose a shady, out-of-the-way spot and leave them undisturbed until the tops are dry. Dig up the bulbs in July, drying them off in a warm, shady spot, out of the sun or the tender skins will peel off. When properly dried the bulbs can be separated and graded into sizes ready for planting in late September. Bulbs the size of walnuts are large enough to bloom next year. Smaller ones may be lined out in the vegetable garden to grow in size. If you are not prepared to go to the trouble of lifting the bulbs every year they may remain where they are but they will become smaller and the flowers fewer unless they are replanted every third year or so.

Spring-flowering bulbs are a good investment for prairie gardeners so plan to include some in your next fall nursery order. Then you'll be able to look forward to a colorful garden of specially favored bulbs.

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# Seeding of Annuals

By W. H. GRAY

Supervisor Florist, Parks and Protection Division,  
Metropolitan Corporation of Greater Winnipeg

Judging from the numbers of inquiries we receive over the telephone, or at horticultural society meetings, there must be great interest in raising plants from seeds. It must be the challenge or maybe the need for a hobby that creates this interest, for unless we plan a very large garden we can buy all varieties of plants from the market gardeners at a very reasonable cost. Still, there is a great feeling of pride of accomplishment when we do raise our own plants successfully. Usually, we raise too many plants for our own use and find ourselves crowded for space. Many of us are not in a position, either through finances or lack of space around the home grounds, to have a small greenhouse, but by utilizing such spaces as window ledges, sunrooms, etc., we can still manage to fulfill our hopes and requirements.

In raising plants from seed, whether under glass or in the open, some conditions are necessary for germination. In their dormant state the seeds contain insufficient moisture to stimulate growth; supply this, and immediately a change will take place in the seed. They will swell and burst their coats; but this does not mean that they will germinate for they require also adequate moisture, warmth and air. Given these three, in the proper amounts, most seeds will germinate; that is, of course, if they are fertile to start with.

There are several different views on what medium should be used for starting seeds. We find the best soil for most seeds is a mixture of 2-parts rotted sod, one-half part leaf mold, and one-half part coarse sand. It is not necessary to add manure as the seedlings should be transplanted as soon as they are large enough to handle. On the market today are several soil conditioners, under different trade names, which have proved very useful in place of coarse sand.

Damping off is the most serious problem affecting seedlings raised in pots or flats and the surest way of preventing this is sterile soil. Do not over water, and allow good ventilation. The soil mixture should be sterilized before using, either by steaming, baking, or soaking with a commercial fungicide. However, if even then the disease does appear, the infected patches of seedlings should be removed with the soil, and the pot or flat watered with Semesan dissolved in water or some other suitable fungicide.

Some of the larger seeds such as dahlia, pansy, salvia, etc., can be sown in pure vermiculite, but care should be taken in watering as they damp off very easily. Some people prefer sifted coarse sand or sphagnum moss; they are less likely to cause damping off than the soil mixtures. In growing begonias, whether the tuberous or the fibrous-rooted varieties, gloxinias, calceolarias, achimenes, or primulas, leaf-soil and peat moss may be added to make the mixture feel light and soft to the touch. A little charcoal (chicken feed size) tends to keep the soil sweet.

In sowing seeds, there are a few points to remember: the pot, tin or box to be used must be thoroughly cleaned of all traces of soil previously used; the soil should be firm but not packed too tightly in the container; there should be good drainage at the bottom of the container, and a space of at least one inch between the soil and the top of the container to allow sufficient air and let the plants grow. The soil should be well watered and allowed to drain before the seed is sown.

The seed should always be sown very thinly and covered very lightly with soil and then sprayed gently with water. The container should be

covered with a piece of glass for warmth and with paper to keep it absolutely dark; as soon as the seedlings appear remove glass and paper and allow full light. Some varieties such as lobelia like a little shade from the direct sun. Transplant the seedlings into larger pots or boxes as soon as they become large enough to handle. The seeds should require very little water, although the seedlings should not be allowed to become too dry once they have started to grow.

A temperature of 70 degrees or over is best to germinate most annuals. Most varieties of perennials will germinate more quickly if the seeds are frozen for 48 hours before being sown, and some like a cooler temperature to germinate than annuals. Many perennials if sown early in January will bloom late in the summer. As soon as the weather permits, the plants should be placed in a cold frame, remembering to give them as much air as possible, to condition them to the climate before planting outside.

By following these simple rules, you should have much success and enjoyment with your seeds, but remember that in this, as in all aspects of gardening, great patience is required.

Some dates for sowing seeds:

January 15, Perennials. February 15, Carnations, Dahlia Unwins, Lobelia. February 25, Pansies, Annual Delphiniums, Vinca, Ricinus (Castor Oil plants).

March 15, Snapdragons, Rudbeckia, Portulaca. March 25, Dianthus, Ageratum, Salvia, Double Petunia, Heliotrope, Matricaria. March 31, Verbena, Nicotiana, Anchusa, Petunia, Coreopsis.

April 9, French Marigold, Gaillardia, Aster, Tagetes, Alyssum, Phlox Drummondii. April 15, Scabiosa, Balsam, Amaranthus, Sunflower. April 25, Larkspur, Stock, Celosia, Cosmos, African Marigold, Zinnia, Annual Chrysanthemum.

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# House Plants in Spring

By STAN WESTAWAY

Horticulturist, Plant Science Department, University of Manitoba,  
Fort Garry, Manitoba

Once the days begin to lengthen plants in the home and in the greenhouse show signs of new activity. Plants that were leafless and dormant send out new shoots; others develop more foliage and send out new stems and flower buds; and even those in so-called cool storage show signs of activity. One wonders at the miracle of growth that surges with the advent of Spring.

To understand the growth response of plants one must be aware of these phases in their development. Why should plants with warmth and moisture not develop in the early months of winter, and yet with conditions that seem so similar break out later into new growth. This knowledge is a guide to the proper care of plants. The short days of early winter are a dormant time and one should not attempt to provoke growth, by disturbance, by excessive feeding, or by too copious watering.

When March blows in we can increase our activity. In fact, we too, like plants, feel the urge of spring and a desire to plant and grow things in readiness for the growing season. It is a time for renovating the older plants. Overgrown rubber plants and dieffenbachia may be cut back to promote new growth from near the base. Shoots will soon develop from the old leaf scars; and the thrifty gardener may wish to stem-root the upper leafy portion before the major act of surgery, and so produce an extra plant. The method used: make a cut in the stem at a suitable point and wrap with sphagnum moss; protect with polyethylene; keep moist and wait until new roots develop in the moss. Then the rooted portion may be cut off and planted. Cut back the old stem to 10 or 12 inches above the soil level. New shoots will soon develop.

Many plants will benefit from top dressing. Remove an inch or so of the old top soil and replace with a good loamy mixture of fresh soil. This in many cases will give your plant a new lease of life. Fertilizing should be attempted with caution. Plants will benefit when in a state of growth. Avoid over-treatment, and in most cases half a teaspoonful of a general purpose fertilizer, such as 11-48-0 or 10-52-17, for a 6-inch pot is sufficient. The fertilizer may be applied in water, but it is advisable to water your plants thoroughly before adding the fertilizer solution, to avoid burning of the roots.

When should plants be repotted? Disturbance during the dormant period is to be avoided. But with active growth and new root development plants will soon overcome the disturbance of repotting. March is a suitable month in which to do this. Large plants may be pushed up in the container by the growth of new roots. Tap the plant out of the container. Remove old drainage material. Shred out some of the surplus roots and replant in a size larger container. Provide good drainage, this is important; and cover the drainage with coarse material such as peat moss or decayed leaves before adding soil. When adding the soil spread uniformly in contact with the roots. Avoid bunching the roots. With the larger, woody plants tamp the soil quite firmly with a potting stick.

The soil mixture is very important: Mix 7 parts good loam, 3 parts peat moss, and 2 parts sharp, builders' sand. Measure by bulk. This mixture will have good drainage, and good water retention. To approximately one wheelbarrow full of the above, add half a pint of 16-20-0 or 11-48-0 fertilizer and

mix thoroughly. To one quart of soil half a teaspoonful of the above fertilizer is sufficient. Too little is better than too much! This soil mixture may be used for topdressing, repotting, and for transplanting seedlings into flats.

March is a favorable time for regrowing new plants. Ferns may be divided. Cuttings from the new growth of many house plants will root readily if given proper care. Avoid wilting, place in sand, vermiculite, perlite, or turface, and keep moist with a polyethylene bag for a cover, and the novice can expect reasonable success.

Bulbs, corms and tubers should be checked in storage. Prevent tubers such as dahlias from shrivelling; they will store nicely in polyethylene bags with a little moist peat moss and kept cool. Begonias may be repotted in soil containing plenty of humus. Gladiolus, if cleaned, should be dusted and stored dry and cool to avoid too early growth. Check your geranium plants. Older plants are best repotted and new growth stimulated. Cut the stems back to develop bushy new growth. Rooted cuttings should be potted in 4-inch pots and the tops pinched back to make them branch out.

Seed and nursery catalogues inform and attract. Plan the spring planting program, and the do-it-yourself, grow-them-at-home gardener, will have made a start with those seeds that require a long season of growth. Spring is on the way!

## Centennial Flower

Canada is approaching its one hundredth birthday. To commemorate this occasion the Canadian Seed Trade Association at its semi-annual meeting in Toronto last November selected the Cosmos Early Sensation, Mixed, Improved as the Centennial Flower.

This flower is a tall-growing annual; its usual height is about 3½ feet. The huge flowers are held upright on long stems which make it excellent for cutting. The colors red, white and pink will add beauty to your home and enhance the beauty of your entire garden.

The cosmos is one of the easiest grown annual flowers. It can be sown right outside in your garden, and will flower in about 6 weeks; flower earlier if started indoors and transplanted to the garden after danger from frost is past. It is interesting to note that this flower does equally well if sown in poor soil or in rich loam. It will withstand drought and does best in a sunny location. The Centennial Flower has abundance of blooms and will hold its blooms right up until frost, giving a source of cut flowers and boutonnières all summer long.

The Centennial Flower will be offered by all seed companies in Canada. Most firms will feature this flower in their catalogue and seed boxes during the Centennial year. The seed will be marketed in a uniform seed packet which has been especially designed for this occasion. This attractive packet also will show the Centennial Symbol in the upper left-hand corner of the packet and the symbol of the Canadian Seed Trade Association on the back of the packet.

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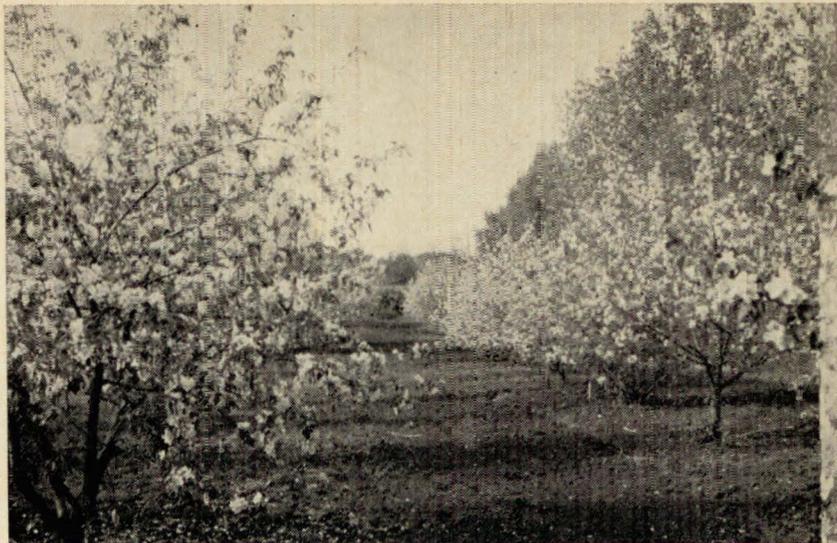
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## Growing Fruit in Central Alberta

By J. R. BLADES  
R.R. 1, Ohaton, Alberta

Little did I realize in 1929 when I planted our first fruit trees, 2 crabapples and 2 plums, that some day I might be considered enough of a horticulturist to be asked to contribute our experience in a publication such as THE PRAIRIE GARDEN. How many of us at that time ever dreamed that we could grow standard size apples; but today this is a reality?

Let us look back to 1929. The 2 crabapples we planted were not named. The plums were the variety Opata, a sandcherry plum hybrid, and these same trees still bear fruit after 37 years. A few years later we planted seedling apple-crabapple crosses by Dr. Wm. Saunders.\* Some proved hardy, and the fruits make a first class sauce. From then on we have added until at the present time we have about 3 acres of fruit orchard, consisting of 150 apple, crabapple, plum, pear, apricot and cherry trees, and many of the small fruits as well.

If I were asked to name our 5 best apples I would say Brooks No. 27, Battleford, Reward, Harcourt, and Haralson. Brooks No. 27 is the most consistent producer of medium-sized fruit excellent for apple pies; and the trees are hardy. Battleford is one of the best large good-eating apples, but not as hardy as Brooks No. 27. Reward is a good large apple which has done very well here the last 4 years. Harcourt is one of the newer varieties, and if it proves hardy could be one of our best varieties; it has size, color and flavor. Haralson is a good-sized apple that colors up well if left to mature. The tree is not too hardy but every few years we do get a fair crop of good keeping apples. These mentioned are only a few of the varieties grown here. Rosthern No. 15 and Jacques are very reliable.

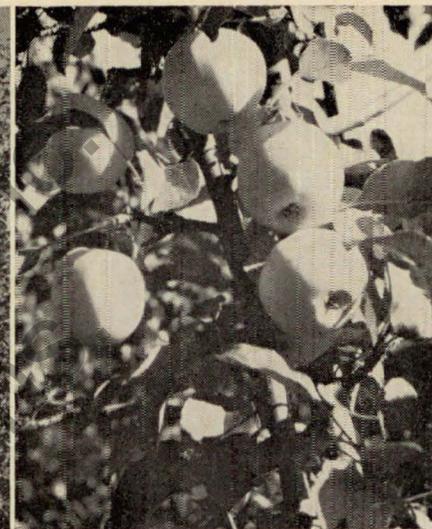
### What About Crabapples?

With us Transcendent has been outstanding. A tree planted in 1939 now stands over 25 feet high with a trunk 42 inches in circumference and has been

\*First Director, Canada Department of Agriculture Experimental Farm, Ottawa, Ont.



Ray Blades and Transcendent Crab.



Blushed Calville.

the most vigorous of any fruit trees we ever planted. Rescue bears one of the sweetest apple-crabs to eat out of hand, but the fruit becomes smaller as the trees grow older. Osman, Robin, Dolgo, Olga and many other crabapples can be grown without difficulty. Our best jelly crabapple is Scugog. It is a red-flowered crabapple which produces large fruit a dark red right through to the core, and makes a jelly rich in color and flavor.

Pears blossom too early and are caught too often by the late spring frosts. Tioma, a Russian pear, produces the largest pears we have grown but the flavor is not too good. Brooks No. 18 is hardy, the fruit a fair size, and make a very nice syrup. We hope soon to have some of the Patterson hybrids.

With plums, Grenville is the best we have grown but is not too hardy. Pembina after 25 years still produces a good crop, and is delicious eaten out of hand. Northern has replaced Bounty with us. The fruit is larger and the trees are healthier. The Russian variety Ivanovka and the other Salicina plums are doing very well. I believe they and their seedlings will eventually replace most of the Manitoba varieties.

Nanking cherries (*Prunus tomentosa*) and the Mongolian cherry (*Prunus fruticosa*) do fairly well, and do make a lovely jam and jelly.

If I may give a few of our observations! Do have a good shelterbelt. Do not plant apple trees in low ground; they do not like wet feet. Do not expect perfect-looking fruit trees; our climate is not perfect. Light pruning is good, but heavy pruning can do more harm than good. If your trees look a little rough, spare the axe. They can still bear a lot of fruit.

For beauty in the home grounds try Rosybloom crabapples. Many of them are hardy and nearly as beautiful as the Japanese flowering plums we see at the West Coast.

The Blades' orchard is a mecca for gardeners in the Spring and Fall.

Mr. Blades has appeared on TV on occasion. I was fortunate in having an interview with him last summer, and discovered we came to Canada at the same age; at the same time; on the same boat — the ill-fated Empress of Ireland in 1914.

—Stan Westaway, Chairman, Editorial Committee

# Sawdust and the Gardener

By J. W. B. STEWART, Ph.D.

Department of Soil Science, University of Saskatchewan  
Saskatoon, Saskatchewan

Every so often, I receive a letter from a gardener who wants to know how to make use of wood shavings or sawdust. He will have heard that it is good general practice to add these waste materials to soil and will ask for confirmation.

The questions that have to be answered are: Does sawdust improve garden soils? If so, how should it be applied? Should wood shavings and sawdust be composted? And, if so, how do you set about composting a material of this sort? The answers to these and other questions are not simple, and doubtless my views will not agree with everybody's, but I have been trained to look at things from a point of view of the soil chemist and have not had a lot of practical experience.

First of all, why should we add wood or parts of wood to the soil at all? Wood is not considered a fertilizer, as it does not contain high percentages of readily available nitrogen, phosphate or potash. We classify sawdust and shavings as soil amendments and as such it is usual to make heavy rates of application, and it requires a lot of hard work to get them mixed throughout the soil. Still, generations of gardeners cannot be wrong, so what good, in fact, does the amendment do to the soil? First of all, it affects soil structure by opening up heavy clays and therefore improving drainage, as well as improving the water-holding capacity of light soils. Eventually this has an effect on yield, although it must be stressed that this does not come about through one application. Also, these amendments represent utilization of materials that would otherwise be wasted. Some of these have an unusual composition and special practices are needed before they can be used in the soil.

Composting might be considered one of the special practices required. In composting, which is a microbiological process, organic materials are decomposed partially by the activity of microbes. The gumlike substances, the fibres, the woody material that make up a lot of the mature plant material are attacked by microbes in the soil. The gumlike substances and the plant fibres are readily decomposed and from these the microbes get the energy to carry on the activities and the carbon they need for building their cells. However, microbial cells contain about 10 per cent of nitrogen, so while large amounts of energy-giving substances are needed, considerable nitrogen must also be available in the synthesis of microbial cells. Therefore it is important to realize that you have to supply nitrogen as well as large amounts of energy substances.

We can state therefore that 2 objectives are achieved by composting. First of all, readily decomposed substances are removed and the nitrogen content is increased, thus removing the danger of inducing a nitrogen deficiency when composts are added to soils. Secondly, the physical nature of material is changed. The plant material loses its strength, breaks easily, becomes friable and crumbly, and easy to handle and incorporate into the soil.

The likelihood is that woody residues from lumbering, woodworking plants and improvement cuttings in forests, will increase in the future. The use of these residues has been confined mainly to sawdust and shavings because of their physical form and the fact that they are available in reason-

ably large amounts in certain areas. There are 2 main methods of dealing with woody residues. They can be incorporated directly into the soil, and this may be the preferred method in Saskatchewan; or they can be composted with soil, leaves and other materials to provide potting soils for greenhouses. Both sawdust and wood chips make excellent mulches for blueberries, strawberries, fruit trees and ornamental garden crops.

Because woody materials are low in plant nutrients, they need extra nitrogen and phosphate when they are composted or added to the soil. In composting you should provide proper aeration, moisture, nutrients and temperature for microbial decomposition. These factors and the nature of the material affect the time required for preparation of the final composition. Composting is usually done by piling organic materials into heaps where reasonable control of these factors can be maintained.

Air should be allowed to penetrate the entire compost heap to allow microbes to act and to finish the compost in the minimum of time. Aeration depends on the size of air spaces within the heap, the height of the pile, and the moisture content. Fine materials such as sawdust are hard to aerate and may be mixed with soil and coarser materials or turned often. Cereal straws and fallen leaves make good material for composting. Compost heaps should be no more than 6 feet high so that air can penetrate to the bottom of the pile. Width and length can be adjusted for convenient handling. The best moisture content for a compost heap is between one to 2½ times that of the dry organic material. If the heap gets too dry decomposition is slowed down; and if the compost heap is too wet it is impossible for air to get in. If possible, water should be prevented from running out of the bottom of the pile because it will contain nutrients that will be lost.

Now to the amounts of fertilizer that have to be added to the compost heap. A recommended rate for sawdust would be between 20 and 30 pounds of nitrogen per ton of dry material. This would be supplied by 45 to 60 pounds of urea for instance. The microbes need so little phosphate and potash that ordinary plant residues supply enough for composting. To sawdust or plant residues that become leached before composting, it may be wise to add phosphate and potash, about 20 pounds of 11-48-0 and 5 to 10 pounds of potassium chloride to a ton of residue.

It is well to remember that rotting proceeds slowly at temperatures near freezing or below freezing in many cases. Compost prepared late in the fall will not be ready for use until well into the next summer. Therefore, if one was to give advice on the composting of sawdust, one would say that it would require at least 3 months under favorable conditions of moisture and temperature. This would mean preparing one summer the compost that will be used in the next year. Alternatively, sawdust may be mixed or incorporated into the soil directly and this may be best. If you do this, remember that you are likely to deplete the nitrogen content of the soil and that you will have to add a higher nitrogen fertilizer to make good this loss. Also remember that the maximum effects of compost on soil structure, such as higher aggregation, pore space and water-holding ability, will be noticed only after several years.

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# Management of Garden Soils

By A. O. RIDLEY

Assistant Professor, Department of Soil Science, University of Manitoba  
Fort Garry, Manitoba

In order to grow well, plants require a growth medium which is fertile, well aerated, moist and friable. These conditions are not always present in garden soils and plant growth is unsatisfactory. The problems that arise as a result can be grouped into those of a physical nature and those of a chemical and fertility nature.

## Conditions of a Physical Nature

When a soil has good physical condition, it is commonly said to have good tilth. It does not become excessively sticky when wet, nor hard and massive when dry. Excess water does not puddle nor drain away too quickly. When it has been worked up by cultivator, or spade, the lumps or clods break down readily to allow the preparation of a good seed bed.

Poor physical conditions generally are associated with:

1. A high clay content which is typical of many soils of western Canada. This causes the soil to have small pore spaces which restrict water percolation, aeration and root development.
2. An excessively high sand content. These soils are generally loose, structureless and have low moisture retention capacities.
3. Low organic matter content. When soils are low in organic content, the problems associated with excessive amounts of clay or sand are intensified. Clays become more massive and sands become less aggregated. Topsoil generally contains the greatest amount of organic matter and is correspondingly darker in color. Subsoil contains virtually no organic matter. Gardens, particularly around new houses or excavations, frequently have had the topsoil removed or buried and have low organic content.
4. Cultivating or digging a soil, particularly clay, when it is too wet, results in clods which become massive when dry, hard to break down, and make a poor seed bed.

## Improvement of Physical Condition

Poor physical conditions of soils can be improved by:

1. Addition of sand to soils with a high clay content. To obtain good results, the soil should be mixed with an equal amount of medium-sized sand, i.e., 3 inches or more of sand should be mixed with 3 inches of soil. Small amounts of sand are of little value. Sand may even be harmful if used as topdressing on lawns.
2. Addition of organic matter will improve the tilth of both clay and sandy soils. Well decomposed manure or compost should be applied every year or two at the rate of 1,000 pounds per 1,000 square feet.
3. Replacement of the topsoil is a simple but expensive way of improving a garden soil but it may be necessary when establishing a garden or lawn around a new home where backfilling has been done with subsoil. A good black soil of loam texture purchased from a reputable landscape contractor is recommended.

## Conditions of Chemical Nature

Conditions of a chemical or fertility nature restricting plant growth are caused by:

1. Low fertility. Sixteen elements are recognized as being essential for plant growth; 13 are obtained from the soil and 3 from the air. Most of the 13 elements are present in adequate amounts for plant growth. Phosphorus, nitrogen, iron and occasionally potassium and sulphur may not be present in adequate amounts in forms which are readily available, but can be supplied by rotted manure and/or mineral fertilizers. Recommendations for fertilizing lawns and gardens are provided elsewhere in this publication.

2. Soil reaction or pH. This refers to the relative acidity or alkalinity of a soil (not to be confused with alkali soils). Soils which are neutral in reaction have a pH of 7. An acid soil has a pH less than 7 and rises in acidity to a pH of 4 or lower (very strongly acid). An alkaline soil has a pH greater than 7 and grows in alkalinity to a pH of 9.5 or greater (very strongly alkaline).

Acid soils are common in areas of high rainfall and where forests form the native vegetation. Such areas are eastern Canada and the United States, and much of Europe. The soils are acid because much of the lime in the soil has been leached out, and lime is often applied to correct the acidity. In western Canada the soils are predominantly neutral to slightly alkaline and do not require liming.

The availability of nutrients in the soil is related to the pH. Most nutrients are available between a pH range of 6.5-7.0. Trace elements such as iron, copper, manganese and zinc, become less available as the pH rises. The availability of nearly all important plant elements except iron, diminishes with increasing acidity.

Gardeners often like to grow plants that are not native to western Canada, for example, plants which require an acid soil when the native soil is alkaline. Alkaline soils can be made acid by adding elemental sulphur. The amount required will depend on the native soil pH and other characteristics which should be determined by soil test.\*

3. Saline soils. In areas of low rainfall or in poorly drained areas, soluble salts may accumulate in the soil. These are most likely to be magnesium sulphate, sodium sulphate, magnesium chloride, sodium chloride and calcium chloride. This condition sometimes can be observed by the appearance of white crusts on the soil surface or by white flecks of crystals within the soil. Most frequently, plants assume an unthrifty appearance, and if the problem is severe will not grow at all. The severity of the problem is best determined by a soil test.\*

Plants vary in their ability to tolerate salt. Among those with moderate tolerance are beets, asparagus, spinach and tomatoes. Plants such as cucumbers, peas, onions, carrots, potatoes, corn, green beans, celery and radish, have low tolerance. Almost all fruit trees have low tolerance. The addition of manure or other organic matter assists plants in overcoming the toxicity, provided the salt concentrations are not too great. There is no chemical treatment for improving saline soils.

\*Provincial soil-testing services are now available at: The University of Manitoba, Winnipeg; The University of Saskatchewan, Saskatoon; The University of Alberta, Edmonton. Information regarding soil sampling and cost of soil testing is available at the Provincial Soil Testing Laboratories.

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# Dwarf Apples in North Dakota

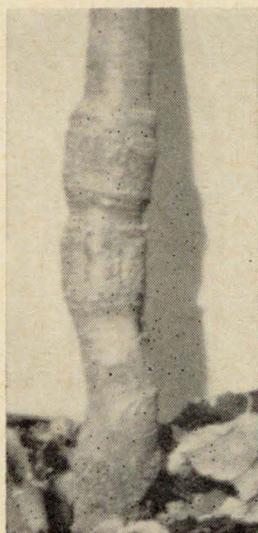
By WILLIAM R. PAGE  
Grand Forks, North Dakota, U.S.A.

My active interest in dwarf apple trees blossomed in 1959. It was then that landscape and fruit garden plantings were developing for our new retirement home on the banks of the Red River in Grand Forks. My interest was directed by Harry A. Graves, Horticulturist, Extension Department, North Dakota State University, to the excellent Cornell Bulletin 783, Rootstocks and Methods Used for Dwarfing Fruit Trees by K. D. Brase and R. D. Way. This stimulating work, plus a careful study of research at United States and Canadian experimental stations indicated certain obstacles to avoid and results to hope for.

Now after 7 years of propagating and growing dwarfs, no serious difficulties have developed, but an apparent incompatibility of dwarf interstems on Siberian seedling roots did occur. However, the extreme of a dream's success was my harvest in 1966 of a peck of Golden Delicious apples from one tree. Many thrills occurred along the way, such as one spring morning to see snow white Dolgo blossoms on a one-year shoot from a bud set on an East Malling IX rootstock.

The advantages of smaller trees for restricted gardens are plain. It also occurs to me that the earlier fruiting of dwarf trees would make replacements less grievous should "killer" weather come. In fact a severe spring freeze could be much reduced by simply covering the dwarf tree with a plastic sheet; heating could be added. Managed properly, dwarfs will do well, at least in protected locations and where trees can be watered when drought comes. Incidentally, my Hybrid Tea roses require more care than my small apple trees.

Professor Brase supplied rooted cuttings and scions of East Malling stocks Nos. VIII and IX. Dolgo, Kerr and Rescue crabs were grafted on these Malling roots or interstems to grow as frameworks for support of less hardy large apples of quality. Other grafts of bark-rings on hardy seedling whips also are in tests.



Double ring EMIX bark graft on Woodarz 48

The story of one tree may well speak for others. A Rescue scion was grafted on EMIX root and planted 6 feet from the east side of the house in spring 1960. The scion failed but one shoot of EMIX grew enough to take a Dolgo bud near base in August 1960. This bud produced a 3-foot whip in 1961. The whip was headed to 30 inches in April 1962 and in May unfolded blossoms from top to bottom. The whip branched and grew well in 1962. With the rashness of a typical amateur, a scion of Golden Delicious was set on one branch in May 1963. This compatible union outgrew other branches, producing 2 vigorous shoots. Three fruit spurs were set and were unhurt by our mild winter with a low temperature of minus 28 degrees. Fruit clusters were thinned to one fruit each. A rainstorm with



Golden Delicious

wind gusts reported at 65 to 75 miles blew the fruit off the tree on September 26. The apples were still green in color but in 60 degree basement storage for 4 weeks turned nicely yellow. Further storage in a refrigerator for several weeks found them of choice dessert quality but not up to a fancy large Golden Delicious from Yakima, Washington.

Only 2 or 3 fruit set in 1965 and developed as runts; perhaps from self fertilization. In 1966 this branch reached full bloom on June 6. No. 7X killed back present after 33°F. below zero in January, third coldest in history here. A heavy fruit set was thinned, one to about 6 inches. Equal pickings were made October 22 and 31. The color was light green to greenish yellow and judged mature enough to approach top dessert quality in storage. After 3 weeks in basement, one sampling was of very good flavor on the way to excellent eating, with longer storage in the refrigerator.

The degree of cold tolerance exhibited in these Malling stocks has been a surprise. The EMVIII and IX rooted stems planted in 1960 were mounded with 6 to 8 inches of earth that fall. They grew to their tips in 1961 after a low temperature of minus 28 degrees in January. I believe all tips were above the snowline. These trees grew where competition from the roots of large native trees may have encouraged proper dormancy for winter. However, the EMIX stem of the "story" tree described above did kill back to a point where it was protected by vermiculite in a 2-quart juice can which topped the snowline and the ground mulch. Perhaps extra water received by this tree delayed ripening of its wood. The next winter brought a low of minus 32 degrees in February but dwarf stems survived above the snow. Roots were protected by mulching plus a foot or more of snow. Unfortunately a summer flood on the river bottom, where most of the East Malling and grafted stocks were planted, killed them all. In my upper backyard one EMVIII, a few crab tops on VIII and IX roots, and also one Dolgo on EMVIII interstems survived.

The winter of 1962-63 was a black one with little snow. The lowest temperature was minus 28 degrees in January. Many usually reliable garden perennials winterkilled. The EMVIII tree had been mounded to about 8 inches for stooling. The mound was mulched with trash around it and 2 inches of settled trash on top. Spring 1963 revealed 2 out of 5 branches dead from crotch browning injury above the mound. A surprise—healthy roots were found in the soil mound within one inch of the top. This plant is located where there is much competition from adjacent plum trees and more distant oak and elm.

The following winter was mild and all dwarf material grew well. Dolgo tops budded in 1960 were 4½ feet to 5½ feet tall. A Kerr tree from

a scion on EMIX set in 1960 measured an 8-foot tip. It bloomed first in 1963 and set a few fruit in 1964. Topworking these crabs naturally delayed their fruiting somewhat. This Kerr tree produced choice fruits of the following varieties in 1966: Haralson, McIntosh, Niagra, Cortland, Currie and Golden Delicious. Measurement on October 6 revealed 10 feet to the tip of Currie branch and 9 feet for Haralson and Niagra. The Dolgo and Golden Delicious of "story" was 7 feet 9 inches. Four grafted stems on another Dolgo/EMVIII root ranged around 9 feet at tips. Further growth is not expected as the fruiting stage is here.

My observations from 7 years of tests as related plus others not described, are reasons for a gardener's optimism. I believe others will succeed with similar methods. When grown in lawn or garden border areas, extra water can be needed during summer, but the competition of other growing things helps to promote dormancy for winter. A 6-inch deep, settled mulch over the area of the Mallings roots should guard against the deep freeze of bare winters. Research has shown that if interior ground temperature goes much below a plus 15°F. East Mallings roots may be killed or badly damaged.

A safer and easier way to grow dwarfs in severe climates may be to graft a dwarfing interstem on certain hardy roots. A deep soil and good drainage will permit planting the trees so that the interstem is just below ground level. An open area at least one foot in diameter should be maintained above the collar position to prevent scion rooting and to provide aeration the first year or two. It is thus easy to mulch this opening around the interstem. Experience here shows that the stem portion of the Mallings will withstand much lower temperatures than would be likely in the pocket that you can provide in the warm breast of mother earth.

For a long tenure Mr. Page was a leader in Extension, Department of Agriculture, North Dakota State University. After retiring he has been able to contribute more of his time to horticulture, doing research, writing, serving as President of North Dakota Horticultural Society and attending most of the meetings of Great Plains section, A.S.H.S., and of the Western Canadian Society for Horticulture. He is an active member of these organizations. Much of his trial work is done on the Page farm, Hamilton. Our cherished neighbor is a frequent visitor to the Research Institute at Morden.

# Problems of the Nursery Industry

By R. H. PATMORE

Patmores Nurseries Limited, Brandon, Manitoba

The importance of tree planting on the prairies has been widely recognized. Large areas are relatively treeless and the planting of trees in such areas has been an essential part of making them livable. Even in those parts where native tree growth does exist the introduction of other species from outside has added greatly to the attractiveness and comfort of living in them.

In fact tree planting on the prairies has been considered so essential, so important, that governments have felt it necessary to go to considerable expense to produce and distribute trees on a large scale for shelter and windbreak purposes, and to spend large sums on research, testing and developing better trees for prairie culture.

The growing and distribution of trees is, of course, the function of the nursery industry, both public (government) and private. This industry is subject to two main handicaps. One is the difficulty of mechanizing tree production and handling, and affects both public and private sectors of the industry. Beyond a few rudimentary processes such as the planting and digging of deciduous trees and some work in the chemical control of weeds, still largely in the experimental stage, the many processes involved such as gathering seeds, grafting and budding, staking, pruning, shaping, handling and grading, still require extensive use of hand labor. For example, the cost of properly digging and balling a 2-foot evergreen now runs close to \$1.00 per tree, plus 75¢ for a carton to ship it in. In a period such as the present when labor is scarce, such a labor-intensive industry faces serious problems.

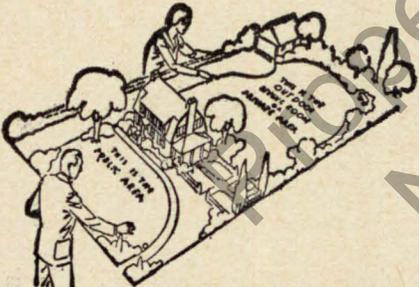
The second handicap, and probably the greater of the two, affects mainly the private sector. This handicap is the difficulty, in fact the impossibility, of attracting capable younger men. This industry has been unable to compete with outside industry in the offers it can make to ambitious younger men. I can think of many who have left the industry during the past 20 years, but can recall none or very few who have entered it.

As men reach retirement age or move out for other reasons they are not being replaced and it can be said that at the moment the nursery industry is facing a difficult situation. This is a serious matter for the prairies. The prospect of prairie homes without an adequate nursery industry to supply the trees and shrubs that make them livable is not pleasant.

Imported trees are not a solution for several reasons. One is that in most cases they are not suitable for prairie culture. Large numbers are brought into the prairies every year and I would be surprised if more than 25 per cent of them ever survive for long. Another reason is that the nursery industry elsewhere is facing the same problem that it faces on the prairies. They are not attracting younger men either. And fly-by-night operators, while they might temporarily satisfy a demand, offer no permanent solution, even when their stock is usable.

There are two types of suppliers in the nursery industry. There is the grower who operates largely on his own. To this man the industry is a way of life. He likes working with trees and shrubs, even if financial returns may be less than he could get in outside industry. He enjoys what economists call non-monetary compensations. These growers operate with a limited supply of labor or none at all apart from their own. If they attempt to expand usually they

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find the labor situation limits their efforts. It seems, therefore, that expansion for them is a practical impossibility in most cases, even if the market permitted it which usually it does not. And small scale operation limits the variety available.

Such growers are not likely to increase in numbers and may not even be replaced as they retire from the scene, assuming the continuance of present economic conditions. Most of them got into the industry before the current economic boom started. Young men who now grow up in contact with the industry but in an entirely different economic environment do not feel drawn to it as their fathers were. They choose the lucrative fields they see beckoning around them, which they find equally interesting as they become familiar with them as their fathers have found the growing of trees and shrubs.

The other type of supplier operates over a wider market. The typical firm of this type depends on labor employed to a limited extent on a year round basis, but largely on seasonal labor. When such labor was readily available this firm had no difficulty operating but the highly competitive nature of the industry has made it difficult to maintain conditions conducive to a stable labor supply. The industry has operated in recent years by depending on the labor it has been able to hold from pre-war years and on men who have come here from the nursery industry in Europe. These older men now are retiring and the younger men from Europe are following the example of the native born in seeking other occupations. A breakthrough in mechanization or productivity in the industry could change the picture, but there is no evidence of this at present.

One hesitates to predict the future. If present conditions continue the industry could be reduced to functioning on a very inadequate scale. Some firms may seek economies of scale by enlarging, but it seems doubtful if these will reduce costs to any great extent particularly in the retail trade, as the point of diminishing returns seems to set in at a fairly low level in this industry. And the wholesale market on the prairies has been too small to justify any great expansion in this field. It would seem therefore that a process of attrition will continue until returns, and this means prices, rise sufficiently to enable the industry to attract able younger men it needs to stabilize itself.

Talk of higher prices will come as a shock. Most people consider prices of nursery stock too high now. And when they are asked the prices that they often are for a particular tree, they can hardly be blamed. But the unpalatable truth is that these prices in general (except for a favored few in a seller's market) just do not pay for the cost of producing and handling at the rates that will have to be paid in the future to get and retain good men.

One noticeable feature of the nursery industry is the absence of big capital in it, not only in Canada but elsewhere as well. Capital has no prejudices when it comes to making money. It will go wherever there is a promise of adequate returns with reasonable safety. The nursery industry even in the heavily populated areas of the United States does not attract it. The large firms there are largely wholesale and family firms which have undergone a process of growth. One of the unpleasant features of such growth in the U.S. is the fact that in many cases it has often been at the expense of low-priced itinerant "bracero" labor, largely from Mexico. It will be interesting to observe the effect of long overdue labor laws recently enacted by the U.S. Department of Labor to protect such labor. In the vegetable industry it is encouraging the invention and use of labor-saving machinery.

Reference was made above to the public sector of the nursery industry in Canada. This government-operated industry undertakes the production and

distribution of windbreak trees to rural areas in the West, consisting of smaller trees handled in bulk. This reforestation includes a number of services such as research, forest protection, etc., and from what I have seen of its purely nursery operation I have judged it to be one of the most efficient in the industry. It has a high degree of mechanization which, of course, the type of material it handles lends itself well to, and a highly developed assembly line method of handling. And it seems to have achieved this efficiency without taking advantage of cheap labor when so much of it was available in the past. Whether it would have a place in the production and distribution of ornamentals is a question for the future and of how well the private nursery industry meets the challenges it faces.

## Hardy Chrysanthemums Are Valuable in Prairie Gardens in Great Plains Area

By H. F. HARP

Technician, Experimental Farm, Canada Department of Agriculture  
Morden, Manitoba, and well known Sunday  
morning CBC Prairie Gardener

A few plant breeders have worked wonders with hardy chrysanthemums in the last 25 years so that now we have a wide selection of varieties quite dependable in most of the prairie regions.

For garden decoration and for use indoors as cut flowers they can provide a profusion of bloom when the perennials have had their innings and the tender annuals are killed by frost.

Hardy chrysanthemums are not long-lived like peonies and daylilies but with proper care in dividing and replanting they can be maintained in good health year after year. Ordinary garden soil without elaborate preparation is quite acceptable to hardy chrysanthemums. Poor soil is improved by spading in rotted manure in the fall in readiness for setting out the young plants in early June. Supplemental doses of 11-48-0 may be applied when the plants are established in July and August. Four ounces to the square yard is the maximum dose applied when the soil is moist and then thoroughly watered in.

Young plants, obtainable from local nurserymen in the spring, are set out 18 inches apart in full sun. Old plants are lifted carefully in early May, detaching healthy stolons (basal shoots) for re-planting in new soil. Plant the stolons firmly and a bit deeper than when attached to the mother plant. To get these root-pieces away to a good start, water them in with a solution of 2 teaspoonsful of 10-52-17 in a gallon of water, giving a half cupful to each plant.

Growth is rapid in June if weeds are controlled and there is no lack of moisture. In July a shallow mulch of peat, rotted manure or lawn clippings will reduce soil temperature and conserve moisture.

It is important to control leafhoppers as they spread virus; tarnished plant bugs suck plant juices from stems to cause malformed blooms; and aphids can debilitate the plants seriously.

Evergreen boughs or brush give good winter protection; grass clippings, wet leaves or other dense materials are not recommended as they tend to smother the crowns.

The hardy chrysanthemum will grow in popularity as new and better adapted sorts are developed; meanwhile choose the varieties listed by your local nurseryman.

# Care and Maintenance of Lawns

By A. C. FERGUSON, Ph.D.

Plant Science Department, University of Manitoba, Fort Garry, Manitoba

Simple starvation is one of the prime causes of weak, thin, weed-infested lawns. Whether it is a new lawn in the process of construction or an established lawn, ample supplies of nitrogen, phosphate and potash are essential.

Prior to seeding or sodding, a fertilizer high in phosphate, such as 10-30-10 or 11-48-0, should be broadcast over the soil surface, at the rate of 10 pounds per 1,000 square feet, and worked into the upper 4 inches of soil. This will ensure an ample supply of phosphate in the rooting zone, and the nitrogen will be all that is needed until the grass is established.

Nitrogen is the nutrient required in the greatest quantity by lawn grasses. If a high-quality lawn is desired nitrogen should be applied at least twice during the growing season; once in early June and again between September 1st and 15th. A third treatment in late June will be beneficial. However, if only one application of fertilizer is to be made, the best results will be obtained by fall treatments. Lawns receiving adequate moisture (approximately 1 inch of water per week during the growing season) either as rainfall and/or by sprinkler, require 3 to 5 pounds of nitrogen per 1,000 square feet per season. This quantity of nitrogen is supplied by 15 to 25 pounds of 21-0-0; 10 to 15 of 33-0-0; or 11 to 18 of 27-14-0. Never apply more than 3 pounds of nitrogen per thousand square feet in any one treatment.

Although some lawns may not need additional phosphate, approximately one pound of this nutrient added once per year, is recommended, especially if clippings are being removed. Phosphate is released slowly and reserves of it are built up in the soil.

An example of how these requirements can be met follows:

Spring: 6 pounds/1,000 sq. ft., 33-0-0, 1.98 lb. N.

Fall: 8 pounds/1,000 sq. ft., 27-14-0, 1.96 lb. N. and 1.12 lb. P.

Total: 3.94 lb. N. and 1.12 lb. P.

In using high-analysis fertilizers (21-0-0 or 33-0-0) which release their nitrogen quickly, care must be taken to prevent burning the grass. These fertilizers should be applied only when the grass is dry and then watered in immediately and if this simple precaution is taken there is little danger of burning the grass, even superficially. The ureaformaldehydes and organic fertilizers release nitrogen slowly and hence are much less likely to burn foliage.

Fertilizers should be spread evenly over the entire lawn area. This is easily done with a well calibrated spreader. Avoid either overlap or misses because an uneven distribution of fertilizer will produce patchiness.

Lawns which have been established on heavy clay soils and sands and/or have a rough, uneven surface will improve with top-dressing. A mixture of sandy loam soil, well rotted manure and coarse sand in the proportion of 1:1:1 is ideal. A sandy loam soil and peat in equal proportions also is good. Just any old black top soil is not good enough. Fine-textured soils high in clay are very undesirable and should not be used for top-dressing. Top-dressing should be evenly spread over the surface of the lawn to a depth of not more than one-quarter inch. Remember, top-dressing is not a substitute for a good fertilizer program.

# Cacti and Other Succulents

By H. H. MARSHALL

Head Gardener, Experimental Farm, Canada Department of Agriculture,  
Brandon, Manitoba

Succulents are fleshy plants that have strongly modified plant forms to fit them for life in an arid habitat. This often gives them a striking or even grotesque form which is the usual reason for growing this class of plant. Flowers vary from small and insignificant to interesting and beautiful. These plants are found in warm or hot dry areas around the world.

Not all cacti are succulent in form nor do all succulents belong to this family. The great cactus family, native to the Americas, contains many species adapted to desert life. However, it contains also a group adapted to living on the branches of trees in the upper storey of moist tropical jungles and on some leafy shrubs or vines.

Succulent species are found in several plant families. The Amaryllis family contains the many species of Agave or Century plant, again from tropical America. A great number of succulents come from arid regions of Asia or Africa but usually these belong to the spurge, milkweed, lily or fig-marigold families. The Crassula, meaning thickish, family contains succulent species from many parts of the world; some are found in the pineapple, sunflower and other plant families.

While succulents belong to many families they have characters in common that enable them to grow in arid climates. Their leaf area is greatly reduced and they may be covered with hairs or with a thick, leathery cuticle to resist loss of water. Their roots are adapted to arid conditions and may be quite intolerant of wet soil.

Because of the reduced leaf area, they require brilliant sunshine to manufacture food at the rate needed to maintain health and vigor. Lack of light is the most common cause of failure to grow well or bloom.

Succulents usually are potted in a coarse, sandy soil which holds little water and will dry quickly. It is a mistake to believe desert soils are sterile sand when in fact they vary in texture and often are rich in soluble salts. Usually they are low in organic matter and nitrogen. Succulents will respond well to moderate amounts of water and fertilizer when growing in full summer sun. At other times do not fertilize and water at intervals up to one month for the thicker-stemmed species.

Certain types of cacti are grown for their showy flowers but these are not the desert species. They grow as vines clambering over rocks, shrubs or trees, and as epiphytes growing in the moss and dead bark on the branches of trees. They include the night-blooming cereus, Christmas, Easter and orchid cactus and their many hybrids.

Flowering cacti should be potted in a coarse, open mixture that may include moss or bark. They should be watered regularly but not kept wet. Those types with thin, flattened stems which serve as leaves will be bleached or burned by full summer sun. They will thrive in brightly lighted shade or winter sun.

Flowering seems to be triggered by different means. The Christmas cactus responds to a long night not broken by lights. Those that bloom in spring do so during longer days. Blooming in the Christmas cactus and others of this group is promoted by being kept moderately dry in late summer, fall or winter. Plants should be watered sparingly for 6 weeks prior to when buds would normally be expected for the particular variety being grown.

Kidney-shaped pond with 3 spray heads at the south approach to St. James Bridge.

## Green Islands in an Ocean of Traffic

By GUNTER A. SCHOCH,  
Landscape Assistant, Parks and  
Protection Division,  
Metropolitan Corporation of  
Greater Winnipeg

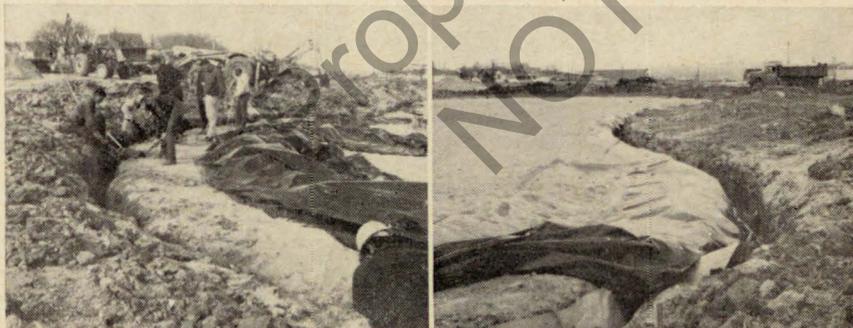
Surroundings of bridge approaches and interchanges in North America are treated usually as lawn areas, possibly with some tree and shrubbery planting. After the Metro Winnipeg Streets and Transit Division had built the St. James Bridge and Interchange, Parks and Protection planned that it would become part of a more elaborate landscaping project. The fact that a major east-west traffic artery passes by this area, and that hotels and residential areas are nearby, called for a rather more ornamental development of these newly created public areas.

The Metro Parks and Protection Division prepared in detail all necessary layout and planting plans for this unusual project. Limestone retaining walls in sweeping curves, pleasing lawn slopes, and a wide variety of woody ornamentals, as well as annual flowers and effectively shaped planting areas, were designed. As the main attraction, water features were included.

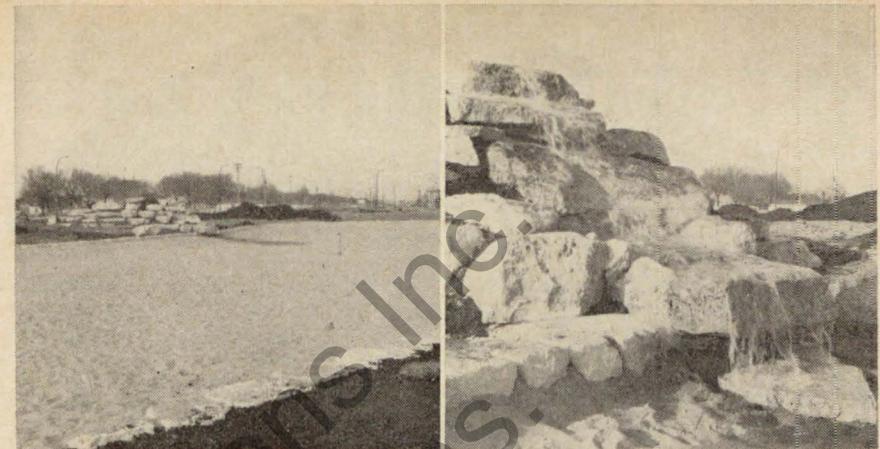
The South Approach, at Academy Road and Kenaston Boulevard, consisting of 3½ acres of land, had been landscaped by a local contractor, according to Parks Department plans and specifications, during the summer of 1964 at a total cost of \$12,000. Its special point of interest is a small, kidney-shaped pond with 3 fountains, walks leading to the pond, and inviting rest benches.

In September, 1964, detailed plans and specifications of a landscaping and irrigation system for the 2 larger sections north of the Bridge were completed and the contract was awarded. These areas include 2 large cloverleaves north of Portage Avenue, and consist of a total of 12.5 acres. This contract price totalled \$60,000, including the sprinkler system for all 3 sections.

**Construction of the 1,900 sq. yd. lily pond on the north side of Portage Avenue. Polyethylene with 6-inch cover of sand is used to hold the water.**



Photos: G. A. Schoch



LEFT—Completed lily pond with a rockery in the background.  
RIGHT—Rockery with waterfall at the west bank of the lily pond.

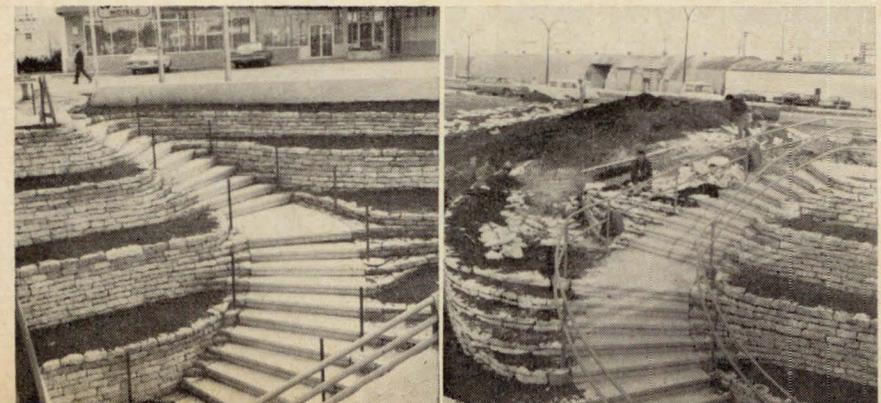
These extensive areas, required a great amount of material. In addition to many other items, over 50,000 square yards of sod, over 1,000 trees and shrubs, 5,500 cubic yards of soil, and over 15,000 lineal feet of plastic pipe were required to complete the landscaping. Special consideration was given to the layout of the 2 cloverleaves, since both can be seen from Portage Avenue.

For the westerly quadrant, an informal layout was designed with a 1,900 square-yard pond as its main attraction. Polyethylene, a comparatively inexpensive material, was used, covered with a 6-inch layer of sand to hold the water. The maximum depth of the pond is 24 inches, the required depth for water lilies. On the west bank of the pond, a rock garden was constructed with large limestone boulders from Stony Mountain. A waterfall, over the rocks into the pond, completes this project.

The easterly quadrant received a very formal treatment, with straight walk-ways parallel to large flower beds and rows of Rosybloom crabapples, towards a large roundel occupied by a circular flower bed. A sculpture or a formal water feature may be installed at a later date, at this location.

This project undoubtedly is one of the largest landscape contracts undertaken in Metropolitan Winnipeg. Great care was taken in designing every detail, and the same care was given to the landscape construction. Resident supervisors of the Metropolitan Corporation observed continuously every phase of this project, now an extremely ornamental green artery of which every Metro Winnipeg resident is proud. Beyond this, it may become an example for North America's town planners, engineers and landscape architects, in making the most of a bridge interchange.

**Limestone retaining walls on both sides of the Portage Avenue underpass.**



# Perennials in the Park Belt

By LAD MARTINOVSKY, Gerald, Saskatchewan

There are a number of perennials which given a little extra care can be grown successfully in many gardens.

The *Scilla sibirica* is the first to bloom in the spring, starting to push through the ground almost before the snow is gone. The bulbs can be planted in amongst trees in partial shade. They have small white or blue flowers and are fairly hardy.

Pasque flower, the Prairie crocus, is the first wild flower to bloom; occasionally double flowers can be found. If planted on sunny banks or slopes they grow well and keep the soil from being washed down by rains. You may find both white and purple flowers.

Fritillaria, of which there are a number of varieties, bloom in early spring. Bulbs are planted early in the fall. *F. pallidiflora* has 6 to 8 pale yellow pendant bells. Some years they are in bloom for Mother's Day. *F. meleagris* has white flowers, or purple speckled with white. Other varieties are *F. ruthenica*, *F. karadaghensis*, *F. pudica*, all are hardy.

If one has a well sheltered location with deep porous leaf mold soil a number of tender flowers may be grown successfully, such as daffodils, hyacinths and narcissus. Snowdrops, Winter aconite and crocuses all grow very well here. Platycodon, the balloon flower, usually single, blue or white, is a summer bloom and likes a sunny location. The Japanese double variety winters well here and could be grown in many more gardens.

A very interesting flower is the colchicum, often called the Wonder Bulb as it will bloom on a window sill without water or soil. It is a member of the lily family and produces large crocuslike flowers in early fall. It is quite hardy. The foliage appears in the spring, dies down in mid-summer, and the blooms appear in September from each bulb without foliage.

*Lycoris squamigera*, often called the hardy amaryllis, produces a flower stalk in late September after the foliage has died down. The lilylike lavender flowers are fragrant, very handsome, and borne in umbels of 8 or more. Strap-like leaves appear in the spring and remain until mid-summer. It often takes a year or two to get them well established and they may not bloom until then.

*Cypripedium*, the Pink Lady Slipper, and Marsh Marigolds grow very well on the north side of a building where they can get a little shade and extra moisture from the run-off the roof when it rains. Plant them in soil rich in leaf mold. Another flower that can be grown is the Jack-in-the-Pulpit, *Arisaema triphyllum*. Plant on the north side of the house where it gets the morning and evening sun and a little extra moisture.

Two years ago when I was visiting in the interior of British Columbia I saw some beautiful fall asters, Michaelmas daisies, which were grown from seeds and brought some back to Saskatchewan. The small shoots were planted late in the fall and wintered well. A mauve pink aster, very double, with flowers about 2 inches across, grows about 3 feet high, covered with flowers; I call it Shuswap. Another aster, blue, not quite double and a trifle smaller, grows about 3 feet high, is very floriferous; I call it Lee Creek. *Lychnis viscaria* grows about 1½ feet tall. It likes a sunny position in well drained soil and has very showy pink flowers.

Lythrum, a herbaceous perennial in several colors from pink, rose to purple, is a mass of bloom all summer until frosts come. We do not find many

plants with such a long period of bloom. You may miss the beauty with one plant, but plant a row and everyone will stop to admire.

Potentilla, the Shrubby Cinquefoil, in variety, a low, hardy shrub, flowers freely all summer in white, pale yellow and gold. The double-flowering Prairie Almond is considered by some to be not too hardy. I have seen it planted on the south side of the house. It stood the hot sun in summer, and the frost and sun in early spring and blossomed very well. It really is a very beautiful shrub with its pink double flowers.

*Viburnum trilobum*, the High Bush Cranberry, is a very decorative shrub which can be found growing in the valleys. The large, indented leaves take on an attractive red color in the fall. White blossoms in the spring are followed by clusters of bright red berries which may be used for sauce or jelly. If the berries are left on the shrub for ornament they will stay on all winter until the birds clear them off.

## Staking Tomatoes

By D. H. DABBS

Assistant Professor of Horticulture,

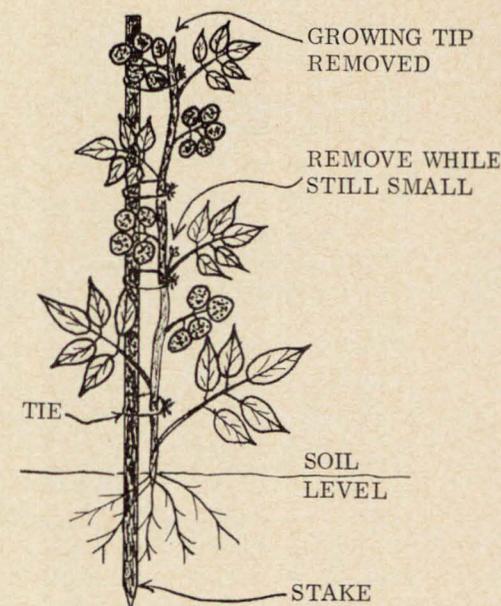
University of Saskatchewan, Saskatoon, Saskatchewan

The vast majority of tomatoes presently grown on the Canadian prairies are of the determinate or so-called self-pruning types. Many home owners, however, still prefer to grow at least a few plants each year of the non-determinate or staking tomato types. Also, there are some persons who prefer to treat the self-pruning types as staking varieties. This practice often will result in earlier ripening and larger size fruit but generally a smaller total yield.

Regardless of the reasons for staking a planting of tomatoes, the training of these plants must be done properly if the desired results are to be obtained. This training consists of the early removal of developing lateral branches, and supporting the plant with a stake.

A 4- to 5-foot stake should be driven into the soil close to each plant at transplanting time. If the plants are somewhat leggy they should be tied loosely to the stake with a soft cord at this time. Each plant must be trained to a single stem by the removal of the small lateral branches as they appear in the axils of the leaves (just above the point of leaf attachment). This removal may be by the nails of a thumb and forefinger, or preferably by a sharp knife.

As the plant height rises it should receive an additional loose tie every 6 to 8 inches of stem length. After 4 to 5 of the fruit clusters have set, the plant should have the growing point removed. This will permit the plant to direct all its energies towards the development of the fruits already begun. Check each plant periodically for the remainder of the growing season for new lateral branches from adventitious buds which should be removed as they develop.



# Compost Valuable for Tilth

By CHARLES F. CROWE

President, Saskatchewan Horticultural Societies Association,  
Regina, Saskatchewan

Soil is the storage house for certain elements and compounds used by plants as well as the home of their roots. It is the task of the plant grower to maintain these elements and compounds. Thus, the physical and the chemical composition of soil is most important in plant production.

Soils vary in physical composition and may be classed as sandy, loamy and clayey. The physical condition of a soil can be improved by drainage, by tillage and by incorporating organic matter. If one expects a good yield of vegetables, fruits or flowers, the soil must be in good physical condition. Therefore, yield or garden results depend upon a soil with good texture and well prepared.

Plants in growth utilize various soil elements; those most heavily drawn upon are nitrogen, phosphorus and potassium. Each is essential to good growth of particular parts of a plant and its absence is denoted by stunting or poor coloration of parts of a plant.

Nitrogen must be available in soluble, nitrate form, particularly calcium nitrate or potassium nitrate, the latter for horticultural purposes. Nitrogen hastens leaf growth and size of plant but too much produces too lush growth and retards the maturing of fruit. This element promotes good lettuce, cabbage and leafy plants.

Phosphorus, available in soluble phosphates and bone meal, hastens growth of seedlings and develops a strong, healthy root system.

Potassium improves the general health and vigor of the plant. It promotes plant resistance to fungi and extends vegetative growth.

Most soils have an ample supply of the other seven or eight necessary elements. Iron may be deficient when a plant yellows in color.

To maintain the plant elements, plant residue, farmyard manure or commercial fertilizers must be used. Almost complete mechanization of our agricultural industry has made a valuable source of plant elements (barnyard manure) scarce and expensive to secure. Commercial fertilizers are readily available but their use does not maintain good soil tilth.

How then can a gardener provide the plant elements, maintain a good soil texture, and provide humus? The answer is compost.

## What Is Compost?

It is waste vegetable matter, plant leaves, grass cuttings, left overs from the garden and preparation of vegetables in the kitchen. Do not use diseased plants or weeds that are almost mature. It is an inexpensive source of material valuable for conditioning the soil.

One should choose a location in a secluded corner of the garden. Scoop a shallow pit about five inches deep four by five feet. Place a layer of absorbent plant material in the bottom of the pit. Pile in all plant debris to a layer of five or six inches deep, packed in tightly. Water well, add any kitchen material, tea grounds, orange peels or other materials that decompose easily,

and cover with a two inch layer of soil. Continue adding six inch layers of plant material, moisten and cover with soil. Do not pile your compost heap higher than four or five feet. The top layer should be saucered slightly to catch rain and maintain the moisture content.

The compost pile should be watched from time to time and kept moist while decomposition is going on. To hasten decay the pile should be turned after about five weeks. In turning, place the outside material of the pile in the centre of the new pile. The pile, if kept at the right moisture, should be completely decomposed in about three to four months. Other factors which hasten decomposition are temperature (warmth) and aeration, and whether or not you add some fertilizer to each packed layer.

Compost when decomposed is a valuable source of humus. It may be used to improve the tilth of the soil; to supply some plant nutrients; to supply a medium for useful bacteria and decomposition micro-organisms to function; to provide water-retaining material in the soil; to open the soil particles and assist aeration; to assist in warming the soil; to supply mulch for flower beds or around the base of vegetables and fruits and shrubs. Screened compost can be used as a lawn dressing and to mix with soil for potting plants in spring, or seeding mixtures.

There are various types of compost housings. An easy and inexpensive type is a fence of mesh wire around the lower layers. This will hold the pile compact and prevent rodents from entering the pile. Cindercrete blocks can be laid out to make the foundation for the pile.

\* \* \*

*The cultivation of the earth is the most important labor of man.*

*Daniel Webster.*

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# Fireblight— Its Prevention and Control

By R. H. KNOWLES, Ph.D.  
Associate Professor of Horticulture  
University of Alberta, Edmonton, Alberta

Before too many weeks of spring are past Albertans will be welcoming the apple blossom. It is paradoxical that these same blossoms must herald also the start of the fireblight season.

For those who have not seen a favorite old tree suddenly go down riddled with the disease, or a young tree destroyed the year it comes into bearing, the term fireblight can have little real meaning. Yet, this is what one must learn to expect — that is, if one is not prepared to do anything about it.

Fireblight is a bacterial disease and the scourge of apples, crabapples and pears. To a lesser degree it attacks cotoneaster, hawthorn and mountain-ash. Fortunately it does not bother other types of fruit, although pathologists have reported something similar on the saskatoon. The name of the disease actually is descriptive because when it is first noticed the damage to the foliage is not unlike that caused by fire. In other words, foliage from infected twigs turns brown, brittle and lifeless.

It is really not surprising that the fireblight season should start with the first blossoms for the disease organism is carried from tree to tree by pollinating insects, and the bacteria which the insects easily pick up from infected plants can gain entry to healthy material through the nectary of the flower. The first indication of the disease generally appears after the petals have dropped and following the first stages of fruit development. At this time the fruit clusters, complete with foliage, shrivel and dry with the fruit seldom reaching a size larger than that of a mature pea.

These early symptoms of fireblight are easily recognized and if the damaged portions of the tree are removed and **burned** when noticed, little future trouble should be expected. Because bacterial diseases are easily spread from place to place by pruning equipment, care must be taken to see that all tools are sterilized prior to making each cut. One of the most satisfactory materials for this purpose is a solution of strong disinfectant (Lysol or Formalin) in glycerine. Since both the basic ingredients are harmful to exposed parts of the body, glycerine works much better than water as a carrier because it does not drop from the tools as readily. Nevertheless, as an added precaution I would consider it wise to use some form of safety goggles to protect the eyes.

When infected portions of the tree are neglected, they act as a source of inoculum for spread of the disease. As I have pointed out, insects chiefly are responsible for its spread in the spring, but I would make it clear also that bacteria can be washed from diseased to healthy portions of a tree by rain, and should the organism fall on an open wound it will have no difficulty entering the tissues.

These secondary infections often are the worst because they are not confined simply to new growth. Frequently they show up on the actual framework of the plant, and when this happens control may call for the removal of whole limbs or indeed sizeable portions of the tree.

The amateur often will not notice secondary infections until large sections of the tree turn brown. In order to avoid such traumatic experiences,

one must learn to recognize secondary infections when they show up. Generally these take the form of swollen cankers on the limbs and trunks; often they split, allowing a watery exudate to leak out. The only method of attack under these circumstances is to cut back into healthy wood at least 6 inches below the canker. Needless to say the sanitary measures already recommended should be practised, and all infected parts of the tree should be burned immediately.

One of the most important chapters of the fireblight story is that dealing with prevention and it is quite probable that if more attention were given to this aspect the disease might not be quite so much of a problem. A few years ago rave notices were given to the use of antibiotic materials for control of fireblight and this might have received more widespread acceptance had not alert food and drug people discovered that the antibiotic was showing up in measurable quantities in honey supplies. Because of this, control by these means is no longer being recommended. Fortunately Bordeaux mixture can be used effectively in a prophylactic way by spraying the blossoms just as the buds are beginning to swell, again when the blossoms are fully open; and a third time when the petals are beginning to fall.

If home owners are prepared to take these precautions there should be no reason why hardy varieties of apples, crabapples and pears cannot be used throughout Alberta to provide the same sort of spring show commonly seen in other parts of the prairies.

A summary of the important procedures is given below.

- Spray trees 3 times with a weak Bordeaux mixture during the flowering period. Bordeaux mixture consists of 2 pounds copper sulphate, 4 pounds hydrated lime and 40 gallons water.
- Cut out infected parts at least 6 inches below the damage. Disinfect all pruning equipment before each cut is made using a 1 to 50 solution of Lysol in a 50/50 mixture of glycerine and water. Burn all diseased tissue as soon as it is removed from the trees.
- Watch for swellings on trunks and branches, particularly those oozing sap. Cut these out when observed and burn immediately.
- During early spring, cut out and burn any limbs showing lesions; on these, usually the outer bark will be curled back. When pruning is done during the dormant season there is no necessity to disinfect pruning tools.
- All wounds should be treated with a proprietary tree paint to prevent further invasion by the disease. Such paints are on the market and generally have an asphalt base.

*You plant and transplant and are dirty and amused.*

*Gray.*

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# Growing Roses in Calgary

By MRS. W. H. DOWLING

President, Calgary Rose Society, Calgary, Alberta

For years growing roses in Calgary had been considered practically an impossibility owing to the heavy, hard frosts of our winters, and the sudden Chinook winds which blow at intervals during the winter, such as we have had this past winter. After starting early in December with extremely cold weather and lots of snow and continuing into mid-January, the Chinook wind followed and raised temperatures to well above freezing, 50 degrees to 60 degrees, and melted most of the snow covering, with temperatures above freezing often even at night. These warm spells cause the sap to flow and subsequent freezing may injure the plant or even kill it.

The hardiness and the beauty of the wild Prairie rose, emblem of the Province of Alberta, led many to believe it possible to grow cultivated varieties here also. In the last few years the number of rose growers has risen greatly and many plant the newer varieties as well as the older ones which have been tried and proved. Bushes grafted on *Canina* understock appear hardier, although some people are trying to grow some varieties on their own roots and a few seem to have had fairly good success. However, the winter care likely will tell the story, as this is one of the main conditions for success in rose growing.

Roses should never go into the winter with dry roots, so should have a good final soaking just before freeze-up, which in this area would be about the end of October. Leaves should be removed, and the bushes pruned only lightly as they will need more pruning in the spring, and should then be covered with soil from some other part of the garden, about 10 inches or 12 inches deep. Straw or boughs may be laid on top if desired.

Before covering one may tie the canes lightly with soft twine to make the bush more compact, and may use butter boxes with both ends removed or plastic rings, etc., to hold the dirt, peat moss or straw, whichever is preferred. They may be wrapped also with perforated plastic before covering, which would keep them clean and have less tendency to harbor insects. Do not uncover the bushes until the first week in May, and then uncover very carefully and gradually, as some bushes start to bud earlier than others and you may injure or knock off the new sprouts.

Spring pruning should be done shortly after uncovering. Some growers apply paint or wound dressing; this is not absolutely necessary but does protect against insects and disease entering the canes. Also, the ground should be disinfected well around the bushes after uncovering. Pruning shears should be sharp and clean for cutting away all dead and diseased wood. Shape your bush the way you want it to be by pruning  $\frac{1}{4}$ -inch above the bud which points in the direction you prefer the growth to be. Canes after spring pruning should be 10 inches to 12 inches in height. This applies only to Hybrid Teas; some other varieties do not need to be pruned as much.

During the first year, no additional fertilizer need be applied other than that given at the time of planting, namely, a good all-purpose rose fertilizer. Established roses should have a good fertilizing after uncovering and pruning in the spring, with a 5-10-5 formula fertilizer. Repeat around

June 1st, and finally about July 1st. Feeding after that tends to keep the wood too soft going into the winter.

Roses need lots of water and should not be allowed to become too dry. The water should not be sprinkled on the leaves, as this is likely to cause blackspot or mildew, but should be done by ground soaking, about once a week. Plantings against walls require watering oftener. Dusting or spraying for insect control should be done at weekly intervals throughout the growing season, right through until frost. Cultivation should be light so as not to disturb the roots. Light mulching with peat will help to keep the weeds under control.

The selection and planting of the bushes must be given much consideration. Choose well shaped bushes with at least 3 good, strong canes, preferably not sprouted. When planting, pick a place that gets at least 8 hours of sun a day; and, if possible, has a slightly acid soil with a pH rating of 5.5 to 6.5, good drainage, good circulation of air, and protection from the wind. Spring generally is the best time for planting in this area. The individual holes must be wide enough and deep enough to accommodate all the roots without crowding.

The most popular roses grown here are the Hybrid Teas, Floribundas, Polyanthas and Miniatures. All are quite hardy. Climbers are becoming more popular although they need more winter care. Some new varieties of climbers that bloom on the first year's wood are now on the market. These are very good also. Climbers must be laid down and covered in the winter.

The Calgary Rose Society which was formed in 1960 received its charter under the Societies Act of the Province of Alberta on March 26, 1964, although it had been in existence for several years previously. One of its main objects, since its inception, has been the establishment of a Rose Trial Garden on June 2, 1964. This was made possible through the co-operation and assistance of the City Parks Department who willingly furnished the land in their Glenmore Nursery, agreed to plant and care for the bushes, and also to look after the recording of the results.

The Society supplied many of the bushes; other donors were H. M. Eddie and Sons, the City of Calgary, and one of our own members, Mr. Paul Soulier. There are at least 35 varieties, and we have been told by Mr. S. H. Daines, Assistant Parks Superintendent, that the City is well pleased with the effort, plans enlarging it this spring, and also will plant roses in some of the other parks. We believe this trial garden to be the first, if not the only one in Canada, started by a rose society. As soon as the Miss Canada bushes become available we intend to have a good showing of them as well. We have plans to purchase more bushes this year, and to replace those which did not do too well.

We held open house and served tea on September 12th at the rose garden. It was a fine day, and we had a good attendance of members and friends. Unfortunately a killing frost had come 4 days earlier, and while the roses did not look too good, one was able to appreciate just how beautiful they had been a few days previously.

At our annual horticultural show the Rose section has expanded considerably every year for the last 4 or 5 years, in quality as well as in numbers. The many excellent challenge trophies, the ribbons and the prize money are great incentives for growers to improve their rose culture, and so in the coming year we hope to have a larger, better, and lovelier display than ever before.

# Plants for Carpet Bedding

By ELIZABETH PARKIN

Greenhouse Supervisor, Wascana Centre Authority, Regina, Saskatchewan

Carpet bedding was well known in the gardens of Europe where many low-growing plants were planted close together to give the effect of a carpet. Often the design was very intricate and each variety was separated from another variety by a clipped hedge; this also was quite low so that the other plants were not hidden. Nowadays carpet bedding is used mainly to symbolize or recognize some public event such as the Boy Scout anniversary or Centennial Year. Floral clocks also use this bedding technique but there is room for carpet bedding in any formal area, maybe associated with a paved patio.

Plants used should be slow-growing, compact and of low-growing habit. They may be grown for the color of the leaves, or the flowers, and sometimes both. Some of the foliage plants may need clipping to prevent flowering, i.e., *Pyrethrum aureum*; or to prevent them growing too tall, i.e. *Santolina chamaecyparissus*. This clipping may need to be done several times during the summer and dead flowerheads should be removed regularly. Colors should be bright and placed in the design so that one contrasts with another. Mixed varieties are not advisable as the whole effect of a rich carpet or definite design may be lost.

Some of the most effective plants to use are grown for their foliage only, one of the best being various varieties of *Alternanthera* which range through green, greenish yellow and shades of red. Cuttings can be rooted in late summer and grown on through the winter. *Iresine Herbstii* also has red foliage; it needs to be kept pinched back when in pots over the winter, and clipped when growing in the bed. *Pyrethrum aureum* is grown as an annual for its greenish yellow foliage. *Santolina chamaecyparissus* is grown for its silver foliage; it is very responsive to clipping, makes a very even edging or outline, and may be over-wintered inside from year to year. Another plant which may be used for its silver appearance, yet has a very different form to the santolina, is *Echeveria secunda glauca*, which looks a little like a broadleaved Hen and Chickens or House Leek. Yet another silver-leaved plant is *Centaurea candidissima* or Dusty Miller which is grown as a half-hardy annual; it is a little taller than the plants mentioned previously so may be better mixed with annual flowers.

Flowering plants which are suitable include varieties of alyssum such as Royal Carpet which is the well known purple. New Carpet of Snow and Little Gem are superior to Carpet of Snow which becomes too rampant in growth. During the latter part of the summer lobelia variety Blue Gown gives a true blue color but Crystal Palace has the added advantage of brownish foliage. Lobelia is not always successful in the dryer parts of the prairies. On the whole ageratum is too tall for carpet bedding but there are a few varieties on the market such as Little Blue Star which enables one to include powder blue in the color scheme.

Fibrous-rooted begonias make an ideal subject for carpet bedding; the colors range from white to pinks to reds, with green or reddish foliage. The variety Lucifer grows well in full sun and others grow well in semi-shade. Yellow shades can be introduced by the use of dwarf marigolds such as Butterball or the Cupid varieties.

On the whole foliage plants are the most suitable types of material for carpet bedding but flowering plants can be used. They should all be planted fairly close together, 4" to 6" is the normal spacing.

# Gladiolus Hybridizing Problems

By J. R. ALMEY

Winnipeg, Manitoba

Considerable has been written about the mechanics of hybridizing gladiolus but little about the problems encountered before a seedling becomes numerous enough to be named and marketed.

It is doubtful if 2 seedlings raised in the last 40 years could be said to be exactly alike. Therefore, when a seedling blooms for the first time, and is considered by the hybridizer worthy of selecting, here is a new flower of which there is only one bulb in the whole world, and possibly a few bulblets. One must keep in mind that if one gets a worthy seedling in 3,000 raised he may be fortunate. By "worthy seedling" I mean one that is an improvement on present-day varieties with similar characteristics and color.

If the selected bulb encounters anything lethal, years of work may easily be ruined. Uppermost in the activities of the grower must be attention to keeping the stock of the selected seedling healthy. Virus and other plant diseases annually take a heavy toll of our glads. There is no known method, outside of the research laboratory, to control virus diseases in gladiolus, and once virus contaminates a plant its destruction is the only course left to the grower.

While some authorities advocate breeding for disease resistance, the main control methods for virus diseases are plot isolation, insect control, and strict, timely removal of plants showing symptoms of virus diseases. One must keep in mind that while a plant may show no signs of virus infection the plant may already have been infected from neighboring plants, and the following season symptoms may appear. Many other garden crops, cucumbers and beans in particular, are sources of virus that is easily transferred by insects (leafhoppers and aphids) to the gladiolus plants. Weedy surroundings containing wild asters and goldenrod must be eliminated or treated. Many wild plants are virus infected. The most common symptoms of virus in glads are streaked petal colors; greenish, off-color blossoms along one side of the stem only, generally undersized; a mosaic pattern to the leaves; and a general stunting of the plant's growth.

Due to our short growing season, increasing the stock of a selected seedling often presents a problem. Bulblet production is the only practical method of rapid increase and the number of bulblets a plant develops varies considerably. The tendency for late-blooming seedlings or old bulbs is to produce fewer bulblets, therefore careful saving is necessary of the few bulblets the bulb produces the first season it is selected. Extra care the next season to get these few bulblets to germinate should be practised.

Good normal flower production can be expected from small and medium-sized bulbs in long-season areas, but to have a plant blooming just before frost destroys all further growth one finds it difficult to fairly assess its ability. Selection would be easy if one knew the plant was doing its best the first time it bloomed, regardless of season, size of bulb planted, or weather conditions being encountered. This uncertainty causes many bulbs to be given a second chance. Too many selected bogs down the undertaking. To be over lenient when selecting may offset any good ones being missed, but the note taking, labeling, separate cleaning, bulb treating, and again plant-

ing of bulb and bulblets, easily explain why new introductions have been costly to produce, and often are worthy of a high introductory price.

While it is not really a problem, the task of taking notes describing all selected seedlings and rating them each year is very time-consuming. Last year (1966) I planted 427 selected seedlings. Each one is numbered so that its parentage can be traced individually. The bloom is cut before any florets fade, placed in water, and the next day, if possible, notes are taken on its qualities. At bulb-cleaning time those which do not rate high enough to warrant further growing are discarded. While the 427 selected seedlings grown in 1966 may suggest the separate treatment of that many lots only, there are additional lots due to bulblets and small sizes of these 427 grown separately. With varieties grown during the past season the total number of separate, labeled lots grown amounted to 904. When it is nearing October 10th, and there is danger of getting frozen in, the digging of this number of lots presents more than a problem. It is a lot of work, but perhaps I'm a poor relation of the "backyard millionaire."

If one did not take such notes it would mean growing many over and over again for no good purpose. Plants react differently to the varied seasonal climatic conditions. The ones that bloom when the day temperatures hover around 90 degree are in trouble. The ones that bloom in late September are favored, but next year they may bloom in mid-August and then can hardly be recognized.

The notes taken can be used in future years as a reference when for various reasons no notes were taken the past season. Sometimes uninvited visitors attend the garden. If they help themselves to the selected seedlings only a year is lost, but if the cut bloom is among those blooming for the first time, the bulb of the plant so cut goes out into the discard without being seen.

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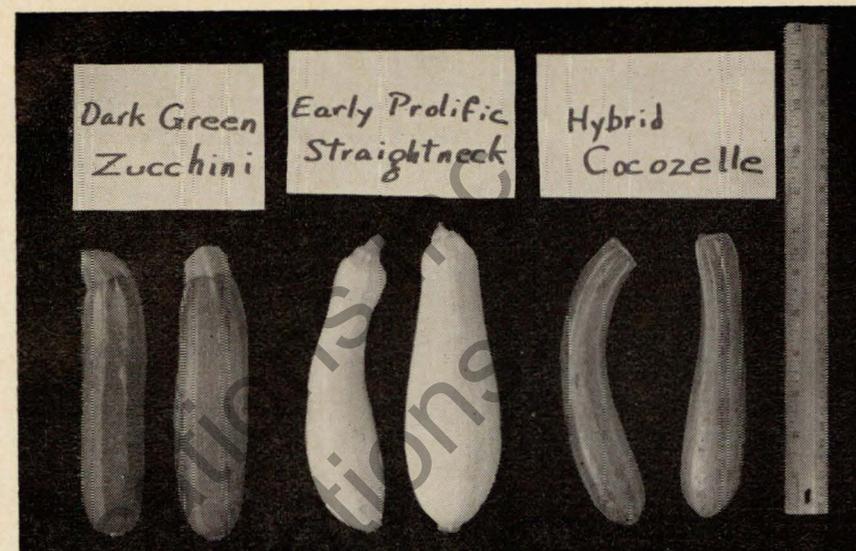


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## Better Living with Vegetables

By J. D. CAMPBELL, Ph.D.

Plant Science Department, University of Manitoba, Fort Garry, Manitoba

Growing and preserving vegetables can provide us a useful and pleasant activity. The time spent preparing the seed bed, sowing, weeding and the many other requirements give us healthful physical exercise. Scientific evidence is accumulating from many workers that high cholesterol levels are related to high incidence of heart diseases. Two useful ways to keep cholesterol down to safe levels is to exercise more and lower consumption of rich, high calorie foods. Growing and eating vegetables will do both.

The highest quality of most vegetables can be obtained only when they are picked, prepared and eaten all in the same day. The next highest quality can be obtained if you freeze or can at the same peak of condition. All vegetables tend to lose flavor in storage; poor storage adds to the problem. People who depend entirely on fresh and processed vegetables from the supermarket never enjoy the full flavor and aroma of home grown, home processed vegetables. Often varieties of the highest quality lack the ability to yield, hence probably will not be grown for commercial production. Most people on the prairies now have either a deep freeze or a frozen food compartment in their refrigerator. Highest quality usually is obtained from freezing. It takes less time to freeze than to can vegetables and the cost of containers is less. In purchasing processed vegetables part of the price goes to transportation; growing your own should enable you to cut down on the cost of food.

Every year interesting new vegetable varieties are introduced by plant breeders and seed companies and there is a challenge in trying out new varieties. When enough growers have tried and liked a new variety it may in time replace an old, standard variety. Thus growers who wish to experiment may play a part in the constant quest for a better, more interesting life. One of the recent trends is towards vine crops which no longer vine. Crops such as

pumpkin have required a great deal of space due to their tendency to spread. Now some bush varieties occupy very little space and the fruit sets at a central location, making harvesting easier.

Summer squash and a pumpkin variety now available have this bush habit. Summer squash varieties of this nature are Zucchini, Early Prolific Straightneck, Greyzini, Chefini and Cocozelle; all are rich in color and high in vitamin A. For highest quality they should be picked when very young and tender, about 7 inches long. To cook, slice through the skin every one-eighth inch and then boil slowly in a small quantity of water flavored to taste. Summer squash can be frozen by slicing, blanching for 3 minutes, then chilling quickly, draining, packing and freezing in plastic bags for year around enjoyment and health-giving minerals and nutrients.

#### Zucchini Casserole

A mouth-watering casserole bound to please the family is given below.

1½ lb. Zucchini squash; 1½ lb. ground beef; 1 medium onion, diced; salt and pepper; ½ lb. Cheddar cheese, shredded; 1 can condensed cream of mushroom soup; ¾ cup milk; 8 servings.

Trim and slice Zucchini. Cook in small quantity of boiling salted water until just tender — drain. Frozen squash may be used in place of fresh. In dry skillet cook ground beef until lightly browned. Pour off excess fat and add onion. Season to taste. Cover and cook over low heat until onion is barely tender. In lightly buttered 2-quart casserole, arrange layers of Zucchini, meat and cheese, ending with cheese. Combine soup and milk, pour over all. Bake at 350° for 35 minutes or until bubbly.

Other new bush types are Cheyenne Bush pumpkin and Gold Nugget winter squash. The Bush Unconn is a small, acorn type of fall squash. All will store well for several months when kept in cool, dry storage.



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# Gloxinia Culture

By F. J. WEIR

Provincial Horticulturist, Manitoba Department of Agriculture and Conservation  
Winnipeg

The commonly known Gloxinia is a very popular house plant developed from a native Brazilian plant known as *Sinningia speciosa*. Botanically, it belongs in the same family as Saintpaulia or African Violet, Achimenes, Episcia and Streptocarpus. Gloxinias are grown mainly for their attractive summer display of tubular flowers with flaring petals. Colors of the flowers range from white to rose, crimson, and purple. Some are self-colored; others are edged or spotted with contrasting or harmonious colors. Although gloxinias can be grown from seed, desired varieties are propagated vegetatively, usually by leaf cuttings.

The gloxinia is a tuberous plant; that is, the flowering portion grows from a tuber, and it is similar in its growth habits to the tuberous begonia. The leaves are fuzzy and velvety and grow in rosettes. The flowers are borne on stout stems 6 inches or more long.

Although most seed companies sell seed of gloxinia in mixture, the following named varieties are procurable now: Emperor Frederick, red with a white border; Emperor Wilhelm, blue with a white border; Etoile de Feu, bright red; Foi des Rouges, deep red; Tigrina, spotted in all mixed colors; Mont Blanc, pure white; Prince Albert, deep blue; Blanche de Meru, white with a pink border; and Queen Wilhelmina, carmine.

If plants are to be grown from seed, it is important that the seed be fresh. If obtained in early fall when it is usually listed in seed catalogues, the seed can be started in February or March. A suitable soil mixture is equal parts of shredded peat or sphagnum moss, sand and leaf mold. To avoid damage from soil diseases, it is wise to pasteurize the soil by adding one cup of water to each gallon of soil medium in a kettle, and baking for 45 minutes at 180°F. The soil is then emptied out on a clean newspaper and kept for 24 hours before use.

As gloxinia seeds are very small, it is not necessary to cover them with soil, but the soil surface should be quite level. After sowing the seed on top of the soil mixture, the container should be set in a pan of warm water and left until the moisture has reached the surface of the soil. The container should then be covered with a pane of glass, and kept in a warm room. Seedlings can be transplanted to a flat when they are large enough to handle, and later from the flat to 3-inch pots and finally to 5-inch pots. The soil mixture for the flats and pots should be equal parts of shredded peat moss and sandy loam with a little well rotted manure and coarse sand. When transplanting, the tubers should have their tops even with the surface of the soil which should be ¼ inch below the rim of the pot, to allow for watering.

Many seedlings started in February or March will have blooms in late summer, but the best flowers are produced by 2-year-old plants. The tubers are ripened off as explained later and can be stored and brought into bloom yearly for many years. There are cases on record where tubers have been kept and have produced flowers for over 50 years.

Many gardeners make their start by purchasing tubers. When these are available, usually in early spring, they are potted with the cupped side up,

in 5-inch pots as outlined above and grown in an east or a west window. Gloxinias do not do well in a south window unless screened from the hot sun by curtains. A moist, warm atmosphere is essential. The soil should be moist but not soggy wet, and water must be kept off the leaves. When the flower buds are forming, liquid fertilizer can be applied twice a week. As soon as the flowers open, feeding is discontinued and the plants can be set in a cooler area to prolong the floral display.

After the blooms have faded water is withheld gradually; when the leaves have died, the pots are stored on their sides for at least 3 months, in 50° to 60° temperature. Occasional light watering during the resting period will keep the tubers from drying out. When small, new leaves appear, the tubers are repotted in fresh soil and the cycle is repeated.

If one wants a new plant from a named or a desired variety, the popular method is to use leaf cuttings. With a sharp knife or a razor blade, a mature leaf at blooming time is cut from the plant, leaving ½ or ⅔ of the stem attached to the leaf, and inserted in water or a good rooting medium such as perlite or turface. The stem first sends out a thin rootlet and before long a thickening may be seen at the end of the stem. This is the beginning of the tuber. From here more rootlets are sent out until a mass of roots has been formed and the end of the stem is about half an inch in thickness. The whole leaf, tuber and roots may now be potted up, using care that the leaf is not damaged. The soil mixture is as suggested previously. The leaf eventually will shrivel and die but the tuber should be watered, and if it is firm, finally will send up a sprout. Plants started this way in early summer can be healthy flowering plants in one year's time.

Gloxinias require temperatures of 70°F. or above, with relatively good light and high humidity for healthy blossoms. If stems begin to grow long, if the plant becomes spindly, if the leaves curl under on the edges, usually it is because the light is not sufficient or the air is too dry. Frequently dry air will cause the buds to drop before opening. Enclosing the plant in a polyethylene bag will keep the humidity at a satisfactory level.

If these few seasonal cultural conditions are provided for the gloxinia, the display of beautiful flowers and attractive foliage is most rewarding.

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## Visit Wascana Centre

By P. J. MORAN

Executive Director, Wascana Centre Authority, Regina, Saskatchewan

When an act respecting an area to be known as Wascana Centre was passed by the Saskatchewan Legislature in 1962, it included approximately 1,300 acres of land and water and the area has since been enlarged by an additional 300 acres of land.

Wascana Centre covers an area of land surrounding Wascana Lake in the City of Regina, seat of the government of the Province of Saskatchewan, planned for the enlargement of educational opportunities, the advancement of the cultural arts, and the improvement of recreational facilities. For almost every resident of the Province, there is something existing or proposed which should satisfy individual interests.

Whether it be music in all its varying forms, the interesting architecture of government and university buildings or park facilities, the seasonal sports activities for young and old, the participation in expression of free speech, the utilization of passive park areas, or the abundance of nature in waterfowl form, Wascana Centre comes close to representing a total environment. While people with their own limited interests no doubt will isolate these areas and search them out, it will be those people with a horticultural flair who will be able to detect the means by which the continuity of Wascana Centre is maintained. Just as the park land of Wascana and that of the legislative grounds arose out of the gumbo of the Regina prairies, so too is a new environment developing at the site of our new University and in the other undeveloped areas of Wascana Centre.

The unifying elements of the Centre are primarily vegetative, trees, shrubs, grass and flowers. The interested gardener or horticulturist literally can have a field day. Botanically minded people already can see trees, shrubs and flowers identified both botanically and with common names throughout the park areas. Eventually, a botanic garden and conservatory will represent an expanding educational phase of the development. A nursery of approximately 60 acres is stocked substantially with a wide range of plant material adaptable to the Regina area; this in itself represents an educational phase of the Centre's development. The material will be used to meet the extensive needs of the Authority in implementing the master plan.

Master Planner Minoru Yamasaki has frequently emphasized that his plan is not new but merely an endorsement and extension of the master plan for the area conceived by Thomas Mawson and Sons in 1913. Since this original plan conceived by Mawson was not adhered to in all of its aspects over the years, some changes were required to accommodate developments since that time and of course the new University complex presented a new planning problem in itself. Consequently, the establishment of horticultural material in the area over the past 50 years has been well demonstrated and it is a recognized fact that further achievements are possible in molding the area into something more than a vast prairie land exposed to the elements.

The enlargement of Wascana Creek into Wascana Lake was the foresight of responsible people in the establishment of their capital city and although the lake is frequently the butt of jokes from many Canadian people in other provinces, it has provided us with the resource to change the face of our prairie city into an environment flourishing with trees, shrubs and flowers.

# Trees on Lake Saskatchewan

By **F. FLAVELLE, Forrester, and D. LOCKWOOD, Park Planner**  
Saskatchewan Department of Natural Resources, Regina, Saskatchewan

The South Saskatchewan River is now filling the reservoir named Lake Saskatchewan and flooding will be complete to the 1,827-foot upper limit in 1967 or 1968. This enormous lake, over 140 miles long with over 450 miles of shoreline, has a huge recreation potential. Plans were laid well in advance and 3 major park sites were chosen at the Main and Qu'Appelle dams and at Saskatchewan Landing, together with 8 cottage areas, boat launching sites, a regional park and numerous possible institute campsites.

With the exception of the Qu'Appelle park area, there was an almost complete lack of trees in all these areas. The Saskatchewan government started planning in 1961 an experimental tree planting program to create plantations and belts of trees in the recreation areas. The first priority was the 3 provincial parks. Experimental plantations in the Landing park were cultivated and irrigated, those at the Main Dam were cultivated only, while underplanting and enrichment trials were carried out in the Qu'Appelle park.

A few statistics will give some idea of the size of the job. During the years 1963-66, 71,000 trees were planted in the Qu'Appelle park, 568,000 at the Main Dam, and 467,000 at the Landing, a total of 1,206,000. Trees to replace losses are included in the above total but with a survival averaging 50 per cent in the first 2 years and about 70 per cent for 1965, these were minor amounts.

A mixture of trees was planted together with shrubs in the last 3 years. Of the tree species, the survival of Green Ash has been consistently around 85 per cent, growing about 2 feet per year. Manchurian and American elm also have been used and are growing well. The hybrid poplar shows the fastest growth with annual amounts of 3 to over 4 feet. It was found that rooted poplar were better than unrooted cuttings for survival after the first year. The best conifer for survival by far, although slow growing, has been Colorado Blue spruce. Some Scotch pine have survived and look healthy. Of the shrubs, caragana has grown and survived well. Other promising and attractive shrubs include Nanking cherry, Preston hybrid lilac, Shubert and common choke-cherry and Hansen's hedge rose, showing both good survival and growth.

These trees and shrubs have been planted to provide shade and shelter for a variety of recreational purposes such as camping and picnicking. With such a large program, it was necessary to use forestry methods for planting and mechanized maintenance, keeping costly hand operations to a minimum. The trees are therefore in straight lines, sometimes oriented to the required irrigation pattern, sometimes to the grid land pattern as land was gradually acquired and planted. Although beach formation is difficult to predict, planting was related to possible beaches, the park centres and areas required for picnicking and camping.

At the Landing, the plantations now cover most of the land which will remain in the bottom of the valley. An effort was made to blend the large plantations to the valley wall with spurs of trees into the coulees to try to achieve a more natural appearance. At the Main Dam, the oldest and the major part of the planting is on the east shore of the lake south of the dam where it was open prairie with some gentle slopes down to the water. In both these parks, the landscape of farms and ranches has undergone major changes.

It is not the intention to wipe out the existing landscape but to enhance it and create a park environment.

The next major step is the efficient development of the plantations for recreation use. Roads and various facilities such as parking, toilets, camp sites and maintenance centres have to be sited in or near the plantations in a variety of ways. Campsites require privacy; toilets and maintenance areas require screening from view; and in general, all structures have to be subordinate to the natural landscape. The growth of the 1963 plantations and some experience at Rowans Ravine Provincial Park indicate that plantations can be used when they are about 3 to 5 years old, depending on growth, species and arrangement. Our oldest plantations from 1963 have now reached this condition.

Development of the plantations might be divided into 2 parts. Structures have to be properly sited in relation to the trees, and land form according to the park plan. The more difficult part is to create a viable and stable tree bluff in keeping with the natural ecology of the region and which will sustain recreation use. Maintenance must be kept as low as possible, taking every advantage of the properties of natural poplar bluffs.

The pattern of survival within the large block plantings reflects both the efforts of our maintenance and the influence of natural site factors, soil, exposure and moisture, on the material planted. What part each plays is often hard to assess, particularly in the "dry" plantations at the Main Dam. We must utilize what has survived in its present form and not tear great holes in it nor plug up all the gaps.

To complete these experiments, a method has to be found of planting the right kind of shrubs inside and around the surviving trees to form a natural bluff. It might be desirable to add more shrubs and a few trees in the line. Planting shrubs between the rows which are 10 feet apart can be tried. Short-lived soil sterilants might help keep down weeds while the shrubs become established. An understory ground cover of planted shrubs and shade tolerant weeds will be encouraged. Perhaps in dry periods some irrigation, cultivation or replanting may be required as part of a continuous park woodland maintenance plan and parts of the park allowed to rest and recover without use.

These are some of the methods we are considering in an attempt to make a recreation environment. How can we successfully overcome this problem of transition from plantation rows to poplar bluffs? Any helpful suggestions would be welcome. The results will be of great value to those trying to establish trees under prairie conditions. The trees will serve the millions of visitors expected to come to Lake Saskatchewan.

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# Gladiolus for Northern Gardens

By E. R. HENDERSON, Shellbrook, Saskatchewan

So much has been written about the culture of Gladiolus that anything I could add would be superfluous. Good corms, rich soil, ample rain and sunshine are the best ingredients to produce show spikes.

Gladiolus have been grown in almost every country; even as far north as Alaska good spikes are grown. I happen to be one of 3 or 4 living near our northern edge of agriculture who regularly exhibit at our major western gladiolus shows. I am strictly a hobby grower and my remarks, generally speaking, will apply to exhibition varieties. I have grown probably about 600 named glads but only about 125 varieties each year. This number gives me entries in most classes at the shows. I grow all sizes and colors. Many desirable varieties have had to be sacrificed because of limited time and space.

In my attempt to describe and name some that I have found to be the better varieties I will deal with each color section. If you find that your experience does not agree with mine, please remember that varieties behave differently in separate areas.

**White.** A well grown white glad can be sensational and there are a lot of good ones. At the present time Antarctic seems to control this section in western Canada; with me it is late mid-season, with flower heads having 24 to 27 florets. It is a truly exhibition glad but sometimes is a wee bit short in the handle. Although it propagates well usually it does not produce a large corm. Glacier is nice, has a good handle, but lacks the flower head of Antarctic. Rainier is one of the real toppers with lots of stretch, substance and form; it is tough to beat. Estraleeta is another beauty though does not seem to be completely healthy. If you like a blotch, you must grow Repartee and Sylvia Joy. The first named has a distinctive red blotch, the latter a dark blue, both will give you something to talk about and they are early enough for any area. Two of Murray Tyndall's whites, Elite and Little Wonder, are excellent miniatures that will take their share of prizes.

**Cream.** The Canadian-bred, All American, Landmark has pretty well dominated this class since its introduction in 1960. It can be terrific but does require some training and care which usually repay the effort. Floradora, a very pale cream, in fact whiter than some of the whites, is another that is good and has a ruffled floret that is beautiful. I tried the newer Dairy Queen but the corms I planted were not large enough for this northern area. What I saw made me want more but it was late and it will in all likelihood require starting. Ares has so dominated the 300 division that I grow no other in this class. Dido and Domino are 2 worthy miniature creams; Domino is early and frequently misses the shows. Now that Towhead has been transferred to the cream class it will be crowding both as it is a real good one. Green glads are shown in this class; I like both Green Ice and Green Woodpecker and they can offer plenty of competition.

**Yellow.** In the past 10 years I have grown many yellows but still have not found what I want; some good ones are too late. Last year I grew 10 varieties and the most promising was Van Staalduine's Gold Coin, a 400 size with good color and form. I had some nice spikes of Golden Miracle but it is a bit late. Topolino was my best 300 yellow; Sparkler has given me a few nice spikes but not as consistently as I would like. Len Butt's Statuette and Golden Rosebud give me contenders in the 200 section and both are dependable.

**Buff and Orange.** The 19-year-old Atlantic still offers tough competition in this class. It has stretch and form, and can give an all around outstanding display. Some complain about its color and it will burn with heat but it is still good. A. B. Coutts is becoming an oldster and is also good and healthy but somewhat late for the West. Peter Pears, the newer K & M variety, is making its mark in the "win" column and is one you will like. Isle of Capri, another newcomer, will be hard to stop when it gets wider distribution; its color has more life than most glads in this class. I have grown Bornholm since its introduction and it still is one of the best 300 glads. If you would like to try one that is a bit late, then make it Cronus; it can provide a ribbon of bloom, perhaps a little short in the handle. Coq d'Or 226 has nice form and usually gives me a worthy miniature entry.

**Salmon.** Perhaps the best known glad today is Salmon Queen; ever since its debut in 1955 it has been the leading salmon and it is doubtful if any other variety will give you such a high percentage of exhibition spikes, and plants that require no pampering. Some growers have criticized its health but that has not been a problem with me. Summer Pearl was "best in show" at Regina this year, so I could hardly miss mentioning this one. It also is easily grown, has a long handle and holds its head erect. This class has a number of good ones and if you like them big and good, grow Goliath. Thunderbird is another that should be included in any planting and with this group you will have something to talk about. This year I grew Circus and Elf for the 300 class. Circus was attractive and had a really good flower head but its handle was too short. Elf is quite early and an excellent variety. Parfait was my main miniature salmon but I liked what I saw of the ruffled Ikon; it also had better color than Parfait.

**Scarlet.** This is another class that gives me a problem. I wish some hybridizer would come out with something better in this section. Welcome can be nice and is early but has a tendency to open slightly between the 2 rows of florets; this may have been the season because this fault was not noticeable last year. Victory is nice sometimes and is one of the better scarlets but not consistent enough for my liking. For a 300, Kerry Dancer supplies me many good spikes. I have seen some lovely spikes of Gladiator but the percentage that I have been able to grow has been small. Little Diamond is hard to dethrone from top spot in the miniatures.

**Light Pink.** The light pinks were greatly strengthened by the addition of Pink Prospector. If well grown this one can really go places; 22 to 25 florets are common and its color and grace are lovely. It is a tremendous propagator and until something much better comes along should be in your plot. Fischer's Spring Song was introduced to my garden this year and I expect it to be there for some time; I have yet to see another glad with such heavy substance. It requires some coaching but is worth every minute of the time spent. Now that Pink Sensation is no longer rose but pink, all of the others will have much tougher competition. This late mid-season variety is one of the best; this year a good 60 per cent of my spikes in this variety were show calibre and I would have to give it top rating in my entire planting. Judy-Lynn has been my best 300 pink for the past 2 years; I am looking for something good to grow with it even though it has produced 3 first prizes in 2 years of growing.

**Deep Pink.** Although there are a lot of deep pink varieties, to date none have been able to dispose of Spic & Span, but I find it difficult to obtain good dependable corms. Mr. Baerman's Heavenly Pink looks promising, as does Pink Supreme. The new All American LaFrane proved much too late for here. If you want a good 300 pink and don't mind starting the corms early,

then try Gem State. I have tried for 3 years to have one to show and have not made it yet; in 1963 I had a spike with 36 well placed florets on a ramrod spike, but no show, it is late with a capital L. Camelot would appear to be the most satisfactory of the miniature pinks.

**Light Red.** There has been some strengthening of this class and for me Band Wagon takes the lead; 25 florets are common and it has decent form. Winnebago Chief is another good one that I call scarlet and of course I grow Royal Stewart which is quite formal, and if the corms are not too old usually performs better. Beauty Elf is listed here but I really don't see much red about it; it has good form and I will grow it to win. There is talk of Frisky being put here. I find this hard to understand as our growth here is as large as anywhere and judging from the spikes I have seen it is a 200 glad and a good one to give Red Ribbon some competition.

**Rose.** Last year I tried several different rose glads and had some pleasant surprises. Concerto was good, easily grown and with pleasing form. If you like them tall, grow Victorian Rose; my corms were not large and the plants looked sickly for some time but then they took off and were good. I have grown Pagan for some time and it is still able to hold a spot on my roster. Three rose 300's are grown, Florella, Hilite and Tea Rose; all can give you their share of exhibition spikes. Last year I grew Heavenly Pink as a pink; this year it will have to be rose but whatever its class, it is something to really take the eye with its wonderful clean penetrating color. Leilani is my favorite small rose glad; here again I am told that it is to be re-classified as a 300. I have seen dozens but only twice an overgrown spike. Upper Crust is a nice, plain petaled rose 200 but too late.

**Black Red.** Most black red glads are inclined to be late but this does not prevent me from growing some. Dark Brilliance, for me, is the most consistent to date and this sport of King David is hard to beat if you can have it blooming by show day. The much talked about Last Rose is worth playing with but would have to be started in most areas of the West; I liked what I saw of it. Negus, which is so hard to obtain, is an easy leader in 300 competition but here again you are plagued with a late variety. I have not had a black red miniature but from what I have seen of Dark Victory it will be given its chance.

**Lavender.** There are plenty of good lavenders on the market today. The Australian Floral Dance is one of the better ones and does well almost wherever it is grown. Three corms of Lavender Ribbon produced 2 winning spikes so I am likely to allot this one more space. The controversial Heirloom is early and can give bloom as good as any. In the past I have grown Hit Parade for my 300 spikes, but now that Lavanisque has been put in its rightful place it will take over as it is one of the easy ones to grow and show.

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## Growing Orchids in the Home

By MRS. ALICE KRAMER  
Winnipeg, Manitoba

Growing orchids is a fascinating hobby in which anyone interested in flowers, and particularly unusual plants, may indulge.

I got my start some 4 years ago when a friend gave me what is known as a "back bulb division" or cutting from one of her plants. This produced new "eyes," pseudo bulbs and leaves, then later a sheath from which came the blooms. The bulb of the orchid is above ground and is called a pseudo bulb.

These plants have never failed to bloom, sometimes more than once a year, and with very little care. They have had from one to 9 beautiful blooms at one time and, since starting, the hobby has become so fascinating that more orchids and different types are now in my collection. Orchids are grown in osmunda fibre or tree bark. Some people use a combination of osmunda and peat or osmunda and bark. The latest catalogue brings news of a new inorganic medium, "E-Z Pot 'n Grow." All must be obtained from growers in British Columbia, Ontario or the United States.

Orchids are easy to grow and require a minimum of care. They like a good bath, dunking the whole pot in warm water, followed by a feeding of fertilizer every 2 weeks or once a month, depending on the number of times it is necessary to really bath them. You let the pot dry out completely before the next bath because orchids do not like to stand in water. Fertilizing is necessary as the potting mixture contains little or no nutrient. The mixture is similar to that in their native habitat where some orchids grow on the trees. As a fertilizer, I prefer Fish Emulsion, given as directed. They appreciate also a fine spray of water on the leaves occasionally and, of course, the house dust washed off.

Orchids, like all plants, are affected by some pests, the most common being mites and snails or slugs, but they can be controlled reasonably well. I use African Violet spray (Stim-u-Plant); Malathion mixed with pure soap suds works equally well. I grow my plants in an ordinary planter (clay pots) resting on vermiculite which is kept moist to produce humidity, in a south-east window, with normal house temperatures.

There are many varieties of orchids, not all suited to a home. Some are very expensive and some are very reasonable; but you too may find a friend who must split her plants. This happens about every third year, or when the roots and bulbs grow outside of the pot instead of in it.

For home growing, the Cattleyas, the corsage orchid, prove most satisfactory. I have lavenders, whites and a very interesting hybrid *C. Jewell x C. Dowiana*, which has a yellow petal, veined in pink and a deep maroon trumpet. Miniature orchids are different and easily grown. I have a type called *Phalaenopsis Equestris Rosea*, which produces tiny 1½ inch flowers, 5 or 6 at a time for about 10 months of the year, on a spray from the central leaf. Cypripediums are another good one for the home. They have a very

grassy, attractive foliage, something not all orchids have. These give a pouch-type bloom and come in a wide color range with some odd shades of greens.

Several good books on orchids may be borrowed at local libraries. One I like is *Orchids and their Cultivation* by David Sander. These books have illustrated pictures of the different species, how to grow, how to separate, and almost anything you would wish to know. Also, the growers are more than helpful.

Reputable growers I know are: Burnaby Orchids, Burnaby, B.C.; Dale's, Brampton, Ont., who have a limited selection of mostly specie type orchids; and Fennell Orchid Company, Orchid Jungle, Homestead, Fla., U.S.A.

When ordering from the United States a permit to import must be obtained first from the Department of Agriculture, Production and Marketing Branch, Plant Protection Division, Ottawa. There is a duty to pay, but by buying plants bare root (unpotted), the duty is lower and it's fun to pot one's own plants. Fennell Orchid Company send an illustrated catalogue on request, so that you have a good idea what the plant will look like.

## Judging Flower Arrangements

By MRS. BETSY SHORTT

Winnipeg Horticultural Society, St. Vital, Manitoba

Flower arrangements are evolving into a complexity of designs and styles; seldom are two alike. This confronts the judge with the difficult decision of determining the ones most deserving of awards. It requires concentration and careful study as there are many requirements to be considered.

Following are some basic standards for judging flower arrangements:

1. The first thing a judge must do is to familiarize himself with the rules and regulations set up in the prize list of the show he is to judge, as each show usually has different rules.
2. Next, make sure that the exhibits are in the correct section; that is, the arrangement should suit the purpose stated for that section, i.e., coffee table, buffet, etc.
3. Check all entries for wilted flowers and other faults; these can be set aside while you judge the rest of that section. Ascertain that the requirements for each section are strictly adhered to; for example, if a section requires an arrangement "using white blooms only," no other colors should be considered; or, if a section requires an arrangement in a metal container, be certain that this stipulation is followed.
4. A good arrangement has a pleasing and attractive overall design, with good balance, color harmony, and a focal point of interest.
5. If possible, each arrangement should be set on a table (any small one will do) by itself, so that its individual merits may be better seen. It is very difficult to judge a table full of arrangements set close together as they detract from and quite often clash with one another. In this manner, small arrangements will receive equal consideration with the larger ones.
6. Simplicity in line and form usually makes for the most attractive arrangements. An arrangement is better when it contains few flowers; also few varieties, unless these varieties blend harmoniously.
7. Color. Most prize lists now specify the colors to be used in different sections. Where not specified, the use of colors that harmonize with or complement each other are most desirable. Too many different colors are

distracting, and give a jumbled or "busy" effect. In the case of the Victorian (or Traditional) arrangements this rule need not be strictly adhered to. Here a greater profusion of flowers and a wider range of colors are used. No two flowers should be level with one another in this type of arrangement. Colors and varieties of flowers are best grouped rather than scattered throughout the design. White is considered a color.

8. The container should be suitable as to color, size and shape, and should be part of the overall design. Correct size is most important. Too small a container makes the arrangement top heavy; too large a container has the opposite effect. Simple containers usually are suitable for most arrangements (Prize list should be referred to for types of containers to be used). As a general rule, very ornate or many-colored containers detract from the effect of the flowers. However, more ornate containers may be used with the Victorian or Traditional arrangements as they are more in keeping with the era represented. The Victorian arrangement usually is one-sided and an overall fan shape; some may be five times the height of the container.

9. A Dining Table centre should be low enough to see over and pleasing when viewed from all sides.

10. A buffet arrangement may be one-sided, of many sizes and shapes. The oriental influence has resulted in a simple, rigid outline and grouping of materials (i.e., flowers, leaves, branches, drift wood, etc.) which are prominent features of many contemporary (modern) arrangements. Foliage sometimes is used as a major part of these arrangements.

11. Coffee Table. This centre or arrangement should be equally attractive from every angle. As coffee tables come in so wide a range of shapes and sizes in the homes of today, there may be large or small floral arrangements and sometimes these are judged separately.

12. Sweet pea arrangements are best when they have that "airy" look with just a little space between the blooms, not bunched down into a tight mass. A "fill" is allowed usually with sweet peas.

13. Miniatures are judged on the same basis as the larger ones and should have good design, etc. The container and artistic use of the small flowers are a challenge to the skill and the imagination of the exhibitor and require more than a passing look to determine the prize winners. It takes close study of these tiny arrangements before arriving at a final judgment.

14. Failure to cover up the needle point holder, frog, wires or other types of support, detracts from the overall effect and counts against the entry.

15. Unless specified in the prize list, foliage used need not necessarily belong to the flowers used and should harmonize with the flowers, but should not be a dominant factor. The color and the texture of the foliage can aid in overall balance and harmony and act as a background in buffet arrangements and as a coverup for the holders.

16. The quality of flowers is important; one poor specimen may disqualify the whole. Especially when there are very many excellent arrangements to judge, this immediately would penalize the entry. However, keeping in mind the fact that these likely were the best the exhibitor had in his or her garden at the time, and if on the whole the arrangement is among the three best, consideration of an award would be in order, as flowers and foliage need not be perfect by horticultural standards.

17. Originality. While all arrangements are original, reflecting the imagination of the individual, there are those which stand out and deserve a reward for their unusual and attractive design. Some arrangers have most ingenious ideas which attract the eye and catch the fancy of all observers.

# Flower Varieties for Prairie Gardens

Through the kindness of Mr. Lionel Moore, Director, Prairie Farm Broadcasts, Canadian Broadcasting Corporation, the gist of information in the following paragraphs is harvested from THE PRAIRIE GARDENER, Sunday morning talks prepared by Mr. H. F. Harp, Canada Department of Agriculture Experimental Farm, Morden, Manitoba.

## Annuals

Among the varieties of merit are: Marigold, with large flowers: Yellow Nugget about 1 foot; tall Double, Sovereign, Alaska. Sweet Basil, Dark Opal. Ageratum: Blue Jacket. Petunias: Red Satin, Coral Satin, Tango, Inca, Mercury, White Satin, Appleblossom. Salvia: St. John's Fire, Red Pillar, Blaze of Fire. Zinnia: Firecracker, Redman, Old Mexico, Scarlet Gem, Envy. Climbing annuals: Ornamental Gourds, Scarlet Runner Bean, Morning-glory, Hyacinth Bean, Climbing Nasturtium, Cathedral Bells (*Cobea scandens*).

## Tulips

For outdoor planting: Golden Harvest, Queen of the Night, Ivory Glory, Smiling Queen, Paul Richter, Nyphetos.

## Herbaceous Perennials

Bellflowers of value for the border: Carpathian, Cluster, Peachleaf, Canterbury Bells. Beware of the Rover Bellflower because it is of wide-straying habit and difficult to eradicate. Phloxes: Ada Blackjack and White Pyramid are durable. Most garden phloxes are short-lived. They like soil somewhat acid and enjoy a cooling mulch during summer. Combat spider mites. Relatively thrifty varieties; Carillon, Bridesmaid, Aida.

Balloonflowers are tolerant of heat and rather dry soil and perform for years with little attention. Shoots are late showing in spring. Monkshoods: Sparks, Bicolor, Fischeri; moisture-loving. Coneflowers: Goldenglow, Gloriosa Daisy, Purple Coneflower, Sweet Coneflower as in the variety Herbstonne. Siberian Iris hybrids can thrive for years without disturbance. Division of clumps is best done in spring. Foliage is healthy and handsome all through the season in the border.

Perennial Asters: Plenty, Perry's Blue, Princess Margaret Rose, Pacific Amaranth, Sunup, Morden Lavender, Royal Blue, Victor, Pink Bouquet, Tapestry Rose; and the two 6-inch dwarf mounds: Modern, Fay, mauve; Morden Cupid, white. Primroses like cool, moist surroundings and are well placed on a north-facing border. Some plants for the Sunny Border: Monarda, Catnip or Nepeta, Painted Daisy or Pyrethrum, Gaillardia, Shasta Daisy, Oxe-eye Daisy.

## House Plants

Amaryllis. Repot every third year or so. Otherwise topdress, removing an inch of soil from the top and replacing with fresh. Bulbs after forcing, don't keep daffodils or hyacinths as they prove quite worthless. Tulips may be saved but it will take at least two years to rebuild up strength after they have been subjected to this off-season flowering. Everflowering Begonias are the easiest plants to grow and need little care except an occasional watering and a little tidying every few weeks. Westport Beauty, a double form, has no reproductive parts and is propagated by cuttings, usually taken in March.

Cuttings usually perform best when taken in late winter when new life is beginning. Watering with cold water is harmful to all plants, and most

especially to warmth-loving kinds. Flowering plants require good light at all seasons; foliage plants are less demanding. Plants with tough, leathery foliage, as Rubberplant, Bowstring Hemp, and Aspidistra, have their leaves washed frequently or wiped with a soft cloth dipped in milk to refresh the lustre. Give them a place in full light during the short-day winter months. Christmas Cactus is not a desert plant but an epiphyte. The chief causes of bud-dropping are too much watering and too little light.

## Vegetables

Onions planted too deeply will be slow to come into growth, will tend to develop thick necks, and the bulbs to be tardy in ripening up. The Cabbage tribes need a firm soil, rich in organic content and well charged with nitrogen. Tomatoes should be kept uniformly moist to escape splitting of the fruits and blossom-end rot disease. A Starter Solution, one-half cup to each, is helpful to transplants.

## Fruits

Shelter from drying northwest winds is vitally important to fruit trees and fruit plants. Protect the southwest side of those fruit trees which have tender bark from late winter sunshine to prevent injury from sunscald. Tinfoil or other reflecting wrapping can protect against mice and sunscald. The strawberry patch is well treated with 4 to 5 inches of flax straw spread when autumn temperature descends to 10 degrees.

## Planting Trees

Remember it is a tree you're going to plant, not a fence post, so have a large hole. For most stock this will be at least two feet each way. Don't cramp the roots. Curling the roots around the bottom of the hole is bad planting. Don't set the tree more than one inch deeper than the nursery soil mark on the stem; this is very important in heavy or clay soils. All woody plants are to be planted firmly. Water after planting but not again until in full leaf.

The native Highbush Cranberry deserves much more use in our gardens. In nature it occurs usually in somewhat shady spots where the soil is moist and rich in humus but it will thrive in the sun when given deep soil. Its winter fruits, red in winter, are a special attraction. Commercial nurserymen have strains with large fruits. The Ohio Buckeye, or American Horsechestnut, is one of our best hardy, small trees. Russianolive thrives in lean soil and tolerates some salinity.

Roses are well mounded with coarse, dry sawdust in late October to a height of about a foot. Dry soil, peat moss, and similar mulches may be sub-

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stituted for the sawdust. In November a heavy covering of straw, preferably flax straw, is spread for insulation. Flax is less troublesome in litter-forming than cereal straws.

#### Miscellaneous

A mild Starter Solution is made by dissolving one teaspoonful of 10-52-17 fertilizer in one gallon of water; pour a half cupful around a plant. A well groomed lawn is the most important feature of the garden but a poorly kept one will detract more than anything else from the general appearance of the whole property. Evergreens moved to dry soil will suffer excessively. Plant them with the least possible root disturbance. At very best there will be some shock to the plant in the operation.

Lilies, like roses, are easier to maintain when grown in a separate bed or border. Dig the soil at least 18 inches deep and loosen the subsoil beneath this. For refill make up a mixture of equal parts loam, peat moss and coarse sand. A select group of Saskatchewan-bred lilies will include: Patterson-Lemon Queen, Bronze Queen, Rosalind, Burnished Gold, Edith Cecilia, White Princess; and Porter-Rusty, Early Bird.

When flowers fade on peonies and on lilacs a critical period begins for the plants for next year's buds are now being formed. Water well during dry spells; spread a light mulch of an inch or two; fertilize the soil around the peonies.

Early snow cover is most important to herbaceous perennials, particularly those with evergreen leaves. There is a danger of injury from smothering when straw is piled on deeply. Much of the damage is caused in spring when the snow has melted and the plants are exposed to the drying winds.

#### Flower Shows

Freshness of product is most important. Quality means clean, well grown varieties in prime condition when seen by the judge. The specimen must be typical of the variety, fresh, and uniform in size.

The idea is to display flowers, fruits, vegetables of the best possible quality, and in the best possible manner, so that the outsiders and non-members may become interested in gardening. Only first class material has a place on the show bench.

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*Royal Opal Aster*

## Hardy Asters for the Autumn Garden

By A. R. BUCKLEY

Horticulturist, Ornamental Plant Section, Plant Research Institute  
Research Branch, Canada Department of Agriculture

#### How Asters Were Developed

In England the wild perennial asters of North America are known as Michaelmas daisies and have long been recognized as garden flowers.

In some old texts the genus was referred to as the frost flower and this truly is an appropriate name, for every year when the first killing frost of the Ottawa Valley in Canada has blackened the dahlias, ruined the cucumbers, and curled the flowers of the so-called hardy chrysanthemums, these beautiful perennials are as bright and showy as ever. They are the only flowers left to attract the bees and the butterflies that swarm around them in such numbers that the true beauty of the flowers often is lost in a maze of insects.

Bailey's Manual of Cultivated Plants lists more than 600 species of asters particularly abundant in North America. They belong to the large and diverse Composite family, members of which are found all over the world. Canada is blessed with a large number of species of asters growing in all kinds of locations, some preferring shade, others moisture, and some dry soil. Their distribution is such that some grow under subarctic conditions, others in prairie lands, and some in the more equitable climate of British Columbia.

Two species that have played a very important part in the origin of our present perennial aster varieties are the New England aster, which has

blooms of royal violet and ranges in distribution from New England through Quebec to southern Alberta; and the New York aster, which has smaller, blue-violet flowers and grows in eastern United States and Quebec. Most of the 700 cultivars of perennial asters that exist today were raised in England where these flowers were appreciated much more than in their native land.

In recent years an attempt has been made by British, Canadian and United States breeders to develop cultivars that form mounds of bloom, rather than as formerly flowers at the tips of a very long stem. As a result we now have a large number of forms in perfect mounds from 6 inches to 4 feet high. Flower colors range from white to light and dark blue and light to deep pink. All these new types are so solid with bloom from ground level to the tips of the plants that no foliage can be seen.

#### Good Varieties

In the following lists the heights are those at flowering time. They are only approximate because they vary with growing conditions.

#### Tall Plants (over 30 inches)

Amanda. Blue-violet blooms of appealing color, 1½ inches across; vigorous plants.

Barton Royalist. Tall, floriferous; rosy-pink flowers.

Beechwood Challenger. Clean, vigorous, floriferous plants; blue-red blooms.

Blandie. Tall, many-stemmed plants; blooms white to cream.

Tapestry. Medium tall, vigorous; many double, light rosy-pink blooms, similar to bachelor's buttons.

#### Plants of Medium Height (18 to 30 inches)

Beechwood Beacon. Shorter than Beechwood Challenger; rosy-red blooms from mid-September on.

Eventide. Two-foot plants with 2-inch blooms of perfect form, purplish-blue.

Fairy. Compact 2-foot mounds of open-petaled blooms, pale pink to white.

Lavender Gown. Perfect mounds covered with ray-type, lavender-blue blooms.

Little Boy Blue. Vigorous, floriferous; a mass of luminous, lavender-blue blooms.

Peter Harrison. Perfect mounds of light pink, narrow-petaled blooms.

Pink Lace. Mound-type, floriferous plants with lilac-pink blooms.

Royal Opal. An introduction from the Hamilton Botanical Gardens, extremely floriferous plants with pale lilac-blue blooms.

Royal Sapphire. Another in the Royal series; mound-type plants with medium lilac-blue blooms.

Winston Churchill. Small foliage on medium-sized plants; bright, almost wine-red blooms in profusion.

#### Dwarf Plants (under 18 inches)

Canterbury Carpet. Very dwarf, good carpet kind; flowers small, intense purplish-blue.

Lavender Midget. Each plant a mass of lavender-blue blooms from mid-September on.

Lady in Blue. Mound-type plants with star-type, lilac-blue blooms.

Peter Pan. Vigorous plants, covered with starry, lilac-blue blooms from September 20 on.

Pink Bouquet. Perfect mounds of luminous, starry, light pink flowers.

Purple Prelude. Low, spreading plants with large blooms of good form, reddish-purple with a gold centre.

Purple Feather. Compact, floriferous plants with ray-type, violet-blue flowers.

Romany. Low, many-stemmed, floriferous plants with 1½-inch purplish-blue blooms.

Rose Serenade. Mound-type plant, covered with rose-pink blooms which fade to a silvery hue.

Snowball. Ten inches high, with a ball-shaped profusion of shaggy, white flowers.

#### How to Grow Asters

All the cultivars mentioned are obtainable from nurseries in Canada and the United States as small plants, usually delivered for spring planting. Don't be discouraged by their tiny size because in one season they will produce magnificent flowers. For best effect they should be banked in a border according to height and about 3 feet apart. Their soft, pastel colors all harmonize well.

After they become established divide them at least once every 3 years to ensure compact healthy plants. To do this, dig up the whole plant in spring when the shoots are barely an inch above ground. Divide the plant into pieces having 3 to 5 shoots. (Some gardeners prefer to divide the clump every year into single shoots.) Plant 3 inches apart in clumps of 5 or 6, and these shoots will grow into large mounds.

These mound-type cultivars will not need staking, but any of the taller, older varieties must be staked securely in early summer with stout bamboo canes at least 5 feet tall, 1 cane to 3 or 4 shoots. When staked this way the plants do not appear strangled but, on the contrary, look as if they were growing naturally without ties.

Care must be taken at all times to prevent seeds from falling to the ground and germinating, because if they do inferior seedlings will crowd out the original plants.

Perennial asters are easily grown in Canada for, as noted earlier, most of them have been derived from native species. Sometimes in late summer a mildew may develop on them and completely spoil the beauty of the taller-growing specimens. The best way to check this disease is to apply a Karathane spray as soon as signs of the mildew appear and repeat this application three times during the fall.

A garden is a pleasant thing, a sanctuary filled with living plants where one may idle among beauty and fragrance of flower and fruit, bud, and leaf, bark and twig. A place where quiet reigns and the spirit walks at dawn and dusk. A sanctuary hallowed by memories of family and friends, a never failing source of peace to the mind and joy to the soul. Making the garden grow prolongs life and the fullness thereof, and there need be no serpent in our Eden.

E. H. "Chinese" Wilson

in *Aristocrats of the Garden*, 1926.

# Garden Problems

Subjects often confronted, with brief suggestions on first-aid measures. Readers are directed to Department of Agriculture and University reference literature for fuller treatments.

## Nutrition

**Yellow Leaves.** Often caused by high-lime or other saline conditions in the root zone of the plant. The condition is referred to as lime-induced chlorosis. Acidify the soil with peat moss, sulphur, iron sulphate, or acid soil. For immediate relief, spray the pale leaves with a fine spray of iron sulphate, one ounce dissolved in one gallon of water; half strength on young foliage. For longer benefit, work iron sulphate into soil 2 to 3 inches and soak with water; or/and drill holes into the big roots and lower trunk and fill with iron citrate; cap with wax or corks.

**Small Leaves** in May, withering and dying when less than half grown. Evidence of roots being killed by deep cold or poisons, etc. Remove the tree and replace with stock growing on hardy, drought-tolerant roots. Supply shelter from penetrating cold western winds.

**Leaf Drop.** Any one or more of a number of causes. Escaping gas, faulty watering, too strong fertilizer, injurious sprays, insects, disease. Explore the situation and relieve causes. Supply plant needs in moderation.

**Tip Burn** of foliage may occur from a number of causes. Outdoor plants may have their leaves scorched between the veins and along the edges by hot, dry, windy weather in midsummer. Water freely to keep the plant amply supplied. Plants indoors may have edges of leaves crisped when hot and sunny, water loss from the leaves being greater than what is coming up from the roots.

**Lack of Flowers.** This often accompanies too rich feeding. Cut down on the nitrogen. Water moderately. Supply sufficient light for sturdy growth. Restrain root area of house plants by using as small pots as practical. Over-potting makes for leaves rather than flowers.

**Overburden on Oak Trees.** Trees in their natural state have developed roots at the position where they function well. More than 6 inches of basement clay or other earth piled over them harms the tree. Causes may be both smothering and drought. Construct a dry well about the tree. Lay field tile in about 4 lines on the natural soil radiating out from the trunk a distance of at least the branch spread. Water the well freely during dry weather.

## Pruning

**Time to head back trees.** Deadwood is to be removed whenever and wherever it occurs. All major pruning of woody plants on the northern Great Plains is left until spring. Open wounds exposed to deep cold and dry air for many months during the dormant season are weakening and conducive to extreme winter injury. Most spring-flowering shrubs are pruned immediately after their flowers fade. Spruce, pine and fir are shaped up in early July. Any long straying branch may be shortened in early season to bring the plant into balance.

**Wound Dressing.** All cuts over three-quarters of an inch across should have a smear of wound dressing. Asphalt-base paints are non-toxic and are favored. Orange shellac is acceptable for temporary use but is of short duration. House paints with turpentine and other drier materials are toxic and to be avoided.

**Overgrown Hedges.** What shape for a 4-foot Caragana hedge? Cut back to near the ground in April. Height of stubs about 4 inches at outsides and

about 10 to 12 inches in the middle. Shape to conic form, with maximum width of 6 inches on the top and of 24 inches at the ground, dimensions of 2 inches and 18 inches would be better. What is wanted is a dense, green barrier, not a broad plateau of vegetation. The broad hedge means a third side to prune; waste of ground; difficulty in removal of clippings; unnatural shape; and a tendency to develop openness near the ground.

**French Lilac.** Aim at removal of wood when it becomes 3 years old. Have 9 stems, removing the 3 oldest each June after flowering, and allowing 3 new shoots to spring up from the crown. It is most desirable to have your bushes on their own roots; their suckers will be of the desired variety. Clip out all flower spikes as flowers fade and before the weakening process of seed formation begins.

**Spireas.** Most of the spring-flowering kinds are pruned in late June or as their flowers dry up. The Bumalda types, as Froebel and Anthony Waterer, perform best when cut to the ground, within 4 inches, in April, year after year. Work in fertilizer in April or early May.

**Beheading Wild Tree Seedlings.** Seedlings harvested in the wildwood have long, straying roots. When dug, at least seven-eighths of the feeder roots are left in the earth. Cut back the tops severely so that the remaining roots are faced with a reasonable task of establishing the transplant. Such bushes as Saskatoon and Highbush Cranberries need to have their stems severed at almost ground level or they fail to grow. In contrast, nursery grown bushes, which have had repeated root pruning, have a compact mass of strong rootlets and establish with little or no heading-back. Water, shelter, and mulch newly planted stock.

## Insects

**Spruce Spider Mite.** This is the worst curse on our evergreens. The tiny suckling creatures brown or make-gray the foliage, make the twigs fuzzy with webs, suck the life sap from the plant, and gradually kill the valuable evergreen. Simplest treatment is to drench the tree or bush with a strong, fine spray of water in the evening on each of 5 successive days. Kelthane is the first choice of insecticide. Aramite is out of favor because of its tendency to induce malignancies. Sulphur sprays help. However, Kelthane is more fully effective.

**Pine Needle Scale.** Spray with Malathion when the French lilac is in bloom, about the first and second week of June. Repeat August 7 to 15.

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\*T.M. Reg'd.



**Aphids or Plant Lice.** Spray with Malathion as soon as the soft insects are seen on ornamental and shade plants. In the vegetable garden use Rotenone (Derris) or Pyrethrum.

**Currant Fruit Fly** on currants and on gooseberries. Spray with 2 teaspoons of Methoxychlor 50% wettable powder in one gallon of water first when three-quarters of the fruits have set, and secondly 10 days later.

**Cankerworms** on apple, boxelder, etc. Spray with Methoxychlor, as for currant fruit fly, as soon as the larvae appear.

**Leafhoppers.** Spray or dust infested plants as soon as damage begins. Repeat at weekly intervals until insects disappear. Use Malathion 50% emulsion, 1 tablespoon per gallon, but stopping at least 5 days before harvesting crops.

**Flea Beetles.** Spray or dust with DDT, changing over to Rotenone as soon as cabbage and cauliflower begin to form heads or when radish and turnip roots begin to protrude from the soil.

**Onion Maggot.** Dust 11 ounces of 2½% Heptachlor on each 100 feet of row to be planted, applying the poison down the furrow, and sow the seed down the centre of the treated furrow.

**Turnip Maggot.** Use 22 ounces of 2½% Heptachlor as a 12-inch band along 100 feet of the intended row. Work in lightly. Sow the seed down the centre of the treated band.

**Lilac Borer.** Paint the bark, or a wound low down on the stem, with Cygon 2E, a liquid concentrate systemic insecticide. May be used full strength as a paint or diluted in water as a spray.

**Plum Curculio.** Spray with solution of 3 teaspoons Methoxychlor 50% in a gallon of water when the fruit is just beginning to form. Repeat in 10 days.

**Cutworms.** Apply sprays or dusts as soon as the first damage is seen. Use Heptachlor around the base of the vulnerable plants on a warm evening.

**Slugs.** These can prove to be a tough and obstinate plant enemy. The area can be rid of them by spraying the soil with Metaldehyde in June or as the eggs hatch. Otherwise fight them by removing their hiding places, or trapping them by spreading wet boards on the ground and half shells of grapefruit. These harbors are turned over in the morning and the gray slugs destroyed. Commercial growers depend upon baits which contain Metaldehyde and tricalcium arsenate, moistened and set out in the evenings.

#### Plant Diseases

These plant maladies mostly are caused by fungi but some are bacterial and others are virus. We bear in mind that fungicides do not cure but they provide protection. They do not kill fungi growing inside the plant or seed but they can take care of spores on the surface. They are protective in nature and are applied to prevent ills rather than to overcome them.

**Damping-off** of young seedlings. Sterilize the soil in the seedpan, and treat the seed with Semesan, Arasan, or Spergon. To check advance of disease, soak the soil with a 1:1000 solution of Mercuric Chloride or with a commercial drench.

**Fireblight.** Cut off diseased branches about 6 inches into the green wood below. Disinfect tools after each cut. Withhold fertilizers.

**Mildew, Powdery and Mildew, Downy.** The latter grows more deeply into the leaf and thrives on cool, moist nights. Improve the circulation of air. Prevent by keeping a protective covering of Sulfur, Karathane, Mildex or Zerlate on the leaves. Destroy badly infested leaves.

**Botrytis Blights.** Common on peony, lily, and other bulbous plants. Soak with a fungicide when new stem is about 4 to 6 inches high in spring. Repeat in 10 and in 20 days. Destroy tops by fire in October.

**Rusts.** Remove and burn badly infested leaves. Dust or spray with Captan, Sulfur, or etc., weekly.

**Leaf Spots.** Collect and burn all afflicted leaves in autumn. When new leaves are half grown, spray with Captan, or etc. Repeat after wet weather. Many of the hundreds of kinds of leaf spot do little harm.

**Black Spot** of Roses. Water in forenoons; keep leaves dry in evenings. Use a multi-purpose mixture, dust or spray, preferably containing both Captan and Karathane or their equivalents. Treat after wet weather.

**Mosaic** is caused by a virus; there is no cure. Remove and destroy at once. Spray against insects that might transport the disease.

**Aster Yellows,** and other virus diseases. Treat as for Mosaic.

**Potato and Tomato Late Blight.** Plant on fresh ground. Spray with Zineb or Nabam, or apply copper dusts while the leaves are moist with morning dew. Repeat once or twice.

**Snow Mold.** About the first week of November, spread 1 pound of Semesan, mixed with sand for even distribution, over 3,000 square feet; or 2 ounces of Calomel (Mercurous Chloride) with one ounce of Mercuric Chloride over 1,000 square feet of turf.

**Silverleaf.** Rogue out and destroy the plant, unless the condition becomes corrected after good fertilizing of the soil.

**Black Knot.** Cut off the blackened branches down about 6 inches into the healthy wood in March or April. Spray with Captan, or etc., when leaves are about half expanded.

**Plum Pocket.** Pick up and destroy all bladdered fruit. As the buds swell in early May spray with Captan, or etc., using as a spreader-sticker a spoonful of detergent in a gallon of spray. Repeat when leaf buds show green tips.

**Brown Rot.** Spray to control insects. Collect and destroy all rotting fruits. Follow a spray program, using Captan, Thiram, Maneb, or Sulfur.

**Gummosis.** Remove and burn all dying twigs. Protect against winter injury. Cut out cankers and swab with solution of Mercuric Chloride, 1:500, then smear with asphaltum paint.

**Cedar Apple Rust.** Keep red cedars at a distance from prairie crabapples, hawthorns, saskatoons, and other alternate host plants. Pick off and burn the jelly like galls in early spring before horns grow out. Practise a spray program as for apple scab, spraying monthly with Ferbam and Sulfur or similar fungicides.

**Wetwood or Slime Flux.** Fertilize and water well to improve vigor of the tree. Bore from below upward to the bottom of the leaking spot with a large gimlet or a small bit to drain and to relieve the inward pressure built up by the fermenting sap. Clean out the dead tissue and weak branches. Swab with household bleach, one part in 5 of water. Smear with asphaltum-base paint or tree wound dressing.

#### Animal Pests

**Mice.** Tree guards of wire, aluminum foil, white sulphite building paper, or of metal hardware cloth or screen. Trapping, using peanut butter, cheese, etc. Poisoned grain in a can with one side bent in, or in board harbors which protect birds from the poisoned feed.

**Rabbits.** Trapping, shooting, fencing the crop plants with enclosure of

poultry netting. Spraying with repellent liquid in October, or painting with 2½ pounds Thiram, 1 gallon Asphalt-water emulsion, and one gallon water. Dusting with Rotenone appears effective on vegetables.

**Deer.** Fence with 7-foot page wire, or make a cylinder of snow fence around each tree; or use repellent as small cloth bags of both blood meal and of bone meal (raw state), hung up in the trees; Malathion sprayed around the enclosure seems repelling for some time; or use one of the commercial chemicals.

**Pocket Gophers.** Dig down to their runways and place a gopher trap, or spread poisoned carrots, apples, etc., in the runway, near their mound of earth.

**Dogs.** Protect evergreens by spiny plants, or with barriers. Nicotine sulphate spray is repellent for about 2 or 3 weeks. Some commercial repellents, sold under trade names, keep the canines off for a long or a short time.

**Moth Balls** are not to be spread out in the garden. Although they have a little merit in discouraging cats and some other animals they are a distinct hazard. Children putting them in their mouths have been hospitalized, seriously ill from the poison chemical.

#### Some Common Troublesome Weeds

**Quackgrass.** Dig out, root and all, dry, burn. Or treat small patches with Dowpon, Garlon (Silvex mixed with Dalapon), 4 ounces per 1,000 square feet or as directed; or Amitrole, ½ ounce to 1 square yard — all applied to actively growing grass. Dowpon treatment will make the soil toxic for about 5 weeks.

**Purslane.** Get them young! One flick with the back of a rake will dispatch them while in the reddish seedling stage. Later pull up by the root and bury in moist soil to rot them. Spray with 2,4,5-T or with Silvex.

**Chickweeds.** Dig out and remove before seed drops. Treat with Silvex, MCPP, or Dicamba.

**Field Bindweed.** Dig out by the roots. Repeated spraying with one of common weed chemicals.

**Dandelion, plantains, pigweeds, shepherds purse, etc.** Wet with 2,4-D.

**Canada Thistle.** Dig out by the spreading roots; wet with Dicamba and repeat the treatment.

**Knotweeds.** Wet with Dicamba.

**Goutweed.** Dig it out. Resistant to common sprays.

**Creeping Charley** (*Lysimachia nummularia*). Hoe it out; wet with Dicamba.

**Vetches, including Tufted Vetch.** Dig it out with the straying roots; wet with Dicamba.

**Poison Ivy.** Amitrole (Amino Triazole) is considered effective with one spraying after the leaves have attained full size. Brush-kills require at least two treatments to kill the plants.

**Green Scum on pool, Algae on pots, etc.** These very minute plants are smallest forms of weeds we see. Treat the water with Copper Sulphate ('Blue Stone', 'Blue Vitrol'), ½ ounce to 11,000 gallons of water. Put the crystals in a cloth bag and swish it through the water. This dilute amount is not harmful to gold fish. An alternative is Permanganate of Potash, a chemical not injurious to animal life. Use to give a pink tinge.

#### Pesticides

Brief comment on some of the most used pesticides. ALWAYS read carefully every word of the directions found on the container wrapper. Follow

the instructions precisely. Most of the chemicals are potent POISONS. The remarks which follow are only guidance in the absence of information from the manufacturer.

**Captan.** 50% wettable powder, 1½ tablespoons in 1 gallon of water, for a large range of fungus ills, including rusts, leaf spots, blights, black spot, rots.

**Karathane,** 25%, 1 teaspoon in 1 gallon, for mildew.

**Sulfur,** wettable, 3 tablespoons in 1 gallon, for rusts, mildew, etc.

**Maneb,** 70% powder, 1 tablespoon in 1 gallon, for leaf spots.

**Thiram** (Arasan or Tersan) 2½ tablespoons in 1 gallon, for seed treatment, lawns, bulbs.

**Bordeaux Mixture,** 4-4-40, 20 tablespoons in 1 gallon. Fungi.

**Lime-Sulfur,** 32 tablespoons in 1 gallon. Fungi.

**Ferbam,** 2½ tablespoons in 1 gallon. Rusts, leaf spots.

**Zineb** (Dithane, 78, Parzate) 1 tablespoon per gallon. Blights, spots.

**Malathion** 50% emulsion, 1½ teaspoons per gallon, for aphids, scale insects, bugs, some chewing insects, and some mites.

**Methoxychlor,** much like DDT but safer on food plants, 50% wettable powder, 2 teaspoons per gallon, for fruit flies, curculio, etc.

**Kelthane** wettable powder, 1 to 2 tablespoons per gallon. Mites.

**Nicotine Sulfate,** 40%, 1 tablespoon per gallon, for sucking insects; dog repellent; add soap as a sticker.

**Chlordane** 40%, 1½ tablespoons per gallon; for ants, bugs, grubs, weevils, earthworms.

**Mercuric Chloride,** 2 seven-grain tablets in 1 quart of water to make a 1:1000 solution to treat crown rot, bulbs, etc.

**Cygon,** a systemic. A liquid concentrate to be painted on the bark, or mixed with water as a spray, for aphids, mites, some borers.

**2,4-D** apply as directed, while the plant is in active growth. Used on many broadleaf plants as dandelion, plantain, mustards, pigweeds, etc.

**Silvex** (Fenoprop) effective on chickweeds, clovers, black medic. It is 2,4,5-T propionic acid. Mixed with 2,4-D to kill woody growths.

**MH** (Maleic Hydrazide) to reduce growth of grass.

**Amitrole,** to control quackgrass, poison ivy, Canada thistle.

**Ammate** to kill brush, trees, creeping-root perennial weeds.

**Dalapon** (Dowpon). Spring and fall to control quackgrass. Mixed with Silvex, is used to control vegetation on walks, driveways, etc.

**MCPA** is closely allied to 2,4-D and is more impressive on buttercup, and Canada thistle.

**Dicamba** (Banevel D), a benzoic acid that is applied similarly to 2,4-D but is effective against chickweeds, wild buckwheat, creeping charley, knotweed, smartweed and Canada thistle.

\* \* \*

*God grows weary of great kingdoms, but never of little flowers.*

*Rabindranath Tagore.*

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# Plant Names

By W. R. LESLIE, LL.D.

Landscape Consultant, Winnipeg, Manitoba

Individual things are given names to distinguish them. Thousands of names are used for individual people. Tens of thousands are needed to name the enormous number of types in the plant world. Each is given two names: the common, popular, or vernacular name; and the scientific, botanical, or Latin name.

The botanical name is in Latin which is the universal language of learned men. Research men are driven to scientific nomenclature for reasons of exactness or clarity and for brevity. The Latin name is accepted all over the world and is found in reference books and articles; its use is imperative when accuracy is involved.

Common names, although often easier to remember and simpler in use, sometimes prove misleading because of their local application. For instance, Boxelder is the common name for *Acer negundo* in Texas and many other places where it grows, but on the Canadian prairies it is often called Manitoba Maple. Many examples come to mind at once, such as the various common names for *Amelanchier* among which are Serviceberry, Juneberry, Snowy Mespilus, Shadbush, Shadblow, Saskatoonberry, Saskatoon, Prairie Blueberry, and another source of confusion may rise because a common name may be used for various other genera of plants. Some examples are noted in Dusty Miller, Burningbush, Mayflower, Gilliflower.

Many tropical plants have not won any well recognized common name and plantsmen have found it practical to adopt the botanical generic names, as Aster, Begonia, Canna, Dahlia, Gardenia, Hibiscus, Hydrangea, Prinsepia, and Plumbago in such cases. Some names certainly are strange and rather difficult but fit into everyday speech. For instance, note *Aspidistra*, *Chrysanthemum*, *Dieffenbachia*, *Delphinium*, and *Rhododendron*. These are familiar to everybody and are readily adopted if taken singly as we learn about plants and their performance and preferences. To quote R. E. Holtum: "Nobody ever yet made a good garden without mental as well as physical effort, and the small extra effort necessary to learn the correct names of plants is well worth while." By acquiring plants under their meaningful botanical names the gardener is building his plantations as planned.

If plants had but one common name, and if it were used as we know it in all countries, the whole problem of names would be simplified.

An effort in this direction was made by the American Joint Committee on Horticultural Nomenclature. Their labors took form in the book *Standardized Plant Names*, published in 1942, and the 677 pages have been a blessing to many plantsmen. The book is the accepted reference for names by many organizations. It is widely comprehensive. What other source of official nomenclature have we for common names?

The committee accord all generic names a capital first letter. It is optional whether common names are capitalized or not. Certainly, writers often find it desirable to employ capital letters for the sake of emphasis, to make them stand out plainly, as does John Smith compared to john smith.

Five rules, among others, were laid down at the International Conference, London, 1930:

1. Disuse of Capital Initials for all species and botanical varieties. The genus name does have a capital beginning. Example, *Prunus americana*.
2. Double 'ii' ending of species names changed to single 'i'. Example, *Berberis thunbergii*, not thunbergii.
3. Sign of the possessive (') to be omitted. Example, Bowns Lily.
4. One standard Common Names for each plant.
5. Consolidating Compound Names, elimination of hyphens. Examples are Buffaloberry, Bellflower, Cherryplum, Mountainash, Russianolive.

## Further Rules:

A varietal name in use for one variety of a kind of plant should not be used for another variety of that kind, even though it be attached to a different species. Example, there should be only one plum Bounty.

Varietal names likely to be confused with one another should be avoided. Example, Alexandria and Alexandrina as varietal names for the same kind of plant.

Where personal names are used to designate varieties, the prefix Mr., Mrs., Miss, and their equivalents should be avoided.

Excessively long words and words difficult to pronounce should be avoided.

The articles 'a' and 'the' and their equivalents should be avoided. Example, Giant not The Giant.

**Scientific Naming.** Plants are classed into groups according to their relationships. To quote from Dr. C. R. Ure's article, page 31, *THE PRAIRIE GARDEN*, 1960:

"The world's plant kingdom is broken down into sub-kingdoms, sub-kingdoms into divisions, divisions into classes, classes into orders, orders into families, families into genera, genera into species, and the smaller unit is variety or cultivar. As readers of these notes will be concerned mainly with cultivated plants names, their interest will centre on genus, species, and varieties or cultivars. These terms, variety and cultivar, have the same meaning, and can be used interchangeably. Cultivar is essentially a technical international terms synthesized from the words cultivated variety."

It is from Linnaeus *Species Plantarum*, 1753, that the modern method of naming plants is derived. Each species was given a name consisting of two Latin words, or words in Latin form. The first is the generic name, and the second is the species. This binary nomenclature is practised everywhere.

Botanical names apply primarily to wild plants. As improvements are achieved in these, resulting in some distinguishing feature, the plant is given a variety name. Example, *Juniperus sabina* *Arcadia*, which is the *Arcadia* variety, or cultivar, of the Savin Juniper. The only apparent difference between two plants may be that of flower color, as sometimes is the case in petunias, but the seedsman has two varieties for the gardener by reason of the significant contrast in coloring.

Hybrid plants, those which have been derived by crossing two or more botanical species, are given horticultural or garden names which are not Latinized. Plantsmen use only the generic name and then the garden name as *Crataegus Toba*, *Toba* Hawthorn. Or, the name may be written to reveal the constitution of the plant: *Crataegus (succulenta x oxyacantha) Toba*, *Toba* Hawthorn.

# Slugs Like Tender Things

By C. GRAHAM MacNAY  
Research Branch, Canada Department of Agriculture, Ottawa

Slugs annually cause considerable losses to farm, garden and greenhouse crops, especially in wet seasons and in humid regions. They eat the foliage, are particularly fond of the tender young shoots, and feed on ripe fruit, especially strawberries.

Slugs feed almost entirely at night, though some species may feed on a dull day. They and their eggs are very resistant to extremes of weather as they are hidden in the soil and under protective objects when conditions are unfavorable. Two species, the gray garden slug and the brown slug, are the principal offenders in most of Canada. Several other species occur mainly in greenhouses or in the humid coastal regions of British Columbia.

These gray and brown species when fully grown and extended seldom exceed 2 to 3 inches in length. They cannot be distinguished by their color, as it varies in different localities, and their feeding habits are similar.

Slugs are completely dependent on hiding places for protection from heat and predators. To keep them out, eliminate rubbish, boards, boxes, stones, fertilizer bags and the like; keep grass and weeds cut short and crop remnants cleaned up; and, when cultivating soil, break it down to a fine tilth and a compact surface before seeding.

Protect small plantings or valuable plants with collars of wire fly screen set in the soil and projecting an inch or so above the surface with the cut edge uppermost. Strips of fly screen may be tacked to the upper edge of a cold frame or flat, with the cut edge projecting upward. Traps are useful and may consist of pieces of thick bark, small boards and the like laid on the ground. Each day, collect and destroy the slugs that gather beneath them.

Metaldehyde is one of the most commonly used chemical controls. You may obtain it as a prepared bait either pelleted or unpelleted. Or you may make your own bait by thoroughly mixing 2 ounces of powdered metaldehyde with 4 quarts of bran, shorts or oatmeal. Apply dry or slightly moistened. You may broadcast it or place a teaspoonful every few feet beneath or near the plants to be protected on a warm evening in clear weather. Rain will destroy the bait. Re bait 2 or 3 times at weekly intervals. Liquid metaldehyde (50%) also may be used. Mix it with water, one tablespoon per gallon, and sprinkle on the soil in the evening. One gallon will treat about 100 square feet.

A copper-lime dust also is effective and less costly than metaldehyde. Mix one part by volume of dehydrated copper sulphate with 10 parts of hydrated lime. Apply late in the evening in warm, clear weather. Use a double cheesecloth bag or hand dust gun for small areas. One pound of dust will treat about 500 feet of row or 1,000 square feet.

Various residual insecticides applied as dusts or wettable powders also have proved effective.

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# Autumn: Season of Seeds

By BARBARA TUFTY

*(Companion article to Unfolding of Spring. Reprinted by permission of the Editor, Science News, published by Science News, Inc., Washington, D.C.)*

Autumn is a summing-up, a storing of the essence of plant life into tiny capsules that inundate fields and woods with abundance. Autumn is a time of harvest and new, hidden life.

Now as the north pole of the spinning earth turns farther from the sun, the sun's rays fall more at an angle over the Northern Hemisphere, casting a mellow, amber light across the land and bringing cool nights, fading flowers and falling leaves.

To the casual eye, the world of nature seems to be slowly dying. Gone are the wild blue gentians from the woods, the Queen Anne's lace from the fields. Many migrant geese, ducks and songbirds have already departed for greener areas to the South; the buzzings of the katydids and the cicadas are silent now; and chipmunks and woodchucks prepare for their long winter sleep in hollow trees and soil. Each day the sun sinks more to the south on the horizon and the mystic feeling of sadness and death seems to fill the blue, hazy air.

Yet autumn is not the season of death and decay. On the contrary, it is one of the busiest, most fruitful seasons of the year. With extraordinary precision and economy, each dogwood, cattail, oak, goldenrod, ragweed and other tree or plant packs a condensed image of itself into a capsule, and then in paradoxical, wild extravagance scatters it high into the air, drops it into the sea, or flings it one way or another across the land.

Millions, billions, trillions of these seeds, each outfitted with essential ingredients of its parent plant, plus stored food and a hard outer shell to help it survive the winter, are cast over the earth in an effort to guarantee survival of each species. Most of this scattering is in late summer and autumn, but many seeds are strewn also in April and May.

## Established Plants

A few hundred million years ago, after plant life had crept from the salty oceans and become established on land, relatively few kinds of simple seed-bearing plants existed. Then there were enough nutrients as well as space, water and sunlight to go around. The naked seeds merely dropped from the parent gymnosperms or cycads and flourished in the ample space below. But as the world became crowded with vegetation, the plants evolved into more complex forms and developed new devices for sending their offspring away from crowded areas into faraway places where chances were better for survival.

Many ingenious mechanisms of the immovable, seemingly helpless plants make use of wind, water, animals and even unsuspecting man for dispersing their compact progenies. The seeds designed to catch the wind and ride its currents are some of the most beautiful. These seeds produce fine, silky fibres that spread out in rays, looking like fragile umbrellas, parachutes or sails. Everyone knows the parasols of the seeding dandelion, irresistible to children who blow them to make their wishes come true, quite unaware that they have just become accomplices to dandelion propagation.

Another familiar sight along country roads is the silky down of the purple thistles, the softness compensating for their formidable stickers. When

the weather turns cold and the hours of light become shorter, the ugly, warty milkweed pod splits open to release glistening masses of white down attached to flat, brown seed. Tiny parasols of goldenrod and aster waft carelessly across sunlit fields, as do the wind-blown seeds of the more humble goat's beard, willow herb and salsify.

#### Other Wind Catchers

Other wind-catching devices are wings, the stiff fragile projections attached to such trees as the sycamore, maple and elm. When the moment of rupture from the parent tree arrives, the air catches the underside of the wing, and the tiny bundle of life glides or spirals gently to the ground, several paces away. Plants such as lilies and begonias have paperlike borders that act like tiny kites.

Another system Nature has devised to harness the wind is to use the rolling plant as a whole to shake out the seeds. These plants are the tumble weeds and tumble grasses, light weight, many-twigged and somewhat circular in shape. When the seeds are ripe, the whole plant breaks off at the root, and the wind rolls it gaily across prairies and fields, scattering seeds in its wake. Not all seeds spill at once; they shake out gradually as the pods dry, split open and the plant tumbles on. Some seeds, such as those of the iris, poppy and the prolific orchid, are so fine that a good huff of air will scatter them across the land.

Another natural vehicle, water, can carry certain seeds with waterproof coats for long distances, sometimes hundreds of miles. This system of seed transportation occurs mainly along the oceans or the water courses of the tropics, areas of perpetual summer where water does not freeze. Coconut trees bending over the water's edge drop their heavy seeds into rivers, bays and estuaries where they are wafted by currents and waves into the great oceans and so to other shores.

The largest seed in the world, the 40-pound Seychelles nut or sea coconut, mystified people around the Indian Ocean for centuries. These seeds were found awash on shores and beaches and no one knew where they drifted from, or upon what kind of tree they grew. Finally in the mid-18th century, sailors discovered the goliath seeds growing on coconut trees on Praslin Island, one of 29 islands in the Seychelles in the Indian Ocean.

Indian mulberry seeds are housed in a sort of bladderlike sac that floats like a small buoyant raft across the water. Japanese black currants often wash ashore on the Oregon coast, thousands of watery miles from their homeland. The freshwater water lily bears seeds in a spongy belt filled with air chambers like a life preserver. When the belt finally rots and decays, the seeds sink to the mud bottom and take root.

Some plants use neither wind nor water, but have evolved their own built-in ejection system of shooting out their seeds. This system works on the principle that while certain natural fibres dry out, they often shrink, twist and split. As the fibre pods mature, they become dryer and slowly twist, then suddenly burst open and eject their seeds. The flat, dark seed pods of the bright yellow broom, for instance, split open with small, explosive pops that sound like a series of tiny firecrackers in the still, warm afternoon. When the pod splits, each half twists sharply around like a corkscrew, snapping the thin stalks by which each seed is attached, and catapulting them out with a snap.

The pods of the common witch hazel shrub explode and send their round seeds rattling among the autumn leaves 5 to 10 yards away. This surprising

behavior on the part of a docile plant so astounded certain puritanical forefathers that they believed the shrub was hexed or bewitched, hence the name.

#### Shooting Seeds

The Virginia knotweed grows a group of elastic cells at the base of each fruit. At the slightest touch on the hook part of the dried flower, these cells uncoil and throw their seeds. The touch-me-not or jewelweed is another impatient plant that shoots its seeds by means of coiled up filaments.

One of the strangest mechanisms of a plant to perpetuate itself belongs to the wild geranium or crane's bill. Attached to each seed is a long threadlike tail that is coiled into a springlike spiral and covered with silky hairs. When the air is dry, the tail curls up like a corkscrew, pulling its precious living burden behind it. During a series of curlings and uncurlings, the seed-carrying tail crawls along the ground in wormlike fashion until it reaches suitable soil where its sharp point drives downward, dragging the seed to its winter resting place.

Many seeds develop sticky or hooked appendages or spines, hooks or awns that catch on to the fur of a passing rabbit, dog or sheep and hitchhike a ride for a while before they drop off or are brushed off. Autumn fields are filled with the waiting seeds of burdock, cocklebur, stick-tight, Spanish needles, goose grass and many others. Some plant appendages can cause painful suffering and even death. The stiff, cruel spikes of such plants as the grapnel, the African devil's horn, or the feathergrass of Russia can work themselves deeply into an animal's flesh. When this happens where the flesh is especially sensitive or the barb cannot be removed, infection and death may follow.

Seeds are transported by animals in many other ways. The tempting fruit of the wild black cherry, the succulent gooseberry or the bright red dogwood are always in demand among the birds, which swallow them whole. The seeds of these fruits, or drupes as they are called, are indigestible and protected by a strong covering. They pass through the food canal of the bird and are deposited many miles away. Bright-eyed bluejays and tufted titmice are tireless planters of nuts and grain, tucking them away in secret holes in trees and crevices where they are soon forgotten and left to sprout in the spring.

Then of course there are the busiest planters of all, red, grey and black squirrels—which bound after acorns, beechnuts, walnuts and other nuts. Each bushy-tailed, short-memoried fellow seems to know what he's doing as he hunches over the hole he digs in the ground, drops his seed, gives it a pat, and goes away, leaving a potential tree snug in the ground.

Man, of course, probably is the most efficient seed planter of all in today's present world, with his scientific methods that produce great harvests of hybrid wheat, golden corn, orange pumpkins and other prosperous fruits of autumn. Yet, unwittingly, he also continues to transport the more humble seeds of nature, burrs stuck to his clothes after an afternoon's walk through the woods, blackeyed Susan and ragweed seeds tucked in crannies of his much-travelled car, and dandelion, yarrow, Bouncing Bet and shepherd's-purse seeds riding as stowaways on ships and airplanes.

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# Hints on Landscaping Around the Home

By F. J. WEIR, Provincial Horticulturist,

Manitoba Department of Agriculture and Conservation, Winnipeg, Manitoba

Homeowners in prairie Canada are fortunate. We must admit that Gardening is a challenge anywhere, and particularly is this true where winters are long and cold, air is low in humidity, and where annual precipitation is limited. However, plant breeders have done an outstanding job making available to us varieties of trees, shrubs and perennial flowers which can stand up under these rather rigorous circumstances.

Gardeners in the prairies can be very proud of their gardens. Visitors to our area are amazed at the attractiveness of the gardens in our towns and cities as well as those on farmsteads. Interest in home-ground improvement continues to grow. Because of the shorter work week more young couples are realizing that the sooner their property is landscaped properly, the sooner they will benefit from it. Most people plant up their grounds with the idea of making them attractive and more livable, and are not so interested in the fact that each improvement adds to the monetary value of the property.

Most homeowners achieve a tremendous amount of satisfaction from having planned their own grounds, although for those people who do not have the time, opportunities are available for them to make use of the services supplied by landscape architects and nurserymen. Planning the home grounds is not difficult, providing a few basic ideas are kept in mind. It is important that the individual make full use of available reference texts and bulletins from libraries and government and university agencies before starting.

When considering the lot development there are certain gardening chores which have to be done; but there are other ones which can be omitted if plans are made carefully and hardy varieties of plants are used. Proper planning beforehand should result in a yard with a minimum amount of maintenance and expense after the plants have become established. It is thus important, wherever possible, that permanent material in the form of trees, shrubs and perennial flowers be used; that only hardy varieties of these be planted; and that only varieties requiring a minimum amount of trimming or pruning are used.

A plan of the grounds should be made up so that a yearly program can be arranged in detail. It is wise for the homeowner to extend the project over a three to four year period, unless he is having the work done by a landscape contractor. A three to four year program will spread finances over a longer period, and also allow more time for the completion of the project. The front and back lawns should be put in during the first year to cut down on the amount of soil to be tracked into the house. If there is need and room for a shade tree, it should be planted the first year. A few hardy annual flowers can be used as foundation plants for the first year.

The second year can be spent in planting the foundation shrubs around the house. In the third and fourth years, border plantings, shrub or perennial borders can be established, as well as the other desirable features such as rock garden, rose garden, lily pond, patio, etc. By the end of the fourth year, most of the plantings should be in.

After making up a plan to scale of the home grounds and deciding how much can be done each year, the homeowner should try to picture and then

to indicate on the plan the various features to be incorporated into the development of the lot.

The front lawn, good or bad, creates the first impression on the visitor. It should be neat, carefully trimmed, healthy and weed-free. One's eyes should then be drawn to the front door. This can be done very easily by suitable shrubs or shrub groupings on either side of the door. Other foundation shrubs can be at the corners to make the house look more natural by covering some of the harsh, unnatural lines of the corners. Lower-growing shrubs are planted under windows, with care taken in selecting them that when fully grown they do not need to be trimmed. Taller shrubs can be planted between the windows.

The general appearance at the front of the house should be modest and pleasing, but not flashy. The use of coarse-textured shrubs or shrubs with variegated or colored foliage should be avoided as foundation material. Low-growing evergreens are excellent foundation plants, but care should be taken that varieties to be planted at the sides of the house exposed to the winter sun, should be resistant to or able to withstand sun-scald.

Unless there is need for a fence to outline the boundaries of the lot, it is better to let the front lawn merge into the neighbors' lawns on both sides. This is particularly important if the lawn area is small as it makes it look more expansive. In the average urban front lawn there is not room for any shrub plantings except around the foundation. If there is room, these plantings should be restricted largely to the edges of the property, or if the lawn is quite large shrubs can be used in clumps or groupings.

Included in the back yard is the work or service area, where facilities should be provided for delivery of fuel, for garbage collection and for laundry. Here provision should also be made for relaxation, hobbies and outdoor family living. Where possible, the service area should be screened from view by plantings of tall shrubbery. In general, the plantings in the back yard should be restricted to borders and corners, thus leaving the centre of the lawn open for family enjoyment. It may be necessary to have a taller-growing hedge planted at the back boundary to provide privacy. Trimmed hedges, generally speaking, are to be avoided because of the annual maintenance. If a hedge is required a variety should be selected which will grow to the desired height, rather than one which has to be trimmed every year. If the homeowner has a special garden hobby, provision should be made for it somewhere in the back yard.

In selecting varieties of shrubs and trees it should be emphasized that shrubs be planted to add or to attract interest, to provide shade or wind protection, or to break up a large expanse of lawn. A shrub should never be planted without first ascertaining if it is the most satisfactory shrub for the job intended, and that it is in the right place. Under no circumstances should shrubs be planted here and there in the yard only because someone likes them.

If a wise choice is made when selecting shrubs, interest can be maintained throughout the year. Evergreens are attractive for the full year but, if used exclusively, they create a rather sombre and depressing impression. Shrubs differ considerably in their performance and appearance, depending on the shrub and the time of the year. Some are at their best when they are in bloom, others have attractive foliage; some have small insignificant flowers or no flowers at all but have a pleasing form. Some have colored or variegated foliage during the growing season while others have brightly colored fall colors. Some have attractive colored bark; others have fruit which is attractive and provides food for birds. Flowers, both perennial and annual, and bulbs can be used to fill in when shrubs are not at their best. Flower beds or borders are most effective in front of a shrub group or border planting.

Lawn strips less than 3 feet in width are difficult to mow. Often the hand clipper is the only solution.

## Shortcuts in Maintenance

By GUNTER A. SCHOCH, A.I.L.A.  
Landscape Architect, Parks and Protection Division, Metropolitan Corporation of Greater Winnipeg.

—Photos by G. A. Schoch

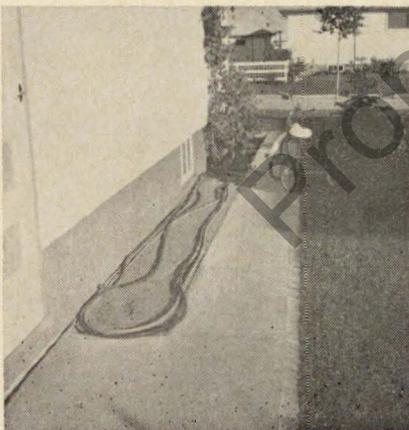
The success of a landscaped area, more than any other kind of physical development, is dependent on proper maintenance. Good care will bring a well planned garden to successful maturity; bad or inadequate care is apt to destroy the quality intended in the plan.

On the other hand, many a new, dream home has turned out to be an enslaver of the family, presenting them each week with enough projects to take up all their spare time and energy. For this reason alone the potential maintenance of the yard should be given careful consideration when the landscape layout is planned.

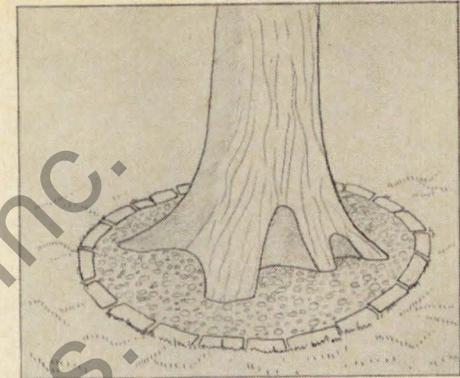
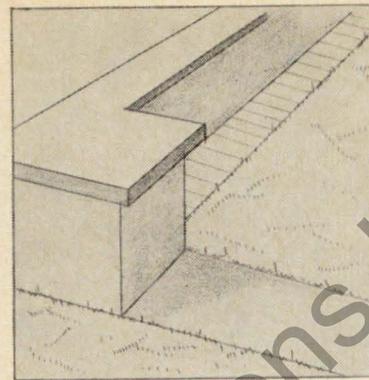
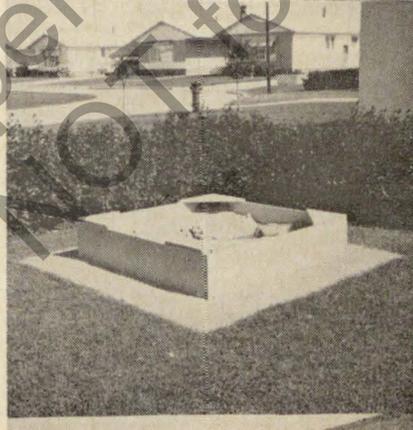
Most maintenance labor undoubtedly is spent on lawn care. The choice of material is an important factor in lawn maintenance. The bowling or putting green usually is held up to us as ideal, but for the homeowner who is neither striving for horticultural perfection nor prepared to provide meticulous weeding, watering, fertilizing and mowing, such beautiful green carpets may not offer the best solution.

Various lawn grass mixtures, consisting of at least 50 per cent of Blue-grass varieties, require less maintenance and adapt themselves more easily to varying conditions of soil, sun, shade and water supply. On steep slopes, narrow strips, pointed corners, small bays and lawn areas cluttered with

*A narrow strip between house and sidewalk has been covered with limestone dust. This eliminates hand-clipping and provides convenient storage space for the garden hose.*



*A sandbox in the lawn is a nightmare to the homeowner. But not if an 18" grass strip is removed around the sandbox and filled with the sand or limestone dust.*



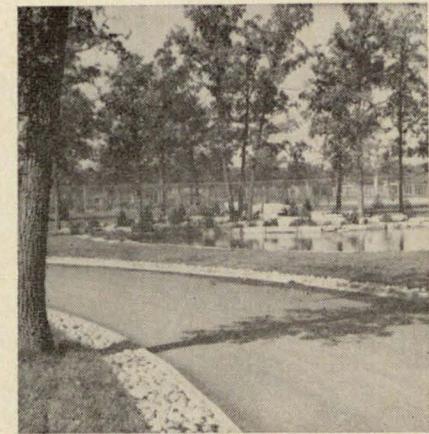
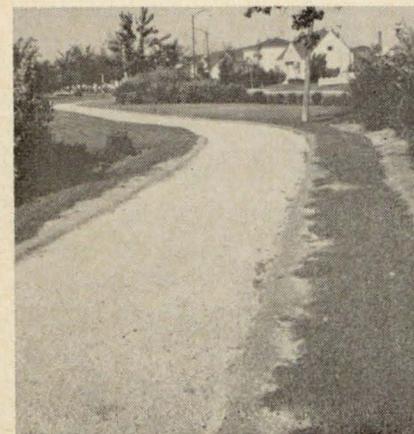
*Left—A row of bricks along walls or fences will greatly reduce edge trimming.*

*Right—Brick-bordered crushed stone is placed around this tree trunk to eliminate hand-clipping.*

trees, shrubs and garden ornaments, mowing may become a torture. But on large areas which justify the use of a power mower, grass is the most pleasant and the most easily maintained ground control.

After mowing, the greatest annoyance in lawn maintenance is hand clipping and edging. A design which encloses the lawn with paving will greatly reduce these problems. Bricks or slabs laid flat in sod level along walls and fences will eliminate clipping. An even less expensive method is the use of brick-bordered sand, gravel, crushed stone or limestone dust on narrow strips between house and sidewalk, around the sandbox, or encircling a tree in the lawn. Metal, brick or masonry curbing along beds prevents the grass growing beyond its boundaries and eliminates edging. Areas heavily used are best surfaced with other material than grass, since it would require extra attention to feeding and watering. Pre-cast concrete, natural stone with smooth surface, poured concrete, asphalt or sand may be used for this purpose.

Cultivated beds range also high on the maintenance list. Continuous care is required. The size and number of planting areas should be adjusted to the maintenance that can be expended. Maintenance is an important consideration also in the selection of plants. Their ultimate size and shape must



*In public parks where lawn edges may be worn off, the use of fieldstone curbing has been successful.*

be in accordance with the space available. Mistakes in this respect involve the homeowner in hopelessly long struggles with overcrowding, spindly growth, insects and diseases favored by weakened growth.

Careful landscaping eliminates work and saves hours of working time. Here is a check list you may apply to the conditions of your yard:

1. Install mowing edges between lawn and planting areas.
2. Eliminate hard-to-mow corners and sharp curves in lawn.
3. Remove isolated shrubs from lawn or surround them with brick-bordered gravel.
4. Pave lawn areas where foot traffic is heavy.
5. Use chemical edgers that keep grass from growing, or use a power edger to trim around unavoidable lawn obstructions.
6. Avoid too close lawn mowing, which leads to weeds.
7. Rely on power equipment to take work out of gardening.
8. Control weeds chemically.
9. Let mechanical timers shut off your sprinklers and hoses.
10. Use a mechanical fertilizer spreader.
11. Feed generously to promote good growth and deep roots.
12. Rely on architectural structures to keep garden handsome even when out of bloom.
13. Use low-upkeep type fences and walls; hedges only where their softness contributes to the design.
14. Add a garden work centre where equipment is handily stored, easy to find and kept in good condition.
15. Provide a ramp for wheeled tools and equipment.
16. Use masses of a few kinds of plants, not assortments.
17. Mulch the soil with peat or vermiculite to retain moisture and discourage weeds.
18. Use plant ties instead of string when tying up plants.
19. "Condition" poor soil chemically.
20. Rely on dusts instead of sprays for pests.

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# How to Grow Healthy Seedlings

By CLAUDE BERNIER, Ph.D.

Department of Plant Science, University of Manitoba,  
Fort Garry, Manitoba

Flower and vegetable seedlings grown under glass and in the field are subject to a destructive disease called damping-off, caused by a number of very common soil-inhabiting fungi (*Pythium*, *Rhizoctonia*, *Fusarium*, etc.). The fungi often attack and kill the young seedlings before they reach the surface of the soil. They also cause the rotting of seedling stems at the ground line, and attack the roots of the plants that survive the first two types of the disease, causing stunting of the plants.

Damping-off may be effectively controlled by treating seed with fungicides and applying fungicides as drenches to the soil around the base of the seedlings, or by sterilizing the soil and the pots or flats. The two fungicides most commonly used for treating seed are Thiram 75 (also sold as Arasan 75) and Captan 75 (also sold as Orthocide 75). To treat a packet of seed, place a small amount of fungicide into the packet using the tip of a pocket knife blade or the broad end of a toothpick, fold the top of the packet and shake thoroughly for a minute or two. Excess seed protectant may be sifted out before planting. When seed is planted in unsterilized soil, chemical drenches with Thiram, Captan or Zineb (1 tablespoon per gallon of water) can be applied to the soil after emergence or after transplanting, using one pint of the solution per square foot. Repeat at 5-day intervals if disease persists.

Disease-inducing organisms in the soil can be killed by heat sterilization (pasteurization). Heat treatment has the added advantage of destroying insects and many weed seeds. The following methods are suitable for treating small amounts of soil in flower pots or small flats. In all cases, the soil should be slightly moist, friable and not over 4 inches deep in the containers (pots, flats, glass or metal pans) so that the heat can penetrate throughout.

**Oven pasteurization.** Bury a small potato (about 1½ inches in diameter) in the soil and cover the container with aluminum foil and seal down the edges. Punch a small hole through the centre of the foil and insert a meat or candy thermometer into the soil. Place in the oven at about 180 degrees to 200 degrees and keep the soil in the oven 30 minutes after the temperature reaches 180°F. Then remove and let cool. The potato should be well cooked. Avoid oven temperatures above 200°F. which might burn the organic matter in the soil and destroy soil texture.

**Pressure cooker.** Put several cups of water in the bottom of the cooker. Stack the containers on the rack inside the cooker, separating each container with strips of wood to allow free circulation of steam. Close the lid and wait until all the air is forced out and steam is escaping before placing the pressure indicator on the outlet. When the pressure has reached 10 pounds, (second line on the pressure indicator) run at this level for 15 minutes.

**Steamer without pressure.** Pour about a gallon of water into a laundry boiler or large canner. Use a rack to hold the soil containers out of the water. Apply sufficient heat to keep the water boiling and adjust the lid so that it holds in steam but prevents much pressure from building up. Apply heat for 30 minutes after live steam begins to be forced out.

To avoid unpleasant odors in the home the last 2 methods can be practised outside or in the garage on a hot plate. When pasteurized soil is used, care should be taken not to contaminate it with dirty tools and the seeds should be treated with a fungicide before planting.

# Slugs in Prairie Gardens

By M. E. TAYLOR

Canada Agricultural Research Station

Slugs may be unfamiliar to many prairie residents for, although common in eastern Canada and British Columbia, they did not appear on the prairies in significant numbers until recently. The natural climate of the prairies is generally considered too dry for slugs. They have managed to become established, however, in well-watered city gardens and likely will continue to spread as artificial watering becomes more general in towns and villages, and on farms.

Slugs damage plants by eating the leaves and tender shoots. In the more humid regions of Canada they attack almost all field and garden crops including grains, clovers, vegetables, ornamentals and small fruits. On the prairies they occur mostly in home gardens, attacking leafy vegetables such as lettuce, ripe strawberries, and some other garden plants.

Slugs belong to the group of animals called molluscs which include clams, oysters and snails. Unlike their near relatives, they have no protective shell. To protect themselves against drying, they must live in moist places such as under leaves, boards, and rubbish. They come out to feed only at night or on dull, damp days. A shiny trail composed of a sticky secretion marks the course of slugs over soil and plants. They lay their eggs in the soil or under boards and rubbish. The eggs look like little balls of jelly and are very tough and resistant to heat, cold and drying.

Several things can be done to help control slugs. Sanitation is important. Get rid of all plant rubbish, boxes, boards, sacks or other materials under which the slugs can hide and lay eggs. Do not allow rank grass or weed growth to develop along fences. Traps or barriers may be useful under some circumstances. Collars of fly screening can be placed around special plants. Small boards or bark about 6 inches square can be placed on the soil between rows in the garden. Each morning the traps should be lifted and the slugs collected and destroyed.

Many commercial poison baits, sprays and dusts are available, most of them containing metaldehyde. This chemical has an extraordinary attraction to slugs and paralyzes or kills them when they eat it or crawl over it. For best results the poison should be supplied on a warm, moist night when the slugs are most active. All the slugs do not come out each night; some engaged in egg-laying remain hidden in the soil for 2 or 3 days. Usually it is necessary to apply a second or third treatment at 5-day intervals.

Several metaldehyde baits are available, some in the form of pellets. You can also mix your own bait. For small home gardens mix 2 ounces of pure metaldehyde in 5 pounds of bran, dampen and apply 2 pounds per 1,000 square feet. You may broadcast the bait evenly over the soil or place it in small piles around the plants. If possible place the bait under foliage, otherwise it may be eaten by birds. It will not harm birds but the bait they eat is not available to kill slugs. Metaldehyde dusts and sprays also are effective. Apply them on the soil, not on edible foliage or fruit. Do not expect to find all the slugs dead in the morning after applying poison. Metaldehyde paralyzes them but does not kill them outright. Paralyzed slugs exposed to the sun soon die; those in the shade of plants may remain alive for several days but will not feed again.

## Two for One . . . Air Layering

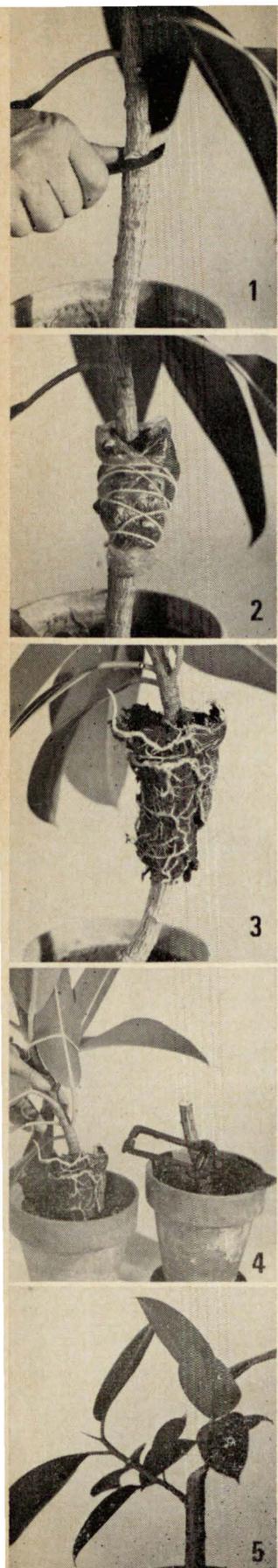
By GUS WEISS

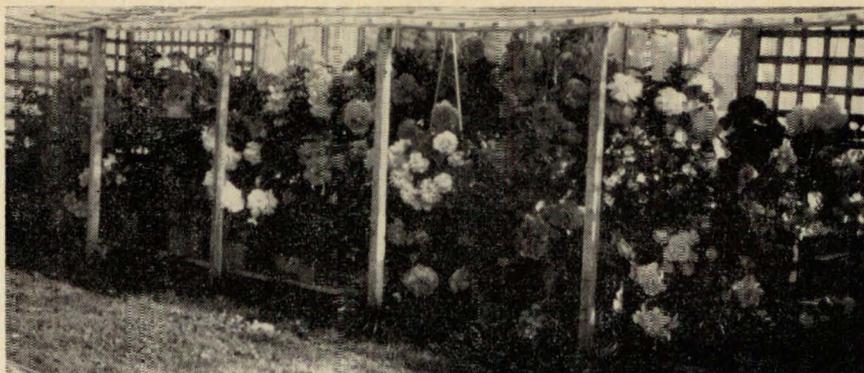
Greenhouse Manager, Department of Plant Science,  
University of Manitoba, Fort Garry, Manitoba

The rubber plant (*Ficus elastica*) and its closely related types lend themselves to air layering, or so-called stem rooting. Overgrown plants which are a problem in the home, may be made more manageable by this method, as well as providing an extra plant.

(1) Select a location on the stem where the bark is brown and woody; the green portion of the stem does not root as readily. (2) Cut a fairly deep notch or cut into the stem to about one-third of its thickness, and wedge open with a small splinter of wood to prevent the cut from healing over. (3) Wrap the area around the cut with a handful of moist sphagnum moss, usually obtainable from the florist. Wrap again with clear plastic, leaving the top open to facilitate watering. The moss must be kept moist at all times. (4) Some weeks will elapse before rooting starts, but when roots can be seen through the plastic it is time to consider planting the rooted portion. Cut off the stem below the rooted area. Remove the plastic. Leave the moss and the roots intact, and plant firmly in a well drained 6- or 7-inch pot, preferably a clay pot. There should be no difficulty in establishing your new plant in this way. (5) The stump of the old plant may be cut back to 8 or 10 inches above the soil level. It will develop new shoots from the old leaf scars.

Overgrown dieffenbachia may be rooted in a similar manner excepting that no cut needs to be made into the stem. Merely wrap with sphagnum moss as indicated above and roots will develop readily if the moss is kept moist at all times. Follow the same procedure for planting.





## Tuberous Begonias in Peace River Area

By Mrs. ARTHUR OLIVER  
Fairview, Alberta

I start my tuberous begonias into growth about March 20th and find the plastic strawberry baskets very suitable for the purpose. I fill the basket with leaf mold and press in the tubers so that the flat, upper side is even with the top of the basket, and keep the mold just nicely moist but not too wet.

When the roots are sufficiently developed that they show through the sides of the basket, the tubers are planted in wooden boxes made of three-eighth-inch plywood, 8 inches square and about the same in depth, with allowance for good drainage at the bottom. The leaf mold is treated with a little Mergamma to kill any worms that may be present; the tubers are transferred directly into the boxes without being removed from the plastic baskets, and covered with about an inch of the leaf mold. I always water with rain water.

After danger of frost has passed in the spring, the plants are moved outdoors into a slatted shelter open to the north, arranging them on 3 step-like benches. Plastic covers for the shelter are conveniently on hand to protect the plants from damage by the north winds. During the hot and dry days the plants are sprayed and the ground under the benches is kept moist. After the first light fall frost, I cut the plants back to about 6 inches above the tuber and move them into the house basement where they remain until started again into growth the following March. Large tubers are cut in half before planting and dusted freely with sulphur. Tubers bought 5 years ago are still doing splendidly. The stems may run 1½ inches thick, and the plants may grow 1½ feet tall.

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## Horticultural Society Activities in Saskatchewan

By D. R. ROBINSON, B.S.A.

Extension Division, University of Saskatchewan, Saskatoon, Saskatchewan

The summer of 1966 was one of generous rainfall in almost all areas of the province and as a result the Saskatchewan Horticultural Societies enjoyed a very good season. The annual August show is one of the main events of the year and Show entries right across the province probably were more numerous than they have been for the past 15 years.

The suggestion is made sometimes that the smaller urban centres are having difficulties or that they are "fading away." In so far as the 1966 horticultural shows are concerned this does not seem to be the case. Twenty-six societies in towns and villages held shows with an "average" for entries only a little less than that for the shows in the 10 larger cities.

A good number of the societies distribute premiums and with rising costs this can become a problem. Sturgis society gave 3 strawberry plants as a premium and additional plants were sold. This society, in a small town, holds 11 educational meetings a year. They have a rotating program committee. Regina and Indian Head have maintained good programs for children and, in particular, their children's garden competitions are rather outstanding.

In order to get some of the newer Rosybloom crabapples into circulation Eston society purchased 36 Almey crabapples and sold them at half price. Echo Lake society reports that, for meetings in general, a telephoning committee is a must. It would appear that horticultural societies often are weak on publicity. Last summer the Melfort society had an attractive float in the annual exhibition parade and this float was among the prize winners. On a previous occasion it was mentioned that 2 of our smaller societies, W. Willoughby of Parkside and Last Mountain Lake of Bulyea, hold their August shows in 3 communities, rotating from year to year. It is a practical way of "taking the show to the people."

We must not conclude this article without referring to our fifth Provincial Horticultural Show. This Show was held at Rosetown and with entries totalling 1,537, including fruit, it was the largest provincial horticultural show to date. It would be difficult to pick out any classes or sections as superior to others, but the gladiolus classes, with almost 400 entries, were really outstanding. Likewise, there were several very attractive entries in the classes for decoratives and arrangements.

Various other worthwhile projects could be mentioned. Quill Lake plants flowers at the town hospital each year. Other societies are assisting with the landscaping of senior citizen's homes. Prince Albert conducts beginners' classes for new exhibitors. A few societies make use of local facilities for radio and television broadcasts and newspaper articles on gardening. Melville has a rather unique centennial project. They have obtained an ox cart and are having it mounted on a cement block in the shape of the Centennial flag in the regional park. At least 2 of our societies in 1966 carried out a vegetable testing project in co-operation with the Extension Department, University of Manitoba, and 2 or more are sponsoring 4-H garden clubs. Quite recently 2 societies sponsored horticultural short courses and 8 additional courses are planned for the coming season. Altogether, the Saskatchewan societies had a very successful season in 1966.

# DRIFTWOOD

By MIDGE WIBBERLEY

Cariboo Country, 100 Mile House, British Columbia

Men make such a fuss over little things!

To me, the bathtub seemed a perfectly logical place in which to scrub my precious pieces of driftwood. But it seems the menfolk in our family take exception to competing with bits of juniper-bark on bath night. Besides, they tell me, that I will, eventually, plug the drain. This, I believe, is sheer conspiracy, designed to discourage me from using it for this purpose.

Besides, I only use the bathtub in the winter time. All summer long I use our little fishing boat. It makes a dandy "scrubbing" tub! When it is filled with water, not only am I able to get innumerable big pieces of driftwood in it, and a whopping big scrubbing brush—there is still room left for me to get in with it. This is an immense help, for I am able to scrub, and soak, and splash (the driftwood, that is) without any thought of having to clean up afterwards.

But there again I run into quite a bit of opposition, particularly when a fishing trip is planned!

However, these are very small obstacles which we simply have to overcome if we are going to be driftwood collectors. I do think this "collecting" is a disease—and I do believe driftwood collecting is one of the more virulent types. Once bitten, you are a "gone goose." No longer will you be able to stroll casually along the beach, or drive aimlessly through the countryside, or climb high hills to view the breath-taking beauty. Instead, you will gradually become related—in posture that is—to a Beagle dog, running over the terrain with your eyes and nose glued to the ground. For the fascination of ferreting out odd bits of twisted branches, age-old knots, unusual growth patterns in pieces of bark—is simply irresistible!

Even your mode of travel, will, of necessity, change. A "compact" car will become inadequate; a larger car still unsuitable; a pick-up truck more helpful; and a four-wheel drive (as your field of searching becomes wider) a must!

I have, I believe, in the last four years, brought home enough driftwood to keep us in fireplace wood for the next two years, that is, if I could ever be persuaded to part with one single solitary piece of it.

I find no distance is too far to walk if there is a possibility of something interesting to be found, no sand bank too steep if there might be a "find" at the bottom, or no piece too large as long as I can get it off the ground. All must be brought home!

So perhaps one of the first requisites for this collection is having some place to put the darn stuff when you DO get it home. After you have filled the basement, the attic, and spare bedroom and the broom closet it is time to start looking around outside. Friend husband's workshop is a likely spot — that is, after you have filled the double garage and the guest cabin.

Seriously, though, you DO need a spot where you can work on it and be able to leave the "muss." There is an incredible amount of loose bark, sand, bits of branches, leaves, and dust which must be taken off with the first rough cleaning. At this point, too, I endeavor to saw off my unsightly protuberances or damaged ends which detract from the natural beauty and contour of the wood.

This cleaning is followed by the "bath" (previously described)—a most helpful procedure, for I find a good scrubbing with warm water, preferably, a little detergent added and a wire brush, will work wonders. I do not use bleach, although I am aware that it is recommended if you wish to change the color of your wood somewhat. Soft shades of pale pink, yellow, off-white can be achieved with the addition of ordinary kitchen bleach in your scrubbing water.

Over the years I have had dozens of suggestions on how to get driftwood cleaned, sanded and "finished." Many of these methods I have tried — but I always seem to come back to one main way of doing it — the hard way! I use, mainly, an old pocket knife (generally quite dull), a small gouger with a wooden handle, and a curved "blade" wrapped with tape for a handle. And, of course, vast quantities of elbow grease!

What a tremendous overpowering thrill you experience when the color starts to emerge and the lovely shape and contour of the wood become apparent. What a joy!

I work, mainly, with juniper and I am sure there is no more difficult wood to clean. Some of the gnarled, old, dead roots which have been wind-swept, dried out, clinging to barren, almost inaccessible spots, are a real challenge to work on. But the beauty is there — and needs only our attention to make it apparent.

I do have a sanding disc, which I only use occasionally, generally, on the bottom of pieces to make them "sit." Most of the work in sanding is done by hand, using different grades of sandpaper, then finishing off with steel wool. When the pieces are clean and smooth, I rub a coat of boiled linseed oil into them, wiping off any excess oil, then leaving them to dry.

There are several ways of doing the final finishing. The type depends on the piece of driftwood itself — its shape, and grain, and contour. Some I simply keep rubbing oil into them; some a coat of hard wax and a polishing until they gleam. Still others I varnish or shellac. (This always brings a howl of protest from other collectors — for apparently, to use varnish on driftwood is considered just "not done".) However, I have found that some pieces simply require a "lift" if they are to be interesting — and that a few highlights provided by varnish, place them above the ordinary.

Your final finish, then, in my estimation depends entirely upon your own individual taste. It seems foolish to be bound by a rigid set of rules when you are simply working with driftwood for the sheer enjoyment of it. Experiment, then, with different finishes — find one that appeals to you, and use it. The main thing is, of course, to have your driftwood really clean and smooth before any type of finishing is attempted.

Anyway it's YOUR driftwood — so enjoy it!

## Greening of Potatoes

A number of instances are reported each winter of potatoes becoming green or "sunburned" in storage. The only way in which this can occur is for the tubers to be exposed to at least some light and even a very weak light will cause greening eventually. This greening is detrimental to the eating quality of the tubers. At the very least, they must be deeply peeled in order to remove the green flesh and normally the remainder of the tuber will cook yellowish and will likely also have a bitter taste.—D. H. Dabbs, Department of Horticulture.

# Dahlia Culture

By BJORN PETURSON, Ph.D.

Dahlias are one of our most adaptable and useful garden flowers. They come in heights ranging from dwarfs little more than a foot high, useful for the front of the flower border, to giants over 6 feet tall suitable for background specimens. The flowers come in a great variety of colors and range in size from flowers more than a foot in diameter to ones less than 2 inches across; and the variation in shape of flower is as great as the variation in color and size. Among the many hundreds of dahlias there are many different varieties which one could use for landscape effects, flower arrangements, show specimens at flower exhibitions, and a variety of other purposes.

Some hints on growing dahlias under Red River Valley conditions are given in the following paragraphs.

## Soil Preparation

Dahlias grow well in a wide variety of soils. They will thrive and produce a good crop of flowers and roots in any soil which will produce a good crop of vegetables. They do best and are most easily handled in well drained sandy loam.

In the Red River Valley where soils generally are heavy and sticky the soils can be greatly improved by a liberal addition of acid peat or well rotted barnyard manure, or by a composition of both. These need not be added to the entire garden although such additions to our soils would in most, if not all, cases improve the soil for culture of all vegetables and flowers. If the dahlias are grown in rows like vegetables, it would be sufficient to dig a trench 16 to 20 inches wide and add the soil amendments to this trench. If the dahlias are grown as single plants in spots here and there, dig holes 2 by 2 feet, about 8 inches deep, and add the required soil amendments to them together with some bonemeal and a small amount of fertilizer high in phosphorus.

The treatment suggested not only improves the growth and health of the dahlias but also will ease the lifting of the clumps in the fall, and will largely prevent injury to the roots. If the amendments suggested are not readily available sharp sand, that is, sand from a gravel pit, could be substituted. Sand from the shores of Lake Winnipeg or from our other lakes is absolutely unsuitable for Red River soils. Lake shore sand is so fine and worn so smooth by water action that it tends to bind our heavy clays together very tightly, much as cement would, and thus aggravate the condition which it is supposed to remedy.

## Where to Plant Dahlias

Dahlias, generally, produce the best plants and flowers in a location exposed to full sunlight all day, but they will thrive and produce a good crop of flowers if they get daily from 6 to 8 hours of sunlight. In fact, some varieties produce better flowers when grown in partial sun than when grown in full sunlight all day. For example, the scarlet flowers of Coltness Gem will fade badly and look insipid when exposed to the full sun all day but will retain their exquisite natural color for many days if grown in partial shade. However, the flowers of many dahlia varieties have fast colors and are not affected by strong sunlight.

## When to Plant Dahlias

In a short-season area such as we have in Manitoba the date of planting of dahlias is most important. It is hardly worth while planting unless one is

assured of a flowering period of at least a month. This can be achieved by planting short-season varieties early. All dahlias, early, mid-season and late varieties should be planted about May 7 in the Winnipeg area. One should be prepared to protect these early planted dahlias from spring frosts by covering with Hotkaps or boxes. In some years no frost protection will be needed and in other years protection will be needed only on a few nights. In the Winnipeg area frosts usually do not occur after June 7. Therefore, in this area, those who do not wish to go to the trouble of protecting their plants from late spring frosts should adjust their plantings so that their plants emerge shortly after June 7.

## How to Plant Dahlias

Dahlia roots should be planted from 2 to 3 feet apart at a depth of about 6 to 8 inches. Holes about 18 inches in diameter and about 8 inches deep should be prepared with the proper soil amendments added. The roots should be planted horizontally with the eye end about 2 inches higher than the tail end, and covered to a depth of about 2 inches. As the soil warms up and the sprouts emerge the holes should be gradually filled in. At planting time a stout stake,  $3\frac{1}{2}$  to 5 feet high, should be driven in at the eye end of the root. Staking the dahlias and tying them to the stake as they develop is essential. Unstaked dahlias, more often than not, are at least a partial loss.

The area around each dahlia should be free of weeds, but cultivation should be shallow in order not to damage roots which grow near the soil surface. A 2-inch mulch of peat would help to conserve moisture and to keep down weeds.

## Watering Dahlias

Dahlias are water-loving plants and should be well watered at all times, but good drainage is essential for they do not respond well to perpetually wet feet. In fact, in Mexico, the country of their origination, their name is Acocotti (Water Pipe), which refers to their love of water. When dahlias are watered they should receive sufficient to moisten the soil to a depth of 4 to 6 inches. A light surface sprinkling usually is not effective.

## Disbudding and Pruning

Here in our area plants grown to one stem seem to give good results. The leaves and side branches of the stem should be removed to a height of from 8 to 12 inches depending on the variety. No further pruning is ordinarily necessary except for removing the two side buds of the terminal branches in order to give the main bud a better opportunity to develop.

## Harvesting Dahlias

In southern Manitoba dahlias usually are cut down by frost during the second half of September. In some mild seasons, with a little protection, they may survive into October. The roots should be dug about 10 days after the first killing frost. The 10 days between the death of the top and lifting of the roots allows the roots to mature somewhat and to develop a covering more impervious to water loss. If liberal amounts of peat and barnyard manure have been added to the soil the plants will lift easily without appreciable root injury.

## Storing Dahlias

After the clumps of roots have been cleaned of soil and dried for about 3 or 4 hours they are ready for winter storage. The dahlias can be stored as undivided clumps and the clumps then divided into individual roots in the spring; or the clumps can be divided in the fall and the roots then stored much as one would store carrots. If they are to be stored as clumps some of the soil

should be removed from the clumps and these placed in boxes which have been lined with waterproof paper and packed in sawdust, sand, dry soil or peat soil. The boxes should be stored at a temperature of 40 to 50 degrees in a well ventilated room.

The writer has had good results with the following storage method:

(1) The soil is cleaned from the clumps immediately after digging and the clumps are then divided into individual roots, making sure that each root has a bud. The small side roots and the tail end are cut off each root with a sharp knife and all cut surfaces are covered with dusting sulphur. The roots are then numbered with an indelible pencil with the number which has been assigned previously to the variety from which they came. These numbers will remain legible throughout the winter and following summer and usually will be readable when the dahlias are lifted.

(2) The root divisions are dried for a few hours and then placed in a ventilated plastic bag. Each bag is only about half filled and the unused portion is rolled around the roots. The roots are then placed in wooden boxes and covered with sawdust. The roots are examined periodically during the winter, taken out and dried if too moist, and if too dry a little moisture is added to the sawdust. The storage temperature is of course the same as for dahlias stored as clumps.

### Dahlia Troubles

#### Mosaic

Dahlias are affected by a number of virus diseases. The symptoms are somewhat variable but the most common are mottling of the leaves with dark green and yellow areas and with some crinkling of the leaves. Often there is a varying amount of stunting ranging from a slight reduction in size to a severe stunting reducing plant height from a half to a quarter of normal. If a dahlia becomes virus-infected all parts of the plant, including the roots, are affected; all roots produced by infected plants carry the virus. Some varieties seem to be but little affected in growth and flower production by virus infection; we speak of these as virus-tolerant. Other varieties are severely affected in performance by a virus infection.

Since dahlia viruses are spread by aphids these insects should be kept in check by spraying the dahlias and surrounding areas with a good insecticide during the season. If the affected plants are not appreciably reduced in size and produce normal flowers, they may be considered virus-tolerant and need not be discarded. Any virus-infected plants which are stunted or show flower abnormalities should be discarded. Growers should use varieties which have been found by experience to be virus-tolerant or which are listed as virus-tolerant.

It is probable that most, if not all, of the extant dahlia varieties are virus-infected. Some probably are symptomless virus carriers and others are obvious carriers of virus infection but not appreciably affected by the infection. Still others are severely affected by viruses and should be avoided. Methods have been developed by which virus-free cuttings can be obtained from infected plants. The methods of obtaining these virus-free cuttings require special techniques and cannot be used by the ordinary grower.

#### Root Rots

Both fungi and bacteria attack the roots and crowns of dahlias. The organisms may destroy the roots or plug the water-conducting vessels of the plants thus causing them to wilt and die. Remove and destroy affected plants. Plant only roots from healthy plants in new or sterilized soil.

#### Powdery Mildew

Dahlias are often attacked by powdery mildew. A white, powdery substance, the body (*mycelium*) of the fungus, grows on the surface of the leaves. Powdery mildews of most plants are quite easily controlled because the fungus grows on the outside of the leaves where it can be reached by fungicides. This disease can be completely controlled by applications of dusting sulphur or Karathane.

#### Insects

Practically all the insects which attack dahlias, including aphids which spread virus diseases, can be controlled by Malathion during the growing season. The red spider mite is the worst enemy of the dahlia in our area, particularly in dry seasons. These mites attack the under side of the leaves. They are so small that they cannot be seen with the naked eye. The first sign of red spider damage usually is a whitish spotting of the leaves owing to loss of chlorophyll (leaf green). For good results control measures must be started before leaf damage has occurred for after the mites have extracted the juices from the leaves they will not recover even though the mites are killed. Red spiders can be controlled by applications of Kelthane.

#### Varieties

No dahlia test gardens have been established thus far in our area and, therefore, any information on the performance of varieties must be based on the experience of local growers.

## Junipers

The junipers provide excellent ground cover and can be used to some extent in foundation plantings, says Dr. R. E. Harris, Horticulturist at the Beaverlodge Experimental Farm, Alberta. They are useful on banks, in rockeries, and in places where green cover without too much maintenance is desired. The prostrate junipers are those usually in favor in Alberta. Popular species are the common juniper (*Juniperus communis*), the Savin juniper (*J. sabina*), and the creeping juniper (*J. horizontalis*).

The common juniper is a dense, low shrub with awl-like leaves carried right to the soil. Its berrylike cones are light blue and the plant is excellent for sandy banks in full sun. The Savin juniper is an upright, spreading type with a height of up to 3 feet. Varieties are available. The creeping juniper is a vigorous grower with long, narrow branches that root readily as the plant spreads. Colors vary from dark green to silver grey and blue, and the leaves often take on a purplish tinge in the fall.

Beaverlodge has a special interest in the creeping junipers, two having been introduced from this area. Both were collected by John Wallace, formerly of the Experimental Farm and now joint owner of Beaverlodge Nurseries. He selected the variety Wapiti in the wild state from the Wapiti River south of Beaverlodge in 1952, and it was made available for distribution by the Experimental Farm in 1959. It is fine-textured, lustrous green, has an upright growth of 12 to 16 inches, and can be encouraged to a spread of 8 to 10 feet.

The variety Dunvegan Blue is silvery blue in color, creeps close to the ground, and provides excellent ground cover. It was collected by Mr. Wallace on the banks of the Peace River near Dunvegan, and named and introduced through the Beaverlodge Nursery. Two other creeping juniper varieties recommended by Dr. Harris are Andorra and Waukegan.

# Care of African Violets

## 1. Pots

Either clay or plastic pots are suitable for African Violets. However, do not use large pots. It is very seldom that a Violet requires larger than a three-inch pot. It is better to use a small pot and fertilize regularly than to be continually repotting. This is perhaps the most common mistake made by inexperienced growers.

## 2. Soil

Soil used for African Violets should always be sterilized. If you grow only a few plants it is just as inexpensive and more convenient to use prepared Violet soil to which a little vermiculite—about one part to three parts of soil—should be added. If you prefer to mix your own, a good formula would be one part leaf mold, one part vermiculite or sand, two parts of good garden loam. Sterilization requires about 1½ hours in a 250-degree oven. If you have a meat thermometer, bake the soil until the thermometer reads 180 degrees for one-half hour.

## 3. Light

Your Violets can stand plenty of light as long as it's not the burning rays of the summer sun. If you use a south window, have a glass curtain to diffuse the sunlight. Violets will do well in north, east and west windows—but don't risk strong direct sunlight particularly in the west windows in summer. Get your plants as close to the window as possible so they will get the light from the top; give them a quarter turn once a week to keep them from leaning toward the light—and then, watch them bloom.

When the short days of winter come along, you can bring a favorite plant into bloom by placing it under a lamp (close to the light) for three or four hours each evening. (They do like 12 hours of light a day—if they can get it.)

## 4. Temperature

The temperature that suits you will suit your African Violets. They grow best at approximately 68 degrees, with a slight lowering at night. Whether you like to keep your home at 80 or 65, your Violets won't show any great difference. Do avoid draughts.

## 5. Watering

Water your African Violets from either the top or bottom, whichever is most convenient for you. If you consistently water from the saucer, it is a good idea to give an occasional watering from the top to flush the salts that will crust the soil surface back down into the soil.

Tepid water—that is water that is room temperature or slightly higher—will not spot the leaves unless the plant is sitting in the sun. *Never water until the top soil feels dry*, but don't let the plant dry out until the leaves droop; and never leave your plant sitting in a saucer of water for days at a time. When the soil is moist to the touch, the saucer should be emptied.

## 6. Fertilizers

Feed your plants at least once a month with any of the water-soluble plant fertilizers on the market. Use *one* teaspoon for each *gallon* of water, or *one-quarter* teaspoon for each *quart* of water. Don't let your violets "stand still" or they won't bloom. Keep them growing with plant food.

## 7. Humidity

Like ourselves, violets like a little moisture in the air around them. In winter, particularly, our air is very dry, so keep the vapor pan on the furnace filled, if you tend your furnace; or if you live in an apartment, set your plant saucer on top of a shallow tray filled with sand, or crushed rock (chicken grits) kept moist. A relative humidity of 40 to 50 per cent would be just right for our plants, but they will do very well at much lower readings.

## 8. Washing

Once a month is a good bath schedule for African Violets. Use a fine spray (a fly spray kept just for that purpose will do fine) and use water that feels neither warm nor cold to the touch. Spray until the water washes all the dust from the leaves. Let them dry out of draughts—and out of the sun. This will help them to grow crisp, clean, healthy foliage.

## 9. Propagation

You can increase your Violets by division, seed, or from single leaves. The last method is the easiest and produces young plants very quickly.

Lower leaves from *young* vigorous plants are ideal for this purpose. *However*—if you take a leaf from an older plant, make *sure* it is *not* a lower leaf. These are old and spent and may never produce plantlets. To remove a leaf, pull the stem gently sideways. It will come away clean from the base of the plant.

With a sharp knife or razor blade, cut the stem back on a slight angle. This will produce more plants per leaf. Set it aside for 30 minutes to heal. Insert the stem 2 inches deep in sand or vermiculite, and firm in place so the leaf stands upright. When the roots have formed so that the plant does not wiggle when touched, transplant the old leaf and the new plants into soil. The little plants grow faster if the leaf is left on, but it's possible to use the leaf again.

\* \* \*

## Force Branches for Winter Bloom

By C. G. HARD, Extension Horticulturist,  
Institute of Agriculture, University of Minnesota, St. Paul, Minnesota

Tired of winter? Forcing a few branches of a flowering tree or shrub is one way of bringing spring into the house early. On a bright day when the temperature is no lower than 20°F., take the opportunity to prune your flowering crabapple or plum and bring a few of the branches into the house.

Plunge the branches into a deep container of lukewarm water and then set the container of branches in a cool location such as the basement. If the branches are small enough lay them in the laundry tub and cover them with water, leaving them for about 20 minutes to soften the buds. At intervals change the water and make fresh cuts at the ends of the branches so they will take up water. It is also a good idea to syringe the buds once or twice a day to keep them soft. Leave the branches in a cool place until flower buds begin to open; then they can be arranged into bouquets.

Flowering crabapple and plum can be forced into bloom in 18 to 21 days. Lilac, June berry, pincherry, chokecherry and forsythia are among other flowering trees and shrubs which can be forced. Forsythia will come into bloom in 9 or 10 days.

# Hostas for the Shade

By A. R. BUCKLEY

One outstanding group of plants that I find most interesting and versatile is the Hosta or Plantain Lily group. The species within this group have an exceptionally wide range of green and variegated colored leaves and will withstand almost dense shade as well as full sun. Old gardeners will know the group as funkias, but the name Plantain Lily has been established for both the ancient and the modern generic names.

The common and most familiar species is the Fragrant Plantain Lily (*Hosta plantaginea*) which forms a rather massive light-green tuft of leaves and bears white trumpetlike blooms 4 inches long on stems 3 feet high. The leaves are 6 inches wide and 10 inches long on stiff stalks 8 inches long.

Several other kinds are available today from specialists who have searched many countries for different species and have bred new varieties for different colored foliage and wider open and larger flowers. Now you can get tiny plants which form small 4-inch rosettes to huge mounds of tropical-looking foliage 5 feet wide and 3 feet high.

All Plantain lilies are easy to grow and except for mild attacks of slugs in moist, shady areas, they are unaffected by pests or diseases. They need a good, rich, deep, medium loam with plenty of organic matter such as well decayed leaves or peat moss. Although they will withstand full sun, a location with some shade should be selected if you wish to retain good lustrous foliage.

The large-leaved Plantain lilies in combination with ferns as a dramatic contrast are very lovely. Their use has also been suggested as a means of covering up daffodil foliage after it has died down. Plant the daffodils or narcissus among a group of Plantain lilies and they will bloom before the leaves of these plants appear in the spring. Smaller-leaved kinds are excellent for ground covers in the shade and even the large, giant-leaved ones are useful under trees where a ground cover might be desirable. The smaller, variegated-leaved types are useful for edging a border of annuals.

Most gardeners like these plants for their use as foliage in arrangements. A few leaves serve as a spectacular base for arrangements in spring, summer and fall; or the leaves of many species can be used to form one large green arrangement.

One large Canadian mail order nurseryman lists five good varieties; other lists I have read have different types, so that you should, with a little patience, be able to muster about seven or eight to start your collection. If you take the trouble to write for United States and European catalogues, you could probably amass a collection of 40 or 50 different kinds.

Since most of you will be content with a few varieties I will confine these notes to those which usually are available. Don't look for these plants under the name Plantain Lily in our catalogues, for it would seem that with this particular plant nurserymen prefer to use the Latin names which are quite confusing and not often correct at that. They are given under the generic name of *Hosta* which is followed by the Latin descriptive epithet. The first name in the catalogue I am reading is *Hosta fortunei aurea-maculata*, a golden, marginal-leaved form of the Tall Clustered Plantain Lily, (*H. fortunei*). It is a large plant with striking leaves which are extremely useful for decorative arrangements as well as for leaving in a shady area where some soft effulgence is desired. *Hosta medio-variegata*, another variety sold in Canada, is most likely the white-margined leaved form of this same species. *Hosta sieboldiana*

*elegans* is nothing more or less than the beautiful Blue Leaved Plantain Lily (*H. glauca*). The handsome, foot-long leaves of this species are gray-green at first and later change to a powdery-blue. The texture of each leaf is best described as 'seersucker' or somewhat marbled. Its full beauty lies in its leaves for its lilac-white flowers produced in July are not very effective.

The plant sold as *Hosta undulata albo-variegata* is the Wavy Leaved Plantain Lily (*H. undulata*). It has medium-sized leaves with very wavy margins as the name 'undulata' suggests. The leaves are variegated white and green, very clean in the shade but as pronounced in full sun. This species too has flowers, and these are quite impressive for they are borne abundantly on stems which arise 3 feet above the plant and stand like a lavender cloud above the foliage.

A fifth variety sold, Honeybells, is a hybrid between two species and was developed at Bristol, Connecticut. It has light green leaves and very handsome flower spikes of striped lavender-blue, with a pronounced fragrance said to be similar to the Trailing Arbutus.

Hostas are trouble-free, dignified, very hardy and easy to grow, and are suitable for every garden that can give them slight shade.



## Cosmos

### Early Sensation Mixture Improved

Cosmos can be sown direct in the garden and will flower in 10 weeks if sown from seed. It may also be started indoors for earlier bloom and transplanted to the garden after danger of frost is passed.

The plant produces extra large flowers with broad, fluted petals for cutting and plant height is 3 feet. Cosmos will flower all summer long until the frost in the fall.

There are 3 colors in the Cosmos Early Sensation Mixture, pink, red and white, and the reasons Early Sensation Mixture was selected as Canada's Centennial Flower by the Canadian Seed Trade Association are:

It is an annual flower; it can be grown successfully from coast to coast; it can be grown in the garden from seed, and does not have to be transplanted; it is very effective in mass displays; it can be used as a cut flower; it can be used as a boutonniere; it is very reasonably priced so that no Canadian would be deprived of growing the flower because of the cost; the seed can be produced in Canada, making it truly a Canadian Centennial Flower.

#### Prairie-Grown Lilies, Roses, Fruits, Hardy Nursery Stock

We propagate only varieties that stand up under our severe conditions. Our general price list is ready for mailing in late February, the Lily list in August.

HONEYWOOD NURSERY, (A. J. Porter)

- Parkside, Sask.

## The Wild Rose

By P. D. McCALLA  
Edmonton, Alberta

Supervisor of Horticulture, Alberta Department of Agriculture

The floral emblem of the Province of Alberta is the *Rosa acicularis*, popularly known as the Wild Rose. It is very common around Edmonton and widespread throughout the province, usually on northern slopes and in denser shade and cool areas. This rose was chosen as the floral emblem of the province by the Floral Emblem Act of 1930.

It is interesting to re-read part of an editorial in the Edmonton Journal of February 24th, 1930. "While the rest of the country and the world for that matter are worrying about what is to be done with the unmarketable wheat crop of the prairies, the honorable members for Alberta are selecting a floral emblem for this province . . . and they are not selecting any kind of flower, just for the sake of having an official bloom. The wild rose appears to be the favorite, and this is evidence that Alberta's parliamentarians know their floriculture. The wild rose, what more beautiful flower could be chosen? Fragile and fragrant, the wild rose makes inestimable appeal to the finer sensibilities of all the lovers of the beautiful; and it is so appropriate to a western province. Have the prairies not been made to rejoice and bloom as the rose? Yes, this flower will typify the natural progress of a great province and at the same time testify to its cultural development."

The first interest in a floral emblem for the province was in 1926. The Women's Institutes took a vote through the schools and after a hot race between the tiger lily and the wild rose, the latter won by a good margin. The Floral Emblem Act reads as follows: "The Flower known botanically as *Rosa acicularis* and popularly called the wild rose shall be adopted as and deemed to be the floral emblem of the Province of Alberta."

The wild rose makes a strong appeal to people interested in native plants. The simplicity of the flower, pleasingness and delicacy of form, color and texture and sweet fragrance, are attributes which symbolize the charm, grace and beauty of nature. The flowers of the native species usually are single and pink and the plants are more particularly suited to the production of naturalistic effects in rather extensive developments such as characterize the parks and larger estates rather than to the planning of small gardens.

It is a low shrub usually 3 to 5 feet. It is the tallest of the native species. The stems are covered with thorns. The leaflets are 5 to 7, usually 5, and dull and hairy on the upper surface. The flowers are single, pink in color, and bloom on laterals from two-year or older wood. The flowering period is short usually early in June but often later in the month if the season is delayed. The fruit usually is pear-shaped with a distinct neck and a deep crimson color.

The wild rose has beauty of line, color and fragrance. It has to be handled with gloves. Let anyone be so bold as to grasp it roughly and he will retire, utterly defeated. Like other Albertans it has become thoroughly rooted here, and on its own behalf beautifies the summer landscape; its scarlet berries brighten the winter.

Today an extensive rose breeding program is being carried out on the prairies by many of our outstanding plant hybridizers. They are working to

develop a rose with many of the attributes of the Hybrid Teas but hardy enough to stand the prairie winters. One of the parents in many of these trials is the native rose (*Rosa acicularis*). It is being used primarily to impart hardiness to the crosses and while it is true the way is often long and hard much progress has been made and it will not be too long before the hopes of our rose breeders and all those who love this beautiful flower will be realized. Some selection also has been done, and the University of Alberta for example has an extremely attractive plant double-flowering and more compact than the type. The school children and people of Alberta chose wisely 37 years ago when they named this plant the floral emblem of this foothills province.

## Lime-Induced Chlorosis

By L. J. LaCROIX  
Assistant Professor of Plant Science,  
University of Manitoba, Winnipeg, Manitoba

Chlorosis is a general term employed to describe plants whose leaves have a marked deficiency in chlorophyll content (chlorophyll is the green pigment common in most plants). This condition commonly is a symptom of iron deficiency and more specifically is expressed by the loss of green color between the leaf veins. The symptom appears on the newer growth first and under extreme conditions these leaves yellow and die. Trees subject to this condition may show chlorosis on isolated branches due to the differential zones of feeding of the root system. Affected annual plants in general will survive but may be severely limited in amount of growth and flowering. Yearly recurrence of the condition with perennials may result eventually in death of the plant.

Some crop plants which are seriously affected by chlorosis include strawberries, raspberries, field beans, peas, corn and apples. Some ornamental plants susceptible to chlorosis are: rose, delphinium, spirea, *Prunus spp.*, mountain-ash, geranium, iris, snapdragon and petunia. Within each species some varieties are more sensitive than others, e.g., Hanson Hedge and Dr. Merkeley roses tend to be more resistant to chlorosis than Persian Yellow and Hansa.

Most soils have sufficient iron to supply the small requirement for normal plant growth but this iron frequently is unavailable to the plant. A combination of high lime and neutral or alkaline soil conditions results in iron unavailability and thus the term lime-induced chlorosis. Soils of this type are widespread throughout the prairies.

A number of cultural practices are beneficial in preventing or overcoming lime-induced chlorosis: Grow varieties or species of plants that are resistant to this condition; provide good subsoil drainage and avoid over-watering; add organic matter, such as manure, to the soil. This will help to maintain good soil structure and aeration and may be of benefit in preventing chlorosis.

If these methods fail then iron chelates may be used to advantage. Two forms of chelated iron are available under the trade names Versenol and Sequestrene 330. They should be applied to the soil as near to the rooting zone as possible at the rates suggested on the container. This may be done by mixing the material with the top soil around the plant for low-growing shrubs and annuals; and by placing the material in a series of holes in the soil 2 to 3 feet deep and 2 feet apart in circles about the trunk of trees. These holes should extend out to the drip-line of the branches. In both cases the plants should be well watered after application of the chelated iron.

The use of chelated iron in general is more effective in overcoming lime-induced chlorosis than older methods such as soil application of ferrous sulphate or sulphur. The high cost of chelates limits their use to small areas.

# Rock Gardens and Rock Garden Plants

By MRS. M. HANNA, Regina, Saskatchewan

My rock garden was built from a patch we inherited when a cement sidewalk and a paved road were put in. What once was a narrow border for pansies between our foot-high rock fence and the city sidewalk is now turned into an awkward piece of elevated ground about 2 feet higher than the sidewalk, 3 feet wide, and the whole length of our property. It was made into a rock garden with slabs of Tyndal stone left over from the rock fence.

There are many different types of rock gardens, including rock and pool gardens, retaining wall gardens, terraced wall gardens, etc. You should visit your library and look through the many books available on the subject. While most are written by eastern Canada or American authors, one can follow the construction ideas and pick plantings from our own prairie nurseries.

Any rockery requires good drainage, soil enriched with manure or leaf mold, or peat moss. The rocks must slope toward the rear or toward the back of your garden, so that the soil does not wash away. Most rockery plants have fine, shallow roots. It is most important in the very early spring, after the snow has gone, that the drying winds of April and May do not wither the roots. The plants should be pressed firmly into the ground, and watered at regular intervals. (Leave autumn foliage on overwinter to catch the snow.) Any thinning should be done in the spring. Many plants start to bloom in June, so need care in the earliest part of the spring when it is too early to work in other parts of the garden. If you give them this care at the proper time, little attention will be required for the rest of the summer, except for watering and weeding. It is best to use a canvas soaker or fine plastic misting hose for watering.

Listed below are the rockery plants with which I am familiar, giving their flowering time and heights. My garden is exposed to sun and wind all day, and every pest known to the gardener including kids, bicycles, cats, dogs and salt solutions put on the streets during winter months. They thrive through it all, so you can see how tough and hardy they are.

Rockery plants mostly are perennial and come in shades of rose, mauve, blue, and yellow. To add other color, I plant the odd rockery snap, petunia, or pansy in bright red, white, wine color and salmon shades. Most plants are easily confined within the rocks for at least 2 years before they need thinning. Achillia the Pearl, with white puffs of double white flowers, nice for filler in bouquets, and Yarrow with rose or yellow, flat flower heads (nice for winter bouquets), must be chopped and dug up each spring, as the roots will run under rocks and choke out other plants.

Rock plants seem to be particularly free from disease and bugs, but look out for slugs. You can get them easily from the stones you bring in to use in your garden. As a precaution, place a few slug pellets either under the rock or beside it every couple of feet, when you are cleaning the rockery in the spring.

In the fall, water well before freeze-up to avoid frost heaving, and if there's any extra snow around in the winter, toss some on the rockery. Rockery plants are among the prettiest flowers and I hope every gardener will find room for them, even if it is between a few stones lining a driveway. One very recent and good book on rockeries is All About Rock Gardens and Plants by Walter A. Kolaga. It is well illustrated.

Sedums .....	July.
Evergreen Stonecrop .....	4 to 6 inches. July, yellow flower.
Blush Stonecrop .....	10 inches. July, rose color.
Variiegated Stonecrop .....	8 inches. Green leaves edged yellow. Yellow flowers and red seed pod, very showy (seed pods are attractive sprayed for winter bouquets).
Spurium Roseum .....	4 to 6 inches, pink flowers.
Spurium Album .....	4 to 6 inches, white flowers.
Sempervivums (Hens and Chicks) .....	These are little rosettes 2 to 3 inches high: they vary from bright green to touches of amber and purple on the fleshy leaves; they should be placed near the front so they can be easily seen. Four good varieties are: Globe Houseleek, Pedoyanum, Reginae, and Tectorum Rubrum.
Sea Campion .....	6 inches, bluish green foliage, high, pinky white flowers; remove seed pods or they will spread and become a nuisance.
Akita Columbine .....	6 to 8 inches, really pretty blue and white dwarf, July.
Spiderwort .....	12 inches, grassy foliage, July and August, bluish purple flower, 2 to 3 to a stem.
Douglasia .....	2 inches, June, yellow flowers.
Carpathian Bellflower .....	12 inches, blue cup-shaped flower, July.
Mountain Daisy .....	4 to 6 inches, mat of bright green leaves, mauve daisy, July and August.
Wild Sweet William .....	12 inches, blue flowers, June.
Phlox—Subulata Varieties .....	Bloom in late May, early June.
Autumn Rose .....	Rose shade, deeper centre.
Lilac .....	Pale lilac shade.
Temiskaming .....	8 to 10 inches, bright rosy red, most colorful of the three.
Rosyveil Babysbreath .....	10 inches, bluish pink, very airy and pretty in the rock garden.
Speedwells .....	9 to 12 inches, July and August, pink and white, short spikes of flowers.
Siberian Avens (Geum sibericum) .....	9 inches, brilliant orange scarlet flowers somewhat like a single rose, stand out anywhere.
Thymes .....	Really lovely in the rock garden and fragrant. The best ones are Ukrainian thyme, 8 inches, pink flowers, and Mother-of-Thyme, 4 inches, deeper pink flowers, July.
Alpine Aster .....	Mat of purple daisylike flowers with yellow centres, flowers 6 to 9 inches, June.
Lavender .....	Nice anywhere, but must have sun. Will winterkill in cool, wet soil or poorly drained soil.
Chrysanthemums .....	
Dorothy Howard .....	12 to 16 inches, white.
Pygmy Pink .....	9 inches, rosy pink.
Cree .....	18 inches, dark red.
Sutherland Pink .....	9 to 12 inches.
Joan Brandon .....	Deep bronzy yellow, 12 to 15 inches.
Julie Brandon .....	Bronzy red, 12 inches.

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# Fertilizing Trees

By A. R. BUCKLEY

Why not take a good look at the trees on your property and see if they wouldn't benefit from an application of fertilizer? You may not be able to tell just by looking at them, but if they are more than 10 years old and have never been fed, the chances are that a good feeding now would improve their growth, make the leaves greener next fall, and render them less prone to attacks of insects and disease.

In the forest the tree has a good layer of decomposing leaves to provide plant foods. In the lawn or along a curb, the tree must exist on what food is available in the soil in which it is planted and yet it is given more room than the forest tree and is expected to make a larger tree with a greater spread.

In order to prevent the inevitable slow starvation which will result if a tree uses all the available food within reach of its roots, feeding should be resorted to. This is especially true of older trees, such as those 50 years or more of age. The commonly accepted method of feeding a tree is to bore 2-inch diameter holes 12 to 18 inches deep in the ground at points under the outer perimeter of branch spread. If a single circle of holes will not hold all the fertilizer needed, another circle is made inside or outside the first.

The holes are spread usually 18 inches apart and the rows spaced 18 inches wide. The holes are then filled to within 3 inches of the surface through a funnel so as not to spill the fertilizer on the lawn; then water well if the ground is dry. There is no need to fill in the hole after the job is finished since they will aerate the soil and also help tree growth.

The fertilizer recommended by tree experts is one which approaches 10-8-6 formula, i.e., 10 parts nitrogen, 8 parts phosphorus and 6 parts potash. In Ottawa the nearest formula obtainable is most likely 6-9-6 or 10-6-4, but the 6-9-6 is preferable because of the greater amount of phosphorus. The need for elements other than these three has never been established except in extreme cases, and the addition of such trace elements as boron, manganese or iron has had no effect upon the trees fertilized in various experiments carried out by arborists in search of a good formula.

After it has been established that the trees need more food and the formula is selected, the next consideration is the dose to apply to each tree. The best way to arrive at the proper dosage is to add the height of the tree in feet to the branch spread in feet, plus the diameter of the trunk in inches at 4 feet high. The height and spread of the tree must necessarily be approximate; one need not go to great lengths to determine these measurements. Adding these measurements will give the amount of 6-9-6 to apply in pounds; thus a tree 50 feet high, with a 50-foot spread and 18-inch diameter, would need 118 pounds of fertilizer applied in the holes.

Arrange to have not more than one pound of fertilizer in each hole. If it is impossible to place holes all around the tree, reduce the amount of fertilizer accordingly so that not too much will be placed in one hole, thereby probably causing burning of the roots. It is generally recommended that for conifers such as pines and spruces, blood meal be used instead of the above formula.

A series of experiments by the State of Illinois over the past few years suggests that feeding trees by surface application on lawns gave the best results and was the easiest method. The experiments used the boring hole method (they used a high-powered electric drill with a 2-inch hole attachment), the injection of liquid fertilizer method, and the surface layer method. For the

surface application, 6 pounds of nitrogen combined with phosphates and potash were applied to 1,000 square feet of lawn area. This would mean an 80-pound bag of 6-9-6 to a 10-foot circle around a tree. Since a normal lawn application would be one or two pounds of actual nitrogen to 1,000 square feet, you can see how much more excessive this fertilizer would be. Yet it did not burn the lawn except when the application was made in June and the grass was wet. In October no burning of the grass occurred; in fact, the lawn, as well as the trees, grew prolifically.

In the surface feeding experiment the same amount of fertilizer was applied to large trees as to small trees; the smaller trees, of course, would have less of an area spread than the larger ones. If you try this I would recommend the 6-9-6 fertilizer in which the nitrogen is released slowly; a urea-formaldehyde type would be preferred.

## WINNIPEG—CITY OF TREES

Trees in Winnipeg abound,  
Trees in numbers that astound;  
Trees we everywhere discern,  
Trees — more trees — at every turn.  
Trees to left and trees to right,  
Trees are everywhere in sight.  
Trees in evidence so much,  
Trees so close they almost touch.  
Trees — long avenues of such,  
Trees that miles and miles extend,  
Trees that never seem to end.  
Trees — to still more trees the trend;  
Trees — Trees — Trees —  
In plenty and profusion,  
Trees — a galaxy of trees.  
And this is no illusion,  
For Winnipeg is now indeed,  
A City bountifully treed;  
The greatest of its graces,  
Its parks and public places.  
Winnipeg —  
Where two great rivers meet and join —  
The Red and the Assiniboine.

WILLIAM HODGSON,  
Beamsville, Ontario.

It was the writer's privilege to work in Winnipeg's parks and public places for nearly 30 years.

*This used to be among my prayers — a portion of land not so very large but which should contain a garden, and near the homestead a spring of everflowing water, and a bit of forest to complete it.*

Horace.

# Annuals with the Colors of the Flag

By A. R. BUCKLEY, Horticulturist,

The Plant Research Institute, Canada Department of Agriculture, Ottawa

For a once-in-a-century garden that will catch and hold the attention of all who pass by, plant annuals with the colors of the Canadian flag, brilliant reds and dazzling whites. Nothing could possibly present your centennial project with such dynamic force.

At the Plant Research Institute's Test Gardens last summer a series of red and white annuals were grown for the purpose of determining which kinds would be best suited for a red-and-white bedding effect and to find red annuals that match the red of the Canadian flag. In this particular experiment it soon became obvious that cultivars of the annual salvia (*Salvia splendens*) in the "turkey red" group were the only ones that matched the scarlet red of the new flag.

It was established also that all good vivid reds and clean whites were eligible to represent our national banner. To purists, however, it is suggested that dwarf salvia such as Tom Thumb or Piccolo be used for the red part of the flag and white alyssum such as Carpet of Snow for the white. A bed composed of these annuals will not bloom all summer long, for there will be times when the fading flowers of salvia will need to be picked off and the alyssum to be clipped in order to rejuvenate them.

The most impressive annuals for bedding and ones that can be counted upon to produce a show of color almost all summer long are the petunias. Nowadays with the amazingly reliable F-1 hybrids it is easy to make bedding plans and be sure of getting the right colors without fear of having a large number of purple or bluish rogues pop up to spoil the effect.

In our trials, continuity of bloom, freedom from bacterial spotting, and quick recovery from rain damage were considered necessary for high ratings, and there were many varieties that qualified for inclusion in a red-and-white bedding scheme. The two I liked best of all were Candy Apple, a brilliant red, and White Sails, a large-flowering pure white that bloomed consistently through all weather and under the most adverse conditions. There were times late in the season when this gallant petunia was blooming alone among the 325 other cultivars. Red Magic, planted with its counterpart White Magic, also made an excellent combination.

Other top-rated dependable red cultivars were Red Ensign and Red Satin. Good dependable whites were Glacier, Paleface and Snowstorm. For window boxes, patio planters and hanging baskets for new F-1 balcony type petunias Red Avalanche and White Avalanche are bound to please. These two are actually outperforming and outshining the hitherto supreme Cascade strains usually reserved for this purpose. Starfire, a bicolored red and white, was the best petunia to use for flag colors on a single plant. Petunias are easy to get from nurseries and garden centres in full bloom in flats or boxes. In most cases it is advisable to pinch out the tops of the plants as you set them out in the garden. This takes courage, but it will result in a better branching habit and a longer blooming period. If you prefer to grow your own plants from seed, start them early, at least by the end of March.

There are many other annuals you can grow in your red-and-white centennial garden. In our trials the annual phlox (*Phlox drummondii*) was better than some of the petunias from the standpoint of brilliance in both red and white coloring. Two cultivars, Fireball, dark red, and Snowball, glistening

white, combine to make a very striking effect. Both are very dwarf compact types. These phlox plants prefer full sun and a soil rich in organic matter. Sow them inside as you would petunias or get greenhouse-grown plants.

With the appearance last year of the Floral Carpet series, a new race of dwarf snapdragons, all of equal size and conformity but in separated colors, can now be used in bedding schemes calling for consistent flowering, dwarf mounded, compact plants. This Floral Carpet group can be had in separate colors, each one preferably stable and usable as edging or as carpet plants. Combine Floral Carpet red with Floral Carpet white to give a good red and white effect. The white does not glisten like the white of petunias and phlox but it suits the tempo of the red snapdragon and makes a good contrast.

Perhaps you would rather have a mixed border of alternating red and white annuals of varying heights. This planting will give you a greater variety of forms, textures and heights, which you can vary according to your taste. In the following lists, annuals marked with an asterisk may be sown directly in the ground in early May; the others are best started earlier in the house or obtained from your nurseryman or garden centre.

Tall plants, from 2 to 3 feet for the background, might include \*Early Splendor amaranthus, noted for its vivid red foliage all summer; \*cosmos in varieties Purity, white, and Dazzler, vivid red; snapdragon, zinnia varieties Topper, white, and Redstone Rocket, red.

Medium-sized annuals, from 15 inches to 2 feet for the middle of the border, are White Cascade petunia (16 inches), white; \*Polar Bear zinnia (24 inches), white; \*White Supreme larkspur (18 inches), white; \*Forest Fire celosia (18 inches), vivid red; Candy Apple petunia (15 inches), red; and \*Blaze zinnia (20 inches). Dwarf plants 8 to 12 inches for the front row might include a white variety of pansy such as Mammoth White (8 inches); \*Bravo dianthus (8 inches), red; Floral Carpet White snapdragon (8 inches); annual phlox varieties Fireball (8 inches) and Snowball (8 inches); Starfire petunia (12 inches), red and white bicolor; and Floral Carpet Red snapdragon (8 inches), red.

To finish the bed off, border it with dwarf Snow Carpet alyssum, so that you form a continuous ribbon of white flowing in and out of spaces which might occur in the front.

## My Neighbor's Rose

*The roses red upon my neighbor's vine  
Are owned by him, but they are also mine.  
His was the cost, and his the labor, too,  
But mine as well as his the joy, their loveliness to view.*

*They bloom for me and are for me as fair  
As for the man who gives them all his care.  
Thus I am rich, because a good man grew  
A rose-clad vine for all his neighbors' view.*

*I know from this that others plant for me,  
And what they own, my joy may also be,  
So why be selfish, when so much that's fine  
Is grown for you, upon your neighbor's vine.*

—ABRAHAM L. GRUBER.

# The Saskatoon . . .

## *A Valuable Native Fruit*

By R. E. HARRIS

Research Station, Canada Department of Agriculture, Beaverlodge, Alberta

The saskatoon is native to the southern Yukon and Northwest Territories, all the Canadian prairies and the northern prairie states of the United States. It is extremely adaptable, and will grow under a wide range of climatic conditions and in all types of soil except poorly drained and heavy clay soils lacking in humus.

Saskatoons were used extensively by the Indians in pemmican; they were a major source of fruit for the early settlers; and they are still popular. They are good eaten fresh, cooked in pies and other desserts, made into wine, and home-canned or frozen. Considerable interest has been shown in the saskatoon as a commercial crop for the fresh fruit market and for the processing and freezing industries. Saskatoons also make attractive ornamental shrubs and hedges and are a good source of food for birds.

You may grow saskatoons from seed or from root sprouts, root cuttings or softwood cuttings. Growing them from seed is easiest but many bushes grown from seed differ from the parent in size and fruiting characteristics. It is harder to propagate saskatoons vegetatively but many growers use this method to ensure that all the plants will be identical to the parent.

Most saskatoon bushes produce suckers or root sprouts. Remove root sprouts in early spring with as many fine roots as possible, cutting the tops off about 2 inches above the roots. Plant the sprouts in a nursery row and keep them moist until they develop strong tops. Pieces of root about the diameter of a pencil and 4 to 6 inches long make the best root cuttings. Take the cuttings as early in the spring as possible and plant them in rows. Be sure the stem end of the root is up and only 1/4 inch below the soil surface. Keep the roots moist and shaded from bright sunlight until the new shoots are well developed.

Cuttings should be 3 to 6 inches long. They will root readily if taken from the current year's growth. Take cuttings in the spring while they are growing actively and put them in an intermittent-mist propagating bed. A bottom heat of 68° to 70°F. tends to lengthen the time when the cuttings will root; and the use of rooting hormones, such as 0.3 to 0.8 per cent indolebutyric acid in talc, usually increases the number of roots. Leave the cuttings in the propagating bed through the winter and move them to the nursery in the spring.

Choose planting sites that are not subject to late spring frosts. As saskatoons bloom in May, late frosts sometimes damage their blossoms. Transplant the young bushes to the field when they have developed strong roots and tops. A good, vigorous bush 6 to 12 inches high is ideal for transplanting. Try not to destroy the fibrous roots. When digging, take as many roots as possible and never let them dry out. Exposing the fine roots to sunlight even for a few minutes is enough to kill many of them. Set the plants a little deeper than they were in the propagating bed. Firm the soil around the roots and cut off about a third of the top growth. Water them if the soil is dry.

Cultivate to control weeds and to prevent the soil surface from caking. Keep the cultivations shallow. Deep cultivation damages roots and encourages suckers to develop. Clean cultivation should be practiced in dryland farming. On land under irrigation, a grass-legume mixture seeded between the rows helps keep the soil in good condition. Most prairie soils do not need fertilizing

for saskatoons. Where clean cultivation is practiced, cultivate and seed with a crop of oats or barley between the rows as soon as the saskatoon crop has been harvested. This traps the snow, adding to soil moisture reserves, and also prevents erosion. Work the cover crop in as soon as possible in the spring.

Saskatoon plants begin to bear fruit when they are 2 to 4 years old. The fruit is produced on the previous year's growth and on older wood. Usually young, vigorous branches yield the largest and sweetest fruit. Prune the bushes in early spring after the danger of severe cold weather is past and before they start to grow. Prune so that bushes are no higher than 6 feet. Remove all weak, diseased and damaged growth; cut off the low branches; and thin the centre growth to keep it open.

Saskatoons grow in clusters. The fruit ripens evenly and the whole crop usually can be picked at one time. Yields of over 6 tons of fruit per acre can be obtained with proper management. The fruit usually is picked by hand, but it can be gathered quickly and without damage with a hand-operated vibrator that is used for picking highbush blueberries. When picking for the fresh fruit market, make sure that the fruit is not overripe or crushed, torn or bruised. Fruit that is barely ripe has a higher vitamin C content and jells more readily than mature fruit and also is better for freezing and preserving. Fully ripe fruit has a higher sugar content and is better for wine making.

Smoky and Pembina are recommended for the production of good quality, medium-sized fruit, and Forestburg for large fruit of fair quality. Altaglow is excellent for ornamental purposes and the fruit is quite sweet.

*Altaglow*—A self-sterile, white-fruited variety, readily pollinated by the blue-fruited saskatoons. Has distinctive, columnar form and reaches a height of 18 feet. Foliage retained in the autumn, changing from dark green to deep purple, bright red and yellow. A very attractive ornamental introduced by the Province of Alberta Horticulture Station, Brooks, Alberta.

*Forestburg*—A large-fruited variety with fruit reaching 7/8 inch in diameter and growing in good-sized clusters. Quality satisfactory but not so good as that of Smoky or Pembina and the fruit matures slightly later. Introduced by the Research Station, Beaverlodge, Alberta.

*Pembina*—Fruit large, fleshy, slightly oval, full flavored and sweet and grows in long clusters. Upright, slightly spreading, vigorous bush, reaches a height of about 10 feet and produces few suckers. Introduced by the Research Station, Beaverlodge, Alberta.

*Smoky*—Has large, fleshy, round, unusually sweet, mild-flavored fruit growing in medium-sized clusters. Bush is spreading and reaches a height of 6 to 8 feet. Produces root sprouts quite freely. Introduced by the Research Station, Beaverlodge, Alberta.

For recipes using saskatoons, write to the Extension Department of the University of Saskatchewan, Saskatoon, for a copy of Bulletin No. 155, *Using Saskatchewan's Native Fruits*, and to the Research Station at Beaverlodge for mimeographed information.

• • •

*Man free, working for himself, with a choice  
Of time, and place, and object — and followed by a train  
Unmoved, unthought of even — simplicity  
And beauty, and inevitable grace.*

Wordsworth.

# Woody Plant Test Arboretum at the University of Manitoba

By LOUIS M. LENZ

Assistant Professor of Ornamental Horticulture, Department of Plant Science  
University of Manitoba, Fort Garry, Manitoba

The Department of Plant Science (Horticulture) has undertaken to develop a Woody Plant Test Arboretum. An arboretum is defined, according to Webster, as a place in which trees are cultivated and exhibited. This new arboretum is being developed on a broader, more general sense of the term, as a place in which ornamental woody trees, shrubs, vines and ground covers, and herbaceous perennials and annuals will be cultivated and exhibited.

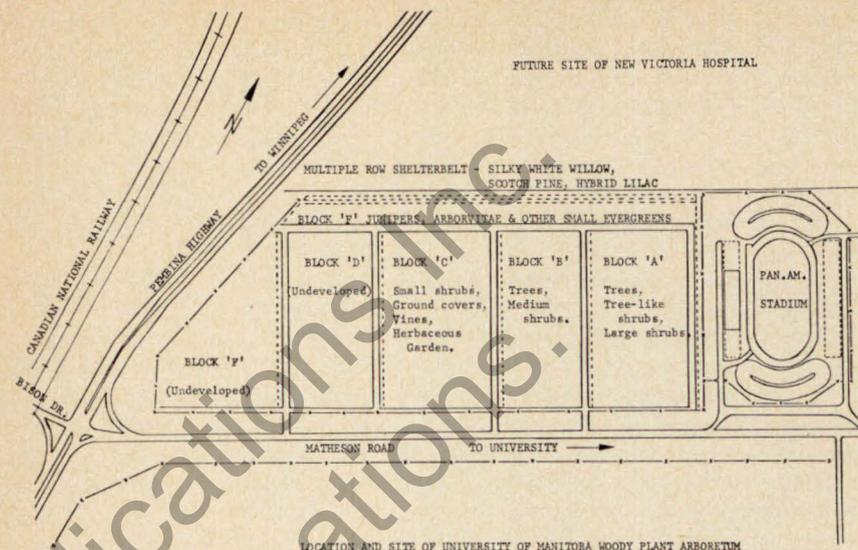
The development of such a plant collection has long been overdue in this area. The only organized plant collections of this nature existing in the eastern prairie region are at the Canada Department of Agriculture Morden Research Station and the Indian Head Prairie Farm Rehabilitation Act Tree Nursery. This new arboretum will be of inestimable, long-range and increasing value to the University community and to the people in the Greater Winnipeg and surrounding area because of our specific soil and climatic characteristics as well as the large population centre it will serve.

The arboretum will be of significant value to nurserymen, landscapers, professional and amateur horticulturists as well as to the general public. Through the years it will be used as a field laboratory for the testing and study of ornamental plants as to growth characteristics, hardiness, adaptability, maintenance requirements, growth rates and growth habit, as well as for observing the details of foliage, flower and fruit characteristics. In addition, it will provide a source of material for taxonomic, genetic, plant breeding, nutritional, propagation and pest control studies.

Why then has such a project not been undertaken in the past? This question can best be answered by reviewing University development. With the ever expanding Fort Garry campus, the land areas utilized by Plant Science, especially Horticulture, for growing and testing crops have been continually taken over for new buildings and parking lots. Following World War II until the inception of the present arboretum, the testing of ornamental plants was carried out by temporary plantings in rows where space was available or by spotting in the campus landscape. Thus there has been no long-term, systematic testing of ornamental plants.

It has been realized for some time that there was an urgent need for a permanent area for long-term systematic testing of these plant materials. The idea of an arboretum at the University in its present form was conceived by Dr. A. C. Ferguson. It was felt that such a planting should be close to the campus because its aesthetic value as a unit would add to the overall appearance of the campus and contribute lasting beauty to the main approach to the University. It should also be close at hand for use as a student laboratory and as a field laboratory for research, testing and studying landscape plant materials. The new site is close enough to campus to serve the above functions, yet far enough away that there should be no pressure to take it over for other purposes in the foreseeable future.

In 1963, at a time when almost all the previous plantings had been replaced by physical facilities and available space for new plantings was non-existent, a tract of university land, under lease to the Canada Department of Agriculture Research Station became available. Foreseeing this as a



suitable site for a much needed permanent arboretum planting, the idea was proposed to the Dean of Agriculture, the Campus Planning Office and in turn to the Board of Governors. The site was then designated for this purpose.

This tract of land, approximately 50 acres, is located as shown on the accompanying diagram, north of Matheson Road (Road of Memorial Elms), the main entrance road to campus and east of Pembina Highway, and is immediately west of the new Pan-American Games Stadium. The entire area has a typical flat topography consisting of a poorly drained Red River clay soil type.

The development of this area into an arboretum was begun in the summer of 1963. Before any plantings were made, a considerable amount of land forming was necessary to improve drainage as well as to provide suitable access. The result was a network of roadways, and drainage ditches to move excess water to a nearby storm sewer system. The planting areas were graded and sloped to provide maximum drainage. An area near the centre of the site was particularly low-lying and could not be readily drained out of the area without excessively deep ditches. Therefore a catch basin 75 x 140 feet and 4 feet deep was excavated. The earth removed was formed into a low mound nearby. This created a pond and mound which will be utilized in the overall development of the arboretum.

The overall layout of the arboretum probably can best be described as a combination of existing physical features and circumstances. This was determined in part by existing roadways, the topography, and necessary grading for drainage. The result was the creation of a series of rectangular blocks, each of approximately the same size, ranging from east to west. Each block is separated from the other and surrounded by a roadway and system of drainage ditches.

Further, at the time when development of the area commenced, the University had tentative plans to provide additional access to the campus through this area. It was possible to implement one of two plans, either a new road along the north limits of University property through the north side of the arboretum, or to develop Matheson Road into a four-lane divided access. If new lanes were to be developed along Matheson, they would be placed north of the existing road, through the south side of the arboretum

because of the desirability of retaining the existing lanes for incoming traffic with the Administration building as a focal point. Through the foresight of the original designers of the arboretum, sufficient area was left on both sides of the arboretum to accommodate this future development. This issue has recently been settled with the latter proposal to make Matheson Road into a four-lane divided road, utilizing the area reserved on the south side of the arboretum. This released 100 feet on the north side for our use, adding an additional 4.5 acres in a narrow strip, the length of the arboretum.

In addition to the above, the final plan of the arboretum evolved through economic necessity. The project is entirely a departmental responsibility. Because of its long-term nature and relatively large size, the cost of development and maintenance was given prime consideration. The area has been laid out in a systematic order of blocks, rows and plots, rather than an elaborate landscape design. This system will facilitate mechanical operations and reduce labor costs. Also it has the additional advantage of spacing the plants so they will develop as typical specimens characteristic of their kind, without competition and thus facilitating study.

An added feature is that all interrow and interplant areas are sown to grass which is maintained as a lawn. This turf was seeded in 1964 by drill at approximately 2 lbs. per 1,000 sq. feet, consisting of a 70:30 mixture by weight of Kentucky Bluegrass and Creeping Red Fescue. There are numerous reasons and advantages for the utilization of grass. The moisture problem of the flat, poorly drained terrain subject to spring flooding, and slow-to-dry clay soil type, is somewhat remedied by the grass. The result is that the area dries and is workable earlier in the spring and sooner following rainfall.

The grass also stabilizes the soil to prevent soil and wind erosion and controls dust when dry. In addition the grass is easier and more economical to maintain and gives the systematic arrangement of the arboretum a neater and more attractive appearance. The use of grass also figures into our evaluation of the plant material by developing an ecological situation found in a well maintained landscape planting, the grass creating desirable competition with the woody plants. A minimal cultivated area is maintained around all plants.

The plants to be included in the arboretum are all woody and herbaceous ornamental plants which have potential landscape value for the area. In the beginning, a list was compiled from known plant materials of the prairie region which are hardy, recommended and available. New introductions and selections will be added as they are released. The original list was compiled by a committee consisting of Dr. A. C. Ferguson, Mr. W. A. Cumming, Professor John Walker and Professor J. A. Menzies. The original list consisted of approximately 80 genera and 600 species, varieties, cultivars and selections.

Since the writer took charge of the arboretum in 1964, this list has been extended to 84 genera and 680 types representing 33 families. The arrangement of the plants in the arboretum is not an alphabetical one, but rather by generic groups; for example, maples are together as are caraganas. The only deviation from this arrangement is on the basis of size. Within the size groupings are standard trees, tree-like shrubs, large shrubs, medium shrubs, small shrubs, ground covers and vines. The result is that some genera may be found in several size groups.

Each size group is planted according to a predetermined spacing system as follows: Standard trees — 30 feet between rows and within rows. Tree-like shrubs, large and medium shrubs are spaced 20 feet between rows and 15

feet within rows. Small shrubs and ground covers are planted 3 to 5 plants equally spaced within a 20-foot plot, each plot separated by 15 feet between rows and 15 feet within rows. Vines are grown on a trellis.

The number of plants of each type varies from 2 to 5 as follows: Trees, large and medium shrubs are 3 plants if a seedling and 2 plants if a clone; tree-like shrubs are 4 plants of each type, 2 are pruned to tree-form and 2 grown as large shrubs. The small shrubs and ground covers are 3 to 5 plants per plot depending on size of specimen.

The entire area is to be protected by a shelterbelt system. A multiple row belt consisting of one row each of Silky White willow, Scotch pine and Hybrid lilac is planted along the north side of the arboretum. The rows are spaced 20 feet apart and plants at 6 feet within the rows. In addition, a single row of Colorado spruce is planted along the west side of each block.

The entire arboretum area is divided into 6 blocks, only 3 of which were available in 1963 and are presently being developed. The remaining blocks will be developed following the original systematic plan and will accommodate the overflow of new types as they are introduced.

In addition to woody plants, an herbaceous garden for perennials, annuals and hybrid roses is now being developed, including a turf grass demonstration. This is in the immediate area of the pond and mound mentioned previously and will be developed in a parklike setting.

Since the modest beginning in 1963, considerable progress has been made in planting the arboretum. In 1964, the multiple row shelterbelt was established along with the single row spruce plantings. The original plantings of woody plant types were also made in 1964, including 140 types. This was increased to 400 types in 1965 and 525 in 1966 which is approximately 75 per cent of the types available. In addition some plantings of herbaceous material have been made including daylily cultivars, chrysanthemum cultivars and other miscellaneous herbaceous perennials. A trial of annual flowers consisting of about 120 varieties is planted each year.

The source of our plant material to date has been the Morden Research Station courtesy of Mr. W. A. Cumming. The Manitoba Nursery and Landscape Association has generously agreed to donate plant material for completing the arboretum plantings. In addition to these 2 sources, new introductions will be made from numerous other national and international sources.

One research project is being carried on currently in the arboretum. An area found to have a particularly high lime content is being utilized to study lime-induced iron chlorosis. We are interested in selecting alkali-tolerant clones from species which normally are susceptible to this disorder, for example Amur maple. The area has been mapped, using a chlorosis-susceptible line of soybeans as an indicator plant. To date, several species of woody plants have been planted including Amur maple, European bird-cherry, Froebel spirea and Japanese tree lilac.

The need for a permanent arboretum planting and systematic testing of ornamental plants in this area is now becoming a reality. The progress to date has been satisfactory and as additional funds become available, it will be developed as rapidly as possible. This is a long-term project and many of the specimens will take years to mature. At present many are small and do not make a spectacular display. This is especially true of the larger types such as trees; the smaller types, such as small shrubs, are developing rapidly and within a few years will be ready to exhibit to the public. With this in mind, we are planning to hold field days during the summer months to acquaint the public with this project. The arboretum is open for inspection on a prearranged basis and you are cordially invited to come and look around.

# Ornamental Trees and Shrubs

grouped as to

## Hardiness and Usefulness

### TREES CONSIDERED RELIABLE

#### Leaf-shedding:

Boxelder — *Acer negundo*  
 Ohio Buckeye — *Aesculus glabra*  
 Paper Birch — *Betula papyrifera*  
 Cutleaf Weeping Birch —  
*Betula pend. var. gracilis*  
 Green Ash —  
*Fraxinus penn. var. lanceolata*  
 Eastern Larch — *Larix laricina*  
 Siberian Larch — *Larix sibirica*  
 Poplars-staminate like Northwest —  
*Populus sp.*  
 Plain Cottonwood — *Populus Sargentii*  
 Northern Pin Oak —  
*Quercus ellipsoidalis*  
 Bur Oak — *Quercus macrocarpa*  
 Acuteleaf Willow — *Salix acutifolia*  
 Laurel Willow — *Salix pentandra*

Siberian Silver Willow—  
*Salix alba sericea*  
 American Linden — *Tilia americana*  
 American Elm — *Ulmus americana*  
 Siberian Elm (Manchurian strain) —  
*Ulmus pumila*

#### Evergreen:

Balsam Fir — *Abies balsamea*  
 Siberian Fir — *Abies sibirica*  
 White Spruce (Black Hills and  
 Alberta Strains) — *Picea glanca*  
 Colorado Spruce — *Picea pungens*  
 Jack Pine — *Pinus banksiana*  
 Swiss Stone Pine — *Pinus cembra*  
 Swiss Mountain Pine — *Pinus mugo*  
 Scotch Pine — *Pinus sylvestris*

### TALL SHRUBS CONSIDERED RELIABLE

#### Leaf-shedding:

Amur Maple — *Acer ginnala*  
 Tatarian Maple — *Acer tataricum*  
 Serviceberry (Saskatoon) —  
*Amelanchier alnifolia*  
 Common Caragana (Selections)  
*Caragana arborescens*  
 Lorberg Caragana —  
*Caragana arb. lorbergi*  
 Tidy Caragana — *Caragana X Tidy*  
 Hawthorn — *Crataegus succulenta*  
 Russian Olive —  
*Elaeagnus angustifolia*  
 Siberian Salt tree —  
*Halimodendron halodendron*  
 Sea Buckthorn —  
*Hippophae rhamnoides*  
 Amur Honeysuckle — *Lonicera maacki*  
 Bearberry Honeysuckle —  
*Lonicera involucrata*  
 Chokecherry — *Prunus virginiana*  
 Smooth Sumac — *Rhus glabra*  
 Altai Rose (Selections) —  
*Rosa spin. var. altaica*

European Red Elder (Selections) —  
*Sarbuscus racemosa*  
 American Mountainash —  
*Sorbus americana*  
 Showy Mountainash — *Sorbus decora*  
 Amur Lilac — *Syringa amurensis*  
 Japanese Lilac — *Syringa japonica*  
 Hungarian Lilac — *Syringa josikaea*  
 Late Lilac — *Syringa villosa*  
 Hybrid Lilac — *Syringa sp.*  
 Grafted Lilacs — *Syringa sp.*  
 Tatarian Honeysuckle (Selections) —  
*L. tatarica*  
 Rosybloom Crabapple — *Malus sp.*  
 Siberian Crabapple —  
*Malus baccata*  
 Manchurian Crabapple —  
*Malus mandshurica*  
 Amur Chokecherry — *Prunus maacki*  
 Wild Plum — *Prunus americana*  
 European Birdcherry — *Prunus padus*  
 Pin cherry —  
*Prunus pennsylvanica*

Flowering Plum — *Prunus triloba*  
 Nannyberry — *Viburnum lentago*  
 Highbush Cranberry —  
*Viburnum trilobum*  
 Evergreen:  
 Common Juniper —  
*Juniperus communis*

Rocky Mountain Juniper (Selections)  
*Juniperus scopulorum*  
 Eastern Arborvitae (Selections) —  
*Thuja occidentalis*  
 Ware Arborvitae —  
*Thuja occid. var. wareana*

### MEDIUM-TALL SHRUBS CONSIDERED RELIABLE

#### Leaf-shedding:

Acanthopanax —  
*Acanthopanax sessiliflorum*  
 Indigo Bush — *Amorpha fruticosa*  
 Russian Peashrub (Selections) —  
*Caragana frutex*  
 Littleleaf Caragana —  
*Caragana microphylla*  
 Redosier Dogwood —  
*Cornus stolonifera*  
 Yellowtwig Dogwood —  
*Cornus stol. var. (flaciramea)*  
 Peking Cotoneaster —  
*Cotoneaster acutifolia*  
 European Cotoneaster —  
*Cotoneaster integerrima*  
 Hedge Cotoneaster —  
*Cotoneaster lucida*  
 Maack Euonymus—  
*Euonymus maacki*  
 Albert Thorn Honeysuckle —  
*Lonicera spinosa alberti*  
 Sweetberry Honeysuckle —  
*Lonicera coerulea edulis*  
 Waterton Mock Orange —  
*Philadelphus lewisii*  
 Schrenk Mock Orange —  
*Philadelphus schrenki*  
 Common Ninebark —  
*Physocarpus opulifolius*  
 Cherry Prinsepia—  
*Prinsepia sinensis*  
 Purpleleaf Sandcherry — *Prunus sp.*  
 Manchu Cherry —  
*Prunus tomentosa*

Golden Currant — *Ribes aureum*  
 Clove Currant — *Ribes odoratum*  
 Siberian Currant —  
*Ribes diacanthum*  
 Meadow Rose Hybrids —  
*Rosa blanda*  
 Turkestan Rose — *Rosa laxa*  
 Rugosa Rose (Selections) —  
*Rosa rugosa*  
 Hardy Bush Roses (Harison) —  
*Rosa sp.*  
 Golden Elder (?) —  
*Sambucus nigra aurea*  
 Silver Buffaloberry —  
*Shepherdia argentea*  
 Ural False Spirea —  
*Sorbaria sorbifolia*  
 Germander Spirea —  
*Spiraea chamaedrifolia*  
 Oriental Spirea —  
*Spiraea media sericea*  
 Pikow Spirea —  
*Spiraea pikoviensis*  
 Korean Spirea —  
*Spiraea tricarpa*  
 Threelobe Spirea —  
*Spiraea trilobata*  
 Tamarix — *Tamarix pentandra*  
 Manchurian Viburnum —  
*Viburnum burejaeticum*  
 Downy Arrowwood —  
*Viburnum pubescens*

### LOW-GROWING SHRUBS CONSIDERED RELIABLE

#### Leaf-shedding:

Lead Plant Amorpha —  
*Amorpha canescens*  
 Poirer Barberry — *Berberis poireri*  
 Pygmy Caragana —  
*Caragana pygmaea*  
 Rose Daphne — *Daphne Cneorum*

Dwarf Winged Euonymus —  
*Euonymus alatus compactus*  
 Dwarf Euonymus —  
*Euonymus nana*  
 Common Woodwaxen —  
*Genista tinctoria*

Canby Pachistima —  
*Pachistima canbyi*  
 Bush Cinquefoil —  
*Potentilla fruticosa*  
 Dahurian Bush Cinquefoil —  
*Potentilla dahurica*  
 Friedrichsen Bush Cinquefoil —  
*Potentilla X friedrichseni*  
 Sandcherry — *Prunus besseyi*  
 Russian Almond — *Prunus tenella*  
 Alpine Currant — *Ribes alpinum*

Dwarf Roses (Dr. Merkeley, Therese Bugnet) — *Rosa sp.*  
 Billiard Spirea — *Spiraea billiardi*  
**Evergreen:**  
 Bearberry — *Arctostaphylos uva-ursi*  
 Oregon Ivy — *Mahonia aquifolium*  
 Creeping Juniper —  
*Juniperus horizontalis*  
 Pfitzer Juniper —  
*Juniperus chin. pfitzeriana*  
 Savin Juniper — *Juniperus sabina*

#### TREES CONSIDERED WORTHY OF TRIAL

##### Leaf-shedding:

Mountain Maple — *Acer spicatum*  
 Silver Maple — *Acer saccharinum*  
 Erman Birch — *Betula ermani*  
 Water Birch — *Betula fontinalis*  
 Smallleaf Birch — *Betula humilis*  
 Middendorff Birch —  
*Betula middendorffi*  
 European White Birch —  
*Betula pendula*  
 Japanese White Birch —  
*Betula platy. var. japonica*  
 Manchu White Birch —  
*Betula platy. var. mandshurica*  
 Hairy Birch — *Betula pubescens*  
 Black Ash — *Fraxinus nigra*  
 Hybrid Ash — *Fraxinus sp.*  
 Manchu Walnut —  
*Juglans mandshurica*  
 Black Walnut — *Juglans nigra*

European Larch — *Larix decidua*  
 Dahurian Larch — *Larix gmelini*  
 Mongolian Oak — *Quercus mongolica*  
 Mongolian Linden — *Tilia mongolica*  
 Russian Elm — *Ulmus laevis*  
 Hybrid Elm — *Ulmus sp.*

##### Evergreen:

Norway Spruce — *Picea abies*  
 Dragon Spruce — *Picea asperata*  
 Engelmann Spruce —  
*Picea engelmanni*  
 Siberian Spruce — *Picea obovata*  
 Finnish Spruce —  
*Picea obov. var. fennica*  
 Limber Pine — *Pinus flexilis*  
 Red Pine — *Pinus resinosa*  
 Eastern White Pine — *Pinus strobus*  
 Douglas Fir — *Pseudotsuga taxifolia*

#### TALL SHRUBS CONSIDERED WORTHY OF TRIAL

##### Leaf-shedding:

Korean Lilac —  
*Syringa oblata dilitata*  
 Persian Lilac — *Syringa persica*  
 Polyantha Rose — *Rosa polyantha*  
 Black Fruit Cotoneaster —  
*Cotoneaster melanocarpa*  
 Manchurian Honeysuckle —  
*Lonicera ruprechtiana*

Black Cherry — *Prunus serotina*  
 Double-flowering Plum —  
*Prunus triloba fl. pl.*  
 Shubert Chokecherry — *Prunus sp.*  
 European Mountainash —  
*Sorbus aucuparia*

##### Evergreen:

Eastern Red Cedar —  
*Juniperus virginiana*

#### MEDIUM-TALL SHRUBS CONSIDERED WORTHY OF TRIAL

##### Leaf-shedding:

Shagspine Peashrub —  
*Caragana jubata*  
 Early Forsythia — *Forsythia ovata*

Silver Berry —  
*Elaeagnus commutata*  
 Greenes Mountainash —  
*Sorbus scopulina*

#### LOW-GROWING SHRUBS CONSIDERED WORTHY OF TRIAL

##### Leaf-shedding:

Purple Barberry — *Berberis Thun. var. atropurpurea*  
 Purple Broom — *Cytisus purpureus*  
 February Daphne —  
*Daphne mesereum*  
 Panicle Hydrangea —  
*Hydrangea paniculata*  
 Tea Rose Hybrids — *Rosa sp.*  
 Shining Rose — *Rosa nitida*

Bumalda Spirea (Froebel, Anthony Waterer) — *Spiraea bumalda*

##### Evergreen:

Golden Pfitzer Juniper —  
*Juniperus pfit. aurea*  
 Mountain Creeping Juniper —  
*Juniperus comm. var. saxatilis*  
 Alpine Creeping Juniper —  
*(J. horiz. var. alpina)*  
 Mugho Pine — *Pinus mugo mughus*

#### TREES NOT CONSIDERED GENERALLY RELIABLE

##### Leaf-shedding:

White Ash — *Fraxinus americana*  
 Butternut — *Juglans cinerea*  
 Japanese Larch — *Larix leptolepis*  
 Western Larch — *Larix occidentalis*  
 White Oak — *Quercus alba*

##### Evergreen:

Black Spruce — *Picea mariana*  
 Lodgepole Pine —  
*Pinus cont. var. latifolia*  
 Ponderosa Pine — *Pinus ponderosa*

#### SHRUBS NOT CONSIDERED GENERALLY RELIABLE

##### Leaf-shedding:

Smooth Maple — *Acer glabrum*  
 Japanese Barberry —  
*Berberis thunbergi*  
 Girdal Daphne — *Daphne giraldi*  
 Smooth Hydrangea —  
*Hydrangea arborescens*  
 Morrow Honeysuckle —  
*Lonicera morrowi*

##### White Mulberry —

*Morus alba sibirica*  
 Virginalis Mockorange —  
*Philadelphus sp.*  
 Cistena Plum — *Prunus sp.*  
 Staghorn Sumac — *Rhus typhina*  
 Redleaf Rose — *Rosa rubrifolia*  
 European Elder — *Sambucus nigra*  
 Garland Spirea — *Spiraea arguta*

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# Light and Plant Growth

By DR. D. CANVIN\*

Plant Physiologist, University of Manitoba, Fort Garry, Manitoba

Sunlight is the normal light under which plants grow. However, in our locality, in winter especially, sunlight is inadequate for good growth of plants either in the home or in the greenhouse. In addition, the wide fluctuations in sunlight in winter often result in plants with a very poor appearance. To counteract the lack of sunlight, artificial lights can be used to supplement sunlight or the plants can be grown solely under artificial light. The remainder of this discussion will deal with artificial light and plant growth.

Three aspects of light are important in the normal growth and development of plants: intensity of light; duration of light; quality of light. The first two can be rigidly controlled, and the third can be controlled to some extent in all artificial light sources.

Artificial light normally is supplied by incandescent lamps or fluorescent lamps or by combinations of the two. Incandescent lamps provide low-intensity light with a high proportion of red light and a great deal of heat. Fluorescent lamps supply more light per watt of electricity and very little heat. Many types of fluorescent lamps are available and each supplies slightly different qualities of light. For example, there are: day light, cool white, warm white, Gro-Lux, and various colors.

By use of different fluorescent lamps or by combining fluorescent and incandescent lamps, light quality can be controlled to some extent. The duration of light can be controlled by an electric time clock; the intensity of light is a direct function of the number of lamps per unit area.

Artificial lights may be used in permanent basement installations or permanent home mounts, on movable carts, or as supplementary sources of light in greenhouses. Lamps normally are mounted 6-18 inches from the plants. If only light is required, fluorescent lamps are used; but if heat also is required, incandescent lamps can be used.

In order to have a good rate of vegetative growth of seedlings, cuttings and most plants, light intensities of 600-1,000 foot-candles and day lengths of 16-18 hours are required. With African violets grown under 600 f-c of light, longer day lengths result in more leaves and markedly more flowers.

Table 1

Growth of African violets, var. Orchid Wonder, under 600 f-c day light fluorescent light for various day lengths for 6 months.

	Day Length (Hours)		
	6	12	18
	Average No./Plant		
Leaves	44.6	54.3	55.7
Flower Stalks	18.9	22.6	28.3
Flowers	92.	180.8	239.

In general, if we exclude photoperiodic effects on flowering, (this will be discussed later) an increase in day length up to about 16-18 hours will

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result in more leaves or greater growth, better root development, and better bulb or storage organ development. Such development is simply a product of photosynthesis (carbon fixation in light) per unit time multiplied by the amount of time. However, we can readily point out exceptions to this rule as tuberous begonias flower best in long days, but require short days for best development of tubers.

Again with African violets var. Orchid Wonder, an increase in intensity up to about 600-1,000 f-c at a constant day length will be beneficial.

Table 2

Growth of African violets var. Orchid Wonder for 6 months under day light fluorescent lamps with an 18-hour day:

	Light Intensity (f-c)		
	100	300	600
	Average No./Plant		
Leaves	34.8	52.3	55.7
Flower Stalks	8.1	17.4	28.3
Flowers	36	111	239.3

If grown completely under artificial light, gloxinia requires about 800 f-c, episcia 600 f-c. Other plants commonly grown in the home, such as peperomia, sansevieria, small dracaena and aucuba, grow quite well at 200-300 f-c of light. Still others, such as dieffenbachia, ficus (rubber plant) and podocarpus, will grow satisfactorily at 50-100 f-c of light. In these latter cases growth is very slow and satisfactory for the home, but more rapid growth could be obtained with higher light intensities.

In addition to intensity and duration of light, some attention must be given to light quality. In general, red light promotes elongation of internodes and branches and enlargement of leaves, whereas blue light has the opposite effect. The white light of incandescent lamps is rich in red and lacking in blue, and most plants grown solely under incandescent lamps will be tall with large leaves, open growth habit and fairly succulent vegetation. Alternatively, plants grown in blue light will be very short with small leaves and a compact habit of growth. Invariably, plants in red light also will be paler in color than plants in blue light, but low intensity also will bring about this condition. In order to obtain plants of normal growth and shape, a proper balance of red and blue light is necessary. Most fluorescent lamps will supply a reasonable proportion of both, but warm white lamps supply more red in relation to blue than cool white, Gro-Lux or day light lamps, and plants will be taller with a more open habit of growth under the former lamp.

## Photoperiodism and Flowering

Horticulturists have known for a long time that the length of the light period is important in promoting or retarding flowering in certain plants. For example, chrysanthemum and poinsettia are classed as short-day plants and must have at least 12 hours of continuous darkness in order to flower. However, artificial lights can be used to postpone flowering in these plants until it is desired. Cyclic lighting is the most economical method and consists of switching the light on for 10 minutes and off for 50 minutes for a 4-hour period in the middle of the dark period.

Other plants such as China aster, are long-day plants and remain vegetative in short days. These plants can be made to flower by an interruption of the dark period as previously described. For the control of flowering as outlined above, only very low intensities of 10-50 f-c are required and these can be supplied by incandescent or fluorescent lamps. Many other plants, such as African violet, and tomato, are day neutral, and do not require critical day lengths.

With most plants, a higher proportion of red light in relation to blue light will promote flowering. Thus, plants under warm white fluorescent lamps or under fluorescent lamps with incandescent supplementations will invariably flower 5-10 days earlier than the same plants under only cool white, day light or Gro-Lux fluorescent lamps.

#### Display and Plant Appearance

In general, white light is preferred for plant display because it renders plant colors in a "natural" way and harmonizes with room lighting. However, because certain colors of light can emphasize or subdue plant coloring they may be used to enhance the visual appearance of the plant. For example, red light will accentuate the red coloring of flowers and leaves, and blue will accentuate the blue coloring of flowers. If green is missing from the spectrum the leaves will appear very dark green. This striking visual picture can be achieved with the use of Gro-Lux lamps and even though in our tests the growth of plants under Gro-Lux was never superior to that under cool white light, the appearance of the plants may be of sufficient aesthetic value so as to justify their use. I wish to caution, however, that such a light regime may not be very flattering to other home furnishings or to people in the same room.

In summary, incandescent lamps or fluorescent lamps can be used for plant lighting. Incandescent lamps at 100 w-sq. yd. will normally supply 40-80 f-c of light over that area. If not supplemented with daylight, growth will be spindly and weak.

If higher light intensities are desired, cool white fluorescent lamps can be used. These are the cheapest fluorescent lamps and the most readily available. Two 4-ft., 40-watt lamps in a reflector will supply about 400 f-c of light 18 inches from the lamps over an area about 24 inches wide. Higher intensities can be obtained by using reflector lamps in banks. Such lamps (slimline) mounted at 4-inch spacing will provide 800-1,000 f-c of light at 18 inches from the lamps. Higher intensities may be obtained by use of high output fluorescent lamps.

Gro-Lux fluorescent lamps can be used in the same fashion as cool white fluorescent. The lamps are more expensive, but do give a better appearance to the plants. In our tests we have found no significant advantages from the use of these lamps. Extensive tests have not been performed with African violets or gloxinia, and it is possible that some advantages could be gained in these plants. Also, the light from these lamps cannot be measured with ordinary light meters because light meters have a different sensitivity. If arranged on the same basis as cool white lamps, light intensity will be sufficient.

For further information, the following bulletins can be obtained by writing to the appropriate companies:

From Canadian General Electric Company, Limited, 945 St. James Street, Winnipeg; Bulletin TP-127, Plant Growth Lighting; Bulletin LS-168, Light for Plant Growth; What's Happening to Horticulture?

From Sylvania Electric (Canada) Limited, 905 King Edward Street, Winnipeg; Instructions for using Gro-Lux Fluorescent Lamps, and other advertising material.

## Commercial Nurseries Catering Especially to the Prairie Trade

Readers interested in obtaining adapted ornamental plants, fruit trees and small fruit plants are advised to patronize nurseries located in the Prairie Provinces and named in the accompanying lists.

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| Alberta Nurseries (Berggren Brothers)<br>Bowden, Alberta                          | Diduck Nursery (M. Diduck & Son)<br>720 Taylor Avenue, Winnipeg 9                |
| Banff Trail Nursery (E. J. Lord)<br>311-19th St. S.W., Calgary, Alberta           | Eigler's Nursery (A. Eigler)<br>Virden   |
| Beaverlodge Nursery (J. Wallace)<br>Box 127, Beaverlodge, Alberta                 | Evergreen Nursery (C. S. & F. B. Stevenson)<br>Morris                            |
| Grandview Nurseries (W. J. Boughen)<br>Dawson Creek, B.C.                         | Fegol's Nurseries & Landscaping<br>(K Fegol)<br>Box 5, Gr. 355, R.R. 3, Winnipeg |
| City Limits Nurseries (W. H. Phillips)<br>7307-82nd St., Edmonton, Alberta        | Gaybird Nursery (Ed Robinson)<br>Wawanesa  |
| Clover Bar Nurseries (K. P. Roberts)<br>R.R. 1, Bremner, Alberta                  | Glenorchie Nursery (H. M. Orchard)<br>Box 23, Gr. 2, R.R. 1, Winnipeg            |
| Edmonton Nursery (E. McCrimmon,<br>J. Chedzoy)<br>R.R. 6, North Edmonton, Alberta | Green Thumb Nurseries (N. Winchar)<br>Box 8, Gr. 114, R.R. 1, Winnipeg           |
| Haddock Landscape & Tree Service<br>Box 766, Calgary, Alberta                     | Hood's Nursery (A. Hood)<br>Selkirk  |
| Haysboro Nursery (K. Raaz)<br>92nd St. & Elbow Dr., Calgary Alta.                 | Hunt's Nursery (J. A. Hunt)<br>Carman  |
| Mayhew Nursery<br>Box 14, Midnapore, Alberta                                      | Kackenhoff Nursery (E. Kackenhoff)<br>1851 Legion Street, Winnipeg               |
| Mountain View Nursery (J. Ross)<br>1007-2nd Ave N.W., Calgary, Alta.              | Koop Nursery (J. Koop)<br>Kleefeld   |
| Pollock Nursery (A. E. Pollock)<br>9754-69 Ave., Edmonton, Alberta                | Lone Pine Nursery (G. Leftrook)<br>283 Hoddinot Road, R.R. 3, Winnipeg           |
| Seed Centre Ltd., (H. Wigelsworth)<br>9339-118 Ave., Edmonton, Alberta            | Morden Nurseries (H. Temmerman)<br>Morden  |
| The Lacombe Nurseries (J. McDonald)<br>Drawer U, Lacombe, Alberta                 | Patmore Nurseries Ltd. (R. H. Patmore)<br>Brandon                                |
| Western Nursery (J. MacKintosh)<br>Box 360, Calgary, Alberta                      | Poole's Nursery (R. Poole & Son)<br>1304-21st Street, Brandon                    |
| Zaychuk Berry Nursery<br>R.R. 6, Edmonton, Alberta                                | Portage Plains Nursery (A. H. Young)<br>Portage la Prairie                       |

### MANITOBA

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| Alma's Nursery (Mrs. A. Olexawitch)<br>Box 4, Gr. 338, R.R. 3, Selkirk | Sadok Nursery (O. Juskow)<br>Box 41, Gr. 3, R.R. 1, Winnipeg                   |
| Aubin Nurseries (L. Aubin)<br>Box 289, Carman                          | Senkow's Nursery (E. T. Senkow)<br>55 Westmount Bay, St. Boniface              |
| Boughen Nurseries (R. M. Boughen)<br>Valley River                      | Shelmerdine Nursery Ltd. (W. C. Shelmerdine)<br>3612 Roblin Blvd., Winnipeg 20 |

## MANITOBA—Continued

Skinner's Nursery Ltd. (Dr. F. L. Skinner, M.B.E.)  
Dropmore  
Stevenson Nursery  
R.R. 1, Morris  
St. Joseph's Nursery (Father A. Gagnon)  
Otterbourne  
Turner's Dutchman's Nursery & Garden  
Centre (B. Turner)  
1060 Sturgeon Road, Winnipeg 22  
Van Dungen's Nursery (H. Van Dungen)  
Lot 137, St. Mary's Road, St. Vital  
The Wallace Nurseries Ltd. (S. Bodnaruk)  
Island Park, Portage la Prairie  
Wenham's Nursery (Mrs. J. Wenham)  
Lot 58, St. Mary's Road, St. Vital  
Wolfe's Nursery (H. Wolfe)  
Morden

## SASKATCHEWAN

Dalmeny Nursery (A. Littleton)  
Dalmeny, Saskatchewan

Dutch Growers  
Sutherland Sub., Saskatoon  
Estevan Greenhouses & Nurseries Ltd.  
(W. Fichtemann)  
Estevan, Saskatchewan  
Green Thumb Nursery (R. Drury)  
Assiniboine Ave. E., Regina, Sask.  
Hardy Plant Nursery, (P. G. Hunt)  
Airport Road, North Battleford, Sask.  
Honeywood Nursery (A. J. Porter)  
Parkside, Saskatchewan, Area Code 306  
Lake Shore Nurseries (G. Krahn)  
Sub. P.O. 11, Saskatoon, Sask.  
Michael's Nursery (M. Kushman)  
650 Keith Crescent, Moose Jaw, Sask.  
Mountain's Nursery  
Box 522, Lloydminster  
Prairie Nurseries Ltd. (T. A. Torgeson)  
Estevan, Saskatchewan  
Prairie Rose Nursery (J. Ediger)  
Rosetown, Saskatchewan

## Care of Nursery Stock

Nursery stock should be ordered in the late fall. Generally speaking, spring planting before growth starts is recommended. If planting is done in the fall, there is danger that the plants will be heaved out of the ground by the freezing action of the soil in the winter. Evergreens can be moved quite satisfactorily either in the early spring or in late August or September.

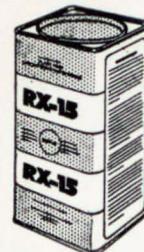
When nursery stock arrives, plants should be stored in a cool, moist room, out of the sun and wind. If there is some delay before planting, the packages can be opened and the plants "heeled in" in a well drained area. When planting is being done, care should be taken that the roots are kept covered with damp sacking at all times to prevent the roots from becoming dried out from exposure to air or sun.

Plants should be set in the ground a little deeper than they were when grown in the nursery. Holes for the plants should be large enough to accommodate all the roots when they are spread out fully. Good garden soil should be used to cover the roots, and it should be firmed well to fill up all air spaces. Plants should be watered adequately.

Immediately after planting, shrubs and trees should be pruned to give the roots a chance to become established. All branches should have the top third cut off. This is not necessary with evergreens.

When evergreens are delivered with the soil and roots wrapped in burlap, be sure that the ball of soil is not disturbed. The plants should be set in the ground with the burlap intact but after the soil has been firmed around the ball of roots, the burlap can be loosened at the top. Evergreens should not be pruned. Each fall before freeze-up evergreens should be watered well.

## RX-15 ALL-PURPOSE PLANT FOOD



Fast Acting — Clean — Odorless — Non-Burning. Absorbed quickly through roots and foliage to provide more blooms, color, beauty. Easily applied to lawns, shrubs, flowers, vegetables, house plants. Safe, economical. One pound RX-15 makes 40 gal. liquid fertilizer.

## NEW RX-20 ROSE FOOD

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## NEW RX-30 EVERGREEN FERTILIZER

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## RX MIRACLE APPLICATOR

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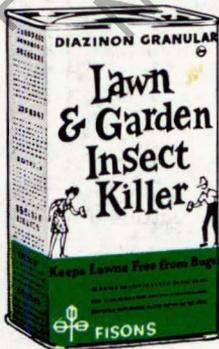


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