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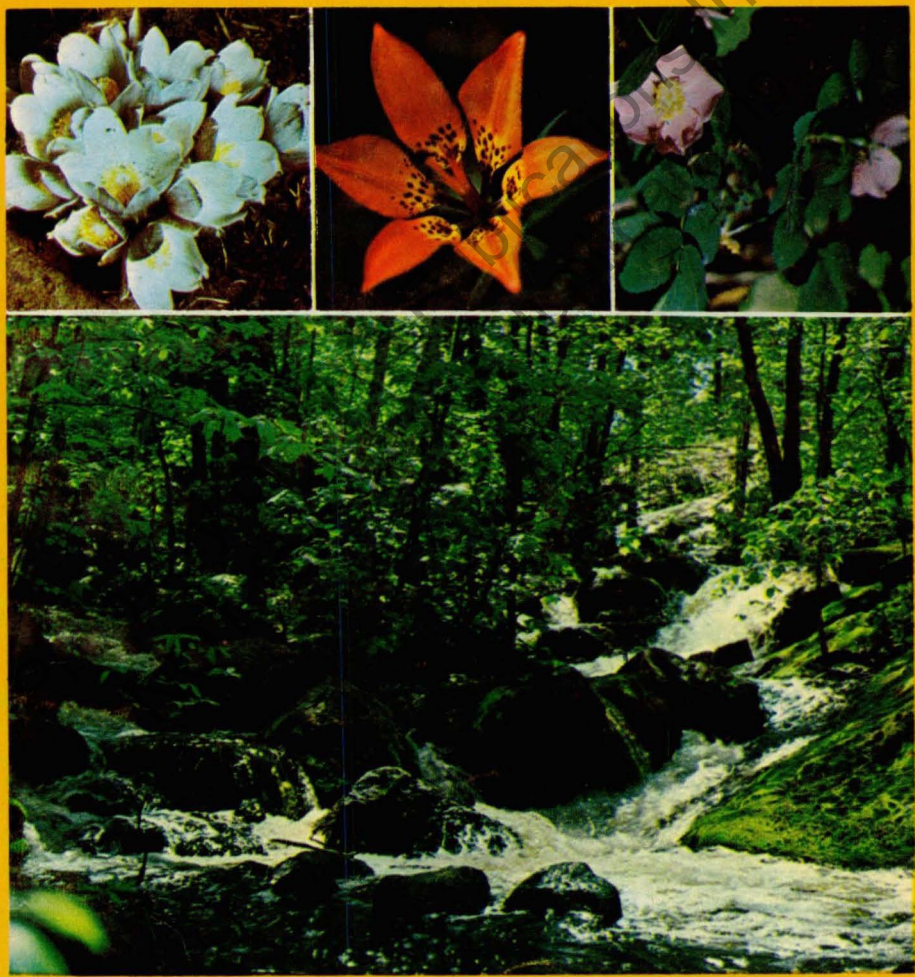
THE 1971 PRAIRIE GARDEN

Western Canada's Only Gardening Annual

Floral Emblems

Prairie Anemone	*Prairie Lily*	*Prairie Rose*
Manitoba	*Saskatchewan*	*Alberta*



Published by

Winnipeg Horticultural Society

THE PRAIRIE GARDEN . . . 1971

The Prairie Garden

WESTERN CANADA'S ONLY GARDENING ANNUAL

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

Winnipeg, Manitoba — 28th Annual Edition, February, 1971

The Prairie Garden 1971

Again it is our privilege to bring to you another Prairie Garden. Our chief source, as in the past, is some fifty Western Canadian professional horticulturists, amateur gardeners and men dedicated to maintain and enhance the beauty of our land.

The continued sale and increase in distribution over a period of twenty-eight years is evidence of our success in filling a need. New readers each year, join our ranks, many of which after becoming exposed to our current edition eagerly write for the back issues that are still available. We believe that our book is not only for the avid gardener but also the novice and even the indifferent homeowner whom we believe we can not only direct but inspire, for fundamentally all of us want a nice home inside and *out*.

A little basic knowledge on what to plant, where to plant, how to plant and how to care for what you have planted, will pay rich dividends. If we can't answer your particular problem, we can at least direct you to where you can obtain the necessary information.

The purpose of the Prairie Garden is to help and guide prairie dwellers to a fuller life.

We also wish to express our sincere thanks to our contributors who have again made this book possible; the support of our advertisers is also gratefully acknowledged.

THE PRAIRIE GARDEN COMMITTEE

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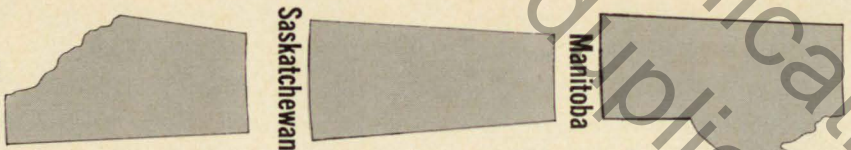
Cover Picture: McGillivray Falls, one of the beauty spots described in our initial article, The Nature Trail.

For Western Gardeners and Homeowners



Ideas Inspiration Facts

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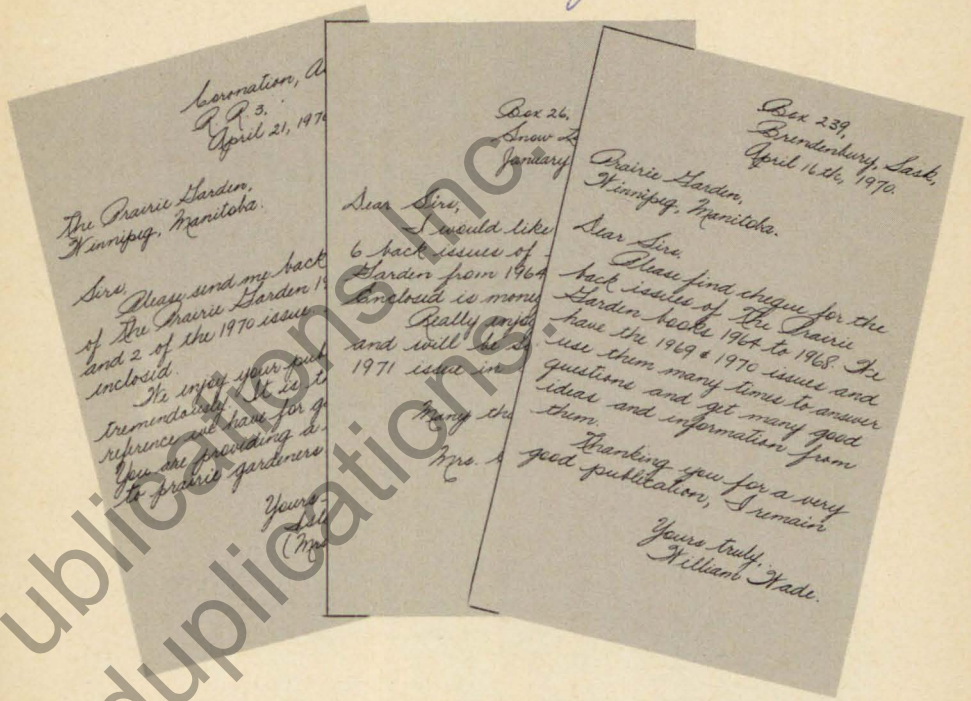
Over One-Quarter Million Prairie Gardens

have gone out to prairie gardeners. This is our record to date. This has all been accomplished by a committee of dedicated individuals, members of our sponsoring organization the Winnipeg Horticultural Society.

For further gardening information sources see page 116.

J LB



Hundreds Like These in our Files

Indexes for Ready Reference in back issues of the Prairie Garden are available free of charge, on request from the Publications Branch, Manitoba Department of Agriculture, Norquay Bldg., Winnipeg, Manitoba for the following years — No. 1, 1946-1962; No. 2, 1963-1965; No. 3, 1966-1968; all inclusive. To bring The Prairie Garden Indexes up-to-date, we list 1969-1970 on page 117.

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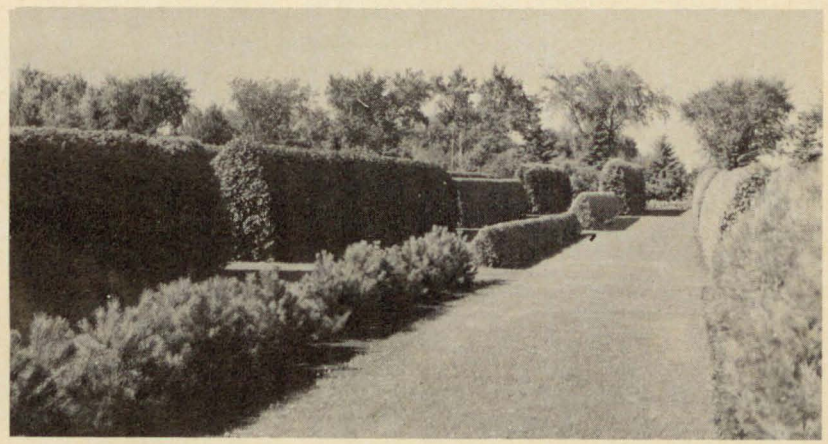
hooty hortus

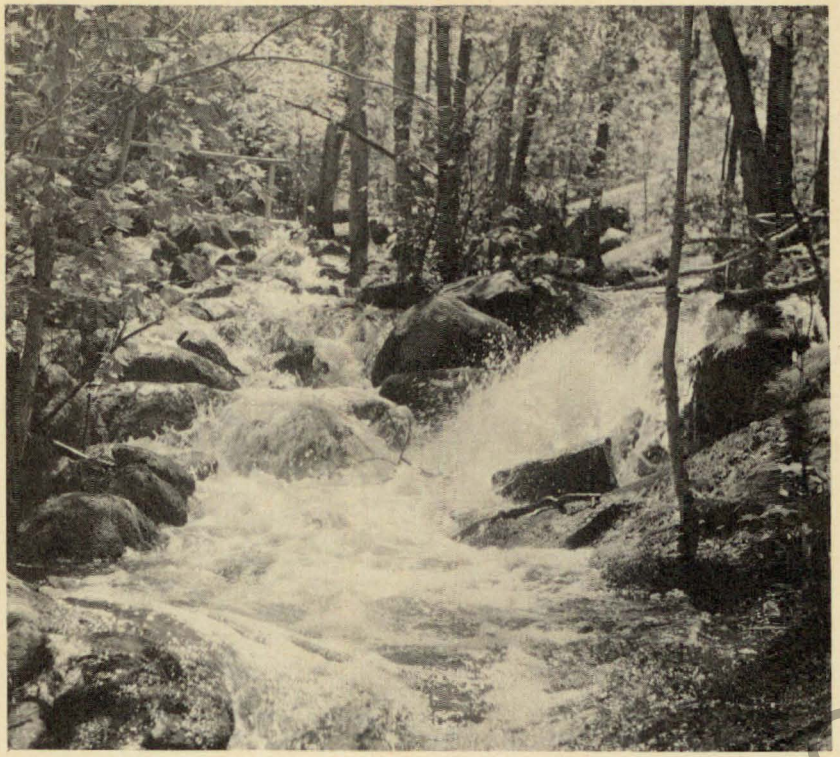
We take pleasure in introducing our new Feature Writer; his name is **hooty hortus** ; his wisdom is that of the Masters, such as H. F. Harp, the Prairie Gardener of CBC radio and author of a new book by that name, A. R. Buckley, Plant Research Institute, Ottawa and others; his pen is that of the editor. We trust that his observations are of interest and benefit to you the prairie gardener.

Index to **hooty hortus** Features

"One picture is worth a thousand words." The C.D.A. Research Station at Morden, Manitoba, prune their hedges as shown in this photo.



How do you?



The Nature Trail

G. W. Malaher

There is a sense of adventure in getting away from the highway or the crowded beach. The young, and the not-so-young, all at some time have that curiosity as to what lies over the hill or up the stream beyond the sights and sounds normally encountered. To find out is an adventure, but one frequently not taken for fear of getting lost.

The Nature Trail provides a splendid solution both in satisfying that sense of adventure and in banishing all fear of becoming lost; for the trail is marked for you to follow. It provides a wonderful opportunity for a family outing.

Designed to include as many types of terrain as is possible in the chosen locality, the trail is not one to be followed in the shortest time possible, but to be followed in a leisurely fashion, observing the changing aspects of the landscape, the flora and all the living things that make up the forest community. Most people are interested in nature in one way or another. What the individual will look for will depend a great deal on personal interests, but to get the most enjoyment out of it those interests should be cultivated to include all aspects of the natural environment. To merely see the flowers, the trees, the birds and animal life without knowing their names and something more about them is to miss half the enjoyment of the trip. Children will be full of questions about what they see and there is a wonderful opportunity here to teach them an appreciation

Road Sign at start of McGillivray Trail

of nature in all its forms. If the older members of the group are not themselves well informed there are many handy little reference books which can be taken along. The Peterson series of books on the wild flowers, the birds and animals is one of the best for the average person. The books are well illustrated and of a handy pocket size. Other small booklets are obtainable from the Queen's Printer, The Canadian Forest Service and Dept. of Agriculture, Ottawa. Our own Manitoba Conservation Branch of the Dept. of Mines and Natural Resources also has a number of free booklets for distribution.

The laying out of a Nature Trail requires first an intimate knowledge of the general area through which the trail will pass and this may take several days of preliminary scouting before any attempt to pick out the most desirable route is made.

The objectives are to include as many examples of the regional environment and objects of interest as can be done without making the trail too arduous. The ideal trail is winding so that new vistas appear as frequently as possible. It is cut only wide enough to provide a good path so that the natural appearance is disturbed as little as possible. When feasible one or more viewpoints may be included where people can rest for a few minutes, drink in the scenery, listen to the sounds of the forest and learn to recognize each one. By all means take a picnic along but leave no litter behind you to spoil the spot for others. The writer recently saw a small sign in an East African National Park which might well be

Family rest spot on the high rocks

used to advantage in Canada:

Let no one say, and say it to your shame
That all was beauty here, before YOU came.

To cover a nature trail once is to realize only part of its interest, potential or changing beauty with the seasons. There is the beauty of the first green leaves and plants in the early spring. At this time too the songs of birds and the many species on migration may best be heard and observed. The streams too are in full flow as they hurry the snow water down to the sea.

Using the McGillivray Trail in the Whiteshell as an example, the latter half of June is perhaps the best time to search for, observe and photograph the wild flowers of the forest: the Lady Slipper, the Moccasin Flower, the Bunchberry and the tiny Twin Flower nestling in the mossy places between the rocks — the Yellow Clintonia, Bearberry, Wintergreen, Blueberry, Star Flower and many others.

As exuberant Spring gives place to the warm and dryer months of July and August the search for flowering plants turns more to the cooler and more moist portions of the forest. Careful search will reveal several varieties of Pyrola and, if you are lucky, both Indian Pipe and the Coral Root. These last two species are particularly interesting as they are devoid of any green pigment. Both are saprophytes, living on decaying wood or vegetation. Along the streams or lake shores the blue iris, the water lily, Spotted-Touch-Me-Not and tall Joe-Pye-weed will catch the

Viewpoint, looking up McGillivray Creek to the lake

searching eye. By this time too the Bunchberry forms a carpet of red in many places, and the yellow flower of the Clintonia has given place to a cluster of deep purple-blue berries.

As autumn progresses and the leaves change colour the whole aspect of the nature trail changes again. Many people think that only eastern Canada can show a riot of autumn colouring, but many parts of Manitoba, particularly the Whiteshell, the Turtle, Riding, Duck and Porcupine Mountains, rival most Eastern scenery at this time of year. At this time too the wildlife can be more easily seen. The squirrel and the chipmunk are busy filling up their winter larders and the beaver are busy repairing the lodge and the dam before winter sets in. That pile of sticks and branches poking up above the water beside the beaver lodge is the winter food supply. Deer are on the move for the mating season is approaching and the call of the moose may be heard along the way.

Each season of the year is different and to know the nature trail each must be experienced.

Nature Trails, apart from those in Riding Mountain National Park, are a new thing in Manitoba. Four trails, from one half mile to three and one half miles in length have been laid out in the Whiteshell, but brochures have only been prepared for two of them to date. A short trail has also been made in the northern section of the International Peace Garden.

Public use and interest in such trails will determine the extent these are developed and others added.

Shelter, with Beauty and Fruit

Dr. W. R. Leslie

These old-time buffalo pastures — the Prairies, have become the home, the permanent home, of many peoples. And one of the first means of improving living conditions is to establish a shelterbelt to soften the force of the winds which otherwise blow free.

In primeval days creatures of the wild sought out sheltered quarters for winter, or the short-day, low-temperature season. Bison yarded up in grassy valleys; deer wintered in oak and other woods; and fur-bearers denned in caves or holes in the ground or in trees. Man is anchored to his holding so is obliged to build his protective shelter. It has been reckoned that an efficient shelterbelt provides advantages comparable to moving the home 300 miles south for the winter season.

Let's take inventory of what we know about tree shelters, and then speculate upon what significant improvements might be achieved by boldly setting about to modernize and glamorize the tree belts protecting and adorning the estate.

The following basic summary is from my bulletin, C.D.A. Pub. 901, "The Prairie Home Orchard", 1954.

"Wind

"It is impractical to attempt tree fruit growing on the Canadian prairies unless shelter is provided against winds. Shelter may come from natural hills, native woodlands, or from rows of planted trees. A hill is considered twice as effective as a deciduous tree shelter. Belts of evergreen conifers are intermediate in effect. As most unplanted farms in the prairie region are almost treeless and relatively level, discussion here will relate to such conditions.

"Formerly the term 'windbreak' was used for a planting of one or more rows of trees, while 'shelterbelt' referred to a planting of five or more rows, or to that number of rows sufficient to impart the impression of a grove. Nowadays the two terms are commonly employed indiscriminately.

"An efficient windbreak performs the following functions:

1. It protects the soil and tissues of fruit trees against drying winds. The benefit extends throughout the year, protecting against the prevailing westerly winds of summer and autumn, the penetrating cold north winds of winter, and the parching south winds of summer.
2. It prevents undue drying out of the blossoms and thus extends the time that the stigmas remain prime for pollination.
3. It permits bees and other pollinating insects to work on the flowers in breezy weather. A wind blowing freely at 15 miles per hour restrains bee flight considerably. When winds reach a velocity of 25 miles per hour, the bees remain in their hive. This may mean little or no set of fruit.

4. It decreases the danger of fruit being blown from the spurs and twigs, and of mechanical injury to foliage and branches through lashing by the winds.
5. It attracts and supplies homes for insect-eating birds.
6. It traps and holds drifting snow, and favors the deposit of an even blanket of snow in the sheltered orchard area. The accumulated snow not only supplies a protective covering to the roots and crowns of the fruit trees but also contributes moisture when spring thaws take place."

An enlightening treatise, "Winds and Storms" by B. W. Currie, Physics Department, University of Saskatchewan relates facts on the average direction and velocity of winds for various parts of the prairies and Northwest Territories.

At Winnipeg the wind *average* miles per hour, for each month, January through December: — 10.0; 10.2; 10.6; 10.4; 11.3; 10.3; 9.1; 9.7; 10.5; 10.6; 10.7; 10.2.

Compared to Winnipeg, air movement at The Pas is about two-thirds the velocity, while at Churchill the rate is about 40 per cent stronger.

A weather factor of much significance is that of WIND CHILL. The effect of air movement is exceedingly important. Recall how rapidly wet laundry dries on a windy day, and how soon a hot drink cools under a whirling fan. Meteorologists have worked up charts which relate the effect of wind to temperature readings. Samples are:

Temperature	Wind per hour	Wind Chill
— 1 F	10 miles	— 16 F
	20 miles	— 33
	40 miles	— 48
— 10 F	10 miles	— 27 F
	20 miles	— 46
	40 miles	— 61
— 20	10 miles	— 39
	20 miles	— 59

There are hundreds of excellent shelterbelts on prairie farmsteads, and one of the special pleasures of touring through the country is to come to a well-planted rural estate protected by thriving tree belts in which spruce trees are associated with golden, or yellowtwig willow. Where the plantation also includes some white birch, banked down with one of the red-barked species of dogwood, the picture is still more impressive. The natural impulse when coming to one of these fine contributions to the scenery of the community, is to stop and take off one's hat to salute the inspired citizens who built the oasis.

Dotted across the wide prairies are four areas where whole townships have been ribbed with field shelter rows, sponsored by Departments of Agriculture. They are at Lyleton, Conquest, Aneroid, and Porter Lake. Not only have the plantings proved profitable to the farmers but have brought an air of well-being and distinction to the districts.

Deserving of particular note is the cooperative project of a group of farmers, most of whom are second generation, in the Darlingford district. They had the Morden Experimental Station grow thousands of seedlings of hardy tree fruits — crabapples, hybrid apples, plums, cherryplums, and some apricots, with which to plant single rows through their fields.

After twenty years the farms have taken on distinctive look in terms of beauty and of useful fruit, evidence that it is practical to have at least some of the field belts composed of plum, cherry, saskatoon, cranberry-bush, buffaloberry, and plums.

Some of these bushes put forth some sucker growths. If left alone, they can become somewhat invasive, however control is easy with a seven-sided Manitoba hoe.

One opportunity, seldom used, is to flank native woods, aspen bluffs and willow areas with seedlings of hardy tree fruit seedlings. Planted to the eastern side, and given moderate attention, they add charm and useful produce. Furthermore, public parks would have new interest if thickets of plums and cherries were grown. Waste, corners and stony spots may well be planted to wild fruits, to sumac, willows with colorful winter bark, and to evergreens.

What can be done with the wildwood is demonstrated by Dr. (Mrs.) James A. Richardson on her extensive estate along the Assiniboine River in the heart of Winnipeg. The thicket undergrowth along the sidewalk has been kept shorn a couple of times each year for a long time. The result is an unique and eye-catching hedge of natural material, — plum, saskatoon, cranberrybush, nannyberry, arrowwood, hazel, arkansas rose, bittersweet, hawthorn, wild grape, riverbank creeper, dogwood, pincherry, chokecherry, and snowberry. Dr. Richardson also pays homage to the dim past by tending an Indian trail which has served Redmen since long before white people came. On moccasin feet they travelled this trail through the woods to skirt the river.

There is no problem in adding new color and glory to the rural shelterbelt. A start can be made by having the inner row of the main belt of Blackhills or native spruce, these are green all year. Willows contribute bark color in dormant season and the Siberian silver or silky willow has silver leaves, as does coyote willow, Russianolive, buffaloberry, silverberry, and seabuckthorn. Daphne willow has bloomy bark and huge reddish catkins in early spring. Tree fruits have beauty of bloom and of fruit, and some have bright twig bark and gay tints on autumn leaves. Schubert chokecherry, cistena cherry and a number of the rosybloom crabapple selections are robed in purple and reddish foliage. Elderberries have an important place in the tree belts. They are unusually fruitful and rapid in growth. Cherry prinsepia retain their red fruits until spring as do Almey, Sutherland, and some other rosybloom crabapples.

These are some of the materials adapted for bringing rainbow effects to the Shelterbelts. They can go into the snowtrap, the main tree belts, or as little islands out from the spruce line. Thoughtful planting can make the prairies into a veritable fairyland, beautiful every month of the year, and a donor of tasty fruit for the family and friends.

LIKE BANANAS

Last Spring a recent bride was showing a friend her garden, the first she had ever planted. The friend noticed several small green clusters at one end of the plot, and asked what they were. "Radishes," said the bride.

"How interesting," commented the friend. "Most gardeners plant them in rows."

"They do?" puzzled the bride. "That seems strange. They always come in bunches at the store."

A Patio With a Difference

Al Holland

We all like to have something different. Why not consider a patio that is detached from the house with a garden shelter on it. By setting the patio area to one side of the yard, you create a new point of interest and activity away from the house. The detached patio area has several advantages.

Perhaps the greatest advantage is choice of location. If sun exposure is restricted in the area where you would prefer to locate the patio, then move it to a sunny location in the yard and provide shelter with an enclosure. This versatility in location allows the capture of the sun's heat on the patio and in the shelter, and the shelter provides a windbreak which can add much enjoyment to a barbecue or party. Every home can have such an area in the back yard.

A broader choice in patio location provides more latitude in selection of both design and construction materials. The design need not follow that of the other building: it can be unique and attractive to both the younger and older members of the family. The patio shelter might even be patterned after a fairy-land house. It could feature stone or brick construction with a built-in fireplace or barbecue pit, enclosed on three sides and with sliding glass doors on the fourth wall. Planters and colored patio blocks might complete this outdoor living room. The partially closed shelter increases privacy, particularly appreciated by teenagers for parties and patio dancing. Latitude in material selection will allow the cost to be kept within reason. There are as many combinations of materials and designs as there are people, and here you can use your own ingenuity in design and construction. Check the Public Library and watch your newsstand for books and articles on patios.

Keep in mind that the kitchen should be within a convenient distance from the patio. This will help to reduce necessary duplication of utensils and equipment. Certain food preparation will be done much more easily in the regular kitchen and reasonable proximity to the house retains some of the hospitality and warmth that the home naturally provides.

hooty hortus says·

Here are two very useful Medium-Sized Shrub Varieties, away from the usual spirea, honeysuckle and potentilla. Cherry Princepia — a spiny shrub with pale yellow flowers, bright green leaves, arching branches and red cherry like fruit. It leafs early in the spring before most other shrubs while its stout thorns make a good barrier.

The Dogwoods — the Siberian with luminous coral red bark; the Red Osier with dull red bark but a useful shrub for sun and partial shade; the Yellow Stem with green-yellow stems to brighten the winter landscape and the Pagoda with its wide spreading tiered branches suggestive of Japanese gardens.

The Landscaped Garden Compared to the Living Room

J. W. Sondershausen

When I look at a landscaped garden, I spontaneously compare it with the indoor living room, and in my mind, it becomes the outdoor living room. In the light of this, I wish to share my experience with you.

By comparison, we use furniture inside, which is placed very effectively and pleasantly, but in the outdoor living room instead, we use trees and shrubs, which also should be placed effectively and pleasantly.

Furniture we choose by styles and colours to match with drapes, walls, and floors. Careful consideration should be given to plant material too. We do not take any old chair in our living room that someone wants to give us, but in the garden we do this. We get a tree from a neighbour and a shrub from someone else. It does not cost anything and there always seems to be space for one more plant in the garden. Truly, gardens are always made of the same sky and earth, water and rock, leaf and bloom. It is what is done with these ingredients that makes a good garden.

So we have to do some studying and planning. Studying trees and shrubs as to what their ultimate size will be is probably one of the most important studies to make. An overplanted garden is the result of a poor study. The problem is that we can rarely afford a full size tree or shrub so we could see how much space is required for it, while furniture is always bought as a finished product.

Just as we do not clutter up our indoor living room with furniture, a certain number of trees and shrubs are only needed outside too. In an established garden, it is often better to have the heart to cut a tree down before it becomes of mature height and spreads and, consequently, spoils another tree. In a new garden, it is hard to resist the temptation of buying two little trees — if you only need one — just because they look so nice. In our average size gardens, only a few trees are required and most of them should only be of medium size, so the sunshine can still fall into the garden.

The fence in most cases is only a physical stop, while your visual walls are the neighbour's house or garage, some distant trees or shrubs, a hillside, or even the sky. The pleasant view we may want to frame with a tree or shrub on either side. The unsightly structure may be screened out by planned planting. A wire fence will act as a picture window if the garden faces on some scenery worth looking at. It also enlarges your garden visually.

A good designed fence needs only a touch of plant material here and there like pictures on a wall.

With a final look at the carpet, there is some comparison too. On a thick piled carpet, you like to take your shoes off to feel it. So it is also with a good turf. You like to see as much of that good looking carpet as possible, both indoors and outdoors.

So, as you are sitting down in either one of your living rooms, make a comparison between your living rooms. Are they planned, functional, pleasant or just a happening?

F. L. Skinner Memorial Library Fund

F. J. Weir

Following the death of Dr. Frank Skinner at his home in Dropmore, Manitoba, on August 27th, 1967, the Manitoba Horticultural Association decided that the most suitable method of honouring the memory of this great man of horticulture was to set up a Memorial Library in his name.

Dr. Skinner is well known over the world for his many introductions of horticultural plants which have found their way into numerous countries and proved themselves to be well adapted to many situations of soil and climate.

A committee, set up by this Association, recommended that the Library be established at the University of Manitoba, and that a committee be appointed to look after the selection of books. In consultation with the University of Manitoba library staff, it was felt that horticultural books for this purpose could be housed in the university library until such time as proper accommodations could be made available in the Plant Science Building.

Reference books for the library would be purchased each year with the interest realized from the fund; and a committee made up of representatives from the University Library, the Department of Plant Science and the Manitoba Horticultural Association would be responsible for the selection of suitable texts to be purchased. All texts purchased would be suitably marked with a book plate, designating them as part of the F. L. Skinner Memorial Library.

A number of individuals and friends of the late Dr. Skinner have indicated that they have reference books and publications of historical value which they wish to donate. These will be welcome and upon receipt will be suitably marked.

In order that library space be utilized to the best advantage, acceptance of such books will have to be conditional on their value for historical or reference purposes.

In launching the campaign for funds, letters were written to many organizations and individuals in Manitoba, other provinces, the United States and Europe, and the response has been wonderful. In Manitoba, donations have come in from horticultural societies, nurseries, agricultural societies, Women's Institutes, and municipalities, as well as many individuals.

The campaign was officially opened with the largest donation by the Canadian Nursery Trades Association in October, 1968. In the list of donations, every part of Canada is represented as well as England, Holland, the states of New York, Montana, North Dakota, Minnesota, Michigan, Oregon, Massachusetts, Illinois, Ohio, South Carolina, Virginia, Maryland, Pennsylvania, Indiana and Alaska.

Officially, the campaign was to close June 30, but as donations were still coming in, the books were not closed and, of course, it will take some little time to have the legal transferral of the funds completed. By Oct. 31, the total on deposit was $4,770.19. Realizing how much it would mean to the Manitoba Horticultural Association, and to the committee to attain the $5,000 mark, the Manitoba Nursery and Landscape Association kindly donated $228.81 to wind up the campaign. Sincere appreciation is expressed to the M.N.L.A. in helping us finally achieve our objective, and to all other organizations and individuals for their kind support.

Manitoba Horticultural Association Home Grounds Competition

Reg Curle

What is it, and for what purpose was this competition instituted? In answer to the first question, the competition is divided into three classes: Farm Home Grounds, Urban Class I and Urban Class II. In essence, any farm or urban home ground sponsored by a responsible organization in Manitoba is eligible to be judged.

Urban Class I is comprised of entries from Greater Winnipeg, Brandon, Dauphin and Portage la Prairie; whereas Urban Class II consists of home grounds from urban centres other than those listed in Class I.

In response to the second question, the purpose of the competition is to promote home ground beautification and to give due recognition to the better types of home grounds in Manitoba.

This past summer, I was fortunate enough to be one of the judges of this competition. Messrs. N. C. MacKay, J. R. Almey and W. H. Gray, all well-known Manitoba horticulturists, were the other three judges. Three more likeable travelling companions one could not ask for. This was a week of work combined with pleasure for me.

In all, fifty-four different home grounds were judged. Nine homes in Urban Class I, nineteen in Urban Class II, and twenty-six in the farm home grounds category made a total of fifty-four. Our travels led us as far north and west as The Pas and as far south and east as Tolstoi. My greatest single task during the week was not in judging the various yards but rather in keeping the other three judges from devouring the entrants' garden produce, especially peas and raspberries!

Throughout the judging of farm home grounds points are allotted for various aspects of landscape design. Each entry is scored out of a total possible score of one hundred. Basically, in the farm home grounds, points are awarded for general plan or layout, shelterbelts, woody trees and shrubs, annual and perennial flowers, vegetables and fruit, and also for lawns and living-out features.

In essence, judging of the urban home grounds is much the same. Consideration is given to general plan or layout, development of the plan in relation to the size of the lot, trees and shrubs, annual and perennial flowers, control of insects, weeds, and diseases, fruit and vegetables and, finally, for lawn and living-out features. Obviously in the farmstead category proportionately more points are allotted for fruit and vegetables than in the urban classes.

The general plan or layout is the most essential point in home grounds judging. This is often the difference between a prize winning home

ground, and just a good farmstead or home ground. A lack of foundation plants, overplanting or haphazard planting are, many times, the cause of a poor score with respect to the layout.

Another point about the scoring of home grounds is that frequently the determining factor between a first and a second place can be a very small point involving upkeep of the yard. Control of insects, disease and weeds can therefore spell the difference between the top standings.

Some discussion this year has been centered on the fact that no consideration has been given to practicality or useability in the landscape plan. Having a beautifully designed yard is one thing but having to spend too much time with upkeep and maintenance is a negative factor. In other words, a maximum of beauty and usability should be equated with a minimum of work. In subsequent years this factor will have to be included if not specifically on a point basis, then at least as a method of choosing between two home grounds with identical scores. In many cases, only a slim margin separates the top three or four home grounds, so this is an extremely important point.

The overall appearance or impression that the home grounds imparts is another factor that is not currently considered in the judging but one that should be considered. This is an intangible item but is one that can create a sense or a mood for the entire landscape plan.

hooty hortus says·

Artificial Light for Winter Gardening. Why not a display shelf in your living room or a growth cabinet in your basement. You will then be able to grow a great range of plants all year round as well as grow sturdy seedlings for use in your outdoor garden, or even propagate plants for your landscape requirements.

The fluorescent tube does a terrific job. It gives light of higher efficiency per watt of power and generates far less heat than the incandescent lamps. Further, plant scientists studying light quality have found that light that is rich in red will make plants grow taller while blue light makes vegetative short-jointed growth. Fluorescent tubes do just this. They give light that is mostly in the blue part of the spectrum but with sufficient red light to maintain healthy growth.

The incandescent lamp with its higher red light and lower blue light intensity can also be used for further light balance and for heat where required.

References: The Prairie Garden (1965, page 115) Fluorescent Lights; (1967, page 116) Light and Plant Growth; (1968, page 127) Lighting for Indoor Plants. Your public library. Two books by Peggie Schulz — Growing Indoors Under Light and Growing Plants under Artificial Lights. Bulletins:— Canadian General Electric Co. Ltd., 945 St. James St., Winnipeg 12, Man., (TP-127) Plant Growth Lighting; (LS-168) Light for Plant Growth; What's Happening to Horticulture? Sylvania Electric (Can.) Ltd., 905 King Edward St., Winnipeg 12, Man. Instructions for using Gro-Lux Fluorescent Lamps.

Principles of Landscape Design

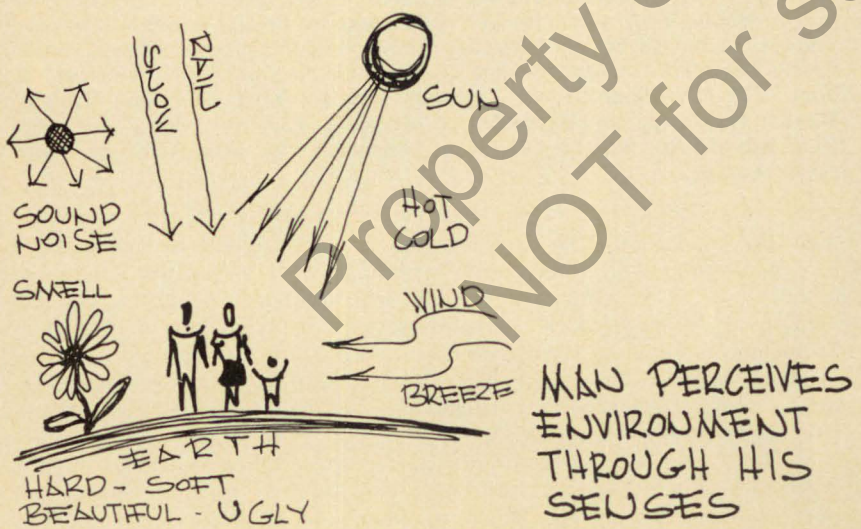
O. M. Hammer

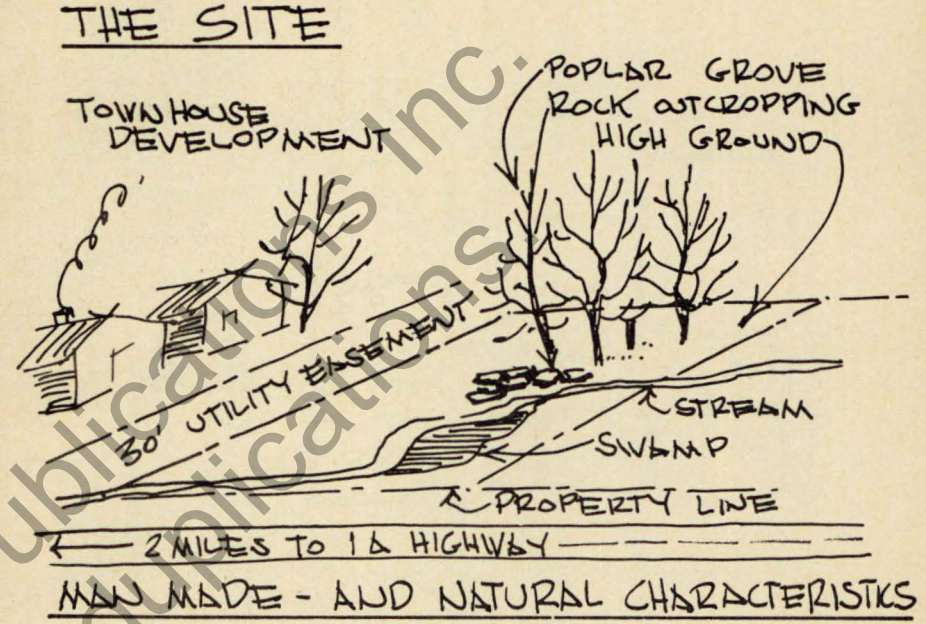
Man is first of all an animal, we commonly assume a superior animal, which observation however is not always supported by history or facts. Man the animal, or homo sapiens if you like is a creature of the forest, the meadow, the sea, and the plains. He is born with the love of fresh air in his lungs, the penetrating heat of the sun on his skin, the desire to take in the breeze of cool air, to touch the softness of rich warm earth and the love to admire clouds sailing on a blue sky.

All planning, all good planning that is, must meet the measure of man's senses — sight, taste, hearing, scent, and touch — yet it is not enough to satisfy the instincts of the physical man alone, one must also satisfy the complete human being.

The garden for many is the only green oasis left in our growing cities. It is my hope, that the following brief insight into some principles of landscape design may help you to achieve a better planned garden or yard.

The first all important step for any project is the selection of a particular site for a particular project. Any site has certain natural and man-made characteristics, which will make this site desirable for a specific use — or no use at all. It easily can be understood that a school site should be close to a residential area, readily accessible (man-made





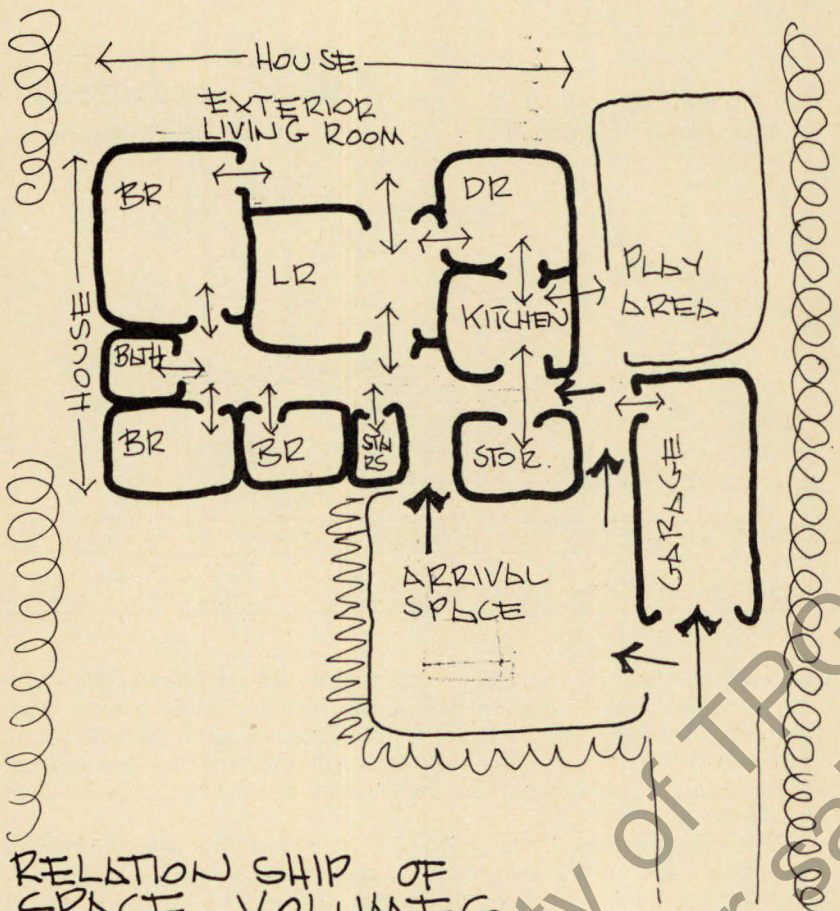
characteristics) and on the other hand the site should offer a rather flat topography for ease of playing field layout and interesting natural vegetation as a valuable aid in biology instruction (natural characteristics). In contrast a moderately rolling hillscape lends itself for detached residential development and discourages commercial development through high development costs.

The next step after site acquisition is a thorough site analysis. Needed is a topographic survey indicating contour lines, surface cover, utility lines, property lines, etc. With this survey in hand site visits during all seasons are in order and certainly the following points should be observed:

1. Plants indigenous or adapted to the area
2. Best views, poor views, objectionable views
3. Trees worthwhile preserving
4. Prevailing wind directions
5. Logical building areas, logical points of ingress or egress
6. Sun diagram (angle to sun)
7. Microclimatic analysis of the area (Sun exposure, wind protection, etc.)
8. Any natural features such as rock outcroppings, springs, swampy areas, etc.
9. Use and owners of adjacent properties, etc.

With this information as an aid the planner should be able to fit the intended uses or better use volumes (buildings, roads, gardens, playing fields, etc.) in the most appropriate manner to the site.

Rather than continue in generalities, let's look at a typical prospective home owner. If he can choose the location of the house on the site, then he is one of the luckier persons. In the typical subdivision there is only one location as determined by the lot size and building lines based on



RELATION SHIP OF SPACE VOLUMES

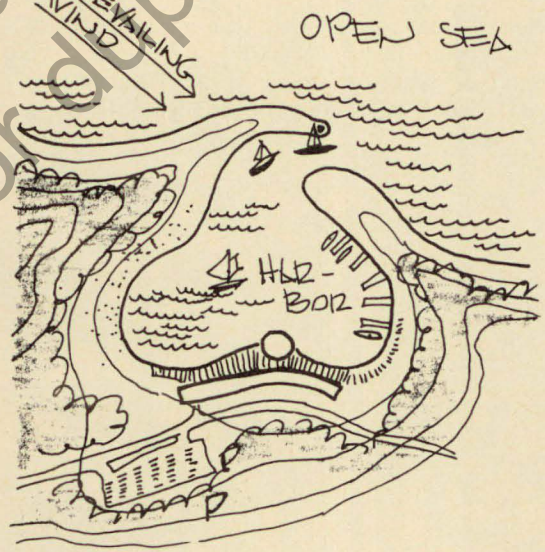
zoning bylaws. Before trying to lay out any walks or establish a lawn, let's assume that the entire lot consists of a series of three dimentional volumes or spaces.

A space is a room formed by a base plane, overhead plane and delineated by vertical space dividers. Even though outdoor spaces are very seldom comparable in size to interior rooms, nevertheless the same design principles apply. Just remember that there is a definite relationship between kitchen, living-, dining room, etc. The base plane may be hard pavement, soft earth, a lush cover of grass, etc.; the overhead plane may be the blue sky, a matrix of glittering stars, a canopy of tree branches, etc.; and the vertical space dividers may be a chain of hills in the distance, a hedge row close by, a screen, fence, wall, etc.

The planner can modify all three space elements and thus create an unlimited number of spaces expressing different uses, moods, feelings and character. As a generality, the larger the space the more open and public

it is — the smaller in size the greater the private character. In the same manner that we associate functions with interior spaces such as living-, dining-, sleeping room certain functions can be associated with exterior spaces. Any function(s) implies a certain set of values and a range of appropriate materials expressing this very function.

A front yard or at least part of it is definitely an arrival space, which should offer a harbor-like quality and give you the feeling of 'homing' in. In scale this means a space in size between the open road and the completely enclosed room in the house. The implication — a space open to the road yet enclosed and protected on the remaining sides. I feel that the comparison with a harbor for the front yard arrival space is most appropriate. A harbor exhorts a magnetic pull upon the weary traveller, offers protection from the high seas (or noise and friction of the road) and a place to tie up your steamer before hopping ashore (entering house). In most cases the front yard harbors not only this arrival space, but serves also as a setting for the house. In this connection it is merely an extension of the street proper with a very open character. To make the front yard more inviting, color in form of flowers is appropriate. To transform it into an exterior living room however, then visual enclosure becomes mandatory.



AN ARRIVAL SPACE IS LIKE A HARBOR

As much as the front yard is a street extension, so is the back yard an extension of the house. The backyard's potential as a living room increases in direct proportion to the amount of enclosure, which may be above eye level plantings, a hedge, vine covered screens, etc. As an extension of the interior living room a hard surfaced patio should be offered adjacent to the house for convenience. Desirable views should be left undisturbed, objectionable views be blocked out, and the most comfortable microclimate be achieved through full sun exposure and wind protection. Other climates may ask for plenty of shade and a fresh breeze. The desired amount of privacy certainly depends as much upon

you as your neighbor. As integral part of the backyard a children's play area is often required. The location should be sunny and overseen by mother from the kitchen window. However, nature and age of the children may alter this concept.

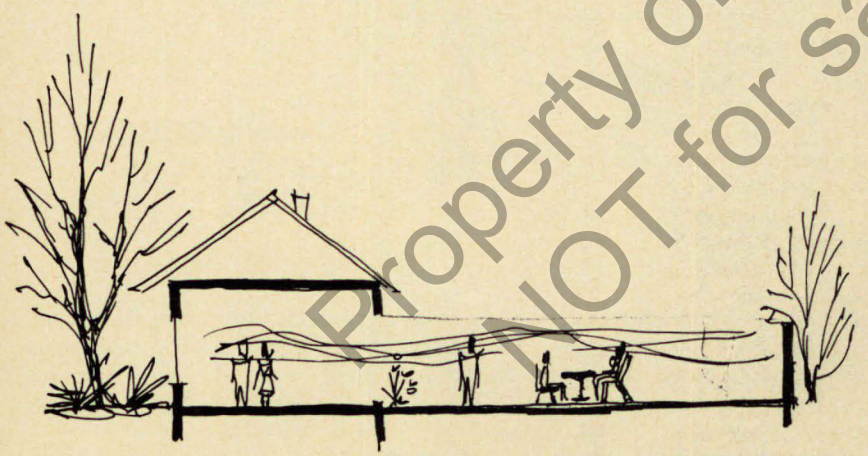
The importance generally conveyed upon a vegetable garden asks for a location away from the house. Desired strong growth of the vegetables means full sun exposure and a wind-sheltered location. The space frame may be a row of raspberries or a low fence. We don't need nor want privacy for this part of the garden.

Before starting any landscape layout, decide upon the use and character of the spaces you wish to create. Depending on these characteristics then decide upon the space frame (vertical space dividers), the appropriate base and overhead plane. Use color where it offers the highest impact. Consider the transition area between spaces, which should have some elements of both. Try to experience these spaces visually.

After you have established the proper space frame, start furnishing it. Furniture positioned along the walls of a room, leaves the greatest amount of livable space. Apply this principle in your outdoor spaces. Consider plants as furniture and building stones. By far the most important building stones are our trees. Place them first, then select shrubs and flowers supplementing them. Observe what plants form a plant community in the 'wild'. The most satisfying plant material is often the one growing naturally in the area, not only will it perform well, but bring the countryside right into your yard.

Now — cultivate your brain, look at your very own garden and ask yourself:

Does it work? What kind of space or room is it? What is the appropriate treatment? Would I like it as a complete stranger? Then — take pencil or spade and get to work.



THE BACKYARD IS AN EXTENSION OF THE LIVING ROOM

Trees for Urban Home Grounds

D. R. Robinson

In the landscaping of urban grounds two or more trees are often planted for ornamental purposes or to provide shade. All too frequently small plants are used which eventually grow into large trees and these trees take up so much room, on the average sized lot, that there is little space for shrubs, flowers and other garden plants. American elm, green ash, the poplars and spruce are trees that could be mentioned in this class. There are several small threes that can be used on urban properties and, with some pruning around the base of the tree to develop a short trunk, these low growing trees will serve a useful purpose and still leave some room for flowers, fruit trees and shrubs. The Siberian White Willow, *S. alba var. sericea,* is a rather attractive, somewhat spreading tree to about 30 feet in height. The leaves are silvery-white in appearance and this willow should prove satisfactory if it is not allowed to go short of water. The Amur Chokecherry, *P. maackii,* is a relative of our native chokecherry but is non-suckering and has coppery-orange bark which is rather noticeable in winter. This chokecherry has racemes of white blossoms in springtime and grows to a height of 20 to 25 feet. Closely allied to the above mentioned species is the May Day Tree, *P. padus var. commutata.* It has fragrant white blossoms in rather large clusters. Like the Amur Chokecherry, the May Day Tree is non-suckering. It grows to about 30 feet and will require some basal pruning to produce a well shaped tree. It is sometimes attacked by a disease, black knot, but pruning out of the diseased parts and sanitary care should keep the disease under control. The May Day Tree is hardy and rather widely recommended. The rosybloom crabapples are so well known today that there is little need to describe them. Botanically they are listed as *M. sylvestris var. neidzwetskyana.* A number of named varieties are available in the nursery trade. With their pink to red flowers and, in some cases, dark colored leaves they are some of our best ornamentals. It could be argued that the rosybloom crabapples do not grow tall enough to produce much shade but some varieties will reach 20 feet in height. There is a fine speciment of Ohio Buckeye, *Aesculus glabra,* in Saskatoon that was apparently planted in 1929. It is at least 20 feet in height. It has attractive autumn foliage and can be described as a small, bushy tree. The Ohio Buckeye is reported doing well at Lloydminster and in some other localities. The Ussurian Pear, *P. ussuriensis,* has been grown in the west for 30 years or more. It has been described by one authority as "an excellent specimen tree for the home grounds". Rather upright in habit, the Ussurian pear reaches a height of 25 feet and has attractive blossoms and ornamental autumn foliage.

For shade and other uses in the backyard I would be inclined to prefer the three first-mentioned species; the three other small trees, however, should not be overlooked.

Shade Tree Research at the Morden Research Station

Wilbert G. Ronald

Rapid urban development on the Prairies has produced increasing interest in and demand for shade trees. American elm has been the most popular shade tree throughout much of the Prairies and only the threat of Dutch elm disease has seriously eroded its position. Although a large number of tree species have been tested and considerable information concerning hardiness, propagation and disease resistance has been obtained, problems such as seed and vegetative propagation and lack of improved cultivars have hindered the general distribution of several promising shade tree species. At the Morden Research Station we are applying some of the resources of the Ornamentals Section to a solution of problems related to shade trees. Research presently underway can be divided into three areas involving propagation, plant breeding and selection, and tree evaluation and demonstration.

Seedling production of rootstocks is an essential step in the production of select cultivars of most tree species. There are exceptions such as willow and poplar which are generally grown from cuttings. There are also a number of trees which will continue to be grown as seedlings even if improved cultivars are available.

One of the main problems in seedling production is seed dormancy resulting in delayed germination and uneven seedling stand. We have been conducting seed stratification trials with problem species such as American basswood, Arnold hawthorn, black ash, ironwood and Japanese tree lilac. As a result of these studies, specific seed stratification treatments are now being recommended for Arnold hawthorn and black ash. Interesting results have been obtained with American basswood but further trials are necessary. If we can produce American basswood and Arnold hawthorn seedlings in large commercial quantities, the main hindrance to production of several superior basswood and hawthorn species and cultivars would be removed.

Vegetatively produced rootstocks have a narrow application in some genera of trees. We are examining rootstocks for columnar European aspen and three rootstocks appear promising. This poplar could have a wider use as a shade tree for narrow streets and small home lots.

A number of trees, of which bur oak, Ohio buckeye and butternut are examples, are not favored by nurserymen even though germination occurs readily and plant growth is reasonably rapid. What are the problems that nurserymen have with these species? Enquiry soon reveals that these species all possess tap roots which make for difficult transplanting and costly guarantees. We will be conducting root pruning experiments with these species which hopefully will result in recommended techniques for producing a shallow fabrous root system.

Our second program is designed to improve the quality of our trees by a program of breeding and selection. Hundreds of improved shade tree cultivars have been introduced in the U.S. but few of these possess sufficient

hardiness to be adapted to the Prairies. Where a wide range of variation in cultivar form, size and adaptation is available, tree recommendations can be tailored to each site.

As part of our program to select improved forms, we have examined hundreds of seedling street trees in Winnipeg as well as elsewhere. Two genera that we have examined carefully have been ash and basswood. These two genera offer considerable opportunity for selecting a wide range of forms. We have selected 10 green ash and black ash clones on the basis of seedlessness, tree form, foliage quality, disease resistance, fall color and leaf retention. In basswood we have found several interesting forms that appear worth propagating vegetatively and testing as clones. Native tree species are also being further examined in an attempt to find superior selections.

The third step in our research program involves the evaluation of rootstocks, existing cultivars and new selections. This is of necessity a long term project requiring vision and continuity. It is difficult to become interested in such a program when one considers that it may be 15 to 20 years before we know which cultivars and rootstocks are most suitable. Due to some deficiency in information concerning existing cultivars and particularly recent selections, the Morden Research Station decided in the spring of 1969 to initiate a shade tree evaluation program. Nearly all of the trees we wanted to test were unavailable from commercial nurseries so we have had to propagate plants at Morden. To date, 29 cultivars and selections have been propagated and several may be ready for planting in the test sites in 1974. It is planned to have plantings on at least three sites on the Prairies. These trials will be planted along city streets and maintained as boulevard trees according to a mutual agreement. Data would be taken for such characteristics as height and caliper increments, date of leafing and leaf drop, flower and fruit characteristics, leaf color in summer and fall, tree form and disease resistance. They would serve as a demonstration of various tree species to arborists, nurserymen, utility companies and the general public. We foresee that these plantings could serve as a valuable known source of seed for commercial nurserymen.

While much could be said about the role of trees in reducing noise and pollution, there is no doubt that in an age of congestion and environmental deterioration, trees can be considered as one of our most valuable environmental assets particularly in our cities. It was a well-known American poet who said "Only God can make a tree". While we do depend much on Nature, it is also true that there are many ways in which we can improve and encourage the culture of trees. As horticulturist, nurseryman or interested citizen, each of us will be helping to improve our environment.

Garden: something most men prefer to turn over in their minds.

Dutch Elm Disease
A Threat to Prairie Elms

V. Hildahl

New pests, especially insects and diseases, that are introduced to areas where environmental conditions are favorable for their sustained development often cause rapid destruction of highly susceptible host plants. Unfortunately the accidental introduction of the Dutch elm disease to North America falls within this category. Although present on this continent for only 40 years, the pathogen has spread throughout eastern Canada and the east-central United States, and is steadily extending its range north towards the Canadian Prairies. Records depicting its progressive movement westward and northward indicate that it will probably affect the entire range of white elm.

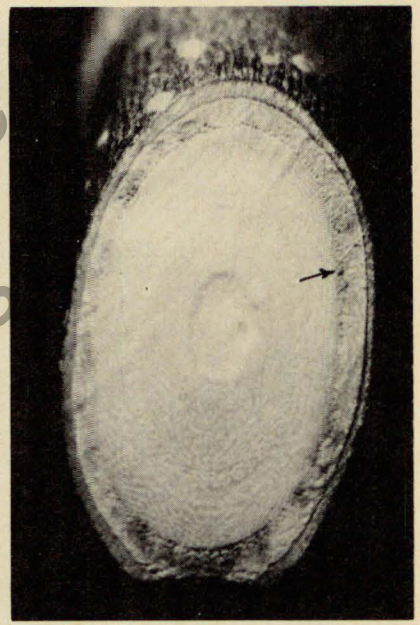
In widespread areas where the disease has been firmly established for several years it has caused staggering losses to natural-growing and ornamental elms. In many rural and urban centres most of the white elms are already gone, and unless rigid sanitation and control programs are put in effect in localities where the disease does not occur as yet, this tree species may well become extinct within the next three or four decades.

Symptoms and Diagnosis: Dutch elm disease is caused by a fungus that can exist in two different forms, and is called either *Ceratocystis ulmi* or *Graphium ulmi*. The fungus invades the vascular system of the tree and spreads throughout the sap stream. Ultimate death of the tree results from plugging of the water-conducting vessels, and from a toxin produced by the fungus. Wide variation occurs in the time required for the disease to kill individual trees. Young, vigorous-growing trees may be killed in a few weeks or in a single season while large, slow-growing old trees may survive for a number of years.

External symptoms of the disease are evident by late June, or early July if the season is retarded. They become most pronounced in late July and August, and are more acute in young trees. The first sign of the disease is a sudden wilting (often referred to as "flagging") of the leaves on one or more limbs in the upper crown of the tree. The leaves on these affected branches may turn dull green, dry out and fall, or they may turn brown, curl, become brittle and remain attached to the stems for several weeks. When the tree is dormant, tufts of leaves remaining on the branches are indicators of the disease but further confirmation is necessary. Following development of the foliage symptoms the affected branches soon die, and the disease spreads to other branches with eventual death of the tree.

The internal symptoms of the disease occur in the outer sapwood next to the bark, and are visible as long, discontinuous brown streaks in longitudinal sections of infected branches and stems. In cross sections the discoloration appears as dark spots or a partial to complete ring. This staining is caused by a dark, gummy substance that is produced by the fungus and deposited in the large vessels of the sapwood formed in the spring.

Longitudinal section of diseased elm branch showing discontinuous brown streak.



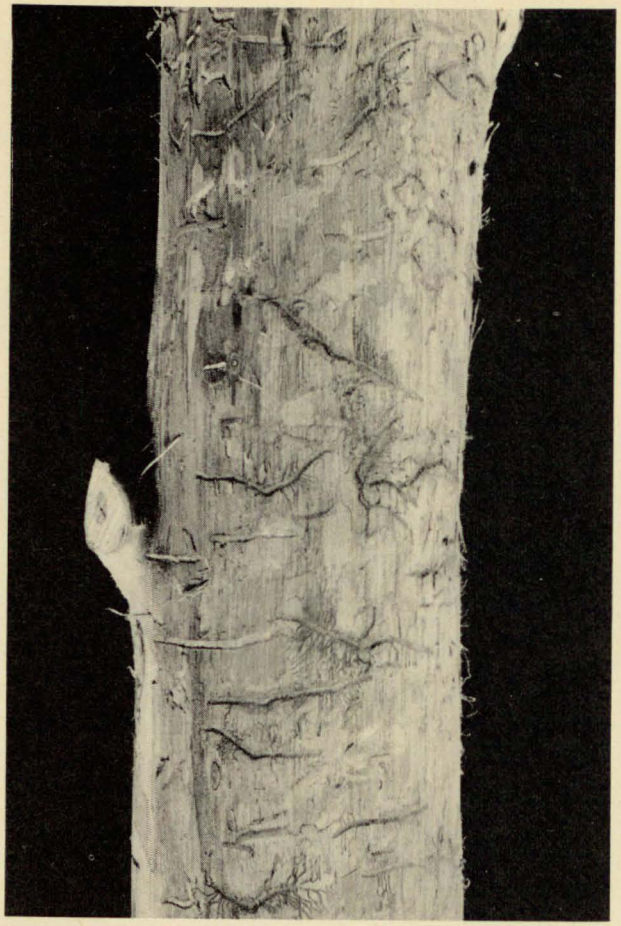
Cross section of diseased elm branch showing partial to complete ring.

Because there are other fungus diseases of elm with similar symptoms, Verticillium wilt and Cephalosporium wilt, Dutch elm disease cannot be recognized from external and internal symptoms alone. Accurate diagnosis of the cause of foliage wilting on unhealthy white elm trees, therefore, requires laboratory analysis and culturing of field collected sample specimens.

Vectors of the Disease: The casual fungus is spread from diseased to healthy elm trees almost entirely by two species of elm bark beetles, the native elm bark beetle and the European elm bark beetle. Because the fungus spores, which develop in the beetle galleries between the bark and outer layer of wood, are sticky they cannot be disseminated by air currents. Instead they must adhere to the bodies of emerging bark beetle adults and be introduced into the sap stream of the tree when the beetles penetrate the bark to feed or establish brood tunnels in the spring and early summer. The European elm bark beetle is more aggressive and generally considered the most efficient vector. This aggressive behavior is shown by the fact in regions where both species are established it almost completely displaces the native species. Nevertheless, both beetles can transmit the fungus and the disease has spread rapidly and caused extensive damage to white elm stands in many areas where only the native species has been recorded.

Some localized spread may also occur through root grafts, but this method of dissemination is usually a significant factor only in long avenue or boulevard plantings of elms.

The native elm bark beetle occurs naturally throughout most of the



Egg galleries of the native elm bark beetle on surface of wood.

range of white elm while the European elm bark beetle was introduced from Europe; being first reported in the United States at Boston about 1904 and in Canada at Windsor in 1948. To date it is found as far west as Minneapolis, Minnesota. The two species of beetles are readily distinguished by the appearance of the adults and by the shape of the egg galleries constructed beneath the bark. The adult of the European species differs from the native elm bark beetle by the concave posterior with blunt spur extending back from the centre. Egg galleries of the European elm bark beetle are constructed along a single line parallel to the grain of the wood. The native species constructs either a single or two diverging egg galleries forming a broad "V" across the grain of the wood. Larvae of both species are similar in appearance being white, legless grubs with brown heads.

The European beetle feeds in small twig crotches thus introducing the spores directly into the tree's circulatory system. The native beetle introduces the spores by the slower method of boring into the elm bark to build feeding galleries and overwintering tunnels.

Methods of Control: It is impossible to eliminate losses to white elm by the Dutch elm disease entirely at the present time, but they can be substantially reduced. Experience has demonstrated conclusively that in areas where adequate tree protection and control programs have been developed and implemented, actual tree losses from the disease have been reduced to less than two per cent annually. Because bark beetles transmit the fungus from diseased to healthy trees there are two ways in which injury can be reduced: (1) by spraying with insecticides to reduce feeding of the beetles on the bark of healthy trees, and (2) by removing and destroying dead and dying elm material in which bark beetle broods can develop. To be most effective one method should supplement the other.

Sanitation, which is actually part of good tree maintenance, is the first and most important step to a good control program. It should be practiced before as well as after the Dutch elm disease arrives in an area and involves the prompt removal of weakened, dying or dead trees (including the stumps), trimming out dead and dying branches in the crowns of living trees, and the destruction of recently dead elm wood with bark adhering to it. The work can be carried out at any time of the year, but wood accumulated during the summer should be destroyed immediately. Wood accumulated during the winter should be destroyed not later than May 1 as this is normally the time the beetles become active. The material may be disposed of either by burning or burying in mineral soil to a depth of one foot. Elm logs, cut and retained for firewood, should be completely debarked to prevent the development of bark beetle broods in them. If the presence of the disease is confirmed, a trench three to four feet deep should be cut in the soil between non-infected and diseased trees as soon as the latter are discovered and before they are removed. This will prevent spreading through root grafts. Diseased trees should be removed to a depth of at least one foot below ground level and the material destroyed immediately either by burning or burying. The use of fertilizers, supplementary watering, and the control of other insects and diseases as required is also recommended as part of the sanitation program designed to maintain elms in a healthy condition.

Spraying healthy trees in the spring and early summer with insecticides reduces bark feeding by the beetles. However, due to the costs involved, it is generally not recommended until after the disease is diagnosed in an area. Sprays may be applied with ground equipment such as high pressure sprayers and mist blowers, or by aircraft. A single application of the chemical is usually sufficient, but to be fully effective all bark surfaces of the trunk, branches and twigs must be completely covered. If it is not practical to spray all healthy elms over a wide area, trees within 500 feet of known diseased trees should be thoroughly treated.

Since the use of DDT has been drastically curtailed for insect control, Methoxychlor is recommended as a substitute. Due to the short residual of this chemical, however, timing of spray application is a critical factor in order to attain maximum control, and should be carried out only after consultation with entomologists.

Current Prairie Situation: Will the Dutch elm disease spread to the Canadian Prairies and how seriously are local elms threatened? Past history has shown that the fungus is readily adaptable and has spread at an alarming rate throughout more than two-thirds of the range of white elm in the United States and Canada. It was diagnosed in 1969 as far

hooty hortus says·

Don't forget another old-fashioned plant — the bleeding heart. It makes a fine plant with handsome leaves and arching stems of pink and white pendulant flowers in May and early June when the border really needs a little colour. It is easily excited into growth in the spring, so don't plant too close to the house, as frost has no respect for its tender new shoots; its proper place is in the perennial border near a late blooming perennial for it can tend to become a bit shabby by season's end.

Bleeding hearts are best transplanted in August. Dig it up carefully, the roots go deep and are thick and easily broken. Divide the roots into pieces making sure that each division planted has two or three 'eyes' or dorment buds.

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north and west as Virginia City, Minnesota, and Mandan, North Dakota (the area it will most likely spread from to Manitoba). More importantly, the pathogen was discovered in 1970 near Breckenridge, Minnesota, less than 150 miles south of the Manitoba border, and constituted the first report of the disease on the Red River watershed. In view of these recent extensions in Minnesota and the pattern established by the disease in previous years it would seem probable that the pathogen will make its appearance in Manitoba within a short period of time.

On the other hand, further northward spread may be hindered to some extent by the prairie environment. Almost invariably rapid spreading of the disease in other areas has been associated with extensive and continuous stands of white elm. Naturally-growing elm in the prairie regions is limited almost entirely to scattered patches along rivers, which may act as a barrier slowing down the natural northward progress of the disease. Despite this restricted distribution of natural elm, however, the species has been planted in concentration on farmsteads and in urban centres for shade and ornamental purpose. The relative isolation of these stands from one another lessens the chance of the disease being spread by infected beetles from settlement to settlement, yet they remain highly vulnerable to attack by the pathogen. Although the flying range of the beetle is only about three miles, the danger always exists of the disease being spread long distances by infected logs floating down rivers during periods of high water or in elm firewood picked up by campers while travelling through infected areas.

There is no way of predicting how severely the Dutch elm disease will affect elms on the prairies if and when it arrives. Should the pathogen be as effective and the disease as destructive in isolated stands as it has been in other areas the economic loss from the destruction of white elm could be incalculable. Furthermore, in many urban centres the aesthetic values and pleasant environments associated with elms could be completely destroyed, especially in centres where this species represents the major portion of boulevard and small park plantings. For example, it is estimated that in Metropolitan Winnipeg between 60 and 70 per cent of all naturally-growing and planted trees are white elms.

Detection and Protection Programs: The possibility of the Dutch elm disease ultimately invading the prairie areas and the potential hazard to local elms was recognized as a serious problem more than a decade ago. Consequently, surveys were initiated by the Federal Department of Forestry as early as 1962 to determine the distribution of the native elm bark beetle; the only important carrier of the pathogen present in the region. Simultaneously, detection programs were implemented for early diagnosis of the disease, and research facilities developed for analyzing sample specimens taken from unhealthy elms. In 1963, Provincial legislation was passed adding Dutch elm disease to the Manitoba Plant Pests and Diseases Act, and more recently regulations have been established outlining methods of control should the disease be diagnosed. Concurrently city and municipal governments have developed new and improved tree maintenance programs in an effort to reduce the serious hazard created by unhealthy and dying or dead trees.

However, the Dutch elm disease problem is not the sole responsibility of the federal, provincial and municipal governments. The destruction of white elm by the disease is a concern and problem to each and everyone in and out of the tree profession. Citizens can contribute significantly toward preventing spread of the fungus and reducing the severity of attack by: (1) reporting immediately the location of suspect trees showing recognizable external and internal symptoms of the Dutch elm disease to their nearest federal, provincial or municipal government agency; (2) removing weakened or dying trees and destroying all elm wood with bark still on it to reduce beetle populations; (3) maintaining all remaining elm trees in a healthy condition by eliminating unnecessary mechanical injury as healthy trees are less susceptible to beetle attack; and (4) avoiding unnecessary transporting of elm trees or elm wood from one location to another, and especially from diseased to non-diseased areas.

Probably the long-term answer to the problem is to encourage planting of non-susceptible tree species wherever possible. However, many white elms in the prairie regions range from 70 to 100 years old and are in danger of being destroyed within the next 10 years. They cannot be replaced in this short period of time. Furthermore, white elm is one of the few tree species on the prairies capable of withstanding the rigors of the climate. Thus every effort must be expended to save the present stands from complete destruction by the Dutch elm disease. We cannot afford to be sentimental about an unhealthy tree that is a hazard to other elms. It must be removed even though an horticultural prize.

Diagnosing the Cause of Yellowing Leaves

Dr. E. A. Maginnes

Every year many requests are received to diagnose the cause of yellowing or chlorotic leaves. In most cases these requests read, "Would you please diagnose the problem on the enclosed leaf and recommend control measures". Requests of this type, for the most part, are impossible to diagnose on the basis of the information forwarded. Most of these people would be less stingy when giving information about the latest scandal or their last operation. But, be that as it may, people of this type maintain and create an additional challenge for those trying to attempt the diagnosis.

Attempting to arrive at the exact cause of a problem is not necessarily easy, because there are more than fifteen factors that must be considered. When starting a diagnosis it is best to divide the possible causes into those that directly influence the above-ground portion of the plant and those that indirectly cause the symptoms by influencing the roots.

Yellowing or chlorosis of leaves can be caused by any of the following factors that influence the above-ground portion of a plant.

1. Insects — Several large insects may cause this problem, but in most cases, mites, which are barely visible to the unaided eye escape notice. They initially cause yellowing of a leaf followed by the production of a webbing similar to a fine spider web.

2. Disease — There are various fungus diseases influencing the surface of leaves or the internal conductive tissue. Diseases visible on the surface of a leaf will usually start at one point on a plant and then spread. A disease of the conductive tissue will usually show up as a darkening of the conductive tissue in the crown or lower portion of the stem. This can be readily observed by splitting the stem.

3. Pesticides — Improper use of insecticides, fungicides or herbicides can result in a yellowing of leaves.

4. Mechanical Damage — This can be caused by hoe damage, a cat testing its claws and many other factors.

5. Nutrient Toxicity — When an overdose of nutrients is applied as a foliar spray.

6. Light Intensity — Some plants will produce yellow leaves under high light intensities, while others will do so under low light intensities.

Some factors influencing the below-ground portion of a plant are as follows:

1. Insects — There are various insects that will attack the roots of a plant.

2. Disease — There are various root rot organisms.

3. Mechanical Damage — Primarily due to cultivation damage.

4. Soil Structure — In some areas the structure of the soil may be such that it will not drain properly and thereby reduce the amount of oxygen available for proper root growth and good plant development.

5. Soil Reaction (pH) — When the soil reaction is above 7.0, nutrients such as iron and magnesium are tied up in an unavailable form and the leaves become chlorotic.

6. Toxic Ions — Watering plants from a water source high in some toxic element, such as sodium, will cause a buildup of the element in the soil and eventual damage. Also, the use of water from water softeners that exchange magnesium for sodium will result in a buildup of sodium in the soil.

7. High Soluble Salts — When the concentration of all the elements in the soil solution is too high, roots will be damaged. This could result from an excessive application of fertilizer.

8. Nutrition — Chlorosis will result from a deficiency of such elements as nitrogen, iron and magnesium. The application of an excessive amount of fertilizer will also cause the symptoms due to high soluble salts.

9. Water — Both over and underwatering can cause a yellowing of leaves. Overwatering will reduce the amount of oxygen present and, as mentioned above, root activity will be decreased or stopped.

10. Improper Planting — Deep planting or the crowding of roots at planting time.

This list of possible factors is by no means exhaustive, but it does contain the most prominent causes of yellowing or chlorotic leaves. It also serves to illustrate the factors that persons must consider when attempting to diagnose a problem and the difficulties that can arise when a diagnosis of an unrepresentative sample with little, or no background information, is requested.

hooty hortus says·

Pinching and Disbudding, Why? Pinching means nipping top growth including terminal bud stems to encourage side shoots for bushier plants and more blooms. Snapdragon is an example of a plant that should be so handled. Disbudding means the opposite. Here you remove side buds to divert the strength of the plant to large single specimens, e.g., for show blooms such as dahlias, roses, etc.

Scale Insects

D. L. SMITH

Scale insects are among the most common insect pests of ornamentals and because of their relatively small size they are often overlooked until the host plant shows signs of damage. Many trees such as elm, apple, cedar and spruce host various species of scales and shrubs such as cotoneaster and dogwood are particularly susceptible to their attacks.

Scale insects damage the plants they attack by sucking juice, usually from newer stems or branches with thin bark. Shortly after hatching the female scale inserts its mouth parts into the plant and remains in that one spot for the remainder of its life. As the female feeds, a waxy substance is secreted to form a scale. The female remains under this scale and lays her eggs there. As the eggs under the scale hatch, the young crawlers chew through the scale covering to find new growth to infest. The males are usually winged and fly in search of females for mating later in the season.

There are four main types of scale insects which attack plants in Manitoba. The following illustrations and descriptions will help you to identify them.

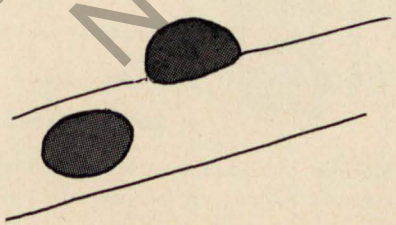
— Color — dark brown
— Shape — oval, flat
— Length — 1/8 inch
— Very hard, often clustered like fish scales on heavily infested twigs and branches.

Oystershell Scale

— Color — mostly grey-white with dark brown area at head end
— Shape — oval, flat
— Length — 1/8 inch
— Males about 1/4 size of females and wingless
— Fragile and easy to flake from infested areas.

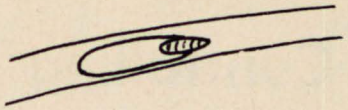
Scurfy scale

— Color — dark brown or reddish brown
— Shape — round, tortoise shaped
— Size — about 1/8 inch
— Scales are soft and easily removed



Lecanium Scales — Various Species

— Color — white
— Shape — long oval, flat
— Length — 1/8 inch
— Hard, easily removed from infested needles



Pine Needle Scale

There are two periods during the life cycle of scale insects when they are moving and susceptible to insecticides. The first period is in early summer (about mid May depending on temperatures) when the eggs hatch and the tiny crawlers are searching out feeding locations. The second period is around mid August when the males are in flight searcing for females.

Sprays of malathion (1½ teaspoons 50% malathion in 1 gallon water) applied three times at 7-10 day intervals beginning in mid May, will control newly hatched crawlers. Insecticides are not effective once the scales begin to form. Repeating the treatment beginning in mid August will control males when they are active. Infested trees or shrubs should be sprayed thoroughly to ensure complete control.

hooty hortus says·

The Spruces (Picea A. Dietr). Don't try to transplant one from the woods. They may look alright in their natural setting but in a few years, not much of a specimen for your garden. Be selective, you normally only need one or two.

Here are my recommendations. First, Blackhills Spruce because it grows slowly to make a compact broad conical tree with dense needles. There is of course, also Colorado Spruce, the selections with bluish needles being very popular. Koster and Hoopesi are two of the best. They grow well in most gardens and make a shapely pyramidal tree with stiff sharp pointed needles. However, a word of caution. Sooner or later they will outgrow their allotted space and become a problem tree.

An excellent blue spruce where space is a factor is Montgomery. It is a natural dwarf that makes a dense bush with short silvery-blue needles; it grows very slowly, maybe five to six feet in twenty years.

Finally in the real dwarf class there is a selection of Norway Spruce that maintains itself at not much more than a foot high with tiny twigs densly clothed with short dark-green needles.

Controlling Wood Borers

A. J. Kolach

There are several species of wood boring beetles and moths common to many kinds of prairie shade and shelterbelt trees. Many wood borer species prefer freshly cut logs or weakened or dying trees. Other wood borers will attack living and healthy trees. The long-horned wood borers, metallic wood borers and the carpenterworm are the most common types, and will be found boring into many different kinds of trees usually near the trunk base or sometimes in branches. Wood borers are usually first noticed by the sawdust at the openings of the tunnels and on the ground near the base of the tree. The larvae stage feeds on both sapwood and heartwood. If left unchecked, considerable damage can be caused by this pest.

Unfortunately, wood borers are not easily controlled, particularly with DDT having been restricted from this use. A suitable tree trunk spray as an alternate to DDT has not yet been found. A somewhat more difficult method, although highly effective if done properly, is the injection of carbon tetrachloride or carbon bisulphide into the burrows in May and June to kill the grub stage. Immediately after injection, burrows should be plugged with putty or similar compound to seal the fumigating gases which will kill the grub. Probing tunnels with wire of proper stiffness can also be effective and is practical where the infestation is light and few trees involved.

Be especially careful when mowing grass around tree trunks as injury at this point can attract these harmful insects.

hooty hortus says·

Consider the Pines (Pinus L.) but be selective. They are normally large forest trees. However, here is one I recommend — "Plumosa". It makes a dense pyramid of attractive greenery all the year round. Further, by carefully pruning back the young shoots to half their length in July, you can keep this tree within reasonable bounds for years.

Then there is the Swiss Stone Pine, a choice slow-growing tree with long bluish-green needles that are soft to the touch. It is fully hardy, making an attractive pyramid at the rate of about a foot a year.

There are also dwarf forms of the variable Swiss Mountain Pine which are excellent for foundation planting. They may grow to six or seven feet but can be kept dwarf by regular pruning.

A miniature pine called pumilio with tiny needles on branches that rarely grow more than two feet high is highly recommended as a fine evergreen cover for the front of the foundation cover or the shrub border.

Pines grow best where the soil is light and well drained.

Pesticide Residue in the Home Garden

G. C. Pratt

There has been much said and written about pesticide residues and pollution caused by pesticides. You, the home gardener, are probably wondering if you are adding to the pollution problem by using pesticides.

There is no cause for concern if you follow the directions and recommendations on the pesticide container.

Pesticides, if used correctly, do not pollute, they are in fact an effective weapon against polluters such as aphids, mites, caterpillars and fungus rots. It is the responsibility of the user however, to see that pesticides are used in the proper manner.

All pesticides are required to be registered under the Pest Control Products Act. This is a Federal Act designed to ensure that pesticides offered for sale in Canada are safe within the bounds of available knowledge. Requirements of this Act are continually changing as new data on residues and other possible hazards come into focus. The pesticide manufacturers are then instructed to conform to current requirements. This does not mean, however, that pesticides do not constitute a potential hazard. It is the user who must read the label and follow the directions to ensure that his own garden is not a source of residue.

There are many things that the user can do to prevent contamination. Use the recommended pesticide for the particular insect you wish to control. This information is available in pamphlet and booklet form at your garden centre or from the extension service.

Study the label on the pesticide can, make sure that you understand the instructions, then proceed with the job at hand.

Do not use more than the recommended rate of application and use an applicator that will give a light even coverage. Most garden pesticides are packaged in containers specially designed for this purpose. In event that a waiting period is recommended, pay particular attention to the period between the date of application and the date of harvest.

If you are using soil treatments it is a good idea to rotate your vegetables to ensure that application is made to a particular area not more than once every four years.

These are some suggestions that a home gardener can follow. Using a common sense approach a gardener can control insects and disease with pesticides without causing residues and in fact can, with a healthy garden, contribute to the balance of nature.

Vegetation Control Around the Home

Dr. E. Stobbe

In his article "I'm a Lazy Gardener", The 1969 Prairie Garden, p. 75-76, Fred Weir states: "Gardening for many people is a hobby; for some it is a relaxation; for some it is just work — often hard work!"

Among the backbreaking jobs the homeowner has is the control of vegetation where it is not desired. To eliminate this unwanted vegetation hand hoeing, pulling or cutting is often required.

There are a number of herbicides that will give total vegetation control, but with most of them extreme care must be taken to avoid killing desirable vegetation along with the undesireable. Two herbicides that have been used very effectively around the home to control all vegetation are paraquot and diquot. Both of these compounds are contact herbicides and kill only green plant material with which they come in contact. Once the compounds come in contact with the soil they are immediately bound to the soil particles and lose their ability to kill plants. Once absorbed to the soil the molecules can be broken down by light and micro-organisms in the soil. In any case, paraquot and diquot do not move beyond the surface of the soil and do not present a pollution problem.

Paraquot and diquot are extremely effective top growth killers of grasses and broadleaf plants (paraquot is more effective on grasses and diquot more effective on broadleaved plants). Applied in the morning paraquot or diquot burn off the plant tops by evening. With perennial vegetation, retreatment is required to kill out the whole plant. Paraquot and diquot can be used anytime during the day, but not in the rain. They are primarily active during the day, or light period, but experimental results suggest that the best kill can be obtained by applying them in the evening (some translocation of the herbicide appears to occur during the night).

Since paraquot and diquot are tightly bound to organic matter, it is important that clear water is used to dissolve and dilute the herbicide. In the concentrated form paraquot and diquot have a long self life but once dissolved in water, the herbicide should be used immediately for best results.

Since paraquot and diquot are contact herbicides, complete coverage of the plant must be obtained to get satisfactory results. As a result, high volumes of water must be used when applying the herbicide.

There are many uses of paraquot and diquot around the home:

1. to keep grass and other vegetation away from the foundation of your home.
2. under fences to avoid time consuming trimming
3. edges around the flower boarders. Keep grass from growing into your flower beds. A straight line can be obtained using a board and if a curved line is desired, use a garden hose as a marker.
4. at the base of trees, woody shrubs and hedges, particularly where rubble stone is used. Care must be taken not to allow any of the spray to come in contact with tree or shrub leaves.
5. control vegetation between patio and sidewalk blocks

6. preparing a seed bed for a new lawn. First level the ground area and prepare the seed bed. Now allow weeds to emerge. Treat the weeds with paraquot and seed your lawn the following day — covering the seed with peat moss. This procedure allows the weeds in the surface of the soil to germinate and be killed. By not disturbing the soil after killing the vegetation, no fresh seeds will be brought to the surface of the soil and a relatively weed free lawn can be established.
7. renovating an old lawn. Instead of removing the old turf and disturbing the yard you can kill the turf with one or two treatments of paraquot and then lay new sod on top of the old sod.

Care must be taken not to walk over the treated area to an untreated area. Some herbicide may be transferred from your shoes to vegetation that you do not wish to control.

Never use paraquot or diquot on windy days and be sure to read the label directions before applying the herbicide. Rates of the herbicide and the volume of water to be used are given on the label.

Paraquot is sold under the trade name of GRAMOXONE. Diquot is sold under the trade name of REGLONE. A combination of paraquot and diquot is marketed under the trade name WEEDRITE. Gramoxone and Reglone can be purchased from most agricultural chemical sales outlets. Weedrite is sold in most department stores and gardening supply outlets.

Gramoxone, Reglone and Weedrite are not cheap chemicals, but when you see the results they do and the labor they save, they are relatively inexpensive. Gramoxone sold in a one gallon container sells for $28.65 and covers approximately two acres. Reglone sells for $26.80 a gallon and covers the same area as Gramoxone. Weedrite is designed for homeowner use and is packaged in a seven ounce container which will cover 800 square feet. The cost of this package is $1.98.

Fig. 1. Using a dribble bar to apply Weedrite.

Fig. 2. Gramoxone and Weedrite give excellent grass control around the base of trees and shrubs.

Gardening on the Tundra

Mrs. I. H. Smith

Gardens in Churchill, Manitoba present their problems. However, this does not deter the courage of those individuals who enjoy planting, cultivating, and watching plants grow.

Two major factors control the size of a garden plot soil build-up, and favourable location. The prevailing wind is northwest, making it necessary to locate the plot on the south southeast side of a building. Here, plants receive the maximum amount of sunshine and warmth during the short growing season — mid June to late August.

Perhaps, more than available space, soil build-up controls the size of the garden plot in the townsite. The soil build-up usually begins by transporting soil from the area surrounding Churchill where soil depths are considerably greater. When obtaining soil from forested areas and the tundra, one should be careful not to disturb too great an area. It takes many years for a denuded area to return to a climax condition.

A good place to collect soil is from the bottom of a shallow pond. Wait until the perma-frost has receded enough to allow the water to drain off. The residue will be dry enough to collect about the second week in August. Pick out the larger stones and you will have a rich humus of decayed plant and aquatic animal material. Many of the pools among the boulders of the Pre-Cambrian Shield produce excellent humus, free of stones, once the water has drained away. The soil must be revived yearly because of excessive leaching from melting snow and the rains. The sandy, gravelly base, topped with loose soil, permits the rapid run-off of water carrying with it the nutrients. Commercial fertilizers may be used, although organic matter is what is really needed.

One usually waits until mid-June for the plot to be free of ice and frost. The soil is lifted and raked. Should there be the least bit of ice under the surface, seeding is delayed. Transplanting of onion plants, parsley and flower plants is delayed. Sometimes it is well into the third week of June before the planting and transplanting can be done. Once the soil is warm enough and this is accomplished, germination and growth is rapid.

July is the warmest month with an average monthly maximum temperature of 82 degrees Fahrenheit and average daily mean temperatures of 54 degrees. The average monthly rainfall is 2.10 inches. The soil dries out rapidly. The plants must be watered regularly by sprinkling.

Salad greens thrive the best. Cress, lettuce, radish seeds, and onion and parsley plants are arranged in rows wide enough apart to allow for cultivation with small garden tools. Beets, dill, potatoes and tomatoes can be grown. Beets rarely get beyond the size for beet greens. Potatoes are grown to an inch and a half in diameter but of no great quality. Tomatoes are better grown in containers that can be moved from place to place. This is done to avoid low temperatures and the strong winds.

Rhubarb, chives, Delphinium, Bluebells *(Mertensia)* and a few hardy roses winter very well if properly mulched and covered by a deep blanket of snow.

A limited number of varieties of flowering plants are given their place in the garden plots. Geraniums, carried through the winter indoors, are transplanted in the garden plot. They must be well protected and do best against a southerly exposed wall. About mid-June, flats of flowering plants are shipped to Churchill. The quantity increases each year. More people are becoming interested in trying their luck at growing plants.

hooty hortus says·

Why not that old favourite Lily of the Valley for that odd corner. Admittedly it blooms best where the plants get plenty of light, and where the soil is fertile, but there is scarcely a spot where Lily of the Valley fails to survive.

The plants will spread reasonably fast to furnish the ground with bright greenery. Then in late May or June the slender flower stems will push up from among the dark green leaves to open their fragile delicately scented bells.

Lily of the Valley is not offered for sale by all nurserymen, but often a gift or exchange with a garden friend is possible. Remember also that transplanting in August is even better than in the spring. Plants each with about three crowns are set out about six inches apart. Some winter protection the first year, such as leaves or straw is recommended.

Flowering plants seem to be the starting point. The popular ones are Pansies, Petunias, Asters, Dwarf Marigolds, Yellow Poppies, and Stocks. Gladiolus can be grown in the plot if given special care and protection. Like the tomato plants, and for the same reasons, they do better if planted in containers.

Gardening in Churchill sounds as if it were a lot of work. It is. However, more and more people are finding it to be most rewarding. Experiences are exchanged amongst the enthusiasts; different plants, than the tried and tested, come in for experimentation. A few greenhouses and coldframes have been built. These are a constant joy to neighbours, friends, and casual observers. The greatest joy of all is teaching the children to try their hands at growing a flower or a clump of chives. How their eyes sparkle when relating their accomplishments!

Cucumbers, Old and New

Ernest D. Whelan

At least one row of pickling cucumbers is a 'must' for most home gardeners. Cucumbers are both satisfying to grow and, as pickles, are a welcome addition to the table during the winter. In the old days the choice of varieties for the Prairies was relatively limited due to the short growing season, however, thanks to the efforts of plant breeders in Canada and America, this is no longer true.

In cucumbers, as in many other crops such as sweet corn, most of the new varieties are hybrids, the result of controlled crosses between selected lines. Hybrids of this type are more uniform and vigorous than the older open-pollinated varieties.

To understand some of the recent advances and problems in cucumber breeding, one must understand how a cucumber plant develops. Cucumbers produce blossoms at the junction of the leaf stem and the main stem of the plant. In this area, called the "leaf node", either a single female flower or four to seven male flowers develop. The male flowers produce pollen but the female flower which includes the immature cucumber, does not. Therefore, for the fruit to develop, pollen must be transferred from the male flowers to the female, and this is usually done by bees. Varieties of the type that produce separate male and female blossoms on the same plant are called "monoecious", and many home gardeners are not aware of this difference between the two types of cucumber flower. Next year, if you grow cucumbers, look closely at the flowers. Ones that have a very small cucumber just behind the yellow petals are the female flowers. Those that have only petals, a blossom stem and contain pollen sacs or anthers containing yellow dust-like pollen are the males.

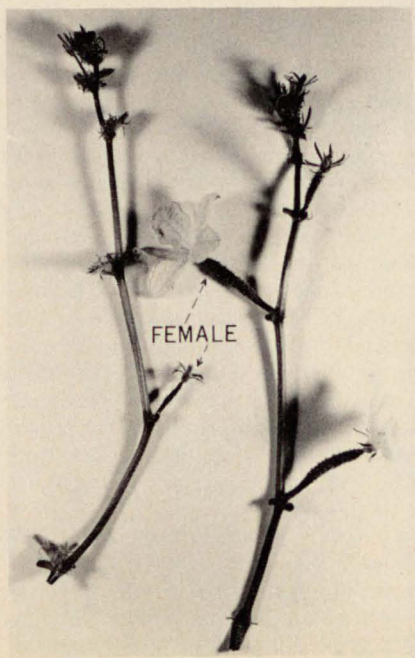
If you are growing some of the older varieties next year such as Morden Early, National Pickling or SMR 18, if you wish to see if you can tell which flowers are male and which are female, look carefully at the flowers. You will find that most of the flowers produced early in the season will be of the male type. Later in the season they will be mostly female. This is because cucumber plants are sensitive to the number of hours of daylight. When the days are long, the tendency is for male flowers to develop. As the days shorten, female flowers are produced.

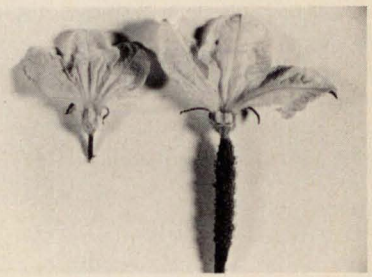
Until the 1960's, all cucumber varieties available were monoecious. However, in 1954, plant breeders in the Department of Horticulture at Michigan State University found a cucumber plant that grew differently. Three plants grown from seed of a Korean variety, Shogoin, produced only female flowers. Seed was obtained from these plants by using pollen from monoecious varieties which produce male flowers. When this hybrid seed was grown, the plants produced only female flowers. Plants of this type are called "gynoecious". Thus, a new type of cucumber plant became available to the home gardeners and commercial growers. Because gynoecious hybrids have only female flowers, they usually produce more fruit than the monoecious type. Some gynoecious hybrids, which can now be bought from most seed houses, include Spartan Dawn, Briney and Pic Nik. As these hybrids do not produce male flowers, seed packages also contain some seed of monoecious type cucumber to provide pollen for fruit set and development.

As is often the case with something new, this gynoecious cucumber caused problems for the plant breeder. To maintain seed of breeding material in the pure state, female flowers must be fertilized by pollen from male flowers from the same plant. This is called "self-fertilization". However, the new gynoecious plants did not produce male flowers to provide the pollen for selfing. Fortunately, it was found that by spraying the growing tips of gynoecious plants several times with a compound called gibberellic acid, a few male flowers were produced over a brief period. The plants could then be selfed to obtain pure breeding seed before reverting back to producing only female flowers.

New types of slicing cucumbers for fresh table use have also been developed and include the gynoecious growth habit. However, in addition to this, some "non-bitter" hybrids are now available. Normally, slicing cucumbers are peeled before being eaten, and unless this is done, many people find them indigestible. This is caused by a chemical substance called the "bitter principle" which develops just under the surface of the fruit. In 1956, investigators in Holland started examining cucumber varieties from many different parts of the world to see if they could find plants which did not produce this bitter substance. After testing 15,000 plants, they found one which was free of the bitter principle. Hybrids developed from this type of material are "non-bitter" and less inclined to be indigestible.

If you plan to grow cucumbers next year, try growing some of the newer hybrids as well as your older tried and trusted varieties. When they bloom, look at the flowers to see if you can distinguish between the female and the male blossoms. Remember, it is only the female blossom that will give you fruit. Whether you grow the older varieties or the newer hybrids, be sure to pick them regularly. Cucumbers left on the vines because they are too large for pickling, will reduce the yield of small cucumbers.





Male (left) and female (right) cucumber flowers. Note the immature cucumber just behind the petals in the female flower, and its absence in the male flower.

Vines from monoecious (left) and gynoecious (right) cucumber plants. Note that each flower at every node on the gynoecious vine is a female flower. In contrast, only one female flower is evident on the monoecious vine; the rest of the flowers are male.

Asparagus Growing

D. H. Dabbs

Asparagus is one of the most valuable of garden vegetables. This vegetable is a member of the lily family and was native to parts of Russia, the Mediterranean region and the British Isles. It was used for food by the Romans and other ancient people and was also highly regarded for medicinal purposes. The plant was brought to North America by the early colonists. Asparagus is not difficult to grow and will thrive under a variety of conditions. It is a perennial crop that, if properly cared for, should produce well for up to 30 years. The plant is drought resistant, but maximum yields of high quality spears will only be obtained if some irrigation water is available during dry periods.

Asparagus is propagated from seed by the nurseryman and can be similarly propagated by the home gardener. It is generally more convenient, however, to buy one- or two-year old plants. For a family of average size, from 25 to 50 plants should provide an abundance of spears for immediate use on the table. If part of the crop is to be canned or quick-frozen, a greater number of plants will be required. The two varieties that have performed the best at Saskatoon are Paradise and Washington.

Asparagus prefers a deep, rich, well-drained, sandy loam. Heavy soils frequently must be used and these are reasonably satisfactory provided the surface soil is of good depth and an abundance of organic matter has been added. Asparagus is a heavy feeder and therefore requires a rich soil, but even a very ordinary soil may be sufficiently improved by the regular addition of organic matter and commercial fertilizer.

Asparagus should be planted early in the spring and traditionally the crowns of the plants have been placed at a depth of four to five inches below the soil surface. This technique is probably still preferred although good results can also be obtained from shallow planting. For gardens where artificial waterings can be given, plants may stand fifteen to eighteen inches apart in the row and the rows may be as close as two and one-half to three feet apart. The more normal spacing is with rows four to five feet apart and plant spacing within the rows of eighteen to twenty-four inches.

There should be no harvest during the first two growing seasons and only a limited harvest during the third season following establishment. In subsequent years a full cutting season of from four to six weeks may be enjoyed, but at no time should spears be harvested after the end of June. The top-growth must be maintained for the remainder of each growing season to allow the plants to fully replenish the stored food in the crowns and fleshy roots. If this is not done the plant will literally be starved to death. During the cutting season all shoots should be removed when they reach a height of approximately six inches. Spears should be cut at the ground line or slightly below with particular care being taken not to injure other young shoots.

It is advisable to mulch with a liberal application of well-rotted manure, peat moss or leaf mold in the fall of the year. If preferred, the organic matter could be applied in the spring, as a mulch is not required for winter protection. In the spring this organic matter can then be worked in rather shallowly with a fork or rototiller along with about one

hooty hortus says·

There is no need for failures in planting Evergreens if you follow a few general rules.

(1) Plant during the last two weeks of August, especially pines and spruces. However, as spring seems to be the most convenient it can also be done in late May before new growth gets started.

(2) In planting, dig the hole deep and wide and plant the tree slightly deeper than it was in the nursery.

(3) When the tree is set at the proper depth, slip back the burlap but don't remove it. It is better not to disturb the roots. The burlap will soon rot.

(4) After firming the soil, make a shallow depression at the base and fill with water several times. In warm and dry weather it is always beneficial to spray the tops, even once a day, while a final soaking in October, particularly if the weather has been dry is very important.

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pound per one hundred feet of row of a high-nitrogen fertilizer such as 34-0-0 or 26-13-0. The advantage of deep planting will be obvious in this operation as the roots will likely be rather seriously injured where plants have been shallowly planted. At any rate, this method of feeding will provide for maximum longevity of a high-producing block of asparagus.

Shallow cultivation during the growing season, until the ferny top-growth completely shades the ground by about mid-June, may be required in order to keep weeds in check. A number of herbicides can be used on asparagus, but local recommendations should be carefully followed if this method of weed control is to be used.

The old top-growth may be left in place as a snow-trap over the winter if desired or it may be cut off at ground level shortly prior to freeze-up.

Squash – The Heavyweight Champion of my Garden

Edgar H. Van Wyck

Editor's Note:

Mr. Van Wyck won the championship for the largest squash at the Toronto Royal Winter Fair in 1970. His squash weighed 250 pounds. Here, in Ed's own words, is the story of his large squash.

Selection of Plot

Shelter is necessary. Squash vines have tendrils and take root from nodes in the vines. Wind moves the vines so nothing of any account will grow on them. My patch is sheltered on the north, south and west and with reflected sunlight and still air, it is warmer on most days than in an open space.

Deep Tillage

I fall plow as deep as the plow will go, which is about 14 inches and that is all I do with a heavy tractor.

In spring I work the land with ordinary garden tiller so as not to pack the ground. The root system of the squash is tremendous and it gives them a better chance in loose soil.

TRANSPLANTING

Squash takes a long season to grow so in Manitoba one has to use it all. Squash is easy to transplant if they are about 3 or 4 days old. The roots spread so rapidly that if you leave them too long they become root bound and can be damaged in transplanting. I put them under a large hotcap made of an old storm window or plastic sash raised on the north side with a 10 or 12 inch board. This can be done as early as the ground is dry enough to work, and this averages out to about May 1st. If you

seed squash about April 15th, it will take 10 days for the plants to come up. In 5 days they should be ready for transplanting. So May 1st is about the time when you transplant.

Plenty of Room

Have single plants at least 20 feet apart. This puts the urban gardener at a disadvantage as few have that kind of room. I have grown over half a ton of squash from one plant. As I mentioned before, if you give the vines a chance, they send out roots and the empty spaces fill up.

Plenty of Water

Vines are composed mostly of water. Foliage is about 3 feet high but after a few fall frosts there is not much left. One can cultivate the soil to preserve moisture until the root system gets big and then one should not let the ground dry up and crack as that would ruin the plant. Watering is the only answer then and they can use a lot while the squash are forming.

Pruning

About August 1st I cut off the ends of the vines and destroy all female blossoms. Any squash after that is too late to mature, and the plants can use their energy for growing larger squash. The results with my squash seem to prove that I'm right.

hooty hortus says·

ANNUALS TO SOW OUTSIDE

The Sweet Pea of course. They should be planted as early in May as you can work your soil. Sweet Alyssum is hard to beat for edging. The old reliable Carpet of Snow for white and for colour variety try Royal Carpet, Navy Blue and Rosie O'Day. Amarantus is an easily grown foliage plant with brilliant red leaves contrasting with the coppery bronze leaves produced lower on the stem. Try Early Splendor, it grows to about four feet. Then there is the Balsams. They are fine two to three foot plants with double camellia flowers. Peppermint is a brilliant scarlet. Calendulas are long suffering annuals that will grow in almost any place. Try Pacific Beauty. Californa Poppy is another annual that must be sown where it is grown. It likes a sunny spot; try Mission Bells, it comes in many colours. Coreopsis (annual) is an excellent source of cut flowers. Nasturtiums are also best sown outside. There are many semi and double forms. They grow best in a relatively poor soil. There is Candytuft in a wide range of colour in the semi-dwarfs. Try the new Giant White Hyacinth Candytuft. There is the Cornflower sometimes called Batchelor's Button, and don't overlook the Cosmos. They have fine foliage and flowers in lovely colours and are excellent for cutting. There is also the new Sunset Cosmos. It is best planted away from the others as its brilliant orange colour is not very compatible with the pastel shades of its brethren. Then there is Portulaca, an excellent plant for that hot dry spot. It again is almost always planted outdoors. And finally don't overlook the Marigolds and Zinnias. They are many and varied. Take your pick.

Vegetable Varieties for Northeast Saskatchewan

R. H. Anderson

For more than twenty-five years, vegetable variety testing has been an important phase of the horticulture research at the Canada Research Station, Melfort, Saskatchewan. Although commercial production of vegetables in the area is limited, the importance of vegetables grown in home gardens cannot be over emphasized and the choice of suitable varieties often means the difference between success and failure to produce a satisfactory vegetable product.

Hundreds of varieties of some twenty or more kinds of vegetables have been evaluated for yield, maturity, quality and general adaptability. The list of available and good varieties is extensive but only a few of the best and some of the newer ones will be discussed here.

Only two perennial vegetables have real importance in the area. Mary Washington continues the best Asparagus variety, far outyielding other varieties tested, e.g., yield in pounds in 1970 were Mary Washington 19.5; Viking 8.6; Martha Washington 8.3; and Paradise 7.5. Rhubarb is the other important perennial vegetable. Three varieties have shown good resistance to red leaf disease and are heavy yielders of top quality produce, they are MacDonald, Early Sunrise and Canada Red.

Three new varieties of beans, Spring Green, Speculator and Provider are stringless, have good quality and are heavy yielders; the latter gave the highest yield in the test in 1970.

Although Straight 8 and Sparton Dawn cucumbers are still recommended, the following newer varieties have performed very well at Melfort: Pioneer, Burpless and Shamrock.

There have not been any changes in onion recommendations. Best results are obtained from onions seeded inside and planted later in the garden. The Spanish varieties such as Riverside Sweet Spanish and Hybrid Spanish still give the highest production of good size bulbs. If seeding is done directly in the garden, Fiesta and Autumn Keeper are satisfactory.

Root vegetables grow well in the area. In carrots, the Nantes and Chantenay varieties and strains have proved most adaptable. The Cylindra beet variety has become very popular with most gardeners. It is early and holds its quality much longer than other varieties. Turnip and parsnip variety recommendations have not changed. The Laurentian turnip and the Short Thick and Guernsey parsnip varieties are still on the top of the list.

Cabbage varieties that retain their green color in storage are favoured over other types. The following varieties grow well at Melfort: Storage Green, Houstan Evergreen, Triple Green, Green Acre and Greenback. Dominant is still the best cauliflower variety, although Snowcap gave top performance in 1970.

The Cos variety of lettuce has become popular with gardeners because of its high production, excellent quality and ability to maintain quality over a long period.

Pea variety recommendations have not changed much in the last few years. Stratagem and Onward are still recommended late maturing varieties. Tasty Freeze and Wando still outyield other mid-season varieties.

hooty hortus says·

Planting the Small Vegetable Garden. Lettuce — thin the plants when they are still small, overcrowding will cause plants to run to seed. Plant about one half inch deep, firm soil, watch out for slugs. Radish — sow thinly and water for quick growth or they get 'hot'. Make several sowings. Watch for flea beetles; use Derris Dust. Peas — suggest the wrinkled seed varieties, they are better tasting. Carrots and Beets — need fertile soil, thin when not more than two inches high; a late thinning can give you young carrots and beet greens. Beans — will develop enormous crops in a limited area over a long period.

Prairie Sweet, a new variety, has shown promise for this area. It is a few days earlier than Lincoln and is equal in quality.

Several new varieties of corn have done well at Melfort. Royal Crest, a medium early variety, was high yielder in 1969 in a 15-variety test. Gardentreat is a few days later but yields are high and quality is tops. Summertreat matured the same time as Gardentreat and was slightly higher in yield but did not have as good quality. Of the older varieties, Golden Beauty, Earliking and Spancross are still recommended.

Many varieties, strains and selections of tomatoes have been under test recently, but very few new ones have shown any real superiority over some of the older varieties in this area. The exception to this is the Rocket variety which has become very popular as a small, very early variety. It has outyielded all other varieties in field ripened fruit. A few strains from Beaverlodge show considerable adaptability to this area. Older varieties still recommended for this area are Swift, Meteor, Mustang and Bush Beefsteak.

Variety recommendations for the less popular kinds of vegetables are: *Broccoli* — Cleopatra and Royal Purple; *Brussels Sprouts* — Jade Cross; *Vegetable Marrow* — White Bush; *Pumpkin* — Sugar and Early Cheyenne Bush; and *Squash* — Bush Buttercup and Gold Nugget.

Commercial Strawberry Production
or
The First Phase of a Dream

P. J. Peters

The phone rings. I pick it up and answer, "Hello. Pete Peters here." It is my steno. "Two gentlemen to see you. Shall I bring them in?" The answer is "Yes, Cathy, please do."

Enter two farm gentlemen, Morris and Sam Chubey from Rosa, Manitoba. I know them, as they had attended my last Strawberry Seminar. They've come to discuss the possibility and feasibility of establishing a commercial strawberry enterprise on their farm.

Two hours later they leave and I promise to come and see their soil, water source and protection. I've stressed the necessity of using certified plants, of a complete solid-set irrigation system and the need to follow recommended practices as closely as possible. I wonder just how often the words "good management" were used.

But let's get down to my first visit to the Chubey farm. As I drive into the Chubey yard I realize at first glance that I'm dealing with people who are organized. Everything, just everything, is in its place. The charming home is a modified loghouse, neat, painted and clean as a whistle. A good picture deserves a good frame. The house is bordered by lovely flowers. The barns and other farm buildings are old but functional and well kept. The large, straight hay stack is under roof. Farm machinery is parked well off to the side of the yard. I make a mental note. These people should make good managers.

The dogs have announced my arrival. Mr. Nick Chubey, the father of Morris and Sam, comes up to meet me. I shake hands with his charming wife and say hello to Morris and Sam.

Farm people are friendly people. They make the long hours of extension work a pleasure for the extension specialist. Nick's 77 years have furrowed his face and given it character. The clear eyes that look out from under bushy eyebrows are full of life and sparkle. The long years of farming, its successes and its failures, have only sharpened his sense of humor. Nick isn't quite sure of this strawberry venture his sons want to indulge in.

We go out to the proposed site for the strawberry field. The soil, a sandy loam type, has been tested and appears suitable. The five acres lie surrounded by the river and bush on three sides. There's good protection here. Irrigation will be no problem. The layout is discussed and agreed to. Morris, who farms this homestead of his father's and lives with his parents, and Sam, who is married and owns his own farm, agree that all systems say go. I shake hands and leave.

Winter comes. Certified plants are ordered from a reliable Ontario source. The brothers shop for and purchase a five-acre irrigation system complete with pump. They work and plan their operation with the help of brother Bert Chubey, a research scientist at the Canada Research Station at Morden. It was Bert who suggested a strawberry enterprise to start out with.

The winter passes. Sam and Morris talk strawberries but have enough work to keep them occupied. Both have herds of about 100 beef cattle each. Both also grow grain.

Spring comes. The plants arrive. An old tree planter is pressed into service for planting. It's not ideal but, after some practice, it does the trick. The rows are about five feet apart, the same width as the tractor. The main variety of strawberries planted is Redcoat. A smaller acreage of Guardsman is also planted. Every sixty feet a space is left to plant a guard row of corn and sunflowers. Rain intervenes but planting is finished in about a week.

The irrigation system is set up. It'll cover the five acres and will not be taken up before late fall, to store it for the winter. It is used right after planting so the newly set strawberry plants will establish.

The smiling sun smiles brighter as it sees the plants establish. The weeds are coming fast too. Past experiments have indicated that Tenoran could control the weeds but not too well. Morris, Sam and Bert decide that spending money on Tenoran might be worth the gamble. They apply it at rates of 6 and 9 lbs. to the acre. They immediately irrigate the field. Yes, Tenoran works and works well at both rates. It controls the weeds for 6 weeks. Another application of 6 lbs. is made after 8 weeks. Irrigation follows the application immediately. Control again.

It is July. The runners begin to form. Complete fertilizer is spread on the rows and irrigation follows. It is hot and dry so the field is irrigated every second day. "The earlier the runners set, the better will be your crop". That's what the fruit specialist said. And the Chubey brothers decided to abide by recommendations.

But trouble looms. Some plants are dying. The Chubey boys and the fruit specialist find fat, chubby, white grubs eating the roots of some plants. June bug or white grub. The field had been in a pasture crop some years ago. The soil should have been treated with chlordane as a preplanting treatment. The losses are not serious but point the way to the necessity of completely following the recommendations of the spray calendar.

It is the end of August. The rows are now fully two feet wide. Sufficient runners have set. The rest are cut off while cultivating. The field is a beauty to see. The tall corn and sunflower guard rows nod with satisfaction as they sway in the gentle breeze.

It is the end of October. The irrigation system has been dismantled and stored away. The strawberry rows show a reddish glow. They are fast becoming dormant. It is about time to cover them for the winter. Wheat straw from a weed-sprayed field has been baled and is ready. A machinist from Morden has created a straw cutting and spreading machine. The fruit specialist follows this machine as it spreads some 4 tons of straw per acre.

And winter comes. Snow swirls in the field, covering the straw that covers the berries. A neat granary stands at the end of the field. It is being readied as a sales stand for next year.

Yes, it is next year that'll tell the tale. Sufficient snow should mean good winter survival. A complete irrigation system should keep the frost from killing the blossoms. Everything recommended in the way of insect and disease control will be carried out. I know, because the Chubey brothers are good managers.

What will be the returns? Will the yields be 4,000, 6,000 or 8,000 lbs. per acre? Father Nick Chubey hopes that his sons' project will meet with success. So does the fruit specialist. We hope to tell you a success story in next year's "Prairie Garden".

In Hawaii men often make passes at girls who wear grasses.

Gardening Courses fill a need

Tony Donker

In 1963, the Winnipeg School Division No. 1 realized that something should be done to prevent the continuation of the high percentage of school dropouts. They realized that there were a great number of students who could not grasp the type of education offered to them, and therefore, failed constantly, became discouraged, and dropped out of school.

As a start questionnaires were sent to people in the business community, to find out what opportunities there were in different types of trades. When the questionnaires were returned, it was found that landscaping was near the top of the list of opportunities. With the knowledge of what the business community wanted and needed, the R. B. Russell Vocational High School was built.

About two years before the school was opened, the Winnipeg School Division No. 1 appointed department heads for the various shops. Mr. Donald Peto was appointed head of the landscaping department, but has since been appointed vice-principal of another school. Contacts were

established with the University of Manitoba, the Manitoba Nurserymen Assoc. and Mr. Fred Weir, the provincial horticulturist, and much information was gathered. The function of the landscaping department was established, and the layout of the greenhouse was set up. It was decided that to make the course a success, it must be versatile.

The greenhouse was built into four zones, each with its own heating system, cooling system, fan to remove excess heat, and misting system operated on time clocks. Roof vents were established in two zones and fluorescent gro-lux lights over two benches also were installed. The work area has potting benches, a place to store flowerpots, and bins to store soil, peat moss, perlite, sand, gravel, and manure. The classroom is adjacent to the work area.

The students do all the practical work, from filling flowerpots to planting plants, such as 1500 chrysanthemum cuttings, poinsettias, azaleas, hydrangeas, calceolarias, cinerarias, cyclamen, forced hyacinths, and Easter lilies. They also learn seeding, transplanting and planting of bedding plants. They learn how to take cuttings and grow a few tropical plants, and also are taught insect and disease control. All soil is pasteurized. Before going home, the students wash the greenhouse.

The department has a nursery where the students plant and transplant trees and shrubs. They are taught how and when to take hardwood cuttings. Lining out stock is also planted. They are shown how to burlap trees and shrubs, and eventually do it themselves. Here also the students are shown the operation of a rototiller. Soil is stockpiled which is shredded with an electric shredder.

The landscaping around the school and courtyard is maintained by the students. They cut the lawn, (there are different types of mowers, such as reel, rotary, and 2 and 4 cycle), cultivate the beds, plant bedding plants, aerate the lawn, powerrake, powersweep, and handrake. Tulips are also planted for spring flowering.

To give the students added experience in landscaping and greenhouse work, training stations were established. With the cooperation of several greenhouse operators, the University of Manitoba, Assiniboine Park Conservatory and the provincial government greenhouse, students are able to work and obtain added experience. This work is done during the winter months and is free of charge to those participating organizations. It is an extension of the school because the students work the normal school hours. Senior students are placed, when possible, in the industry from the beginning of May until the end of September, working at the current pay rate. They then return to school to complete their education.

Our 1970 graduation yearbook states the reason for having a fine school like ours.

"The R. B. Russell Vocational High School seeks to prepare students for employment in industry. The concern of the school is not so much how students have performed in other schools in the past, but rather how they will be able to function in a vocational setting. Thus, previous academic performance does not create a barrier against a student being admitted to the R. B. Russell Vocational High School.

"The main function of this school is to prepare students for their life in industry. Therefore, industrial education in shops and related theory instruction in the academic side of the school are integrated as closely as possible. The school attempts to up-grade the students' skills in English and Maths, as well as to offer him the opportunity to participate in cultural and extra-curricular programs."

Saskatchewan Test Orchards

D. R. Robinson

With the co-operation of certain farmers and the assistance of Agricultural Representatives seven small test orchards were planted under the direction of the Extension Division, University of Saskatchewan, in 1965 and 1966. One other orchard was planted in 1967. Several new varieties of tree fruits had recently been introduced and it was thought to be important that these new varieties and a few older ones be tested as widely as possible. Briefly, four orchards were planted in northern districts and four in central and southern districts. Originally each orchard contained 21 varieties — two plants of each. Emphasis was given to standard apples and plums; a few applecrabs, crabapples and pears were included. In all 28 varieties of standard apples were planted, also 20 varieties of plums, 7 of pears and 4 of applecrabs and crabapples. (Actually the number of varieties is slightly larger than indicated, as there have been a few replacements.)

Owing to the fact that the orchards are young, relatively little information is presently available as to fruit yields. Considerable information has been collected, however, on winter injury and the results relating thereto may be of some interest to fruit growers. The data presented below represent a summary of winter injury or winter survival for the three years 1968, 1969 and 1970. For convenience the four northern orchards will be dealt with as one group and the four southern orchards as a second group.

The northern orchards are located at Goodsoil, Meadow Lake, Cumberland House and Hudson Bay. With one exception, Goodsoil, these northern orchards have been hit rather consistently by winter injury — definitely more so than those in the south. Colder winter weather may not be the only reason for tree injury. Relatively heavy autumn rainfall, resulting in delayed maturity of wood, may well be a contributing factor. Of 20 standard apples in the northern orchards 6 varieties have shown less injury than the others. These are Prolific, Rutherford, Yellow Beauty, Exeter, Francis and Patterson. The three first mentioned, appear to be somewhat superior to the others. With reference to crabapples and applecrabs Dawn, Dolgo and Rescue have shown relatively little winter damage. For the most part plums have shown considerable injury in the north. Eighteen varieties are under test and of these Dandy, Elite, Gilman, Norther and Parkside have done best. Seven pears are included in three orchards. Of these Andrew, David and John have done best as regards winter survival.

Let us now look briefly at the southern test orchards. These are located at Fenwood, Lemberg, Caron (near Moose Jaw) and Stonehenge. The most northerly of these plantations is in township 23, just west of Melville. (In contrast, the most southerly of the "northern" plantations is in township 45, near Hudson Bay.) In the four southern orchards 16 varieties of standard apples are under test and on the basis of three years of records (1968-1970) the following appear to be most hardy: Adanac, Brooks No. 27, McLean, Mystery, Patterson, Goodland, Harcourt. Of these the first 5 have done better than the last two. Only one applecrab, Dawn, was planted; it has done well. Plums have shown somewhat more winter injury, in general, than the apples and of 13 varieties (basis three years) the following have done best: Dandy, Parkside, Prairie, Supreme; Perfection also has done well. With 4 varieties to choose from there does not appear to be much difference in the pears as regards hardiness. David, John and Philip have been fairly hardy. Jubilee, the other one on test, is a large pear and is reported as quite good when canned.

One northern orchard, at Goodsoil in township 62, was written up in the 1970 Prairie Garden. (Paragraph two should have read, "1969 yields . . . ".) Once again there was a good crop of apples at Goodsoil in 1970. On young trees (planted in 1965) the best single tree yields were: Yellow Beauty — 80 lbs.; Exeter — 70 lbs., and Exeter — 60 lbs. A few pears were produced at Goodsoil in 1970, probably the most northerly record for pears in Saskatchewan. In part, the success of this orchard may be attributed to good air drainage.

In the southern part of the province a few standard apples and plums were produced at Fenwood and Stonehenge in 1970. These orchards and the other two can be expected to produce more fruit in future years.

A great many prominent family trees were started by grafting.

New Fruit Varieties for the Prairies

S. Mahadeva

Generally, production of tree and small fruit crops on a commercial scale has not been of major importance in the prairies. A beginning has, however, been made in commercial production, expecially in small fruit and to a very limited extent in tree fruit. A large number of interested gardeners have established that fruit trees and shrubs can be grown with success on the prairies. If there is a proper appreciation of a few simple procedures and precautions, almost all kinds and varieties of fruit can be grown.

The Provincial Horticultural Station at Brooks, Alberta has been testing kinds and varieties of fruit for many years — some of the newer fruit varieties that are worthy of growing and for trial are discussed below. The most promising area is in small fruit crops and the following varieties have performed satisfactorily at Brooks.

Strawberries

Newer June Bearing Varieties

Protem This variety was developed by Dr. R. E. Harris of the Canada Research Station, Beaverlodge, Alberta. This variety is extremely hardy and has come through all winters here without any winter protection. The berries are medium to large in size and of good quality; the plant is a good runner producer. This variety has been a very good yielder in the first cropping season with slightly reduced yields in the second and third cropping seasons. The frozen quality has been rated as good. During the four years at Brooks there has been no disease of any significance observed on this variety.

Senga Sengana This variety originated in Germany and has been grown at Brooks for four years. It has an excellent survival rating without winter protection and is a moderate to good runner producer. Yields have been high, it actually outyielded all other varieties in 1970. Fruit is attractive, large, and of excellent quality.

Vibrant This is a new introduction from the Horticultural Research Institute of Ontario at Vineland. It has survived very well without any winter protection, is a moderate to good runner producer and a good reliable yielder. Fruit is attractive, sweet but tends to be a little soft.

Veestar This variety was introduced to Brooks at the same time as Vibrant. Veestar was also developed at the Horticultural Research Institute of Ontario in Vineland. It is a hardy variety and one of the better yielders at Brooks. The fruit is medium to large with a good flavour and of excellent quality when frozen.

A Newer Everbearing Variety

Jubilee is one of the newer everbearing strawberry varieties. It has proved to be very hardy without any winter protection at Brooks. This variety was developed by Mr. A. J. Porter with Northerner as one of the parents. It is a moderate runner producer. The fruit is medium in size of attractive colour, and of good quality. The plants are susceptible to vine diseases under conditions at Brooks.

Raspberries

Of the newer raspberry varieties tested the following are worthy of growing in the prairies.

Boyne This variety was developed at the Canada Research Station, Morden, Manitoba. It has been very hardy at Brooks without any winter protection and a consistently high yielder. The plant is a vigorous grower. The berries are large, firm, dark red and highly acid. The frozen quality is good.

Killarney This is another variety developed by the Canada Research Station at Morden, Manitoba and has been tested along with Boyne. This variety is also very hardy, reliable and productive. The fruit is large and firm, and is of better quality than Boyne. It produces a good frozen product.

The black and purple varieties of raspberry have not been very hardy and are poor producers.

Tree Fruits

Among the tree fruit varieties tested in Brooks, the following Brooks Fruit selections are worthy of growing.

B.F. No. 14 (Apple) Original seed was received from Morden, Manitoba. Parentage unknown. The tree has a hardy, upright tall growth. Fruit is flat shaped of about 2½ inches diameter, cream colour, background overlaid with bright, pinkish, red stripes. Flesh is crisp, juicy, fine grained with a tough skin. Good quality.

B.F. No. 27 (Apple) It is of unknown origin. Original planting established in 1937 at Brooks. The plant is hardy and a heavy yielder. Fruit is 2½" in diameter, greenish color with an attractive red overlay. It is a pleasant eating and a good cooking apple that keeps well in storage.

B.F. No. 41 Manchurian plum *(Prunus salicina)* seedling selected from original seed sent to the Horticultural Station by L. V. Ptitsin of Harlein, Manchuria. Tree is moderately vigorous and of medium size. It blooms and ripens early. Fruit is golden yellow, free stone, tender skinned and highly palatable fresh and cooked.

B.F. No. 40 Manchurian plum *(Prunus salicina)* Origin similar to B.F. No. 41. Tree is very vigorous, blooms and ripens early. Dark green fruit with a reddish-purple overlay. Flesh is green and firm. Size is slightly larger than Opata. Very palatable and tender when cooked.

Several selections from seedling Bush Cherries have a place in the prairie garden.

B.F. No. 36 "Albol" Currant *(Ribes odoratum)* Original plants were collected in Colorado and were grown by Mr. Bolinger of Gleichen, Alberta. Two selections from a large population known as "Albol Black" and "Albol Yellow" have been made. The plants are drought resistant, vigorous, tend to sucker and prolific producers of large, mild currants. They are excellent for jam, jellies and wine. Their attractive, golden yellow aromatic flowers, long racemes of richly coloured fruit and the brilliant hues of autumn foliage also make them attractive ornamentals.

Mongolian Cherry *(Prunus fruiticosa)* Selections from seedling populations have produced fruit up to 3/4 inch in diameter. The plant is hardy and drought resistant. Mild flavoured selections are currently under test. Fruits are deep red and make excellent jam and wine.

For further information, please contact the Provincial Horticultural Station, Brooks, Alberta.

The Role of a Horticultural Society in the Community

F. S. Gugin

An active horticultural society can be a great asset to a community. It can become the conscience of the community with regard to its appearance, and it can make the public aware of the importance of improving home and public grounds and the conservation of the natural beauty of the area, and in many other ways it can help improve the whole area.

Members of a horticultural society can begin at home, beautifying their own grounds by planting trees, shrubs and flowers, and by keeping the boulevard or the entrance to their grounds neat, and also by cleaning up back yards and lanes, painting fences, etc. When one or two persons on a street have well-kept grounds, it is surprising how most of their neighbours will improve their places, either from pride or shame.

The members then can begin to reach out into the community and help to raise the quality of life for everyone. Horticultural Societies cannot alone upgrade and beautify their community, but by cooperating with Parks Boards and other officials, by writing letters to the proper authorities or appearing as part of a delegation, they can continue to press for the preservation of the natural beauty of the area and the beautification of public parks, highways, streets and boulevards within the community.

The Society can plant or suggest the planting of small areas at the entrance to town to trees and shrubs or bright flowers to announce to the visitor or passer-by that this community cares about its appearance.

A committee from the Society can contact the business people to suggest the planting of flowers or shrubs on their premises, if a possible area exists, or otherwise the locating of planters or window boxes to brighten the downtown area. This can also be encouraged at public and industrial buildings and most government departments will cooperate well in this regard.

The local Chamber of Commerce will generally welcome suggestions to improve the appearance of the town by the planting of flowers or shrubs in strategic locations, and such things as baskets of live flowers to hang from the light standards for summer and artificial decorations for Christmas and winter. Where Christmas lighting competitions are not held, these can be sponsored by the Horticultural Society.

In a community where there are inadequate park and playground facilities, a small park could be developed for use by the children or older citizens. A rundown area might be improved or a site chosen where the natural beauty would be enhanced. If a river or stream runs through the district, the park could be located adjacent to it.

School grounds, senior citizens' homes, churches and hospital grounds can be landscaped with the permission of the proper authorities. Where sewage lagoons and car cemeteries exist, these could be screened from public view by the planting of trees. Local service clubs might be encouraged to undertake some of these projects.

One project of a horticultural society that can have a lasting effect on the community is the purchase of recommended varieties of shrubs, trees and plants in quantity to be given out as membership premiums

or for resale to its members each year. After a few years the results will show up in the landscape of the area. Planting projects such as boulevards, parks and the landscaping of public buildings can become a lasting memorial for a society.

Other activities of the society should include holding public meetings and field days with lectures and discussion on subjects related to horticulture and the preservation of natural beauty. The public is generally very interested in hearing the latest information on growing things, landscaping, flower arranging, etc. Other groups might be invited to your meeting whenever the topic would be of particular interest to them.

Books on horticulture can be placed in the local library by the society or if finances do not permit this, then the librarian might be persuaded to order some good books on horticulture for use by society members as well as the general public.

Flower and vegetable and fruit shows and garden competitions are a good way to maintain interest in growing the best and to display what can be grown in the area. Beware of letting these competitions become the only activity of the society, however. A horticultural society that is only known in its area for staging the flower show each year is not making as great an impact on the community as it might.

The encouragement and training of junior gardeners to interest them in growing things and to make them aware of nature's wonders and the desirability of preserving the wild flowers, wild animals and birds, and to teach them to help maintain and improve their own surroundings, are important functions for a horticultural society. It is important to the future of your society as well.

There can be a great expansion of the role of the horticultural society within the community in future if we can take advantage of the increasing awareness which is developing in the population as a whole of the need to preserve the natural resources of trees, shrubs, wild flowers, clean rivers, and sparkling lakes with which our country is richly endowed. Horticultural societies can become the watchdogs in their areas to awaken the public to the necessity of preventing further destruction and pollution of many of the beautiful areas of our country. In these days of mounting concern over pollution our horticultural societies can become a source of inspiration and hope by helping to develop and maintain beauty in our communities and our nation.

Growing Plants From Seeds

Ruby Bryan

Before you actually buy your seeds or bulbs, it is wise to do a little planning. Send for seed catalogues early and, with these as a guide, decide what effect you want to create. Learn what plants are suitable for your location and locality. How much you want to spend, and how much time you can give to the garden. Remember that armchair gardening is much easier than the actual thing! Don't let your enthusiasm induce you to buy a lot more than you can look after. Make out your order, and save out a little from your budget for fertilizer and pest control. You will need both.

Sterilizing Soil

Much has been written about methods of sterilizing soil. Many tried and true ways are offered in every book on growing plants. However, given a fresh supply of good garden soil not previously used for greenhouse work, you should not run into too much trouble. Let us put it this way, if you have lots of time, or like to putter, try them all out, and then stick to the one you like best.

We do it this way. In the late autumn we fill flats with a good mixture of rich compost and garden loam. We also fill others with fine gravel (the kind used for cement work). These boxes are stored where they will freeze hard during the winter. We put them in the potting house and in the end of the garage. Before stacking the boxes, we put slats between to ensure good air circulation. This prevents moulds from forming.

In the season we bring one in as needed, mixing two parts prepared soil and one part peat moss, one part gravel. Small seed flats are filled with this mixture and boiling water is poured in until it runs freedly through ample drainage holes. About one-half inch Spagnum moss is then sifted over the soil to within half inch of the rim. More boiling water is then dribbled on with a large spoon to thoroughly wet the moss without disturbing it. As soon as the pan cools enough to be comfortable to the hand, sow the fine seeds broadcast sparingly. This will be easier to do if you add a pinch of clean-washed very fine, sifted gravel to the seed before sowing.

We label each tray as it is seeded, then cover with about four thicknesses of white kleenex cut to fit the box. When wet, this lets in light but keeps the surface evenly moist. Next we cover lightly with plastic and put in a warm, light place to germinate. We use a rack on a plate warmer, or an electric fry pan is fine, and just recently we heard of a heating pad being put to good use.

It is well to test your heating medium before trusting your seeds to it. Use a thermometer to check. From 85 to 90 degrees is about right for petunias, snaps, foxglove and similar fine seeds. Germination will probably show in about 24 to 36 hours. The plastic should be removed for a few minutes each day to allow airing and checking of flats. When the seeds crack and the tiny sprouts appear, remove the paper, make the plastic into a small tent with wire or stakes, reduce the heat gradually to 70 degrees and place flats under good light. Water gently, keep moist at all times but do not overwater. We use soluble fertilizer at one-third strength recommended to support the seedlings, until roots grow through the sterile spagnum moss. Alternate feedings with plain tepid water, and be sure to air once a day.

Cooler Temperature

Some seeds germinate better in a cooler temperature. Prepare the flats as before but let drain and cool for an hour or so before seeding. If you prefer drills, make them before sterilizing. Cover with a little fine moss and gravel and then with the kleenex and the plastic tent. Keep the paper moist by watering gently. Do not overwater. Check each day for germination. Asters, marigolds and stocks will sprout in 24 hours. Some others take much longer.

A fluorescent light fixture will be found very valuable in giving your seedlings a good start. However, if this is not possible, place them in the best light you can. We prefer to place the flats on a rack or sticks to raise them so that air circulates under the flat, especially if they are placed on a window sill as this lets the cool air from the glass flow out into the room instead of chilling the seeds. If you should strike a dull period at this very important time, even an ordinary lamp is a help, providing a little extra heat and light.

Small Plants

The small plants should be planted in a richer soil as soon as the second pair of leaves appear. For this we use our basic material prepared a little differently. We pour the boiling water over the compost soil, let stand to drain a few minutes, then add the gravel and peat in the same proportions as before. A small amount of organic fertilizer at the rate of two cups per bushel is added. Mix all together and it will be dry enough to fill the flats.

By using the boiling water treatment of good fresh earth, having good drainage in a two inch deep flat and controlling the moisture carefully, damping off is practically unknown. However, we do have "no damp" in the cupboard for an emergency. This year we had one pan of Alyssium which germinated fantastically and was much too thick. This did damp off and caught us unawares. There was still plenty left so we pulled out some from the centre and sprinkled a bit of dry soil over the surface, intending to use the "no damp" as soon as we had a few minutes to prepare it. We forgot it, however, but the airing and the dry soil did the trick and we had no more trouble.

hooty hortus says·

Pruning Hints for You. In pruning Evergreens only a portion of the current year's growth should be removed, never more than half and on young plants it is best to cut only a third. Evergreens will not produce new shoots when cut back to the old wood. Pines make strong shoots that should be cut between the needles. There is nothing more unsightly as pine needles that are cut in half. Deciduous hedges — Don't prune before the plants have had a chance to make new leaves. They need these leaves to help them manufacture food. If you make a start by the middle of June it will be early enough!

Electrically Heated Hotbeds

Gary J. Douglas

Bedding plants grown from seed will gain an early start by sowing in an electrically heated bed weeks or even months before they can be sown out-of-doors. The electrically heated bed may later be converted to a cold frame for hardening of the plants by merely turning the automatic control to a lower temperature, or off completely. Hardy perennials and biennials bloom after the first season by starting them in a hotbed several weeks before it would be safe to plant them outside. Cuttings and roses, shrubs, etc., may be rooted early in the hotbed, and gradually advanced for transplanting the garden.

Depending on the location of the hotbed, plan to install from 10 to 15 watts of electric heat for every square foot of growing area. If the bed is in a sunny location, sheltered and the climate not too severe, an insulated frame will require 10 watts per square foot. If it is exposed to winds and extreme temperature changes, allow 15 watts per square foot of growing area. The frame should be well constructed so that the windows and the boards fit tightly. Line the side walls with two inches of moisture-proof insulation. Many growers, to guard against frost damage or to raise the temperature in the frame for use as a propagating room, place heating cable around the inside walls. Thermostats are an important segment of the heating system. They offer precise control and economical use of the heating system.

Installation methods for the cable vary. If the entire bed is to be used for one variety of seedlings, the procedure is to remove 6 inches of soil below the final intended soil level. Lay the heating cable in on a predetermined grid to give the 10 or 15 watts per square foot, as desired. After this has been done, place two inches of sand on the heating cable. Then lay a fine wire mesh screen on top of the 2 inches of sand. The purpose of the wire mesh screen is to protect the cable from sharp soil working tools. After this has been done, place a four inch layer of soil on top of the screen to bring the bed back up to its desired grade. It may also be necessary before the heating cable is placed to dig down a further few inches and put in some sand or coarse gravel to ensure good drainage. When installing the heating cable, it is important to ensure that the cable does not touch itself anywhere on the grid. If the cable does touch, an excessive heat buildup would be caused and the cable would break down. Also, it is a good idea to have the heating cable spacing at the outer edge of the frame slightly closer than that near the centre. Most cables come in specified lengths and cannot be lengthened or shortened, without causing damage to the cable itself when in operation. In many cases, several varieties of seedlings are to be sown in the same hotbed. The method of installation here is similar up to the place where the wire screening is placed over the sand. Flats containing the various seedlings are then placed on the screening.

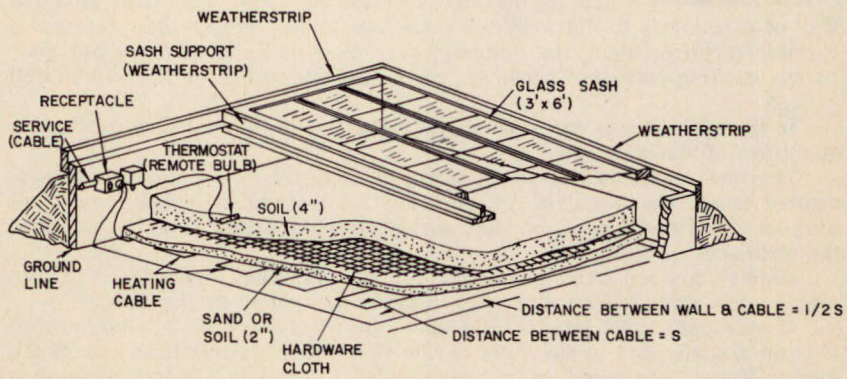
Standard hotbed sizes will make the most economical installation. Standard size is three feet by six feet; therefore, beds six feet wide and in multiples of 3 feet in length are the least expensive to construct. The frames should be built just high enough to give the desired clearance for the plants. If possible, pick a site where the hotbeds will be protected from wind, have good drainage, and be exposed to at least six hours of direct sunlight. If necessary, artificial wind breaks should be provided.

The following measures will reduce heat losses: ensure that the sash fits snugly to the frames; use double glazing or double sashes; bank earth around the outside of the frames; cover the frame overnight to conserve heat.

Two types of covering, a waterproof covering filled with two inches of straw or two inches of waterproof insulation would do a good job. Keep hotbeds level to ensure uniform temperature throughout its full length.

For the operation of a heating cable, it is important that the soil stays wet around the cable. This dampness in the soil allows heat to be transferred from the cable to the required heated area, more quickly. Dry soil acts as an insulator and an excessive heat buildup can cause breakdown of the cable. This is also true when peat is used; as dry peat is an excellent insulator. Peat therefore is not recommended under any circumstances. Always use a thermostat to control temperature automatically and make more efficient use of electricity.

Steady, rather than high, heat is recommended as most desirable when producing plants. Temperatures vary in a hotbed; from 50 to 70 degrees are usually recommended. The use of a thermostat will allow better plants at lower cost. It is highly recommended that seed bed soil be pasteurized or sterilized. During the warm part of the day, it will probably be necessary to ventilate by raising the sash accordingly. The



Construction of an electrically heated hotbed. When seed flats are used, omit top layer of soil and place directly on hardware cloth.

best time for watering is in the morning, since this allows the sun to warm the moist soil and dry the plants before nightfall. Water frequently; never let beds dry out, but do not flood the beds. After the plants have been started, they may be hardened off by regulating the temperature downward to 50 to 55 degrees. Transplant to open ground when night temperatures are above 50 degrees.

RECOMMENDED MINIMUM TEMPERATURES FOR SOME PLANTS
FLOWERS: azalea, bachelor button, calendula, camellia, campanula, carnation, coreopsis, daphne, English daisy, fuchsia, pansy, primrose, rhododendron, schizanthus, snapdragon, stock, sweetpea, violet — 50 degrees.
VEGETABLES: artichoke, asparagus, beets, broccoli, Brussels sprouts, cabbage, cauliflower, carrot, celery, cress, lettuce, onion, parsley, peas, potatoes, radish, spinach, turnip — 60 degrees; beans, cucumber, egg plant, melon, pepper, pumpkin, tomato — 75 degrees.
BULBS AND TUBEROUS ROOTED PLANTS (For early forcing keep cool and moist until roots have formed): crocus, grape hyacinth, snowdrop, anemone, freesia, oxalis — 50 degrees; iris, narcissus, tulip, amaryllis, cyclamen, gladiola, lily of the valley, sparaxis — 55 degrees; begonias, tuberous rooted — 65 degrees.

hooty hortus says·

Success with Gladioli is Easy. Plant early in May in rows about four to six inches apart and from three to six inches deep depending on the size of the corm and the heaviness of the soil. One easy and effective way of planting is to dig a trench some two inches deeper than necessary, sprinkle fertilizer along the bottom, cover over with soil and lay out your corms, making sure that when the corms are covered over the soil is well packed.

In the early stages only normal watering, but in full leaf they need great quantities of water.

The most common insects attacking gladioli are thrips, aphids and two-spotted mites. Good control can normally be obtained with the regular all purpose dusts and sprays on the market. The important thing is to follow the directions on the label.

Gladioli are normally grown for cut flowers. They, however, will also give a very effective display when planted in clumps in the border.

Winter care is as follows. Dig about the first week in October, preferably on a sunny day to speed up drying the corms. At this time cut off the tops to leave stubs about an inch long and dry corms in a warm room of at least 70 degrees for a week or more. The curing process is complete when the remains of the old corm can be separated easily from the new one. Now cut off the remainder of the tops close to the corm, rub off loose skins and treat with garden dust to ward off diseases and kill thrip. Store in perforated paper bags or shallow boxes in a temperature of about forty degrees.

My experience with Fluorescent Lights

Bill Thompson

I have found that using fluorescent lights is an easy way of growing plants inside, thus creating indoor beauty, and keeping your green thumb even in the middle of winter. Since using these lights, this past year has been the easiest since I started being a gardener.

I am a student at Glenboro Collegiate and am interested in growing a variety of plants in many different ways. I have a greenhouse and a large number of mobile cold frames, but I needed more room and decided to make use of our basement. I bought two fluorescent lights locally and received another for Christmas so that I now have three fixtures. A mixture of Gro-lux and cool light make up my set. These lights proved to me that plants will actually grow like magic if given a chance.

Our basement is cool — around 50 degrees to 60 degrees which I feel is good for the growing plants. The lights are on for sixteen to seventeen hours per day, never less than ten hours, or the plants will not bloom. I am very careful that my lights are not too far away or too close to the plants, so the leaves will not burn.

I am also very careful about pests and insects. I had some trouble with aphids but a mild insecticide got rid of them. Some of my friends are interested in plants too, and we compare experiences, and so learn more about growing them.

I grow a large number of plants — geraniums, cactus, mexican hats, creeping figs, and many more. I can never turn down an offer of plants or throw one out! It seems like throwing a well-known friend away. So our basement soon became a jungle. Hanging gardens, shelves of plants, made the cold, dark room a miniature greenhouse. In the end I had a garden of beautiful colors.

I grow flowers, vegetables, cuttings, anything I want for very little cost. Night after night I can work with my plants as there is always something to be done. I have made tulips, daffodils, and hyacinth flower and have even forced my Christmas Cactus to bloom! African violets are my favorites and I have many varieties.

When Spring comes, my plants will all go out to my greenhouse and cold frame. From there they go into borders, flower beds, or as potted plants for the house.

Fluorescent lighting allows us to enjoy our gardening both winter and summer!

The Small Greenhouse

P. D. Hargrave

A greenhouse in the backyard, whether it is free standing, or attached to the house or garage, can increase the enjoyment of plants and broaden the garden experience. A very small structure, six feet long and five feet wide, can produce the bedding plants for a normal lot. It can also supply fresh vegetables and flowers for out of season use. Hobby crops, or potted plants can be specialty items.

A small greenhouse can be easily heated even in extremes of weather but it does present a problem of temperature control on hot sunny winter days and during summer. Before building then, it is wise to solve the problem of ventilation. This should be automatic and co-ordinated with the heating system if at all possible. A fan is more efficient and more readily controlled than a hinged ventilating system. It should be sized to change the air once every minute. As your house increases in size, your heating equipment will have to increase with it, but the problem of ventilating and heating becomes less critical. It is for this reason that we find a space of twelve by twenty feet to twenty-four by twenty feet with ten feet to the highest point much easier to control. The height will depend to a degree on the width. The slope of the glass to the south should be between thirty and thirty-three degrees so that sunlight will enter the greenhouse at its greatest efficiency. The slope mentioned is that desired for a greenhouse in the southern part of prairie Canada. Light is the greatest limiting factor in growing plants in this part of Canada and everything possible should be done to increase its efficient use inside the growing structure. Because houses that run east and west have the greatest light efficiency it is best to orientate your house to make use of this factor.

If the greenhouse is to be used early in the spring and through the summer season it can be glazed to the ground line. Should the structure be intended for winter production it is an advantage to have a well-insulated foundation. The latter type of construction will aid materially in heating the greenhouse during the extremely cold weather and can well form one side of an attached cold frame structure.

The super structure of the house should be well anchored to the foundation or to the wall of the building if it is to be a lean-to. Wood, iron pipe, or aluminum can be used for the framing. If iron pipe or wood are used, it is important that they be well painted before any of the other parts of the greenhouse are added to the frame. Depending upon what you are going to glaze the house with, you will use sash bars or cross members and these can be of either wood or aluminum. Aluminum extrusions suitable for greenhouse construction are now fabricated in Western Canada and a house of this type can be built with the expectations of a minimum of maintenance during its lifetime. Irrespective of what the structure is built with, use brass, cadmium plated or galvanized nails, screws, or bolts. Putty for imbedding glass for sealing structural units to buildings should not be of the type that will harden with age, and should be guaranteed to remain soft and flexible. These types of glazing compounds are available from greenhouse suppliers or from glaziers.

If you are going to use your growing structure for the entire year, it is advisable that you cover it with fibreglass or glass. Research work has definitely indicated that these two materials are the most productive

of plant growth. In a small greenhouse, if you wish to work in it and see out, it might be to your advantage to glaze the walls with glass and cover the roof area with fibreglass. This means that you must have sash bars for the wall portion and cross members to support and to which to fasten the fibreglass. If you are using glass in your greenhouse, work out your greenhouse structure dimensions to suit the number of glass panes that you will have in its width, length and roof area. Standard greenhouse glass comes in widths of sixteen inches, twenty inches, and twenty-four inches and can be purchased in lengths of normally twenty and twenty-four inches. The wider the glass, the fewer sash bars you will require and the greater light efficiency you will obtain inside the greenhouse. If you are using fibreglass, follow the manufacturer's instructions with respect to the distances between the supporting elements that carry the fibreglass. Correct distance prevents sagging of the fibreglass between the supporting members. Fibreglass should not come directly in contact with the wood or metal framing that supports it. Normally, you use short pieces of rigid plastic through which you drive your screws into the metal supports to hold your fibreglass cover.

hooty hortus says·

Two very beautiful Tree Shrubs for your consideration. Toba Hawthorn — a hybrid introduction from Morden. It makes a vigorous small tree but can be restrained for the small garden. It has a long period of interest. It has lustrous lobed leaves, double flowers, first pink, turning to brick red, and scarlet fruits in the fall. Amur Maple a variable small tree or large shrub growing to twelve feet or more, with delicate green leaves most of the year turning to brilliant orange-red at the end of the season. It also has attractive seed pods.

Polyethylene films and similar covering elements are satisfactory for seasonal use — for the production of spring and summer crops they permit the penetration of sufficient light for good growth. In the fall and winter months when the sun is at a very low angle relative to the earth and when our temperatures are low enough to cause excessive moisture to cling to the surface of the polyethylene, these covers do not transmit sufficient light to give good growth. A cover such as this if used in the fall and winter months is satisfactory for the carrying over of stocks but not for good production methods. Should you wish to use polyethylene for your winter use greenhouse, it is preferable to have a double layer for heat conservation. This will be even less satisfactory for growth but it will reduce the amount that you spend on fuel. Usually, polyethylene will give one year's satisfactory cover for a growing structure; it is very risky to depend upon it coming through a second winter.

Your small greenhouse can be very effectively heated with hot air, hot water, low pressure steam, or electricity. Electricity is a very convenient

way to heat a greenhouse if the cost per kilowatt hour permits its use for heating purposes. The heating system, ventilating system and supplemental light can all be looked after with the one source of energy and can be tied together into an automatic system quite readily. Very few small greenhouses will be able to use low pressure steam which is a good heating source under our extremely cold weather conditions of winter. It permits quick circulation and quick heating of the air within the greenhouse during rapid changes of weather. Hot water heating systems, especially if the water in the heating coils is circulated by a pump, are good for greenhouse heating. If there is a danger of heat failure and the freezing coils containing your hot water heating system, it would be advisable to use anti-freeze or high temperature oil for circulating. These two heating liquids will permit higher temperatures to be used in your heating system and will be much more effective during the really cold weather of winter. Hot air heating furnaces are satisfactorily used for heating small greenhouses if the air velocity is not high. It is advisable to have a larger than necessary unit and to slow the fan down. High velocity air should not pass over and through the plants. If hot air systems are used it is often advisable to direct the air around the greenhouse or underneath the benches in plastic tubes with openings regulated at intervals so that the air can be distributed. Down draft hot air heating systems are much better than the normal hot air furnaces used in homes. Whichever heating system you use, it must be adequate to maintain a minimum growing temperature of 65 degrees during the coldest weather. It should be manually or automatically controlled, so that the maximum temperature desired for the crops that are growing is not exceeded. If at all possible have your source of heat outside of the greenhouse. House it in the adjoining home, the attached garage or in a small structure located on the north side of the greenhouse. This structure or space allotment can well provide for a potting bench and soil storage.

Before constructing your greenhouse, and along with your planning program, there are two publications with which you should become familiar. They are written for conditions as found in the British Isles. You translate the practical applications to meet our prairie conditions. They are good publications and give you a background into the requirements of greenhouse construction and growing. The first is the book "Science and the Glasshouse" prepared by W. J. C. Lawrence and published by Oliver and Boyd of Edinburgh and London. The second book is the "Cool Greenhouse" by G. W. Robinson. It is a Penguin book, PH54, prepared in conjunction and collaboration with the Royal Horticultural Society. This latter book is the kind of a book that every grower of plants should have on his library shelf. The greenhouses developed and used for the research work at the Horticultural Station, Brooks, Alberta, were designed and built with products available on the prairies. They can be constructed in units ten feet long. They are twenty-five feet wide and can be covered with any type of glazing material. Plans for these houses are available at a nominal charge from the Horticultural Station. Aluminum extrusions suitable for the construction and glazing of greenhouses are available from the Redcliff Greenhouses, Redcliff, Alberta, and Indalex Limited, 3606 Bonnybrook Road S.E., Calgary. Your local lumberyard will also have plans for greenhouses that you can build yourself. There are also available prefabricated greenhouse structures ideally suited to the backyard. Be sure that you think out what you want to do in your greenhouse, how you are going to do it, and what portion of the year that you wish to use it before you finalize your plans.

Tips for Growing and Grooming African Violets for Show

by Mrs. R. A. Lake

All violets must be named, clean, disease free and single crowned. In selecting your show plant choose a young single-crowned plant whose leaves are growing symmetrically in an even circle or rosette. If small plants or suckers start growing on the main stem or at the base of the leaves gently remove these, also remove the baby or four initial leaves with any outside leaves which lose their normal colour. Turn the plant one-quarter of a turn each day so it is exposed to the light evenly on all sides. If the plant develops gaps between the leaves so that the symmetry is spoiled, stake the leaves to one side or the other with tooth picks. After a few days the staked leaf will grow in the direction you wish and the toothpick can be removed.

To keep the leaves fresh and clean give them a bath with lukewarm water, shake off extra droplets, but be sure not to put the plant in strong light when the leaves are wet as it will cause them to burn.

African Violets need to be fed regularly. A fertilizing program which has proved its worth is six drops of Blue Whale (or any fish fertilizer) to a quart of water. Use this every time the plants are watered. Once a month use a fertilizer high in phosphate — or a fertilizer specifically for African Violets — at one-quarter the recommended strength for African Violets. Be careful not to over fertilize. A regular fertilizing and repotting program is the best way to insure a continuous even growth in African Violets.

A plant which has grown to eight or nine inches across in a 2½" pot should be put in a three or four inch pot. A good rule is to let the plant grow until it is over the pot edge by at least one-third its diameter, then repot again.

In order to have a plant covered in bloom on the show date one should disbud double blossomed plants up to nine or ten weeks and single blossomed plants up to seven or eight weeks before the show. However, if the weather is hot, blooms will come out faster and the disbudding time will have to be adjusted accordingly.

The Canadian National African Violet Show – 1971

will be held in Victoria, British Columbia, in September of 1971 as part of the centenary celebrations of British Columbia's entry into Confederation.

Along with African Violets the show will include a section for "Other Gesneriods" — plants related to African Violets, such as Episcias, Columneas, Streptocarpus (Cape Primrose) and Senningias. There will also be a section for artistic arrangements featuring African Violets.

For more specific directions regarding this Show please direct your inquiries to — Secretary, Victoria African Violet Club, P.O. Box 521, Victoria, British Columbia.

Tropical Plants

W. H. Gray

Malak, Ottawa

Back Row — Left to Right

CACTUS

These plants do very well in well drained pots and need light, sandy soil. They are equally at home in sunny windows or in semi-shade. Soak well and wait until soil becomes dry before watering again. Does not require fertilizing. Propagate from seeds or cuttings.

BOSTON FERN — *Nephrolepis bostoniensis*

An old favourite, still very popular, with minimum attention required, provides rich, dark greenery. Likes little sunlight so does best in an east or north window. Keep evenly moist but not too wet and never allow to dry out. Fertilize every two weeks with a liquid fertilizer. Propagate by division of roots.

Middle Row — Left to Right

MONSTERA *Deliciosa* — Also called Split-leaf or Cut-leaf Philodendron or Mexican Breadfruit

Does very well indoors, but needs some support as it gets older. Leaves should be kept clean by sponging, to prevent disease. Plant shine on leaves makes them more attractive. Likes a little sun such as an east or north window but does well under artificial light. Keep soil moist but not sodden. Needs very little fertilizer. Propagate by air-layering, or from stem or tip cuttings.

CORN PLANT — *Dracaena Warneckii*

Does well in semi-shade such as an east or west window. Keep soil evenly moist but not sodden. Needs very little fertilizer. Tall, leggy plants should be cut down to six inches from soil and allowed to start over. Propagate from tip cuttings, air-layering, or from seeds.

ORCHIDS

Most Orchids grow well in homes, but flourish in warm temperatures and high humidity. To grow well, a great deal of care and patience is required. They should be potted in shredded bark or osmundine (obtainable at most florists). Good drainage is essential. Care should be taken in watering, soaking thoroughly and leaving until soil is dry before soaking again. Keep out of direct sun when in bloom. Usually needs repotting every two to three years, immediately after plant has finished blooming.

PALMS — *Phoenix Roebelenii*

All Palms do best in large wooden tubs, and most require lots of space to spread out. They prefer an east or west window but do well in the north or even in the interior locations with good light. Keep the soil evenly moist but not sodden. Fertilize very lightly if at all. Propagate from seeds or offsets (suckers) from large plant.

Front Row — Left to Right

RUBBER PLANT — *Ficus elastica*

Actually this is not a true "Rubber" plant, but a Fig. These will stand heat, dryness and dark areas for long periods of time; but to flourish must have good drainage. Keep soil moist but not sodden. Grows best in east or west windows. Does not like direct sunlight. Needs very little, if any, fertilizer. Propagate by air-layering. Needs to be pruned to keep from growing too large.

AIR PLANT — *Bromeliad Aechmea Caudata Variegata*

Bromeliads are very popular as house plants at the present time. They grow well in almost any environment, dry or damp, cold or warm, and they prefer semi-shade. They need good drainage as they like to be kept evenly moist but not sodden at the roots. Best not to fertilize at all. Do not use insecticides on Bromeliads. Sponge with soapy water and then rinse with clear water. Propagate by separating small plants from base of older plant.

PHILODENDRON — *hastatum* or Arrow-Head

In recent years, Philodendrons have become very popular as indoor plants. There are both climbing and non-climbing varieties. They succeed with less light than most house plants and like higher temperatures (65-75 degrees). The leaves of the Philodendrons grown indoors should be sponged with soapy water to remove dust and control insects. The soapy water should always be washed off with clear water.

The climbing varieties need supports to which they can cling. Slabs with the rough tree bark serve admirably, or Hawaiian fernwood poles are very good. The soil should be kept moist but not sodden. Good drainage is necessary. Propagate by air-layering. This is the best method and also keeps plants shorter and more bushy.

PHILODENDRON *Selloum*

This is one of the non-climbing varieties, an excellent foliage plant. Same care is given as with the climbing varieties but does not need supports. Keep soil moist and leaves clean for healthy, robust plants.

Unusual Tuberous or Bulbous Plants to Grow Indoors

M. E. Parkin

There are many lovely plants which may be grown indoors to flower in the fall or early part of winter, such as achimenes, smithianthas or calla lilies. This seems to be the time when we need a little help to get over the depression caused by the approaching winter months. Do keep an eye on your catalogues throughout the year, because many of the plants I wish to discuss may only be obtained in spring or summer when winter is farthest from our thoughts. If you are able to grow African violets, many of these plants will like the same conditions, others will need more light and space.

Many of the plants that come into this particular group have one major cultural requirement in common, this is a dormant or resting period. When a mature plant begins to deteriorate in appearance, watering should be slowly reduced until the plant has died down, dead leaves removed and the whole plant stored in a cool place. A temperature of 60° can be used as a general guide. In our conditions of low humidity, it may be advisable to add some water to the pot to prevent complete desiccation.

After this resting period, shoots will appear, the plant should then be repotted and brought back into the light for further growth. If you are unable to provide a cool temperature for this dormant period, many of the suggested plants are cheap enough for you to treat them as an annual and purchase new ones each year.

All of the plants that I suggest you should try; either prefer 70°, or will tolerate this amount of heat. Light is important during winter months even though many of these plants come from jungle areas. We forget that small plants usually grow in clearings or on river banks and we will often push them into a dark corner thinking we are duplicating their growing conditions; and then we wonder why they don't flourish.

Gloxinia

Everybody knows the beauty of the gloxinias, but are you aware of the double varieties; the slipper gloxinia which has a flower rather like a foxglove and the dwarf or mini-gloxinia. The mini-gloxinia is of special interest, as some varieties such as Doll Baby are ever-blooming and thus do not need a dormant period. They are small and compact and useful in restricted areas.

Gloxinias originally came from Brazil but the commercial hybrids come from many different countries including the U.S.A. and Germany.

The culture of the gloxinia is relatively simple unless you obtain tubers which have been imported into Canada. These will have been scrubbed to remove any soil which might contain golden nematodes. This results in it being difficult to get them to sprout. You should place them in a mix of peat and perlite, covering them with three quarters of an inch of this mix, watering well, then place the container in a plastic bag and keep in a warm place. 70° - 80° would be most suitable and the top of the refrigerator might be a good place. After they have sprouted, they can be potted up into a four inch pot in a well drained soil containing humus.

If they grow well, they can be potted on into a five or six inch pot at a later date. Gloxinias are not like daffodils or hyacinths which need a

cool rooting temperature before forcing into growth. When growing vigorously, feed weekly with half the recommended strength of a soluable balanced fertilizer.

When watering, water thoroughly and allow water to drain away. If the leaves blister and turn brown, the light intensity is too bright, conversely, if the leaves or flower stems elongate, the light intensity is too low, which could cause the plants to flower poorly. When flowering ceases, discontinue watering in prepatation for dormancy, then in February remove old soil and repot.

Smithianthas and Achimenes

In the same family (Gesneriaceae) as gloxinias, are smithianthas (Temple Bells) and achimenes (Cupid Bar). The smithianthas have attractive red and green leaves, and yellow or red flowers; the achimenes normally have dark colored leaves with flowers in shades of white to pink to purple, which is the most common color. They came from Central America and Mexico, and flower during the summer months.

Both of these plants have scaly rhizomes which look like greenish furry caterpillars. They are planted in February about one or two inches apart in pans, in the same type of soil as used for the gloxinias. They also are watered moderately at first; and water increased as they grow. They can be fertilized in the same way and need the same light intensity. When flowering decreases, begin to dry off, and repot the rhizomes the following February.

Plants like the gloxinias or achimenes suffer mainly from damage to the leaves caused by low humidity, and if you really have trouble growing them, I suggest you try growing them in a terrarium, using an aquarium or large jar, where the micro-climate around them can be controlled to give more humidity.

Streptocarpus

The streptocarpus or Cape Primrose from South Africa is another member of the gesneriaceae which deserves a place in this article, although it does not really belong in this group, having no storage roots and needing no dormant period. These plants can be grown from seed, the flowers are colors of blue, white or pink and flower continually. Other than the dormancy, the cultural methods recommended for the other members of this family are similar.

Caladiums

Caladiums or Elephants Ear are grown for their beautiful variegated leaves. There are many different varieties but common ones are pink and green, white and green or red and green, they originate mainly from Brazil and British Guiana. The tubers are planted in small pots in February and March, watered moderately and then when large enough are repotted to five or six inch pots in April or May. The soil should be porous and well drained. During the summer months water freely, starting to dry off in November and storing from November to February at 55° to 65°F. It is possible to grow these plants during the winter months by potting in the fall but as the roots are sensitive to both over and under watering and the plant needs plenty of light, I do not advise this. In our prairie summer, the plants must be protected from the bright summer sun and a north or east window would be most suitable.

Calla Lilies

Calla or Arum lilies are from South Africa but in Queensland, Australia they are one of the worst weeds that the sugar cane growers have to contend with. They can be grown indoors. The arrowshaped foliage is

attractive and sometimes speckled, and the flowers may be yellow, pink or white. The white is the most vigorous but it will suffer from being in too large a pot just as much as the other colored varieties.

These plants also need a dormant resting period, this time in the summer and one method is to plunge the pot under a shrub in midsummer and bring back into the house before any likelihood of frost. It can then be repotted but do not put in too large a pot, check for any root rot and cut out with a sharp knife if present. The bulbs should be just buried in loose porous soil, watered once and then checked carefully to prevent drying out. Do not overwater. These plants will need regular feeding with a liquid fertilizer as soon as the roots have spread through the soil and the days get longer. Calla lilies need plenty of light but not bright summer sunlight. They will grow best in the cooler parts of your house and in early summer will show signs of dormancy, the leaves becoming yellow and wilted. Watering should then be reduced and they can be allowed to die down or put outside.

Lily of the Valley

Another unusual plant to grow in the home is one that we normally associate with spring outside — the Lily of the Valley. Prepared roots of this plant which are called "Pips" are now available on the Canadian Market and will sometimes bloom two-three weeks after planting. Don't expect the rich broad green leaves that we are used to outside but they do bring delicate fragrance into your home with the promise of spring to come. In common with many plants that are forced, you will not get a second crop of flowers inside but if looked after you can plant them outside when danger of frost has gone.

Bletia Orchid

The Bletia orchid has been available for a number of years and is a terrestrial orchid, that is, it will grow in an open porous soil with good drainage. It also needs a dormant period. The flower stem will appear at the base of the new pseudo bulb each year. Pot it in March in a small three inch pot and once it has started growing do not let it dry out. Place it in the same amount of light as the gloxinias. Reduce water in September for the dormant period. This species comes from the West Indies.

Speklina or Mexican Fire Lily

Speklina or Mexican Fire lily has orchid-like blooms eighteen inches tall. If these plants are grown in good light conditions in an open porous soil they should have several spikes of flowers. These can be encouraged by reducing the amount of water after each spike flowers, and then water more often as the next flower bud appears. Be careful not to overwater as this plant does come from the dry Mexican climate.

Other Plants

There are many more unusual plants with tubers, bulbs and corms which could be grown in the house. If you have a cool area around 55° you might like to try anenomes (not the prairie crocus) freezias or ixias. Nerines are also worth trying.

Basically the pests which attack these plants are few. Aphids on calla lilies are one, but the major troubles seem to be caused by dry air, so these plants should be kept away from the hot air registers and draughts. Spray lightly if possible (not if they have hairy leaves) with rain or snow water and if all else fails, grow them in a terrarium.

I am sure you will enjoy growing some or all of these plants and you will soon find out the ones you can grow most successfully.

The Patterson Garden

Dr. S. H. Nelson

The Patterson Garden, located at the University of Saskatchewan, Saskatoon, Sask. in memory of the late Dr. C. F. Patterson was started in 1966 and officially opened in 1969 by the unveiling of a commemorative plaque by Mrs. C. F. Patterson.

Dr. Patterson's work at the University of Saskatchewan, Saskatoon, is well known, particularly in the field of plant breeding where he developed over a period of almost forty years many apples, plums, pears, cherries, small fruits, vegetables, and flowers, particularly gladioli and a sensational new color series of lilies.

This garden is a collection of trees and shrubs suitable for, or deemed worthy of, trial for the Saskatoon area and already contains some 650 different trees and shrubs with a further area laid out for expansion. The area will not only serve as a test garden for trees and shrubs but also as a repository for teaching purposes. The trees and shrubs are arranged in rows within turf strips. These turf areas will also be used to demonstrate varieties and cultural methods.

Christmas Plants

W. H. Gray

AZALEA

The Azalea although fairly expensive is an outstanding gift plant, and with care will bloom for several years. These plants thrive on water and should never be allowed to dry out. They like a sunny location away from hot or cold draught.

After the blooms are finished, continue watering as the buds for next season's bloom are already formed. After danger of frost is over, plunge pot out in garden in fairly sunny location. Bring back indoors about September 1st. While outside, fertilize regularly (every week or ten days) with a liquid fertilizer. When plant is brought back indoors, make sure pot has good drainage. Topdress if needed with an acid soil mixture.

JERUSALEM CHERRY OR CHRISTMAS CHERRY

(Solanum Pseudo-Capsicum)

The Jerusalem Cherry with its bright reddish-orange berries and shiny dark green leaves makes an ideal, inexpensive Christmas season plant. It is possible to hand pollinate the little white flowers so that a supply of berries continues. If the plant is kept reasonably moist, the leaves will continue green. Don't let the plant dry out or the berries will drop off.

Once the Jerusalem Cherry begins to die back, save one of the berries and grow your own plants for next year. Sow seed between January 15th and February 15th. Unless one has a garden, it is probably not worth trying to keep the old plants over the summer. After fruiting, cut the plant back to within two inches of its main stem and place pot in garden from June 1st until danger of frost. Fertilize lightly every ten days, using a liquid fertilizer.

POINSETTIA *(Euphorbia pulcherrima)*

These plants come in white, pink, and several shades of red. The red is still the most popular. An excellent gift for Christmas, but quite delicate and needs careful attention. Place in a warm, sunny window and keep them well watered.

After the leaves and bloom have fallen, stop watering and leave in a dry, cool place until about May 15th. Repot in sandy soil. Cut back four to six inches, and place in a sunny window. Water lightly at first but increase water as plant starts to respond. Only allow three new shoots to grow; pinch others off.

After danger of frost, plant pot out in garden in a sunny location. Fertilize lightly but regularly all summer. Keep pinching back to keep plant fairly short and bushy. Bring indoors when weather turns cool. After October 15th-November 1st, plant must have 14 hours of uninterrupted darkness, to allow it to "color-up" for Christmas. It is a lot of work, and a gamble, so lots of luck to you.

CYCLAMEN

A most attractive gift plant, but not really suitable in our modern homes. Likes a very cool temperature (about 55-60 degrees), a location providing good light but not direct sunlight. Should be kept moist but care taken not to get water on the leaves or crown of corm (bulb) as this will cause the newly emerging leaves and flower buds to rot. It is most difficult to try and save the old corm so by getting a new plant each year you will save a lot of heartache.

Photos by MALAK, Ottawa

"Don't Throw Out Those Old Ferns – They Can Be Rejuvenated!!"

Donald E. Fiddler

How many times have you looked at your ferns and heaved an unhappy sigh — your plants just never seem as robust or healthy as they should be. The fronds look pale and don't seem to last any length of time before they begin to brown out, and there are a number of thin runners which never seem to amount to anything. However — take heart! Most ferns will respond very readily to a simple but second rejuvenation program.

The Boston Fern *Nephrolepis exaltata bostoneiensis*

This fern is sometimes referred to as the ladder fern, and produces fronds up to four feet in length and is among the most graceful of the popular house ferns. There are variations of this fern such as *exaltata bostoniensis compacta,* the Dwarf Boston Fern, and *exaltata Whitmanii,* a form with tripinnate fronds which give a feathery plume-like appearance.

Culture

The same cultural practices are followed for all three of these varieties with a little more care being given to *Whitmanii,* which is slower growing and needs a smaller pot size at all times.

Repotting should take place in March or April when new growth commences. At this time all the old and shabby fronds should be cut off as close to the crown as possible. This will enable the young shoots to uncurl before they become too drawn and thin. The best soil consists of three parts of loam and one part of leaf mold or peat moss, with a free admixture of sand and crushed charcoal. A pinch of bone meal will help the young fronds to mature and retain a fresh green colour. The pots should be clay if possible, since ferns do not root too freely in plastic or china containers.

The plants should be taken from the pots, the crocks and all loose soil should be removed from the roots and the plants repotted into slightly larger pots. I cannot stress too heavily the fact that you should *not* overpot. This is perhaps the main reason why ferns do not respond to repotting. The very nature of the plant calls for confinement of roots and limited available food in the growing medium. This is evidenced by the fact that in their wild habitat you will find ferns growing in clefts in rocks, and peat deposits, etc.

After potting the soil should be thoroughly watered to settle it but for some time after this (until the new soil is permeated with roots) care must be taken not to overwater. Once the plants are well rooted, they may be watered freely and bi-weekly applications of weak liquid fertilizers may be given to maintain the production of new fronds and to retain a rich colour in mature ferns. The plants may be exposed to full light but must be protected from strong sunshine. It is important never to allow the roots of most ferns to become dry. Once the fronds wilt from this cause they seldom recover.

Propagation by Layering

Most of the *Nephrolepis* may be propagated by runners. This is particularly true of *Whitmanii* since this variety does not produce fertile spores and vegetative reproduction is necessary to perpetuate their special features.

Runners are put out by the plant in great numbers when a starved condition exists. These runners may be pegged down to the soil in the same pot where they are originating or they may be pegged into small pots filled with a mixture of peat and sand and placed beside the parent pot. When sufficient roots have formed the layers may be detached and treated as separate plants. These small plants will respond more rapidly if they are repotted every six months until they become mature plants. It is not necessary that larger pots be used for the first couple of repottings; only that an opportunity be provided to remove a little of the old sour soil, and add a measure of fresh humus.

Propagation by Division

Division is probably the best method for propagating old ferns for two reasons:

a) The end result will be two or three plants rather than many small immature runners, and,

b) The plants will be handsome specimens within one year.

The plant should be removed from the pot and the old soil chipped away with a pointed stick. If the roots of the plant have begun to decay all of the old soil should be washed from the roots.

The most vigorous outer portions of the plants should be retained for replanting rather than the worn out central parts. Division is made with a sharp knife and each division, consisting of a portion of the root stock, with three or four crowns and roots attached, is potted separately, using pots just large enough to hold them.

Care after potting is the same as for a plant that has not been divided, with even more attention being given to *not* overwatering in the first few weeks.

Adiantum — Commonly referred to as Maidenhair Fern or Ocean Spray Fern

The principal difference between this delicate little fern and the varieties of Boston Fern lies in the fact that this plant may be allowed to dry right back so that no green fronds remain, but care must be taken not to let the soil become completely dry. When the fronds have withered sufficiently they may be sheared off as close as possible to the crown and the plant may be kept in a state of near dormancy for a few weeks.

As soon as new fronds begin to appear the plant may be repotted. The best soil mixture consists of equal parts of loam, peat, leaf mold and sand and the plants should be repotted in March or April depending on when the new fronds appear.

Well-rooted plants are taken from their pots, the crocks and loose soil are removed from the roots, and the plants are set in slightly larger pots, which are nearly half filled with crocks. Plants which have not filled their pots with roots are best left until the next spring.

In cases where the roots have decayed, the plants are removed from their pots and the crocks and all the compost is washed away from the roots. They are then cut back to live portions and placed in pots just large enough to hold them.

Dividing the Old Ferns

Division, which is done in the spring at potting time, consists of separating the plants into small pieces, each piece containing a portion of rhizomes furnished with roots and young fronds. The divided portions are potted in small pots.

After repotting the plants are treated in the same manner as Boston Ferns. When well rooted they are given a light, dry position, where moisture cannot collect on the fronds.

Watering must be done carefully at all times of the year as the roots quickly decay if the soil is waterlogged. Much more water is required in the summer, when the soil dries quickly, than in winter when the temperature is lower and the plants are at rest.

Remember the cardinal rule when handling ferns of all kinds is never over-pot. Maximum response will come from a fern that has filled its pot with roots and is being lightly nourished with a liquid fertilizer.

hooty hortus says·

For Continued Colour in the Garden-Plant Petunias. They are not only the most popular but just about the easiest flower to grow. Their one fault is that they are inclined to get leggy. To overcome this, if the soil is good, don't fertilize and keep your petunias on the dry side. The results will be shorter growth and more bloom.

In choosing your plants, stay with the FI hybrids. They are more robust, have more uniform habits and bloom more freely.

Your first choice should be the FI multiflora types. They are smaller than the grandifloras and for the most part plain, but their colours are brilliant and they bloom profusely. They are particularly useful where masses of colour are desired.

The FI grandifloras are also very popular with their very large flowers, many of them fluted or ruffled. However, they normally do not stand up to wet weather too well. They are best planted in small groups in full sun.

There are also FI grandiflora doubles. They are, however, best for pot or container use. They do suffer very badly from wet weather.

Finally a few hints. Combine petunias in planting with other annuals. Make use of the petunia as a cut flower. Arrangements can be extremely versatile. During the late summer when plants look overgrown and finished, cut them back within six inches of the ground. Within three to four weeks you will have another succession of bloom that will last until frost.

Cuttings

Ruby Bryan

An easy and inexpensive way to obtain more plants is to propagate by offshoots, cuttings and layering of branches. This method has the advantage of reproducing, in most cases, a plant just like its parent. A growing medium, which we have found to be very satisfactory, is made up of one part rich compost soil, one part peat moss and three parts gravel. This is given the boiling water treatment and a plastic tent is used. We use a rooting hormone.

Some cuttings may be inserted immediately but others should be allowed to dry off to eliminate rotting problems. Geraniums should be left for several hours, and cactus and succulent plants should be left for 24 hours before planting. Cuttings should be made with a sharp knife. A diagonal cut one-quarter inch below a leaf node is recommended, the first leaf should be pulled off and the cut dipped into rooting hormone. Do not make cuttings too tall, as a rule a compact growth is easier to root and will make a better plant. We like to make a hole with a dibble (used ball point pens make fine ones). Place the cutting in the hole and firm into the box. You may use clean, sharp sand, Perlite or Vermiculite, either alone or in combination. We prefer the one we use — water with soluable fertilizer when the cuttings have been in a few days and leave them until a good root ball has been formed. They are then potted into two inch pots with our basic soil mixture.

We use the same box over and over again for a whole season with no further treatment. Just snip a cutting and insert as you have good material at hand or the notion strikes you. To propagate trailers, we have several pots just set on large trays filled with our usual mixture. These are kept moist at all times and the plants always provide rooted stock, ready for cutting off and potting up.

It may seem that we are very haphazard in our plant health programme. This is not really so, we always use fresh outdoor soil, keep the pots clean, watch carefully for pests and disease. Any plant not thriving is isolated until we decide what is wrong with it. It is usually sprayed very thoroughly at the laundry sink and, when dry, is then treated with a pest control and is inspected with a magnifying glass. If it still does not thrive we take cuttings, wash them thoroughly in warm detergent and javex solution suds and plant them in a small separate propagating box.

Soil-born pests are treated with Cygon or similar systemics. We find that we have very little pest trouble but are always on the alert for the first sign of the enemy.

Lilies for the Prairies

A. J. Porter

Many people have the impression that lilies are difficult to grow. This is true of some of the more exotic sorts, such as the trumpet lilies and such species as Auratum and Speciosum and their hybrids, especially here in our prairie climate. However, out of the eighty or so known species of lilies, at least twenty of them are hardy here and many of these make good garden subjects. It follows that hybrids of these hardy species will also be hardy in most cases.

These lilies are as easy to grow as potatoes. There are a few precautions to observe. First, lilies like a soil with good drainage. Wet soggy soil will rot the bulbs. Also too rich a soil is sometimes fatal. Many of these lilies originate in sparse soil in mountain areas. When treated to over fertilization growth will be soft and lush and much more susceptible to fungus diseases such as botrytis. Usually an over supply of nitrogen is the cause of this. Most lilies like full sun, though some, such as the Martagons, can be naturalized in open woodlands. Our own prairie lily will also grow in open woods, but will not do well in dense shade. It is regarded as a difficult lily in some regions but here it seems quite at home under cultivation. Some of the species, such as the Coral lilies, are regarded as short lived, but once you have a start in them they are quite easy to raise from seed and in some locations will re-seed themselves. Pocket gophers are fond of lily bulbs so this pest should be guarded against. Some lilies are prone to bulb rots in some soils or locations. These sorts are gradually being eliminated from growers' lists as newer and better sorts become available.

Practically all our hardy lilies are stem rooters, — that is, besides the roots issuing from the base of the bulb, roots also are put out along the stem above the bulb. Thus the bulb should be planted deeply enough for these roots to have a chance to form in moist soil. A good rule of thumb is to cover the bulb with at least twice its own depth. This can be varied somewhat, going deeper if the soil is light and loose. Shallow planted bulbs tend to split into several sections producing weaker and inferior stems.

Lily bulbs vary in size according to age, species, and variety. Duchartrei, a small white turkscap, has the smallest bulbs, seldom reaching more than one-half inch in diameter. Some of the hybrid lilies, such as Red Knight, will sometimes reach several inches and weigh a pound or more when mature. Many lilies, besides division of the main bulb at maturity, will also increase by forming small *bulblets* along the stem below the soil surface. These can be removed in the fall and planted elsewhere for increase. Most will bloom the second summer and can then be moved to a more permanent location. A few sorts, such as the Tiger lilies and some of their hybrids, produce small *bulbils* in the axils of the leaves. These are not seeds, but tiny bulbs, which will grow into plants identical with the parent if planted. They will usually bloom about the third summer. Some lilies will wander underground for some distance, sometimes a foot or more, before emerging in the spring. Thus one should be careful with

the hoe. If this sprout is cut off, the bulb will not throw another until the following spring or until it has passed through another cold period. This could be accomplished by digging the bulb and storing it in a plastic bag in the refrigerator for a few weeks. Mostly one waits for the next winter to do the job.

Lilies do well in a perennial border, or planted among dwarf shrubs or between peonies, etc. To be really effective they should be grown in clumps of three or more bulbs of the same variety. The bright orange, reds, and yellows make excellent accent plants while they are in bloom, and can be placed at some distance. The softer colored pastels look well nearby and make good cut flowers. As cut flowers, lilies will last a long time, the lower blooms being removed as they fade while the upper buds will continue to open. Mature stems are often too large for this purpose in the home so the best cut flowers are had from the small bulblets in the first two seasons of their bloom. Care should be taken to leave at least one-third of the foliage when cutting to feed the bulb for next year's bloom. Cut, don't pull. Of course, if one is cutting for a show, one might be willing to sacrifice the growth of the bulb for that year and cut the whole stem. It will not kill the bulb, but it will take another season of growth to recover.

Normally, the best time to plant lilies is in the fall. They can be planted in the spring if good sound bulbs are obtainable. Lily growers are reluctant to send out bulbs in the mail in the spring as they will sprout in the parcel. These tender sprouts are easily broken and when that happens the bulb must go through another winter before it will grow again, as mentioned previously. In the fall, the bulbs are as near dormant as lilies ever get, so stand handling and shipping better.

Some people are growing the trumpet and Aurelian lilies successfully. Like the hybrid tea roses, these take special care and unless one is prepared to give them this extra care and protection, it is better to leave them alone.

To give a descriptive list here of good hardy varieties would take up too much space. Here are a few suggestions. Descriptions can be found in the catalogs. The following will give a variety of form and color, and a season of bloom from mid-June to early September: Golden Dauricum, Pumilum (Coral Lily) in its several varieties, Concolor, both red and yellow, Earlibird, Lemon Queen, Orchid Queen, Edith Cecilia, Firebright. Red Knight, Pink Champagne, Tiger lily in several varieties. There is now a good yellow form. There are also many other good varieties.

I should give a word of warning about the old red tiger lily, the one with the stem bulbils in the leaf axils. Almost all commercial stocks of this lily are infected with a virus, to which it is quite tolerant so that it performs quite well even when infected. However, other lilies may not be so tolerant, and can suffer severely if they become infected from the tigers, so keep them well apart. Another source of lily virus is the striped and 'broken' tulips. These are striped as the result of virus infection, and lilies can take the same virus, causing a blotching of the color in the lily blooms, which is not attractive.

If you really catch the 'Lily bug' you will want to join the North American Lily Society. The annual dues are $7.50, which should be sent to Mr. Fred Abbey, Executive Secretary, North Ferrisburg, Vermont 05473. There is an always interesting hard cover Lily Annual, also about four bulletins a year, a seed exchange, and a number of Round Robins which will give you contacts with lily people.

Growing Exhibition Sweet Peas in Calgary

Kurt H. Muecke

Soil preparation

My exhibition sweet peas are raised by the Cordon method. They can be grown in the same place for several years provided that it is an open sunny position, sheltered from the wind, with about eighteen inches of topsoil and good drainage. Mine are planted in double rows, the sides twenty-four inches apart and with forty-eight inches between the centres of the double rows (pathway included). The interval between the plants is seven and one-half inches. Having selected the growing area and determined the length and number of double rows you need, dig a trench thirty-six inches wide and about eighteen inches deep for each double row. If you hit the subsoil, keep it separate from the topsoil and fill it back into the trench first. Cover the bottom of the trench with well rotted horse- or cow-manure and bonemeal, then dig it in. Refill the trench to a depth of eight inches with a mixture of topsoil, manure and bonemeal, leaving the last eight inches to be filled with topsoil containing bonemeal only. In the first year use one wheelbarrow of manure and about twelve handfulls of bonemeal for each three yard length of trench; a little less can be used in the following years. Sweet peas like a firm soil so do this site preparation in the autumn thereby giving the soil time to settle.

Seeds and seedlings

I personally prefer to grow the late flowering Spencer-type sweet peas which I buy at British seed houses (Robert Bolton & Son, Birdbrook, Halstead, Essex *or* W. J. Unwin Ltd., Histon, Cambridge). They are sown in seedboxes around the middle of March in a seed compost which is a mixture of two parts sand, three parts fine peat and seven parts loam, all sifted through a one-quarter inch wire-mesh screen and sterilized at 212°F. Some varieties have a very hard seed coat and should be chipped to ensure even germination. Chipping involves the removal of a very small portion of the seed coat with a sharp knife on the opposite side of the scar. Some growers print on their seed packages which varieties have to be chipped (Bolton). After sowing give the seeds a light watering with a fine rose, cover the boxes and keep them at a temperature of between 65° and 75°F, until the seedlings appear. Now uncover the boxes and remove them to a hotframe. As soon as the first true leaves appear, transplant the seedlings singly to four inch plastic pots using the same soil mixture. Now gradually harden off the plants in preparation for planting outside. They can withstand temperatures down to 25°F. After the second pair of leaves have formed cut off the growing tip of the plant as it usually becomes blind fairly early anyway. The plant now develops a number of sideshoots, select the strongest of these as a leader and pinch the others out. If weather permits put your plants out in the garden at the end of April. Remove them carefully from their plastic pots, leave the soilball around their roots undisturbed and plant firmly.

Staking

At each end of the double rows halfway between the two sides I set in a post which has a crossmember four to five feet above the ground.

Two wires are run from one post to the other and are tied to the crossmembers. Seven to eight foot bamboo stakes are then pushed two to three inches into the ground just behind the plants and are tied securely to the wire above. Finally, the plants are tied loosely to the stakes.

Pinching

Once the plants reach a height of nine to twelve inches a more vigorous growth can be established by pinching out all the side shoots, allowing only the leader to grow. From now on it is necessary to check the plants each day for newly formed tendrils and side shoots so that they can be removed as soon as they appear. Also at least every second growth of the plant should be tied to the stake. However, make quite sure that the stem does not grow in a spiral as this makes the later lowering stage much more difficult. For tying I use plastic-covered wire rolled over a broom handle and cut lengthwise with pruning shears. When the flower stems appear cut them as soon as the flowers are open. Do not ever let the flower go to seed.

Lowering the plants

The time for lowering the plants comes when they reach the tops of their stakes; this must be done at least three weeks before the flowers are exhibited. Starting at one end of the double row remove all ties from the first four to six plants on one side and lay them flat on the ground. This and the following operation has to be done very carefully so as not to damage the plants. Next untie the neighbouring plant on this side and lay it alongside the stakes on top of the first plants. Then, gently bend its top from the horizontal to the vertical position such that the top can be tied to the first stake. The plants should now have a height of twelve to eighteen inches. It is important to bend the stem gradually as a broken stem will not mend. Continue this procedure plant by plant to the end of this side and fill the end canes with plants from the other side. Finally work back along the remaining plants, attaching the first four to six unfastened ones to the last stakes. I find that lowering the plants improves the quality of the flowers.

Watering and feeding

Keep the ground moist but not wet. If necessary give the soil a really good soaking but then wait until it becomes fairly dry before watering again. Also make sure that the sweet pea rows are weed-free. When the first flower stems appear I start feeding my plants, alternate weeks, with a standard solution of fish fertilizer. I never use any chemical fertilizer.

Exhibiting

I find it best to cut the flowers during the afternoon of the day preceding the exhibition. As soon as they are cut the flowers should be put into a pail of warm water (100°F) and taken to a cool spot in the basement. When the water has cooled down, I tie each flower stem to a one-quarter inch square stick, about eighteen inches long, and place it in a pail filled with wet vermiculite. Each flower must stand free, not touching any other one and each stick should be labeled in order to avoid confusion of the different varieties. I have found that the best way to get the flowers to the show undamaged and with straight stems is to leave them in their pails of vermiculite during transportation. For the arrangements themselves I support the flower in water either with perlite or else with flower stems cut to a length of half an inch. Ensure that every spike and almost every flower can be seen; spikes with little imperfections should be partly concealed towards the back of the vase.

Dried Flower Harvest

Una Abrahamson

Flower drying — which enables you to preserve the beauties of garden and countryside almost indefinitely — has taken on enthusiastic new life in recent months. One of the prime reasons is silica gel, a practically foolproof crystal that preserves flower colors brighter and richer than ever before. Besides the silica gel method, you can preserve flowers by the time-honored means of sand drying, air hanging, pressing and with glycerin.

Whichever method you adopt — and some will be more suitable to your purpose than others — do choose a warm dry work area, because moisture is the enemy of flower drying. Avoid direct sunlight at all times as it will fade the flowers. It's easier to work where your box can be left undisturbed for a week or more. If you can't take over an attic or guest room for a workshop, work at your kitchen table and store in a dry closet.

Remember, not all plants can be dried and not all plants can be dried by the same method, but it's fun to experiment. Always dry more blooms than you need so you can discard the least successful.

Silica Gel and Sand

Silica gel is a lightweight drying crystal that preserves flowers with spectacular results. It is fairly expensive (about seven dollars for seven lbs. plus 50 cents for packing, $1.35 postage, Man. and Sask., $1.45 for Alta.) but it can be reused indefinitely. Usually it is sold with a bright-blue crystal mixed among the fine white powder. When the silica gel becomes too damp to do a successful drying job, the blue turns to pink. Then it is time to put the mixture in a shallow tray and dry it in a cool oven (about 275°F) until the blue color returns. Silica gel is sold under a number of trade names but it's generally available from retail florists, gardening clubs, some drugstores and from wholesale drug houses. Should you find it difficult to purchase in your area, you can order from Civic Garden Centre, Edwards Gardens, 755 Lawrence Ave. E., Don Mills, Ont.

Besides silica gel there are other drying powders that work in the same manner, though with less spectacular results. Silica sand, which is white and available from builders' supply companies, is better than builders' sand, which usually is yellow and tends to color pale flowers. You can also use equal mixtures of corn meal and borax, or silica sand and borax.

Get a cardboard carton strong enough to hold silica gel or sand to the depth of three or four inches and long enough that several flowers can be dried at once. A wooden box isn't recommended as the sand will leak through the joints, and the full box will be too heavy to move. You can use silica gel from the can, but sift silica sand through a flour sifter or fine window screening to break up lumps and remove impurities.

Silica gel will do all rose shades beautifully — including the reds without turning them purple. With other powders, the most lasting rose colors for drying are pink, yellow and white. To prepare a rose, first put a drop of any fast-drying glue or household cement where each petal meets the calyx and let it dry. It's best to glue all loose-petaled flowers such as roses, pansies, delphiniums, large marigolds and large zinnias. The pompon varieties are sturdy enough without gluing.

Cut the rose when it is completely dry — in the midafternoon. (Glue and let dry.) Keep a stem half an inch long, since long stems become brittle and snap. Insert a heavy florist's wire into the cut end of the stem and

up into the green base of the rose. (The exposed wire can be covered with florist's green tape later.) By wiring first, you avoid damaging the dried flower later. Cut the wire about six inches long and bend it at a right angle close to the head of the rose so that the wire will rest in the sand out of the way.

Scoop away some of the gel, or sand, to make a small depression and insert the rose, head up. Form a wall of the gel or sand around the outside of the flower, then take a handful and trickle it in a fine stream around each petal, working from the outside in, and building up equally on all sides. Cover completely and leave for seven days.

Carnations and pompon dahlias are also dried this way.

Delphiniums and snapdragons dry well if not too large. Pick spikes that have some unopened buds and remove the leaves. Make a long depression in the drying powder, place the flowers face downward, cover and leave for a week.

Zinnias with straight petals are dried with their long stems on. Remove all leaves and put the flowers in the powder head down, sift drying powder over until only the stems show. The stems will curve gently and dry themselves. Pansies, black-eyed Susans and daisies also do well dried head down.

Air-Dry Grasses and Herbs

Many shrubs, herbs, annuals and grasses are dried hung in bunches. Choose plants that are not fully mature and remove all the leaves because these prolong the drying process.

Make small bundles of plants and tie the stems with twine. Hang them from nails in the rafters far enough apart to give good air circulation. Or tie the bundles to wire clothes hangers and leave in a closet.

Grasses will be ready in a week, other plants take at least two to three weeks, depending on the variety and the humidity. Cockscomb, sage, honesty, achillea, milkweed and strawflowers dry well this way. For variety, dry hydrangeas; if you have the Hills of Snow variety wait until the flowers turn green (this is after they have bloomed white) before cutting them. With the paniculate type, leave the flowers until they turn bronze, then dry them.

Pick goldenrod just before maturity, and joe-pye weed in the bud. Cut cattails when they are green and dip them in white shellac (to prevent shattering) before hanging up to dry. Gourds and pomegranates will dry and become hollow if punctured with a skewer. Place them on a cake rack so that air can circulate freely, or they will mold before becoming hollow. Gather pussy willow when the buds are grey, place the branches in an empty jar to dry.

Pressing Preserves Ferns

Pressing is really most effective for flat ferns. Select a spot that will be undisturbed for two or three weeks. Make a bed of several thicknesses of newsprint to absorb plant moisture and arrange the fronds. If branches overlap, place small folded pieces of newsprint between them. Top with several layers of newsprint and cover with a car rug or piece of carpet. Top with books or bricks, using anything that will hold the arrangements in place but not crush them. When the fern edge feels crisp it's ready.

Glycerin Preserves Leaves

Foliage preserved in a solution of glycerin and water is long-lasting. Maple leaves are often difficult to process but are very rewarding when successful. Maple leaves cut when they are green turn a light olive. Gold and red maple leaves, which you should pick in late summer while they are still pliable, become a deep bronze.

Choose well-formed unblemished leaves and branches — the bigger the better, for maximum absorption of glycerin. Wrinkled leaves turn black or become speckled in processing. Immature leaves are too wet to preserve.

Cut the branches about two feet long, wash leaves and branches clean, and pound the lower stems for an inch or two so that the preserving fluid will be absorbed more quickly. Place the branches in a vase or jar and fill to cover the frayed ends and the stems with a mixture of one part glycerin to two parts water. (Glycerin is fairly expensive — but it keeps a long time and evaporates slowly.) Lightly wipe the surface of the leaves with cotton batting dipped in the glycerin mixture. This will prevent wilting, since leaves as well as stems absorb moisture. If the leaves wilt at any time, repeat this washing with glycerin. Never wash leaves with water — it will take out the absorbed glycerin and the leaves will curl up.

Watch the liquid level in the vase and refill immediately there is any lowering of the level. In a few days there will be a gradual change in leaf color. The skeleton of the leaf will become outlined, then the rest of the leaf will color and soon feel quite pliable. Preserving will take from five days to two weeks.

You can remove the branches from the glycerin to arrange with other preserved plants, or you can leave them in the glycerin, adding an inch lump of charcoal to keep the mixture sweet.

Ivy branches can be preserved by immersing them in a dish filled with glycerin solution. Weight down any pieces that float and leave until the leaves change color and become black-green.

Store flowers in layers of tissue paper in cardboard dress boxes. Cover and store in a dark dry place.

Dust fragile dried blooms with a feather, other plants with a child's paintbrush. Glycerined foliage needs only occasional wiping with a slightly glycerin-dampened cloth. Flowers can often be revived by passing quickly through the steam from a kettle.

In any case, next summer's garden will bring another batch of blooms and inspire you to start in preserving all over again.

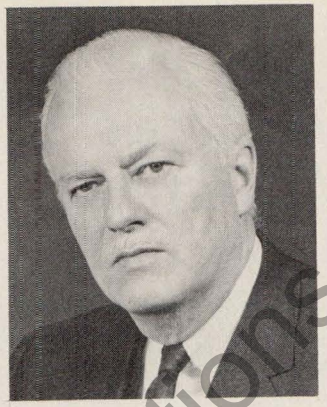
hooty hortus says·

Don't overlook the Junipers (Juniperus L.). It is one of the best evergreens for the home garden. Not all are fully hardy so it is best to buy from a prairie nurseryman. Here are some of the best.

Savin — grows about four feet high to make a spreading bush with bright green foliage all the year round. It however needs shelter from the harsh northwest winds that tend to brown the needles.

There are also two hardy low forms of this Juniper under the names of Arcadia and Skandia. Arcadia grows about two feet high with grey-green foliage while Skandia is slightly lower with needles of bright green. They will grow in either full sun or partial shade. As usual some snow cover and protection from northwest winds is best.

There are also numerous selections of the native Rockymountain Juniper available. Some of the most popular kinds are Medora, Grizzly Bear, Silver Globe, Dunvegan Blue and Prince of Wales.



W. J. Sinclair

The horticultural world suffered a real loss with the passing of Bill Sinclair on October 22, 1970.

He was a Life Member and director of the Winnipeg Horticultural Society for many years; a Life Member of the Red River Exhibition, and for his efforts in that connection, was one of the first group of Manitobans to receive the Golden Boy award. He served as director of the Winnipeg Gladiolus Society and a member of the Executive Committee for many years as well as being a past president of this Society. He was a director of the Canadian Gladiolus Society and a vice president, as well as a director of the North American Gladiolus Council and Canadian regional vice-president for five years. Bill was also a founding member of the Winnipeg Flower Show where much of the credit for its continued success is due to his hard work and ability.

He was an excellent grower and keen exhibitor and although his specialty was Gladioli, his interest covered many other phases of horticulture.

Besides these activities and those of his private avocation, he was vitally interested in church and welfare work. He was a member of the Advisory Committee of the Young Women's Christian Association; a member of the Kinsmen Club; an Elder of Westminster United Church and on the Child Care Committee and Chairman of the Outreach Committee.

He will be sorely missed by his friends and in every group or organization in which he was active during his lifetime, and will long be remembered for his good works and his many acts of kindness and thoughtfulness. We express our sincere sorrow to Mrs. Sinclair.

How We Grow Roses in Southern Alberta

Bernice Muir

My love of roses began in my childhood. My mother was a great lover of flowers and particularly of roses, much of which rubbed off on me. Even a few years ago when I was in hospital my mother's choice of book to send me was "All About Roses."

I have had my successes, also my failures. One of the first times I ever displayed roses, at the district agricultural fair, my entry of three blooms of Peace won a first prize. However, the next year in my enthusiasm, I added too much rotted sheep manure to my rose bed and burned the tender roots.

A lesson was learned and I continued to read every article I saw about roses. Five years ago when we moved to Lethbridge, my husband prepared a bed in the back lawn which is exposed to full sun. This was dug in the fall to a depth of thirty inches and measured three and one half feet by ten feet. It was filled with top soil and peat moss with a layer of bone meal at the bottom at spade level. At planting time in the spring a handful of bone meal was added for each rose making sure it did not touch the roots. The next year this bed was extended to double the length in the same manner. Last year we eliminated two hundred gladioli to make another bed which has twenty-five roses planted two feet apart. We find this too close for comfort in caring for them and think some of the more vigorous cultivators should be three feet apart. We have sixty-two roses.

In the fall we clean off all the dried leaves making sure the bed itself is clean of fallen leaves or petals thus discouraging any disease that would carry over the winter. Water in well after the canes have ripened. We put a sleeve made from thin rough plywood 14" x 14" x 16" high over each bush. This is then partially filled with new dry peat moss and earth. The date for this chore differs from year to year depending on the weather man, but in most years was done before November 15th. One year I had blooms from June 6th to December 6th.

We have never done any fall planting but have had success in planting around April 20th if the ground has thawed out enough to work. If planting this early we mound up each bush higher than if planted in May, uncovering gradually as the new shoots appear. They are usually completely uncovered by May 24th but we are prepared to give them some protection in case we get an early June frost. At the time of unmounding the pruning is done down to live wood at an outward facing bud, cutting out all dead wood and weak stems. At this time a water soluble balanced fertilizer is given at the strength recommended by the producer and repeated at one-half strength every two weeks until August 1st. If there is any sign of chlorosis during the summer Iron Chelates (Sequestrin) is used at the recommended dosage.

We water well by irrigating once a week if there has not been sufficient rain and occasionally use the fine spray of the hose to wash the leaves. This is always done in the morning to allow them to dry before evening thus inhibiting the grown of mould or fungus.

This year we had very few insects attacking the roses. The few beetles early in the season were easily picked off by hand and the good supply of lady bugs did a fine job of keeping the aphid population to a minimum. An early spraying of malathion was done as a preventitive.

One of our biggest problems here is the hot drying winds. So often just before show time we will have a temperature in the ninety degree range and a wind up to forty miles an hour. The special buds I have been watching carefully will be full blown in hours instead of days. This is the time to retire to a corner with any book except "How to grow Roses". After the windstorm is over go out to the garden and cut off all the broken buds and stems, pick up the spent blooms and either make a pot-pourri from them or throw them on the compost heap and let nature take over from there. Have a good look at that row of short bright marigolds that haven't even moved in the wind and decide whether you want the challenge of growing roses or a bed of marigolds.

NOT TOO FAST

Two women were preparing to board the airliner. One of them turned to the pilot and said, "Now, please don't travel faster than sound. We want to talk."

COLORS:

MOSTLY OF FLOWERS

caeruleus — dark blue
cardinalis — scarlet
carneus — deep pink
chloranthus — green flowers
citrinus — lemon-colored
coccineus — scarlet
concolor — same color throughout
cyanus — blue
discolor — of 2 distinct colors
flavus — pure yellow
fulvus — tawny-orange
leucanthus — white flowered
melanocarpa — black fruited
nigra — nigricans — black
nivalis — snow-white
puniceus — reddish purple
roseus — rose-red
rubens — rubrum — red
sanguineus — blood-red
virginalis — white
viridis — green
vitellinus — color of egg yolk
xanthinus — yellow

Wintering Tender Roses in Manitoba

J. H. Nichol

The successful wintering of roses commences at the time of planting. Unless roses are properly planted your chances of wintering will be reduced. Roses to winter properly must be planted with the graft at least two inches below ground level. If this is done, even in a poor wintering year, when many roses are killed right down to the ground level, there is still a good chance of having them grow from above the graft.

Roses to winter properly, should be cared for during the growing season, spraying at regular intervals, and dusted occasionally with a fungicide to control insects and diseases. During the past two years I have used a dual purpose systematic fungicide and insecticide with good results.

Proper mulching and fertilizing are most important. The mulching helps to conserve moisture and makes cultivation easier, while keeping the ground cooler in the hot weather. Use of fertilizer helps to stimulate growth and produces strong plants to grow good blooms. Fertilizing should not be done after the end of July or early August, as you want the growth to gradually taper off and the roses to go into winter in as near a dormant state as possible, and not at the peak of their growth.

To prepare roses for winter, the rosebed should be fairly moist and not dried out before winter sets in. If your roses have leaves infected with blackspot, any infected leaves should be removed and burned, so that the spores of the blackspot will not overwinter in the rosebed.

It is a good idea to dust roses with a general purpose rosedust before covering with leaves. If mice are a problem, place a spoonful of mouseseed in a soup tin laid on its side, several of these tins can be spread throughout the rosebed. The roses can be cut down to about 15 inches high before covering; or left unpruned and pruned in the spring after the growth has started.

Around the rosebed is placed a low fence, about twelve to fourteen inches high and inside the fence are placed dry oak leaves. The leaves are then heaped up in the centre. If branches are available these can be placed on top of the leaves to hold them down and also to catch the snow. Oak leaves are preferable as they do not pack as much as other leaves such as maple and elm. If a plastic covering is used over the leaves then care must be taken to allow ventilation by having the sides left uncovered, otherwise condensation will take place inside the plastic covering with drastic results.

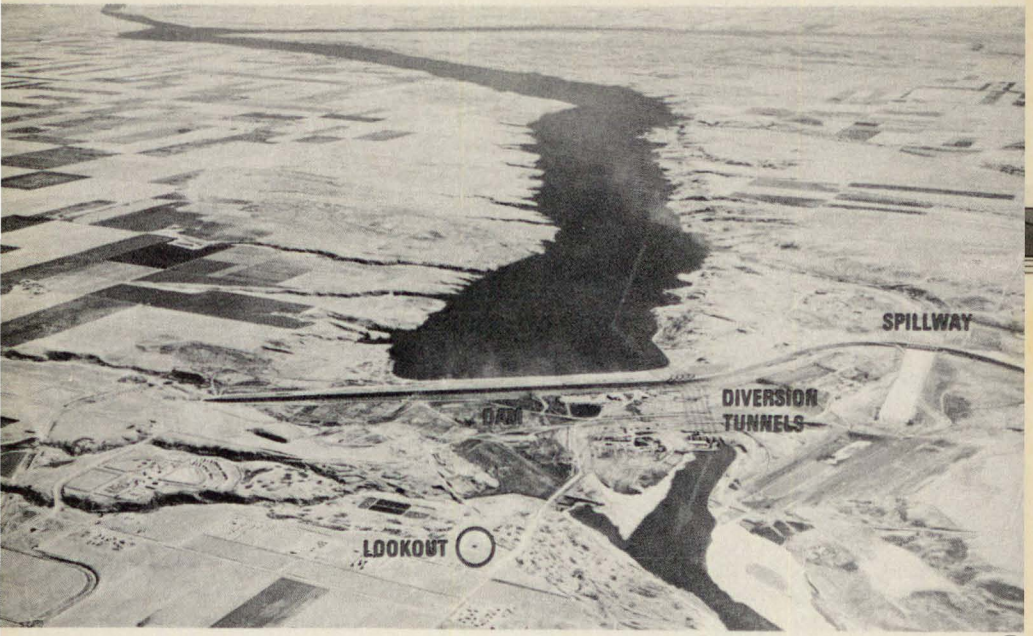
This covering is best done after the ground is frozen. The leaves are piled as close as possible to the rosebed, and can be covered with a blanket made of sacking, to prevent the leaves from blowing around the yard. One difficulty encountered is the early arrival of snow before the ground has frozen. The snow can be removed, and the leaves piled on the rosebed. However, if the snowfall is too heavy to remove without a great deal of work, then leave till spring, and cover with leaves as soon as the snow has melted. Actually there is no better protection than a heavy covering of snow, but keep in mind that protection is required in spring after the snow has gone.

In the spring do not be in too great a hurry to remove the leaves, as the spring is the critical period for successful wintering of roses. Far more roses are lost through early uncovering than too late uncovering.

As soon as the snow has melted off the rosebed in the spring, the leaves should be loosened up so that the air can dry out the leaves. When the leaves have dried out somewhat, remove about half the leaves, recovering the roses with top dry leaves, and removing the lower leaves which are generally moist or wet. The balance of the leaves should not be removed until growth has commenced, and the weather has turned warm, If there is any indication of freezing weather after growth has started then cover each rosebush with a couple of forks of leaves, and I am sure you will find the extra work well rewarded.

For those who don't have oak leaves readily available, I would suggest mounding with earth around the rosebushes and covering with flaxstraw, or any of the rubble from the garden. For a few roses, a stovepipe can be placed around the rosebush, and filled with vermiculite, dry leaves, or sawdust, and then banked with earth. The stove pipe is then removed and used for the next rosebush. The rosebush can then be covered with a plastic bag to keep out the moisture. Individual wooden boxes the size of a butter box can also be used, filled the same materials as described with the stovepipe. The box can then be covered with plastic to keep out the moisture.

Over the past 20 years by using oak leaves as mentioned, I have been successful in wintering our roses with an average loss of about 10%. This even applied in a bad year when we lost only 5 out of 70 rosebushes, when the losses in our area ran as high as 75%. I do feel that a lot of poor results in wintering are due to too late fertilizing, too early uncovering in the spring, and planting with the graft above the ground as indicated in most planting instructions found on the rose packages.



The South Saskatchewan River Project

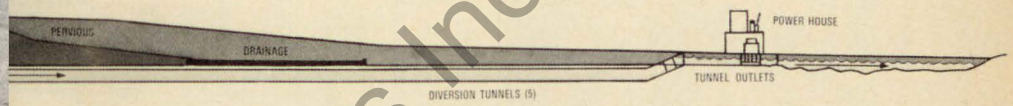
A. D. Hutcheon and G. S. Reycraft

Today the South Saskatchewan River continues to drain the Rocky Mountains and the western plains, but its water no longer flows unchecked and unused to the sea. The 2000 billion gallons of water annually borne by the river have now been turned to the service of man.

The Gardiner and Qu'Appelle Valley Dams

The first step in achieving this end was started in 1958 as a combined project of the Governments of Canada and Saskatchewan. It took the shape of a huge undertaking necessitating the excavation of approximately 9 million cubic yards of material and the placing of over 5 million cubic yards on the east side of the river. This was followed by a dam across the South Saskatchewan River between Elbow and Outlook called the

Profile of the Dam — showing earth construction, diversion tunnels and related structures.



Gardiner Dam after the late Federal Minister of Agriculture, and a smaller one, the Qu'Appelle Valley Dam 25 miles southeast of the main structure. This second structure is to prevent water escaping from the reservoir into the Valley. As most Westerners know, the water impounded between those two dams is now named Diefenbaker Lake.

The Irrigation Project

With the completion of the Gardiner Dam in 1967 the first phase of the South Saskatchewan River Irrigation Project is rapidly taking shape with water to be delivered to a 42,000 acre block on the east side of the river in the Outlook-Broderick Area by 1971.

The second stage, serving about 50,000 acres in the Conquest-Donavon area, is slated to get under way in 1971. As this project expands it is estimated that over 200,000 acres can be irrigated from Diefenbaker Lake.

This project, under the Conservation and Development Branch of the Saskatchewan Department of Agriculture, builds and operates the system for getting water to the farms and carrying off excess water. Water is pumped from the reservoir into high-level main canals from whence it flows by gravity through smaller distribution canals to the farm turnouts.

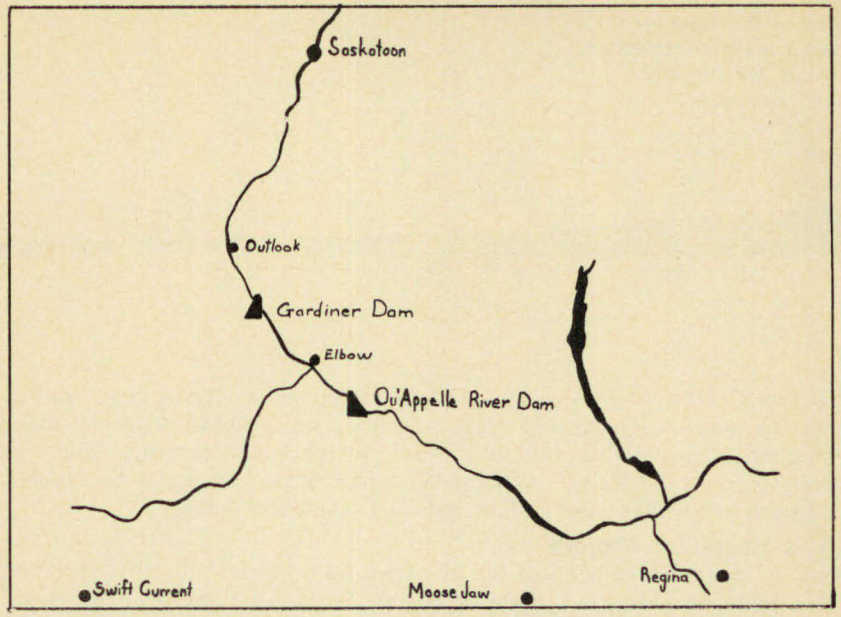
Farmers are responsible for all works required to make use of the water after it reaches these junctions. Farm development may take the form of land levelling or it may be the installation of sprinkler systems.

The Government pays a grant of one third towards the cost of land levelling or sprinkler purchase. Engineering services are supplied free and educational programs are continuing on production, management, and irrigation practices.

About 2700 acres were irrigated in 1968, 5800 in 1969 and about 9000 acres in 1970. In 1970 the crops included 3000 acres of soft wheat (used in cake flour), 950 acres of other cereals, 800 acres of potatoes, 2250 acres of hay, 620 acres of oilseeds and small amounts of buckwheat, peas and canary grass seed. The most exciting projects at the moment are in potato and vegetable production and alfalfa seed.

With yields of up to 16 tons gross per acre of potatoes already achieved and two modern storage, washing and packaging potato processing plants now in operation, potato acreage is fast expanding and should make Saskatchewan self-sufficient in 1971. Test plots of carrots, cabbage, turnips and onions have demonstrated the potential of those crops. However, expanding acreage will depend on facilitites for freezing or canning.

Livestock numbers are increasing and more expansion is planned in spite of the current pressure on hog prices and the keen competition for cows and heifers. However, it will be several years before a major part of irrigated production is marketed through livestock. Even then, it appears



that the true destiny of the project lies in specialty crops, and the farmers may be forced to move quite rapidly in that direction.

All farmers must pay the water tax whether they irrigate or not, although the full levy will be reached gradually over a ten year period. The government has a standing offer to purchase the farms of those not wishing to develop and irrigate. About half of the land in the Outlook-Broderick block has been purchased under this program. The land is being settled under lease-option agreements.

As of November, 1970, eight such leases were held by local residents adding to their holdings; twenty were held by other residents of Saskatchewan, and six went to newcomers to the province. Twenty farmers have developed privately owned land.

If the urgently-needed specialty processing facilities come to the project soon, the 1,800 population of the town of Outlook could double almost overnight and Saskatchewan will be launched on a new phase of development.

Other Benefits of the South Saskatchewan River Project

Power Production

Utilizing the diversion tunnels of the Gardiner Dam the Saskatchewan Power Corporation has entered into the Province's second major hydro-electric development. When the plant is completed, 800 million kilowatt hours of electricity will be available in an average year or more than one third of the total power generated by the Saskatchewan Power Corporation in 1963.

Control of the river will greatly improve the economics of developing hydro sites downstream from the main dam. The reservoir will store the peak summer flows of the river for release to downstream hydro stations

during the winter, when natural flows are low and demand for power is high. Other downstream dam sites are now under study which, if developed, would utilize the entire head or drop in the river. This plan would produce a chain of reservoirs, each extending back to the foot of the next dam upstream.

Water Distribution

The Saskatchewan Water Supply Board is presently developing a system whereby water will be diverted into the Qu'Appelle Valley and thence to Buffalo Pound Lake where it will provide an assured water supply to the water short cities of Regina and Moose Jaw as well as stimulate the development of new industries in the area. It is further planned to extend this development north by a network of canals, pipelines and reservoirs which will deliver water to towns and industries southeast of the city of Saskatoon also.

Recreation Benefits

Recreation on a man-made lake, 140 miles long and with a shore line of nearly 500 miles, will be provided in an area of the Province where the great majority of the population is concentrated, and where major recreational facilities have been at a premium. A development of Provincial parks, regional parks, institutional campsites, boating and general recreational facilities is now proceeding at a rapid pace, all within easy reach of half of the population of Saskatchewan.

The Future

Planners envisage water from Diefenbaker Lake being moved east through the Qu'Appelle system and into Manitoba, and south through the Souris River system to the Estevan area. It is however evident, even now, that the available flows in the Saskatchewan system, will be insufficient to meet the needs of the Western provinces before the turn of the century. Additional water will then have to be brought in from adjacent river basins to meet these requirements.

With this event Diefenbaker Lake will play even a more vital role as a key river-control structure and hub of a major water supply and distribution system.

Some Marigolds
For Your Gardening Pleasure

H. T. Allen

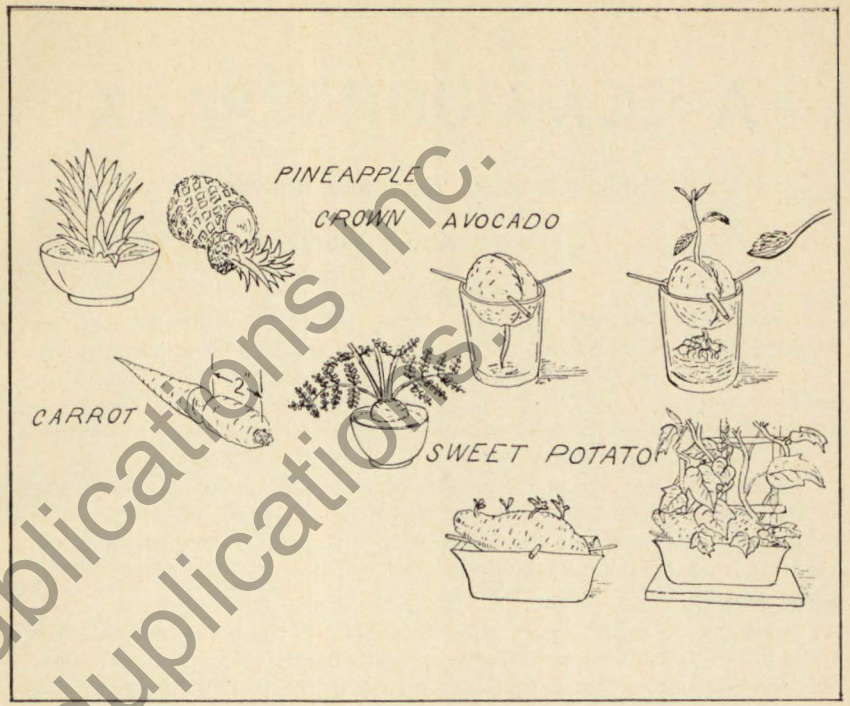
The brightness of color, variety of flower and plant types provided by marigolds makes it one of the most useful annual flowers for the prairie garden. No details of their culture will be discussed herein, other than to emphasize the fact that marigolds are very sensitive to frost and the grower therefore, must carefully plan his seeding and planting to avoid injury or complete destruction.

Marigolds belong to the genus *tagetes* with varieties derived from various species and hybridization within. Three general categories are recognized: African, French and Tagetes and other groupings may be single, semi-double, double, carnation flowered, chrysanthemum flowered, hedge type, etc. Good varietal descriptions are supplied by seedsmen so that growers may make a reasonable choice as to the type required to meet his needs.

The list of varieties that follows has been confined to those generally known as African marigolds. Within this group is a wide range of color, flower and plant size, and season of bloom and, therefore, a variety to meet almost any need. It must be kept in mind, however, that the data provided are only from one variety trial under one prairie condition and variations in varietal behaviour could occur depending upon growing procedures, climatic conditions or other factors. This may further assist the prairie gardener in choosing a variety or varieties of this class of marigold to fulfill a specific requirement.

Varieties arranged in order of colour shade. Pale yellow to dark orange	Days from seeding to start of flowering	Plant size in inches. Height	Spread	Average Diameter of flowers in inches.
Man-in-the-Moon	60	24	18	3.4
Climax Primrose	57	28	13	3.0
First Lady	50	15	13	2.5
Cupid Primrose	57	11	8	1.5
Diamond Jubilee	56	20	15	3.5
Climax Yellow	57	24	18	4.2
Yellow Supreme	64	27	18	3.8
Mary Helen	74	19	11	3.2
Moonshot	57	11	11	3.5
Doubloom	57	33	24	4.9
Lemon Queen	57	27	14	3.2
Cupid Yellow	57	9	7	2.0
Mammoth Mum	55	30	18	3.0
Spun Yellow	47	8	7	2.0
Glitters	57	23	16	2.8
Sovereign	59	25	22	4.4
Spun Gold	50	8	6	2.2
Yellowstone	60	22	21	2.1
Golden Jubilee	57	17	17	3.8
Double Eagle	73	26	20	4.5
Climax Golden	68	30	18	3.4
Orange Jubilee	50	18	17	4.5
Apollo	50	10	10	3.5
Cupid Orange	51	9	7	2.4
Orange Prince	60	29	15	3.4
Guinea Gold	57	24	23	2.8
Toreador	68	22	15	3.5
Hawaii	57	27	22	3.8

One of our friends says, "Next year I'm gonna plant weeds — and see if the flowers won't choke 'em out."



hooty hortus says·

Try Kitchen Gardening — It's Fun. Especially when you do it largely with kitchen discards such as avocado seeds, carrot tops and pineapple crowns. Children will also enjoy this. Get them interested. It can be their first lesson in botany. It will allow them to see the tiny white rootlets emerge and grow and the tender shoots develop into thick green foliage.

We suggest the following as illustrated above.

Pineapple Crown — Set crown on needle flower holder and keep the base covered with water. We suggest a few pebbles to help hold the roots.

Carrot — Top two inches will make an attractive plant with delicate feathery foliage. It can also be set in a needle flower holder and supplied with water, of course.

Avocado — Thrust three toothpicks into base of pit so that it rests with the bottom touching water. Remember to keep the water at this level. When plant has developed substantial roots and foilage it is ready for potting This is the time to start gradually replacing the water with soil. You may have to prune to keep within bounds. If you wish to continue, you can pot it and put it into the garden for the summer months.

Sweet Potato — You can start your sweet potato (or yam) plant in a bowl with toothpick support. As top growth is vine-like you will eventually need some support. Small bamboo garden stakes cut to size and set in a wood base in which you have bored holes will give you an attractive support. When roots are well established, gradually replace the water with soil.

A COMMUNITY PARK

Here is what Killarney, Manitoba has and Is Doing.

What About You?

Hugh Lamont

A Community park can mean many things depending on the needs of the individuals that make up the culture of the area in which they dwell. To the child it means a place to play, to the adolescent it means recreation, to the young adult it can be a place of refuge from the stress of work and social adjustment, to the adult it can be a place of beauty and to the family dog it can mean paradise.

The Town and District of Killarney have four parks in various stages of development and all are fortunate enough to have Killarney Lake as a background. A brief description of each may prove helpful to other communities in planning for the future.

First Park

Initially the first park was a joint project involving the Town Council, the Chamber of Commerce and public service organizations in the District. Later assistance was provided by Provincial Government Departments, both in planning and in financing. Originally the site was a natural wooded area with about a quarter mile of shore line. It now encompasses a sandy beach, a pavilion, a picnic area, a boat launching space and a parking lot. An aesthetic feature of this park is the 1967 Centennial Fountain having as its centre a sculpture of a leprechaun sitting astride a turtle, thus depicting the presence of the nearby Turtle Mountains and the Irish background of the name Killarney.

Situated adjacent to the park is the Agricultural Society grounds that serves to augment the park by supplying playing field facilities and a well treed picnic area. A Committee of the Centennial celebrations has been very successful in re-locating a Pioneer House on the grounds. It is felt this popular park complex is filling the needs of an expanding community and replaces the need to seek the facilities of the more distant Provincial and National parks.

Second Park

The second park, an off the highway beauty spot, was sponsored and developed by the Killarney and District Horticultural Society. Originally the site was a bend in the south shore road that became redundant due to new road construction. Dead trees that scarred the landscape were removed, open areas were reseeded to grass and colorful shrubs and trees, including evergreens, were planted to supplement the natural growth of birch, ash, aspen and wild fruit.

A great deal of credit must be given this dedicated group of horticulturists who have, in three years, transformed a rather drab location into a place of scenic beauty.

Third Park

The improvement of a third location was undertaken by the Kiwanis Club as a public service project. The site is on property owned by the Town and lies adjacent to the Water plant located on the north shore of the Lake.

The property had been lying in its natural state for many years and had little or no maintenance. A plan to scale was drawn up to suit the location and the surrounding area. A choice of low growing shrubs was made to avoid interfering with the view of the Lake from nearby residential property. A Special interest feature is a group of evergreens planted as an island. Varieties selected to represent various tree forms were: Foreground — Juniper (horizontal), Ware's cedar (sphere), Pyramidal Cedar (prism) and spruce for a background. Blue spruce and Grizzly Bear Juniper were included for a variation in color.

Control of vehicle traffic is accomplished by placing posts two feet above ground, spaced five feet apart and painted brown in color to blend with the landscape. It is hoped to improve the steep shore line banks by the use of field stone and ground cover plants that thrive in the sun.

All planting and construction is the result of member "work parties" while general maintenance is the responsibility of a dedicated caretaker, who is paid from club funds.

The development of this park has achieved a two-fold purpose by improving a vacant area and providing a relaxation area within walking distance of the town residents.

Fourth Park

Plans are underway to develop a fourth park that is designed to eventually ease the overtaxed facilities of the first park. The extensive area along the north shore and outside the town site will include a landscaped park area, playing fields and a marine section. It is a joint project of the Town and Municipality.

A few points that may be gained from the experiences at Killarney could include the following:

First choose a site that will best serve the Community. Preference should be given to one that already has natural assests, such as trees, lake or creek.

Have a plan prepared to scale and adhere to the plan. Construction and planting should be on a priority basis.

Involve the whole of the Community as it fosters pride in the final result.

Future maintenance must be kept in mind to ensure the project becomes an ongoing source of enjoyment and beauty.

The choice of planting materials should provide a show from the first opening of the buds in Spring until the last killing frost of Fall.

The use of evergreens shrubs with colorful bark or those that retain their green leaves, tends to brighten the Winter landscape.

Try to avoid straight line effects. A sketch plan that portrays the image of islands, bays and peninsulas leads the eventual park visitor to seek the treasures that lie beyond.

Poisonous Plants in Our Environment

Dr. Vera Gellman

It happened around Christmas time about five or six years ago. I had been talking on the radio about the special poisoning hazards which menace us in the festive season. Among other things I mentioned that the Poinsettia leaf is poisonous. The following morning an irate wholesale florist telephoned me and informed me that an order of two thousand Poinsettias had been cancelled because of what I had said!

The incident clearly illustrates a popular misconception about poisons which is based on ignorance and superstition. To many people anything poisonous is not to be touched, sniffed or looked at or even tolerated in the environment. Yet if it were possible to rid ourselves entirely of poisons we would be deprived of many of our most useful chemicals and drugs and many of our most beautiful and fragrant flowers. The real solution to this problem is education. We must know about poisons and use them wisely. We must learn to recognize poisonous plants and treat them with respect. The beautiful Poinsettia need not be ostracized. It may be observed and enjoyed but not eaten!

People are often surprised and even a little disappointed to discover that their most prized cultivated ornamental is poisonous. To me it is more surprising that nature protects so few of her masterpieces. Only about seven hundred species in the plant world are known to be toxic. One can only speculate as to why some plants are toxic while others are not. Is it a protective mechanism or is it purely fortuitous that the rhubarb leaf-blade, for example, contains oxalic acid which happens to be very toxic to man?

In the past ten years only one child with symptoms from plant ingestion has required admission to a ward in the Winnipeg Children's Hospital. On the other hand, 246 cases of accidental aspirin poisoning have been admitted in the same period of time and four of these were fatal. Plant intoxication, therefore, must be placed in its true perspective. Plants are *not* a common cause of mortality or even serious morbidity in humans. It is not necessary for us to uproot our prize delphinium or chop down our favourite cherry tree. We should, however, be aware of the poisonous species in our gardens and teach our children to recognize them.

Not all plant toxins are simple chemicals like oxalic acid. In fact most of them are highly complex alkaloids or glycosides. Some plants contain a number of different poisons. Many have not yet been identified. In some cases the poison is distributed throughout the whole plant while in others it is confined to certain parts of the plant. Sometimes in order to facilitate dissemination a compromise has been made. A toxic seed is encased in a luscious and eminently edible fruit pulp. The members of the Prunus species (almond, apricot, cherry, peach, etc.) are good examples. The degree of toxicity of an individual plant tends to vary with such factors as environment, weather conditions, soil condition, season and plant age. The young shoots of the potato plant and the green areas on tubers which have grown near the surface contain high concentrations of a glyco alkaloid solanine which causes digestive disturbances and nervous symptoms.

Dermatitis or skin irritation is the commonest manifestation of plant toxicity in man. In some cases handling the plant causes minute droplets of irritant chemicals to be injected into the skin from special organs or hairs on the leaf or stem. The stinging nettle is the best known example of this type. Other plants (e.g., snow-on-the-mountain, buttercup, daisy) contain chemical irritants in their milky sap while yet others produce sensitization in susceptible individuals which results in an allergic dermatitis on contact. Well-recognized examples are poison ivy, chrysanthemum, daisy, tulip, hyacinth, garlic, onion, daffodil, narcissus, primrose, carrot, celery, grasses, cereal grains, spurges, castor plant and citrus fruits.

The pollens of some trees (poplar, maple, ash, elm) are alleged to contain sensitizing agents which cause dermatitis. A few plants contain photosensitizing agents which render the skin sensitive to sunlight (e.g., parsnip, fig, carrot, gas plant, celery).

Second in frequency to skin rashes, plant poisons produce symptoms related to the digestive system. Dumbcane is probably the best known of the calcium oxalate-containing plants. The tiny insoluble oxalate crystals are sharp-pointed so that when the leaf of the plant is eaten the crystals embed themselves in the delicate tissue lining the mouth and throat where they set up an irritation. Because of the swelling which results the victim is unable to talk or swallow — hence the name dumbcane. Each year in the Poison Centre we see one or two patients, usually children who have eaten dumbcane leaves. Once we had a call from a woman who complained of a burning sensation in her tongue after eating cheese. The cheese had been sliced with the same knife which she had used for trimming her dumbcane plant. Other plants which contain calcium oxalate are Jack-in-the-pulpit, caladium, elephant ear, philodendron (split-leaf and heart-leaf) skunk cabbage, calla and wild calla.

Most poisonous plants have been known to us for many hundreds of years even though their toxins were identified only recently. Strangely enough it was not until 1961 that the wisteria plant was recognized as toxic. Since then many cases of intoxication have been reported in children who have eaten the beans or the whole pods of the wisteria vine. Ingestion was rapidly followed by nausea, vomiting and abdominal pain. Similar symptoms are produced by members of the *Amaryllidaceae* family (narcissus, jonquil, snowdrop, amaryllis, tube-rose, daffodil, spider-lily, atamasco lily, snowflake). The alkaloid lycorine is responsible for symptoms and is concentrated in the bulb.

Diarrhoea with colic are the principle manifestations of poisoning by a large group of plants. The nut of the horse-chestnut, all parts of the spurge laurel, the leaves and berries of lords and ladies, pokeweed roots, all parts of the may apple and the rhizome of the iris have all caused severe diarrhoea when eaten. Several members of the yew family have been known to give rise to severe diarrhoea and vomiting, following ingestion of the needles and well-chewed seeds. The baneberries (white, red and black) the anemone, marsh marigold, clematis, buttercup and even Manitoba's own prairie crocus have a variety of toxic effects, the most prominent of which is severe diarrhoea. The berries of English holly the common privet and the honeysuckle have a similar effect. Some poisonous plants not necessarily native to this country, nevertheless, are found here for one reason or another. The castor bean is a popular houseplant and strings of bright red jequirity beans hung around the neck are part of the hippie uniform. Both these seeds contain potent poisons which cause severe diarrhoea with shock and collapse.

The toxic principles in a large number of poisonous plants are a

group of glyco alkaloids known as solanines. They give rise to nausea, vomiting, colic and diarrhoea. The nightshades (climbing, graceful and black), Jerusalem cherry, jessamine, ground cherry or Chinese lantern and the potato are examples of solanine-containing plants. (N.B. Deadly nightshade does not belong to this group).

Rhubarb, Ground sorrel and Virginia creeper contain oxalic acid which has a corrosive effect on the whole intestine and after absorption into the body forms insoluble calcium oxalate. Muscle twitching, convulsions and kidney damage may result.

The autumn crocus and glory lily contain colchicine, a compound which is extracted and used in the treatment of gout. About two hours after eating any part of these plants, extreme diarrhoea occurs with shock and collapse.

Many wild plants and a few cultivated species contain glycosides which, when digested, form cyanides. The hydrangea and the seeds of members of the Prunus species — plum, cherry, chokecherry, apricot, peach and almond — belong to this category. Several seed kernels would have to be eaten to cause symptoms of vomiting, difficulty in breathing, muscle weakness, twitching, convulsions and coma.

A small group of plants produce toxins which mainly affect the heart. The foxglove is probably the best known of these since it is our principle source of digitalis. When taken in small amounts, digitalis has a beneficial effect on the heart beat and it is one of our most useful medications for certain types of heart ailments. As is the case with all medicines, however, in overdoses digitalis can prove harmful. Lily of the valley and the oleanders also produce a toxin with a digitalis-like effect. Monkshood is one of the most toxic of our cultivated ornamentals and equally toxic are its cousins the Delphinium species. These plants produce a toxin aconitine in their leaves and roots which causes a variety of symptoms including a slowing and irregularity of the heart beat.

Other plants which contain heart-poisons are the hellebores (false, green and American white) death camas, lambkill and mountain laurel. Even the lovely rhododendron produces a toxic nectar which occasionally contaminates honey.

Caragana is a relative of the beautiful laburnum or golden chain tree which flourishes in England and the Southern States of America. Both produce a poisonous alkaloid, cytisine, which is highly concentrated in the mature seeds. Because its pea-like pods are attractive to children, laburnum is presently the commonest cause of fatal plant poisoning in England.

Poison hemlock deserves mention not only because it is a common source of poisoning in livestock but also because of its historical interest. It is said to have been responsible for the death of Socrates. Poison hemlock and fool's parsley produce an alkaloid, coniine.

The leaves of all members of the genus nicotiana (tobacco plants) contain nicotine and several of the Lobelias (cardinal flower, Indian tobacco, great lobelia) produce a number of alkaloids, including lobeline. Cytisine, coniine, nicotine and lobeline produce similar symptoms in humans. Muscle twitching, nausea, vomiting, diarrhoea and convulsions may occur when any of the above-mentioned plants are eaten.

Cases of poisoning due to jimson weed have been reported from the United States since 1676 when the early settlers used the seeds to brew a form of tea. The name jimson weed is derived from Jamestown, the area where many settlers succumbed to this type of poisoning. The belladonna alkaloids, atropine, scopolamine and hyoscyamine are present in all parts

hooty hortus says·

Arbor-vitae, better known as Cedar (Thuja occidentals L.). There is a wide variety but for prairie gardens I suggest the following — they are hardy and attractive. Brandon Pyramidal, it grows naturally into a shapely pyramid with dark green foliage that is maintained all through the winter. Also Ware's, a hardy bush type or a very dwarf variety named Little Gem.

Cedars are best planted on the north or east side of the house. They don't stand dry air too well so in the hot dry weather spray the tops with water from your garden hose.

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of this and a number of other plants including deadly nightshade, the jessamines (day, night and willow-leaved) henbane and matrimony vine. The fever, blurred vision, dry mouth, red skin and delirium experienced by victims of poisoning due to these plants are aptly described in the mnemonic well known to the most junior of medical students "hot as a hare, blind as a bat, dry as a bone, red as a beet and mad as a wet hen".

The last group of plants which should be mentioned are those whose toxins exert an effect mainly on the nervous system. The water hemlock is the most important of these because it is responsible for most of the fatal poisonings due to plants in the United States. The toxic principle in the hemlocks is a higher alcohol, cicutoxin. It is present in greatest concentration in the stem and the root. Its main effect in man is the production of convulsions. The grape-like berries of the moonseed vine are also reputed to cause convulsions and so are the seeds of the sweet pea and its non-cultivated relatives.

Finally, there is the group of plants which affect the nervous system and which have recently become popular with our "kick"-seeking youth. This group includes hemp or marijuana which is a source of tetrahydrocannabinols, morning glory (pearly gates and heavenly blue varieties) whose seeds contain lysergic acid diethylamide (L.S.D.) and the nutmeg, imported for use in cooking is a source of myristicin. These toxins are all capable of producing a "high" or dream-like state sometimes accompanied by hallucinations.

This is by no means an exhaustive list of plants which produce toxins but most of the common ones which we are likely to encounter have been mentioned with the exception of mushrooms. Our recognition of poisonous plants has grown over many years largely as a result of reports of sickness and death in livestock which has grazed in fields where poisonous species abound. Fatal poisoning due to plants is by no means common in human beings, although it does occur. About one death per year from plant intoxication is reported to the National Clearinghouse for Poison Control Centres in the U.S.A. In most cases the water hemlock is responsible. In our experience, with the exception of dermatitis, even the production of symptoms is not common. Of course the volume consumed by a grazing cow is vastly greater than that eaten by a curious child and this accounts for the difference in morbidity.

Dandelion Greens

Frances Hamerstrom

reprinted from Wisconsin Conservation Bulletin

We could make much more use than we do of good foods that nature provides. Among them are dandelion greens. They're edible in spring but best in fall.

They may have been gypsies or they may have been Italians, but I shall never forget the day of their coming, for it was the first time I was ever taken for a grownup and the first day I cooked a wild vegetable.

My baby brother and I were out in the garden. Suddenly the lawn was full of women and children wearing bright scarves and blouses and full skirts — even the little girls wore earrings. They talked quickly in a foreign language as they dug dandelions from the very lawn I was accustomed to play on, moving across it slowly with knife blades shining in the sunlight.

I was twelve years old. Taking my little brother's hand, I approached them cautiously to watch what they were doing. It was when I was still trying to phrase a polite question to open the conversation, that one of the women turned to me. Shaking the earth from a dandelion plant, she held it up for my inspection before tossing it into her basket. "Good," she said, and then pointing at the baby with her knife blade, she asked, "Your son?"

I ran to tell the grownups, "They thought the baby was my son, and can we have dandelions for supper?"

"Oh, you shouldn't have spoken to them."

"But *can* we have dandelions for supper?"

"Not today, dear, perhaps some other day . . . ."

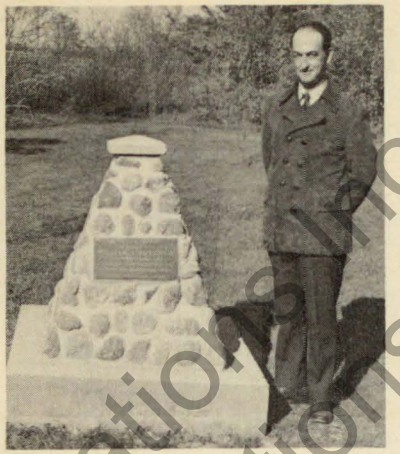
My father stepped outside the door and stood on the porch a moment. Though he made no motion, it was as if he had waved a magic wand dismissing them. They picked up their baskets and their babies and departed — never to return. Once more the lawn looked as it always had, except there were fewer dandelions.

My day was not over. I built a fire behind the lilac bushes, and boiled my dandelions in a tin can, and ate them all. They would have tasted better with salt.

The common dandelion, *Taraxacum officinale*, is a weed introduced from Europe. The Japanese consider the flowers so beautiful that they grow them in their gardens. We, on the other hand, grub them out of our lawns.

For eating, it pays to know when to dig them. Dandelions often live only two years. Those gathered in spring are frequently old and about to flower, set seed and die. Few people know it, but dandelions are at their very best in fall when their leaf rosettes are storing foodstuffs — often for the only winter they will know. They are worth trying in spring, but remember: autumn dandelions are sweetest.

Dandelions can be simply cooked by boiling the tender young greens in salted water like spinach. Another tasty recipe is this one from Charlotte von Sivers: Steam for five minutes over low heat. Add one tablespoon fat, one tablespoon flour and enough hot salted water to make a thick sauce. Add sour cream or yogurt to taste. Stop cooking and eat!



Dauphin Herald

William J. Boughen honored

In tribute to one of Canada's great men of horticulture, the Dauphin Horticultural Society unveiled a cairn in tribute to William J. "Bill" Boughen on Sunday, October 18, 1970, the year of Manitoba's 100th birthday. The cairn was erected on the home grounds of the Boughen Nursery, Valley River, Manitoba, with members of his family and a host of those who remember "Bill" present on this auspicious occasion.

The above picture shows his son Russell standing proudly beside the cairn surrounded by the trees, ornamentals, shrubs and plants, many of "Bill's" own origin, which in themselves are a lasting memorial to his lifetime of outstanding horticultural achievement.

"Bill" Boughen came to the Valley River district in 1889 from England as a lad of seventeen years. A few years later he located his Nursery on forty acres of land, known as the flats of Valley River, on which he spent the rest of his fruitful life producing stock that would enhance the beauty of hundreds of homes over the length and breadth of Canada.

Some of his most superior introductions were the Battleford and Severn apples and the Garnet crabapple; he further originated two of the top plums of the Prairies in Dandy, and a sister Beaver, the latter maturing later with a heavier yield, as well as selecting two of the best native plums in Valley River and Olson.

In 1953 failing health forced him to hand the reins of operation over to his son Russell. He died on March 13, 1958.

"Bill" Boughen's dedication and talents in originating and developing many hardy and superior plants gave him both national and international recognition in his field. The Prairie Garden takes pride in further honoring this great man of the soil.

The "other" World of Lower Plants

Dr. F. Paul Ralston, Jr.

One of the original meanings of the prefix *crypt* is "hidden", thus cryptic — a hidden meaning. One diverse assemblage of plant life is collectively lumped under the heading of the cryptogams, the plants with hidden reproduction. Here hidden is a relative term; certainly it wouldn't be hidden from a botanist with a microscope, but to the gardener who thinks of plant reproduction mainly in terms of pollen, flowers, seeds and fruits the reproduction of algae, lichens, fungi, mosses, ferns and their allies would, I think, qualify them for at least inconspicuous reproduction, if not downright hidden. Although our gardens, yards, and indeed the entire landscape are all richly populated by cryptogammic plants, they're usually as unobtrusive as wallpaper and hence don't rate much attention because we're all so flower-minded.

Mosses and liverworts appear to be quite distinctively different from each other in structure, and after all, its the structure of plants and animals which is the basis for almost all biological classification. Liverworts are green ribbon-like stemless plants which grow in very moist locations. They're often found in nature on streambanks, on north sides of a wet valley, or on the floors of greenhouses which are kept wet by drippings from above. As unlikely as it may seem, liverworts are closely related to mosses, even though the latter appear to have true leaves, stems, and roots. Both of these plants have a similar history of existing through the geological eons of life on earth, and both have basically the same type of reproduction.

At this point let's consider the reason for reproduction in living things. Certainly the reason seems to be to keep that particular kind of creature going on earth, but in practice, most things arise, exist for shorter or longer periods of time, and then decline and become extinct. Some creatures have existed more-or-less unchanged for hundreds of millions of years on earth; others have come and gone in literally a flash of (earth history) time, and/or have changed dramatically from their earliest forms. There's no simple answer to whether or not change is effective for success on earth: some creatures remain much the same and prosper, others have evolved greatly from their predecessors and prosper. If little or no change is necessary, then there are certainly some most effective ways of reproducing simply. The list is practically endless: cuttings from African violet leaves, budding from potato eyes, willow twigs which break off and take root downstream, "leaflets" which drop off the leaf edges of the mature plant and take root, broken pieces of a sponge forming new sponges. But while a potato grower would use eyes to produce more potato plants of the same type, he would use the flowers and hence seeds to breed for new varieties. This then is the principal value of sexual reproduction: to be the source of most of the possible differences in living creatures, which are then introduced into the environment — in nature's laboratory — to find out which characteristics yield the most success for that type of creature. This is information with which we are

all conversant, and forms the base to apply to our present consideration about cryptogammic plants.

To paraphrase the saying, "a hen is an egg's way of making another egg", it could be thought that the green cryptogammic plant, the moss plant, for instance, is a way of making another moss reproductive structure, the salt-shaker like spore capsule which produces millions of spores. It is in the sexual reproduction of these lower plants such as, liverworts, mosses, ferns, and their relatives that their primitive heritage of life in the water really shows up. They actually have flagellate swimming sperms — roughly similar to animal sperms — which swim to the egg through a water film, or dew, or are carried to the egg in splashing raindrops. Contrast this with the airborn (or insect born) pollen grains which must be placed directly on the stigma before their amoeba-like sperms can dissolve their way into the egg of the flower. While its true that some mosses, ferns and their allies can exist in tremendously dry places, its equally true that they are as completely dependent on water for sexual reproduction as is a frog or a toad.

Perhaps the most colorful and diverse structured group of cryptogammic plants are the fungi. One reason why "they" may be so various is that "we" (humans) have lumped a lot of differently evolved plants into one common category. This isn't a unique situation in science, and often leads to basic problems in understanding some diverse assemblages of organisms. A similar situation exists for the disease, cancer: one of the reasons it is such a gigantic difficulty to understand is that actually there are many different kinds and causes of cancer and about the only thing they have in common is that they show approximately the same symptoms. Thus, the first step in its understanding is to realize that one is actually faced with many different causes. Similarly the diversity of the fungi makes it almost impossible to find structural features in common, so in practice their type of reproductive structures are used for classification purposes.

Taking the plant kingdom as a whole, fungi are atypical because they're not photosynthetic. A few fungi appear to be green, but this is only because they acquire a coating of algae, and not because they have any genuine leaf tissue containing chlorophyll in the cells. Since photosynthesis is a common feature of nearly all plants, the fungi must be considered to be basically different in life style. Indeed, their role — something akin to bacteria, that of breaking down organic substances — is a most necessary one in a world economy of reusing raw materials. Think for a moment about the fact that fungi obtain their nourishment in a manner more like animals than of green plants: i.e., by "eating" rather than by photosynthesis. When one considers the two main structures making up the fungus body it is clear that the relationship between how something is built and how it functions can really be dramatic. Look closely into a pile of compost, or within the dead leaves on a forest floor. The material there is interlaced with what seems to be white (spider web) strands. In the previous sentence if we substitute "food" for the word "material", then we can substitute "stomach" for "strands". Although the method of food intake seems to be in reverse; animals put the food into their stomachs, fungi put their stomachs into the food, the basic idea is the same. Both animals and fungi secrete digestive enzymes from cells next to the food, liquify it, and break it down into materials which will readily pass through the cell walls and into the network of the threadlike body. This collection of threads makes up the net like body of the fungus, the hen — so to speak — which will make another egg. All of this eating activity is to build up the

hooty hortus says·

Your Christmas Cactus Does it Flower? A. R. Buckley, the Plant Research Institute, Ottawa says this: Temperature affects many plants in extraordinary ways. The Christmas Cactus (zygocactus truncatus) for example will flower regardless of daylight at 50°F. but if given 65°F. it will respond in the same way as a short day plant. This means that if you grow a Christmas Cactus in the house at normal temperatures of 65°-70°F. you should cover it with a dark cloth to reduce daylight hours.

Many people that grow these Christmas cactus successfully either put them in a dark corner for six to eight weeks during August and September to produce buds or cover plants from five p.m. until seven a.m. with a black cloth each night for the same period.

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body size and food reserves so as to permit reproduction, and it is this eating part of the life of fungi that is literally underground, or more correctly within the (food) substrate, whether it be a dead tree trunk, a layer of leaves, or moldy vegetables. It's fortunate, in the global scheme of things, that there exists this varied assemblance of scavengers of dead plant material, for any crowded environment would soon become inundated with its own waste, be it forest or city, if the garbage processors ceased their functioning. Consider how genuinely tough and resistant are dead plant products — even leaves last several years, let alone trunks and stumps which can last many decades before they're reduced to sawdust by the fungi and thence to elemental raw materials by bacteria. The digestive enzymes of these scavengers must indeed be potent to enable them to successfully process one of the toughest organic materials known — wood.

But, returning to the nutritive activity of fungi — all of which has been happening pretty much within the material in which the strands are decaying, the stage is now being set for the possibility of sexual reproduction. Of course, the fungi have all along had the capability of a sexual reproduction (potato eyes, geranium cuttings, etc.) in that even a small piece of the threads could be carried or blown to a suitable substrate and grow again into another network of threads, but what we are now describing is a reproduction akin to pollen, eggs, and seeds in flowers. By a process similar to sperm and egg formation, some sex cells within the fungus threads fuse together and form a fertilized egg cell. This develops further into millions (or billions!) of dustlike spores together with a structure to disperse them into the air. It's true that orchid seeds are also practically dust-sized, but there the comparison stops because the orchid seed contains a tiny embryo plant having root, stem, and leaves, while the spore from a cryptogam plant is only a single cell but with the potential for developing into a thread, then a mass of cells, and then into the nutritive network of the fungus, or the moss, or whatever kind of plant made those spores. These spores are so light that they can be windborne many miles into the stratosphere and around the world, and so resistant that they can endure drying and freezing. That the world is

not just swamped with cryptogams is because there are so genuinely few places where they can thrive against already established flowering plants.

A few fungi have water dispersed spores; most are carried by the winds, hence the need of a structure to elevate the spores into the air. The expression "something grew like a mushroom" is certainly picturesque and descriptive, but not very accurate. Although the mushroom does indeed spring up in only a few hours, it's quite different from the method of real plant growth. Recall that most fungus activity takes place in the network of threads buried within the substrate. This includes forming the spores and supporting tissues which collectively are the fungus fruiting body, be it a mushroom, cup fungus, or puffball. Over a period of weeks or months, the underground strands of the fungus slowly develop a "compressed" fruiting body, wherein the cells and tissues are actually built. Then when it reaches completion, the threads scattered through the soil suddenly take in water from the soil and literally pump up the compressed or "button" mushroom into its expanded (parasol) shape so that it can now discharge the spores into the air. Thus the rapid mushroom "growth" is really just a hydraulic expansion of tissue growth which took place previously.

Just consider how condensed would be the coverage of the whole field of horticulture, or of flowering plant biology in these few pages. And yet that is exactly what this brief article has attempted to do, in a effort to give you an insight into the entire field of cryptogammic botany — the lower plants — in such a cursory manner. Perhaps the key purpose though has not been to present information but to nurture an increased awareness of this "other world" of plant life in and among your flowers. There are some fine books which might be the best steps in this direction, of which the first should be *Non-Flowering Plants* in the Golden Books series. Not only are cryptogams varied and attractive, but an understanding of their conditions for growth will often tell you a great deal about the successes and/or troubles of your more important flowers whose lives are often intimately associated with the cryptogams around them, especially the disease causers.

In Balance With Nature

John Carew

Reprinted from the American Vegetable Grower

In the beginning
There was Earth; beautiful and wild;
And then man came to dwell.
At first, he lived like other animals
Feeding himself on creatures and plants around him.
And this was called IN BALANCE WITH NATURE.
Soon man multiplied.
He grew tired of ceaseless hunting for food;
He built homes and villages.
Wild plants and animals were domesticated.
Some men became Farmers so that others might become Industrialists, Artists, or Doctors.
And this was called Society.
Man and Society progressed.
With his God-given ingenuity, man learned to feed, clothe, protect, and transport himself more efficiently so he might enjoy Life.
He built cars, houses on top of each other, and nylon.
And life was more enjoyable.
The men called Farmers became efficient.
A single farmer grew food for 41 Industrialists, Artists, and Doctors.
And Writers, Engineers, and Teachers as well.
To protect his crops and animals, the Farmer produced substances to repel or destroy Insects, Diseases, and Weeds.
These were called Pesticides.
Similar substances were made by Doctors to protect humans.
These were called Medicine.
The Age of Science had arrived and with it came better diet and longer, happier lives for more members of Society.

Soon it came to pass
That certain well-fed members of Society
Disapproved of the Farmer using Science.
They spoke harshly of his techniques for feeding, protecting, and preserving plants and animals.
They deplored his upsetting the Balance of Nature;
They longed for the Good Old Days.

And this had emotional appeal to the rest of Society.

By this time Farmers had become so efficient, Society gave them a new title:
Unimportant Minority.
Because Society could not ever imagine a shortage of food
Laws were passed abolishing Pesticides, Fertilizers, and Food Preservatives.
Insects, Diseases, and Weeds flourished.
Crops and animals died.
Food became scarce.
To survive, Industrialists, Artists, and Doctors were forced to grow their own food.
They were not very efficient.
People and governments fought wars to gain more agricultural land.
Millions of people were exterminated.
The remaining few lived like animals.
Feeding themselves on creatures and plants around them.
And this was called IN BALANCE WITH NATURE.

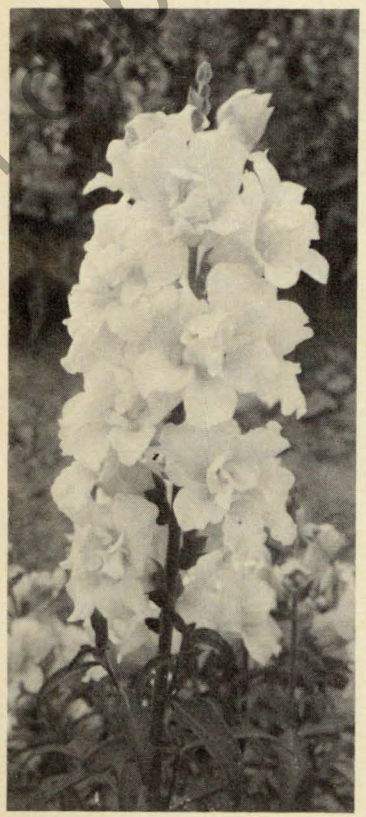
hooty hortus says·

Raspberries are a welcome addition to the small garden. They prosper best in fertile soil, not too high in lime with good light and air circulation.

Boyne and Killarney are two of the best. Plant the young canes in rows, with the plants about a foot and one-half apart, slightly deeper than the nursery. Fertilizer is beneficial while plenty of water when in full leaf and the crop is developing will assure a good crop.

Use of Kilthane, two teaspoons in a gallon of water, will give good control of spider mite. However, only use this chemical during flowering and after the last berries have been picked. During the fruiting season spraying the bushes with the garden hose tends to control this pest.

At the end of the fruiting season cut the old canes down to the ground. They only sap the strength of your plants. The suckers at the base of the plant are next year's fruiting canes. Don't neglect at this time. An application of fertilizer and plenty of water will do much to prepare your plants for next year's fruiting.



Madame Butterfly

There is a place for Snapdragons in Your Garden.

Let's start with the tall ones for the back of the border or for cutting. Suggest you try Rocket. It gets to be three feet high, and comes in separate colours of red, yellow, pink and white.

Then there is the Frontier strain which is not quite as tall as the Rocket, followed by the intermediate types such as the Carioca strain, growing from eighteen inches to twenty-four inches high with each separate colour really a blend of colours. They are very striking and beautiful. This can be followed by the Sprite strain with clear glistening colours, with lighter tip marking, at a height of fourteen to twenty inches.

Further, if you want a dwarf compact variety for your annual border grow Floral Carpet. It is eight inches high in an assortment of bright colours.

For something different there is also another kind of snapdragon called Bright Butterflies, that looks more like a pensternon than a snapdragon.

Then in the real new varieties we have two widely different types. First there is Madame Butterfly with open-faced azalea-like double flowers in a mixture of colours, which are particularly suited for cutting and making arrangements, and finally the Floral Cluster group in separate colours. Their floriferousness and evenness of bloom make them excellent for bedding purposes.

Information Please

We suggest that you supplement your 'Prairie Garden' Library with bulletins from your provincial, federal government or university.

In *Alberta* write to Publications Office, Room 803, Agricultural Building, Edmonton 6, for their list of agricultural publications available. In *Manitoba* write to the Publications Branch, Manitoba Department of Agriculture, Norquay Building, Winnipeg 1, for a similar list of publications. In *Saskatchewan* write to Publications, Extension Division, University of Saskatchewan, Saskatoon. The following bulletins are available on request: 95 — Annual Vegetables in Saskatchewan; 152 — Potato Growing in Saskatchewan; 156 — Perennial Vegetables; 158 — Grafting Fruit Trees; 173 — Landscaping the Urban Home; 189 — A Gardener's Guide to Soil Fertility.

Numerous other publications (and a list of them) are also obtainable from the Publication Division, Government of Canada, Ottawa, with priced publications available from the Queen's Printer, Ottawa.

We would further like to refer you to two other publications, *The Gardeners' Bulletin* published by the Extension Division, University of Saskatchewan, Saskatoon on behalf of the Saskatchewan Horticultural Societies' Association and the *Alberta Horticulturalist*, published by the Alberta Horticultural Association. Both are four page quarterlies giving pertinent information on gardening subjects and news on the activities of their respective associations. Rates are one year, 50c, two years, $1.00. Subscriptions are available from Extension Division, University of Saskatchewan, Saskatoon, and the Alberta Horticultural Association, Box 1083, Lacombe.

Recommended Garden Books for Western Gardeners

The Prairie Gardener — by H. F. Harp, the C.B.C. radio Sunday morning "Prairie Gardener" for over fifteen years. Mr. Harp brings to you a practical concise manual on prairie horticulture derived from a lifetime of gardening in western Canada. Now available in bookstores at a price of $8.95 per copy, or from M. G. Hurtig Ltd., Publishers, 10411 Jasper Ave., Edmonton, Alberta.

Chatelaine's Gardening Book for Canada — by Lois Wilson, garden editor of Chatelaine and an internationally known author on flowers and flower managements. This is a very comprehensive publication, well illustrated in color and black and white "how-to" drawings. It's gardening notes on western Canada are excellent. Now available at bookstores at a price of $12.50 per copy.

Better Ways to Successful Gardening in Western Canada — by Isabelle and Charles Young, two of the most active and successful gardeners and garden writers in Alberta. This book is a thoroughly complete manual on how and what to grow in western Canada. The cover picture, in full color, of one of their flower borders, is a testimonial in itself to their skill and knowledge. Available at bookstores for $3.95 per copy or from the Albertan, 830 - 10th Ave. S.W., Calgary 3, Alberta (plus 30c mailing).

The Canadian Gardener's Handbook — by W. R. Leslie and Margaret Kennedy. Dr. Leslie, Superintendent of the Canada Experimental Farm at Morden, Manitoba for 35 years, and now garden columnist and landscape consultant, is well qualified to bring to you under the Universal Best-Seller Library $1.00 edition a practical, compact and informative guide for successful gardening north of the 42nd parallel.

Abbreviated Index to The Prairie Garden

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Dr. S. H. Nelson is Head, Department of Horticulture Science, University of Saskatchewan, Saskatoon, Saskatchewan. Formerly he was Horticulturist at the Canada Department of Agriculture, Central Experimental Farm, Ottawa, Ontario.

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