THE 1979 PRAIRIE GARDEN

Western Canada's Only Gardening Annual

$3.00

THE PRAIRIE GARDEN . . . 1979

ISSN 0315-6850

The Prairie Garden

WESTERN CANADA'S ONLY GARDENING ANNUAL

WRITTEN BY AND FOR WESTERN GARDENERS AND HOMEOWNERS

A non-profit publication dedicated to the advancement of horticulture in the prairie provinces.

Published by

WINNIPEG HORTICULTURAL SOCIETY

Winnipeg, Manitoba 36th Annual Edition, January, 1979

1979 THEME —

ANNUALS

Price $3.00 per copy

Special quantity prices to Horticultural Societies, Garden Clubs, Commercial Outlets, etc.

Address inquiries and orders to:

THE PRAIRIE GARDEN, P.O. BOX 517, WINNIPEG, MAN. R3C 2J3

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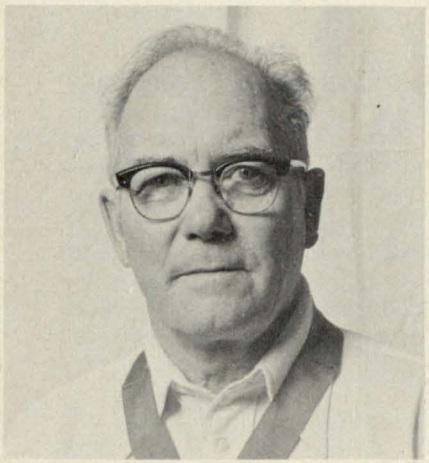
The index is a complete listing of articles, grouped under common headings, which have appeared in The Prairie Garden from 1967 to 1977.

Henry Marshall Receives Linnaean Award in Toronto



Dr. H. H. Marshall

Dr. Henry H. Marshall, a well-known horticulturist working in the Horticultural Science Section at the Agriculture Canada Research Station at Morden, Manitoba, was awarded the Linnaean Award of Honor last summer in Toronto, Ontario.

Dr. Marshall received the medal from the Linnaeus Society of Canada at the awards ceremonies held August 20, 1978, in Toronto for his significant contributions in the field of horticulture during the past thirty years.

The Linnaeus Society is new in Canada. It was formed this year as a Centennial project of the Horticultural Committee of the Canadian National Exhibition in Toronto.

Several months earlier this year in Toronto, Dr. Marshall also received recognition specifically for his rose breeding work. A joint display of his new Parkland series of rose varieties was given by the Toronto Garden Club and Springwood Consultants of Mississauga, Ontario. It featured both live plants and photographs of Dr. Marshall and his roses.

The Parkland series now includes Assiniboine, Cuthbert Grant, Adelaide Hoodless, Ruby and Amorette. Both Assiniboine and Cuthbert Grant have received Awards of Merit from the Western Canadian Society for Horticulture.

Dr. Marshall has been honored many times for his outstanding achievements and well-known work in developing hardy plant material for the prairie climate. His life was highlighted in 1974 when the University of Brandon bestowed on him an honorary Doctor of Science degree.

For the many new varieties of plants he has developed for the prairie climate and the knowledge of prairie plant resources he has documented, he has received an honorary life membership in the Manitoba Horticultural Association, an organization that has also cited him with a Meritorious Service Award. He also holds an honorary life membership in the Brandon Horticultural Society.

HORTICULTURE is . . .

a peck of pickled peppers
a grinning jack-o-lantern
the apple-a-day that keeps the doctor away
grape jelly on a little boy's face
35% of your diet
vitamin C
crisp potato chips for a weekly poker game
a poinsettia for Grandma at Christmas
a boulevard of spreading elms
an arboretum for study and enjoyment
the lilacs children bring to their teacher
the nation's number one pastime
an old fashioned remedy for daily tensions
the folk science of modern society
hardy landscape plants for a cold climate
hot cider after a hay ride
plants grown for profit and pleasure
a colorful chef's salad
a corsage for the senior prom
the beautiful flower border in the neighbor's yard
cool grass under bare feet
manicured greens at a favorite golf course
the home lawn that needs mowing every weekend
a snow blanketed spruce
a pleasing home landscape
a carefully planned environment
people devoted to a better world through food and environment.

Tips on Growing Vegetables

PHYLLIS PIERREPONT
Bowsman, Man.

More Than One Variety in a Row

Planting more than one variety of vegetable in a row results in more being produced per row, and is mutually beneficial to the varieties. This of course applies only if the varieties planted are compatible.

Peas and Turnips — (or rutabagas) are mutually beneficial. If innoculated, the peas put nitrogen into the soil and also provide some much-appreciated shelter to the small turnip seedlings. Both vegetables can be thinned and hilled at the same time. The pea vines appreciate the support of the growing turnips. If early peas are planted, they will have finished producing by the time the turnips are shading them.

Radish, Carrots and Lettuce — are another companionable group. This time, the faster growing radishes protect the small lettuce and carrot seedlings from the drying winds and hot sun. As the radishes are pulled, the lettuce fills the spaces and, when the lettuce is used, the carrots are able to use the space.

Beans and Cucumbers — are another amiable pair. Cucumbers like a little shade and grow quite well among corn and sunflowers. By planting two or three radish seeds in each hill of cucumbers and allowing the plants to mature, cucumber beetles are discouraged.

Pumpkins and Pole Beans — Most people know that pumpkins and squash grow well among the corn plants. Pole beans also grow well with corn as they twine around the corn stalks. I admit it makes picking the corn a little more difficult, but it does save space.

Hints on Planting

If dill is planted among the cabbage plants, the cabbage butterflies are less of a nuisance. Planting onions or garlic among the cole plants, or in alternate rows, also helps to discourage the "butterflies".

One should never smoke while handling tomato plants. There is a virus on tobacco which can be transmitted to the tomato plants and under the right conditions, this disease could destroy the plants. Petunias belong to the same family, so wash your hands smokers, before you handle them!

Fast Germination Tip

There are three varieties of vegetable seeds which take quite a while to germinate. These are carrots, parsley and parsnips. There is a simple way to ensure much faster and more even germination of these three. Open the row and sow the seed as usual, then with a kettle of boiling, or nearly boiling, water, walk slowly along the row pouring the water on the seeds. Cover the row as usual. You will be amazed at how quickly the plants come up. In 1977 my check rows never did catch up to the rows treated with hot water.

Bleaching Celery Tips

A fairly easy way to bleach celery is to place a large milk carton or quart size oil can, with both ends removed, over each plant. Do this before the plant is large enough to be injured in the process. Some earth can be banked around the cartons to hold them in place. I prefer two-quart milk cartons because they are larger and can be cut off more easily at harvest time.

Roses

Would you like to have roses free of black spot and aphids without using chemical sprays? To prevent black spot, interplant the roses with tomatoes. Tomato leaves contain solanine, a volatile alkaloid which seems to prevent black spot.

If it is inconvenient to plant tomatoes in the rose bed, try a spray made by blending tomato leaves and water in a blender. Strain, add a little starch to make it stick, and spray on the roses!

To discourage aphids on the roses, plant any of the onion family among the roses. The onion leaves add a contrasting note and if you plant chives or multipliers, or flowering alliums, you'll have bloom too. Garlic, onion sets or multipliers will all serve the purpose as well.

Plants commonly advertised in National Magazines which are NOT recommended for Manitoba

Japanese maple
Crimson King maple
Tree of heaven
Catalpa
Redbud
Rose of Sharon
Flowering dogwood
Ginkgo (Maidenhair tree)
Honeylocust
Kentucky Coffee tree
Gold-rain tree (Koelrenteria)
Golden Chain tree (Laburnum)
Privets
Austrian pine
Lombardy poplar
Japanese rose (living fence)
Babylon weeping willow

MANITOBA DEPARTMENT OF AGRICULTURE

The Flower with a Future — Lilies

FRED FELLNER
Vermilion, Alberta

Lilies come in many sizes, shapes, and colors. Blooms are three to six inches wide and the plants can grow from one foot to six feet or more. The blooms face down, out and up, and are flat and cup shape. The colors range from very soft yellow to deep yellows, from very soft orange through to deep orange to reds. Also deep red to the very dark and near black red, and in colors of white, cream pinks, purple pinks to the very deep purple reds.

Lilies can be grown on most soils, but the better the soil you can give them the nicer plant you can expect. They like a deep, mellow soil. Drainage is also very important. Never let water stand on the lily bed at any time of the year.

Planting

Lilies can be inter-planted with perennials or in pure stands. The bulbs should be planted in the fall, September or October, or in early spring before the sprouts get too long. If the sprout is broken off, there will be no lilies that season. It will come up in the next season. Plant your bulbs with four inches of soil over the bulb in mellow soil, and three inches of soil in heavy soils.

Lilies can be multiplied by breaking off a few scale from the bulb. Plant these in two inches of soil and keep the soil moist.

Bulbils

Bulbils can be replanted in fall or spring. These are found just under the soil, growing on the stem of your lily plants. Also stem bulbils can be planted. These are sometimes found growing on the stem of Tiger hybrids. Scales, bulblets and bulbils will bloom in two to three seasons after planting. Lilies planted with mature bulbs will grow to their maximum size by the second or third season of blooming.

Varieties

The Asiatic lilies are the easiest to grow. These are hardy most of the time, even without mulching. The Trumpet lily can be grown most places if good mulching is done but be sure that the ground is not too dry before freeze-up. I would say that the Trumpet lily is still a trial lily on the Canadian prairies. However, if you can winter a tender rose like the hybrid tea rose, you can probably grow the Trumpet type lily with fair success.

I have grown the prairie-bred Trumpet for four years now without mulching. As you may be aware, the past four winters have been very severe on many garden flowers, temperatures down to minus 28, without snow on the ground, and down to minus 38 to 42, with none too much snow. So far, I have found one Trumpet lily which looks perfectly hardy, and I have seen some Trumpet seedlings come through their first winter with little damage.

I feel it will be five to fifteen years before we will get many Trumpet lilies nearly as hardy as the Asiatic lilies, but would not discourage anyone from trying the Trumpets, though just a warning, you will need to take extra care, and do expect to lose some.

The pictures illustrating this article show the colors in Asiatic hybrids, and most of the lilies shown are available on the market. Those marked "seedling" are included only to depict the wide range of color already in gardens. There are many new colors and shapes which are being tested. It takes eight to ten years for new seedlings to come on to the market. The very new lilies will be high in price for

Piedmont Gold — Very bright yellow, large out-facing blooms, two to three feet tall.

Barber 17 — Deep pink, out and down facing, two feet tall.

Royal Robes - Robinson — Deep purple red, reflexed blooms, two feet tall.

the first three years, so that only breeders will buy them, and also because the supply is limited.

Some addresses where lilies can be ordered:

Embarrassment — Large bright rose pink, out-facing, on a tall strong stem.

Gay Bird Nursery, Box 42, Wawanesa, Manitoba.

A. J. Porter, Honey Wood Nursery, Parkside, Sask. S0J 2N0.

C. A. Cruikshank Ltd., 1015 Mount Pleasant Road, Toronto, Ont. M4P 2M1.

Riverside Gardens, R.R. No. 5, Saskatoon, Sask. S7K 3J8.

Canadian Prairie Lily Society (J. R. Caldwell), 1616 Landa St., Saskatoon, Sask. S7J 0P4.

Lilies can also be imported from the U.S.A. Many of the newer lilies are listed only in these catalogues. Write to your Canada Dept. of Agriculture, Plant Protection Division, in your provincial capital. Ask for mailing labels, which you send with your order. There will be 15% duty on most shipments.

For lily catalogues and addresses contact the author at Vermilion, Alberta Q0B 4N0.

Editor's Note:

Refer to color section pages 70a & 70b.

The Diakiw Experiment

ROGER VICK
Edmonton, Alta.

"Golden Delicious apples growing in Edmonton? You must be kidding!" This is the first reaction of people who first hear about the backyard work of Mr. Elias Diakiw.

When he first came to Canada from the Ukraine in 1927 Mr. Diakiw, like everyone else from milder climes, found the fruit trees of the Vegreville area frankly disappointing. Some crabapples were being grown on the prairies for ornament or jelly making, but anything more exotic appeared to be out of the question.

Over the next half century a few moderately acceptable apple and plum cultivars appeared in Alberta, and Mr. Diakiw began to wonder if, over a number of seasons, plants could become acclimatized. The usual answer to this idea from local gardeners was that they doubted it. They would go on to explain that hardiness was a genetic trait that would have to be passed on through sexual reproduction, following the established method of hybridizing plants of desirable qualities with those exhibiting hardiness. Selection is then made from the varied seedlings of the F1 and subsequent generations.

In the case of fruit trees, all this takes an unconscionable time, a great deal of space, and a fat purse to ensure maintenance of the trial for many years until the new generations bear fruit and can be evaluated. Likely as not the hybrids are eventually found to be less than satisfactory in one or more respects, and it is necessary to take seed from the more promising specimens, and start a whole new generation.

If the theory of Mr. Diakiw is correct, then hardiness can be imparted into the desirable yet non-hardy cultivars within a period of only five years. What is more, space requirements for testing are minimal, which in turn reduces labour and financial investment.

Experimenting with Hardiness

Obtaining scion wood from Summerland, B.C., in 1974, Mr. Diakiw proceeded to test his theory in his own Edmonton home garden — a lot of average size. The results at the end of 1977 are impressive, even allowing for the comparative mildness of the past couple of winters.

Basically, Mr. Diakiw is attempting to prove that the hardiness trait can be transferred from one species or cultivar used as a stock plant, to a less hardy selection grafted onto it. If, for example, the scion wood of the desirable but non-hardy apple "Golden Delicious" was grafted onto a tree of the hardy but less desirable "Dolgo" crabapple, the new growth of the "Golden Delicious" would become as

Original Dolgo crabapple — 34 branches grafted.

hardy as the "Dolgo," provided that certain grafting and initial protection practices were followed. The procedure is simple, but requires patience, and the practice of a basic gardening skill.

With over 100 living graft unions in his garden, often several on one tree, it is obvious that the work also entails a certain amount of careful record keeping. Each graft union is tagged with a name or numbered metal disk, and the sight of these fluttering in the breeze is the first indication to visitors that this is no ordinary garden. These record numbers appear on index cards in Mr. Diakiw's office, and provide details of the source of material, dates of grafting, etc.

The tender scion wood (e.g., "Golden Delicious") is grafted in the spring to a hardy rootstock (e.g., "Dolgo" crabapple). Instead of leaving the scion wood to continue on the same rootstock, new growth is taken from the scion wood next spring, and grafted onto another hardy rootstock. This rootstock may be of the same kind or different, but always hardy material such as "Dolgo," "Heyer 12," or *Malus baccata* the Siberian crabapple. This procedure is repeated into the 5th growing season, after which the formerly tender scion wood is theoretically as hardy as the rootstocks upon which it has been grafted. Mr. Diakiw also reports that the system has worked equally well using bud wood instead of scion wood — and represents a saving of material.

Some protection is needed for the scion wood for the first few winters; and Mr. Diakiw has found that a wrapping of the current year's growth with 4 or 5 layers of burlap is necessary for the first winter "to protect it from high frosty winds." Fewer layers of burlap are needed for the second winter, and he applies none thereafter. It should perhaps be mentioned that the buildings in the city location of the Diakiw garden do afford some protection, and that the site is therefore a little more favored than rural and semi-rural locations.

Table of Rootstock Hardiness Assimilation

The following table indicates the rate at which rootstock hardiness is assimilated into the less hardy scion wood. For example, if Mr. Diakiw's theory is correct, then scion wood that is half way through its third growing season will have a hardiness rating equidistant between that of the hardy rootstock and the original scion wood.

Assimilation of Hardiness (Hypothesis)*

Growing Season or "Generation"	Number of Winters Survived	Hardiness of Scion Wood (as a % of rootstock hardiness)	
		Spring	Autumn
1	0	0	20%
2	1	20%	40%
3	2	40%	60%
4	3	60%	80%
5	4	80%	100%

*Editor's Note — Author's hypothesis.

Other Experiments

Is all this breaking entirely new ground? Not exactly. L. H. Bailey in his Standard Cyclopedia of Horticulture (1943), mentions the Russian practice of grafting desirable apple selections on the roots of the Siberian Crabapple in "an effort to make a plant better able to withstand a very severe climate."

In 1973, Mr. Dave Robinson, Extension Division of the University of Saskatchewan commented in a Gardener's Guild Newsletter that "The most auspicious approach to growing standard apples in prairie home gardens of the northwest is to plant hardiest crab seeds for roots, bud or graft these near the ground to hardy crab. . . . When the trunk portion is two or more years old, three or four of the main branches are budded or grafted to the desired (cultivar); but one, to three, branches on the southwest are retained as hardy food manufacturers."

Also, several years ago, Dr. Wm. A. Cumming of the Morden Research Station (now retired) was involved in a stembuilder study. He found that Siberian crabapple "Nertchinsk" was most promising as a hardy semi-dwarf stem-piece, and, during the test winter of 1965-66 the topworked apple varieties on this stembuilder came through with little or no injury and bore a good crop of apples. Injury to the same varieties on their own stems in other sections of the orchard at Morden varied from moderate to severe.

More recently there have been some practical results in the Diakiw garden. In 1976 there were two "Delicious" apples produced on third season scion wood, and three more the following year. The "Golden Delicious" scion wood was more satisfactory, with six apples in 1976, and eight in 1977.

"Double-Working"

Mr. Diakiw also uses the well proven system of "double-working" his trees, that is, the grafting of an intermediate cultivar to serve as a compatible stembuilder. The cultivar for fruiting is then grafted to the intermediate or stembuilder. In this way he fruited his first Bartlett pear in Edmonton in 1977, the 3rd season after grafting to "Tait-Dropmore" pear. The latter (serving as the intermediate scion) had earlier been grafted onto the stock pear tree, "Golden Spice." Scion wood of the tender but desirable "Anjou" pear has also proven compatible, and shows signs of increasing hardiness.

If the success of Mr. Diakiw's experiments continue, they will doubtless have tremendous implications for the future of the tree fruit industry of the prairie provinces.

Fruit Material

The following is a partial list of fruit material seen in the Diakiw garden in the autumn of 1977:

Apples: Advance, Battleford, Brooks No. 27, Carroll, Delicious, Golden Delicious, Goodland, Haralson, Heyer 12, McLean, Melba, Patterson, Red Duchess, Reinette du Canada, Rescue, Summered, and 15C-4-44 (Brooks).

Apricot: Local seedling grafted onto Pembina plum.

Cherry: Seedling from local store fruit, grafted onto pincherry.

Pears: "Anjou", Bartlett (Williams' Bon Chretien), David, Golden Spice, Pioneer 3, and Tioma.

Plums: Brooks 40, Dura, Greengage, Grenville, Italian prune plum, Ivanovka, Kaga, La Crescent, Manor, Mount Royal, Norther, Opata, Pembina, Pipestone, and Wessex.

The Friends of the Garden congratulate Mr. Diakiw on his perseverance in setting up this backyard experiment, and wish him continued success.

Wind from the West

MRS. MARY BOYD
Milk River, Alta.

Here in south-central Alberta the biggest problem for gardeners is the wind. It blows from the west off the Milk River Ridge.

In our first attempt at gardening in Milk River town, we found the soil was excellent because the previous owners were very good gardeners. We were a little late in planting but with the help of good advice from our neighbors, results exceeded our expectations. The local flower shop supplied us with bedding plants, and we set out tomatoes and cauliflower. A friend gave us a few cabbage plants, and we were on our way.

While walking around the town one evening we were puzzled by the many plastic bottles and ice cream pails dotting the gardens. We found out they were protecting bedding plants from the wind. So we too rushed around and gathered some for our garden. Enough plants survived, and these were *not* pruned, as the extra branches helped withstand the wind.

We found that our raspberry bushes were at the mercy of the wind. They needed the protection of a hedge or fence, but the small amount of fruit we received was good. As my husband enjoys raspberries, he set to work to build a tight board windbreak on the north side. The west side is protected by the end of our double-wide mobile home, and the east side by our neighbor's home, so we transplanted some raspberry canes early last fall. We hope they survive this winter and we'll be able to enjoy fresh raspberries this season.

Here's to good gardens in spite of the wind!

Birds in My Garden

MARY F. BRENNAN
Ituna, Sask.

Birds and gardens have a natural affinity and give a source of pleasure to both eye and ear. There are various ways to attract more birds to our gardens. One certain method is to plant shrubs which bear fall and winter feed for them. A few annual plants also have seeds which are attractive to some species of birds.

In one corner of my garden I left a heavy stand of chokecherry bushes, and last fall these were festooned with massive trusses of purple fruit. Then one day, almost as if by mutual agreement, the robins and the cedar waxwings descended on them, and within a week there wasn't a berry left. These birds also like the honeysuckle berries, enjoying the orange or scarlet berries of the Tartarian, Zabelli or the white varieties, or the soft, cloudy blue of the Sweetberry honeysuckle in the hedge. The cedar waxwings in particular favour the honeysuckle, often coming to the bushes before the fruit is really ripe. The Peking cotoneaster serves as a welcome source of food in the wintertime for the near relative of the cedar waxwing, the Bohemian waxwing, as does the Mountainash or Rowan tree. I have seen flocks of up to three or four score birds perch in the tops of the poplars, whistling softly as they drop to the hedge, a few at a time, to feed on the clustered berries. These birds also feed extensively on the tiny fruits of the Siberian crabapples. Our well-grown tree of this kind served as a lunch counter for a flock of waxwings all winter last year.

In my garden is a hedge of Cherry Prinsepia, which bears a heavy crop of oval, orange berries. Oddly enough, the robins, while stripping the chokecherries bare, never touched the prinsepia cherries, but the waxwings have almost cleaned them out.

If you want even more exotic birds, a supply of sunflower seeds will attract those occasional but erratic visitors, the lovely red pine grosbeaks, and the equally lovely black and yellow evening grosbeaks. In the bush which adjoins my neighbour's house lives a lone ruffed grouse. He feeds on the crabapples fallen from their tree, and I see his dainty tracks crossing my lawn to the cotoneaster hedge as well.

Among the annuals, the cosmos is very attractive to the goldfinch. In the fall when the seeds are ripening, I have seen one of these little gold and black feathered mites begin at one end of a long row of cosmos and work his way down the whole row, each plant swaying and dancing in turn as he moved vigourously along. One fall I watched a little pine siskin feeding almost at my feet on the fluffy seeds of the tiny yellow Matricaria, so ever since I have left a few of these plants along the garden path, although they are a rampant weed.

In addition to the above birds, in the wintertime you can tempt chickadees, blue jays and both kinds of woodpecker, the hairy and the downy to your feeding tray if you keep it supplied with a large lump of beef suet, along with a daily addition of a handful of sunflower seeds and, for an occasional treat, a few cracked peanuts.

There are not many pleasures to equal that of entertaining these lovely and lively visitors, and the birds which feed at your table are likely to nest in and around your yard the next summer, if at all possible.

As an added bonus this last fall a couple of little chipmunks took a liking for the red berries of a different contoneaster which grows beside my door. They grew so tame that they would climb on to my knee or sit on my hand and eat sunflower seeds, and would even come when I called them. In such small happenings will you find the joy and magic of your garden!

Trumpeter Swan Display for Queen's Visit

YVONNE MacALISTER
Grande Prairie, Alberta

The attached photo shows the Trumpeter Swan's display at the College for the Queen's visit in 1978. The swan is the symbol of the city of Grande Prairie. After I designed the setting, the grass and cattails, the little trees, moss and sand, and the lily pads from a nearby lake, were all picked by local young people. This area is the only place in Alberta where the Trumpeter swans nest, then they fly south to winter in the United States.

My Way with Perennials

MARGARET FOSTER
Barrhead, Alta.

Many gardeners possess no greenhouse; and some even manage without a cold frame. Of the two omissions, it seems to me the latter is the more grievous one. Greenhouse gardening is rather specialized, and while results show satisfactory returns for the expense and effort involved, still an entire garden system can operate satisfactorily without recourse to glass, except for the starting of tender and half-hardy annuals on sunny window sills.

Advantages of a Cold Frame

A cold frame is a very different thing. From the early spring days, when seedlings are beginning to get leggy, tuberous begonias have reached the stage when they must have outdoor light; tomato plants need to be hardened off before they are set in the garden, and for this the cold frame fills the bill. Without it, one must carry all of the accumulated started things out in the morning, and in at night. And even with this watchfulness and care, there still remains the wind. A brisk wind, blowing up suddenly can create devastation among the brittle stems and tender leaves.

There is also another field in which the cold frame shines — the starting of perennials from seed. I have found perennials no more difficult to start than annuals; and one may keep well within a modest garden budget and still have a fair representation of the choice varieties. A long border may be obtained for the same amount that would otherwise be spent for a single named specimen.

There is another advantage that is not as well known, and that is the plant grown from seed and matured in a given environment possesses a native vigor and resistance not found in material purchased elsewhere.

At the outset, it is well to realize that perennials do not germinate as readily as annuals. In the case of the annual, nature sees to it that seedlings are produced, thus ensuring survival of the species; in the general scheme it is not so important that perennial seeds grow, since the plant lives to bloom again. With some kinds, five seedlings from a packet of seeds may be regarded as successful germination but, in view of the range and scope of varieties, this is satisfactory. Nor does this figure indicate anything but the lowest average return: such exotic beauties as Pacific Giant Hybrid delphiniums have germinated 80 per cent for me.

Since perennials, for the most part, do not flower the year they are sown, there is no need to be in a hurry to start them. They will do better if we wait until the end of June, and by this time all the spring occupants of the

cold frame will have moved on. Exceptions are delphiniums and columbines which do not germinate readily in warm temperatures. The delphinium seed needs twenty-four hours in the freezer before sowing, and both kinds need to be sown in flats and placed in the cold frame early in the spring. Dates and seasons vary; a good rule here is to start when the snow is all gone.

Making a Cold Frame

Now as to the frame itself. It should be in a place protected from north and northwest winds, with a southern exposure, well drained, and handy to the house and garden.

Make the frame of tight boards, insulated on the inside with corrugated cardboard, thirty inches high at the back and sloping to twenty-four inches in front and a size to fit the sash that is to be used. A half size sash has much to recommend it: ease of handling and ease of reaching to the back of the frame from the front. For extra protection, bank up a little with soil on the outside. For summer use, a slatted frame takes the place of the glass, which gives dappled and filtered sunlight; and to protect baby seedlings from violent rain or too intense sunshine, one needs a frame of light wood to which cheesecloth or light muslin is tacked, and having a pointed stake nailed at each corner to serve as a leg. These stakes should be of a length so that when the screen is in position there is a two-foot space between it and the top of the frame. This allows free circulation of air.

This is the orthodox cold frame, but should the makings not be readily available, the ardent gardener can improvise and get along fine. On the farm my cold frame was a big, lid-less old trunk with the bottom taken out. The cover was a cello-glass window that had once done duty on a chicken house. The entire structure left much to be desired, yet it served the purpose for years. On one occasion, during an unseasonal cold spell with snow and wind, and with every inch of space taken up with seedlings, slips, resting house plants, etc., the cello-glass window was shut well down and a heavy garden blanket thrown over and tucked in at the base. Everything rode out the storm. When the temperature rose and the sun shone warm again, I removed the covers to find all were flourishing. In the event of the weather being so wintery as to threaten the safety of the plants, being in containers, they can easily be moved into the house.

Soil

Now, to consider the perennials. There is a dual advantage in the frame as compared with an open seed bed: not only can climatic conditions be very largely controlled, the soil can be exactly whatever we desire.

Dig out two inches of the existing earth, and fill level with gravel. Now, with the soil mixture of your choice fill up to within six inches of the top of the frame. My mixture is: top soil from willow land, two parts; sharp sand, one part; pulverized peat moss, one part. Mix well and fill the space prepared. Dust the surface lightly with bone meal and, if available, dust again with powdered sheep manure. People who keep sheep may find treasure of the kind cherished by florists in an old sheepshed unused for a year or two. The dry dust is the kind to gather.

I am quite aware that the experts frown on enriched soil for this purpose, saying that it is useless or worse. It is true that the cotyledons cannot use food in their earliest stages but, conditions being right, almost immediately the first true leaves will appear, and the little rootlets are sent down for nourishment. I would never advise very rich soil, or soil that is at all heavy but, given sharp drainage, no harm will come from the dusting.

Work the soil over thoroughly again, tamp down well, and soak to the saturation point with rain water. Leave overnight. The soil should now be ideal for sowing, just dry enough to crumble apart when grasped in the hand. Make rows three inches apart, sow very thinly — the larger seeds a quarter inch deep, others less. Very small seeds may simply be pressed into the soil. Then cover the rows very lightly with sand, add labels, and put muslin cover in place.

Watering

It is important that the seed-bed must not dry out. Water when the surface is dry, using the finest nozzle, and never sprinkle. Do a thorough job and leave it. Do **not** keep it soaking wet; the surface should dry off for several hours or be left until the next day.

After the seedlings are well up, the cover may be left off at night and on rainy or cloudy days. Shelter from the sun and allow free access of air. By the middle of August the plants should be sturdy youngsters. Gradually harden them to sunlight now by leaving the cover off a little later each day; and watch for a cool cloudy day — just before a rain is ideal — to transplant them into the border. Use plenty of water and don't forget to shade them should the sun pop out.

Any plants, not crowded, may be left in the frame until spring if this is more convenient. The Oriental poppy, which does not transplant easily, can be done, without loss, while dormant in early spring.

It is in the nature of the frame to catch and hold snow. This tendency can be increased by placing light brush across it. All the occupants will be snug and happy; and such things as English daisy, which in much of the west does not survive in the open, will come through with a little rosette of leaves, and flower buds ready to thrust forth.

Seed

Some of the better-known perennials that can be grown easily from seed include Iceland poppy, Oriental poppy, pyrethrum, English daisy, forget-me-not, delphinium, columbine, gaillardia, scented pinks, sweet William, lychnis.

Sow the best seed you can get. High-priced seed is not expensive when considered in terms of perennial plants of named varieties, true to color and type.

Caution: Whenever the sash is used on the frame, ventilation must be given. Even on fairly cold days open a crack on the side away from the wind, and on warmer days open a little more. Moisture on the glass indicates the need for more air.

Show What You Grow

YVONNE MacALISTER
— A Judge in the Peace River Country
Grande Prairie, Alta.

The fall is the time of flower shows and fairs, the time gardeners get a chance to show what they can grow. The time a show judge can walk into a hall in a small community and see a splash of beautiful color and shapes, knowing that he or she is seeing the results of many hours of tender loving care. It is a time when a judge likes to just stand back and enjoy the view!

Judging

A close inspection is made at first to see if the exhibitors have read the Judging Standards for Horticultural Shows. These are available at all Department of Agriculture offices, and a judge must follow these rules, committee rules, and also use common sense. Note is made of the variety, whether it is easy to grow, or was some staking required to keep it straight, or special light, food, or just simply a lot of extra care needed. These are a few things that help the Show Committee and the judge. A very important item of course, is to have a lovely display for the public to enjoy and learn what can be grown in the area.

Suggestions for Showing

The following list of suggestions may help everyone involved to have an enjoyable day.

1. Get a Show Sheet and study it, as each Show has different rules.
2. Check off the classes you may wish to enter.
3. Look over your possible entries, and fill the cards well ahead of time.
4. Be sure to get your entries in on time. (Rings of rolled up newspaper around and between the exhibits will help keep them safe while being transported.)
5. Be a good sport if you do not win. Speak to the judge, not your friends, if you are not happy about some of the judgments.
6. Remember, a judge works only on what is before him, or her, not on what you meant to bring.
7. Also remember a judge is looking only for a well grown plant, not a super giant. Just a well grown healthy plant.
8. Always put the correct number and measurements called for, as this is checked immediately.
9. Try to put the names on all plants and flowers, this is of interest to many of the spectators.
10. Keeping these things in mind, go and enjoy yourself. Meet people with the same interests as yourself, and take pride in winning ribbons. It is thanks to people like you, who take the time and trouble to bring your exhibits, that any show is a success.

It is a time to exchange ideas, help your fellow gardener, as trial and error takes so much time. Remember the older gardeners who gave you a helping hand over the years. Take time to visit their gardens and learn from them.

I always enjoy presenting my yearly trophy to a helpful, outstanding gardener. I wish you all good luck with your growing and showing.

It Can Be Done

Fruit Growing in Alberta

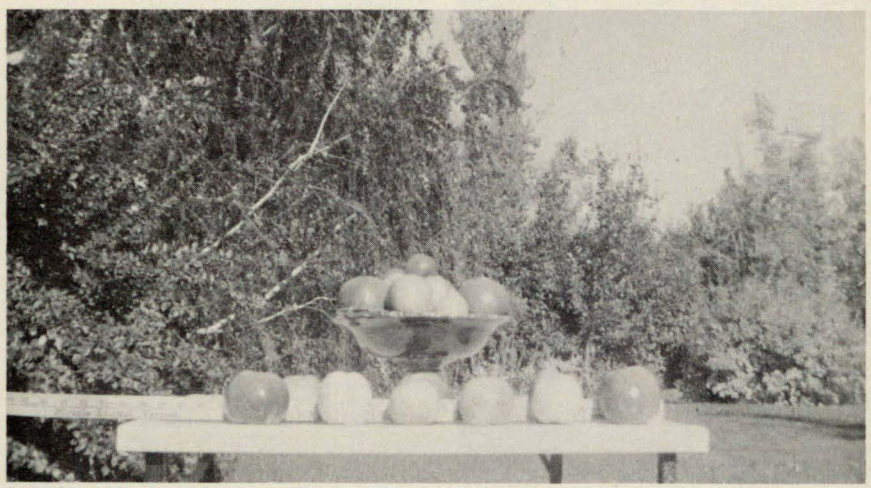
MISS JOAN BLADES
Fairfields Farms, Ohaton, Alberta

Beginning

In the year 1929 the "Country Guide" magazine offered four fruit trees with a subscription. The growing result of these trees gave my father, John Raymond Blades of the Ohaton district, near Camrose, Alberta, his start in horticulture as a hobby, and turned a dream into reality. Those Russian apples and two crabapples are still producing!

Now began the search for more fruit trees. The large ploughed area already had a natural windbreak from the north and west, and a row of caragana was started to the south. Such trees and shrubs as Nanking Cherries, Opata plums, sandcherries (for better pollination), Piotet, Columbia, Transcendent, Manitoba Spy, Haralson, Hibernal, more Russian seedlings, Siberian Pear, more plums and gooseberries, currants and raspberries were now fruiting. Many other trees were also planted but, unfortunately, did not survive mice, rabbits, hard winters, early spring frosts, and drought.

Many people soon heard about our project and came to see for themselves that edible fruit could be grown in Alberta, and our farm soon became a popular place for Sunday drives.



Fruit from the Ray Blades' orchard.

Many Varieties Tested

In 1945 the Brooks Provincial Horticultural Station became interested and a new piece of ground was readied, windbreaks planted, and many new varieties tried. Not all of these were hardy, and so as the prairie nurseries kept advertising hardier apples and larger plums, these were tried, and today a very good variety of large apples is being grown, as well as plums, cherries, applecrabs and crabapples.

After a very bad winter of mouse damage, grafting became widely used. This was bridge grafting which proved quite successful, and soon led to bud and cleft types of grafting. Many small crabapples now produce large grafted apples. In fact, one of ours has seven varieties — Siberian Original, Renown, Harcourt, Rutherford, Transcendent, Moscow Pear and Maclean.

Good pears and apricots have been tried repeatedly, now three apricots and four pears of fair quality are producing. The best pear, so far, is Phillip. This pear is large, several weighing one-half pound. The little Parker pear is nice to eat out of hand but it is rather small for canning. Also the Brooks is fair. The best large cherry is Meteor, but must be netted early as the birds also like it very much.

Old Piotet still producing.

Three years ago, the first time in over forty years, a severe outbreak of fireblight took its toll, especially of the Rosyblooms, Transcendents, Brooks 27 and the pears. Much cutting, spraying and burning seems to have it checked.

The Results

The part-time hobby of a full-time farmer cum horticulturist grew into a full time job. More recent good apple varieties such as Luke, Goodland, Advance, Adanac, Collet, Minnesota 447, Harcourt, some numbered Brooks, and Dad's own plum from seed, are producing well. When there was more fruit than we could use, it was given away, but the destructiveness that followed made it essential that it be a supervised pick and sell job. In the fall it can get pretty hectic, especially Sundays.

There are now many people who are growing their own fruit trees after seeing what can be done. Dad showed the way and proved what can be done when someone has enough determination. A Diploma from the Alberta Horticultural Association and from the Western Canadian Society of Horticulture hangs proudly on the wall. Dad, 'Ray', passed away October 5, 1977, but his efforts will never die, the beauty of Fairfield Farms will remain an inspiration to all who love trees, fruit, birds, and beautiful grounds.

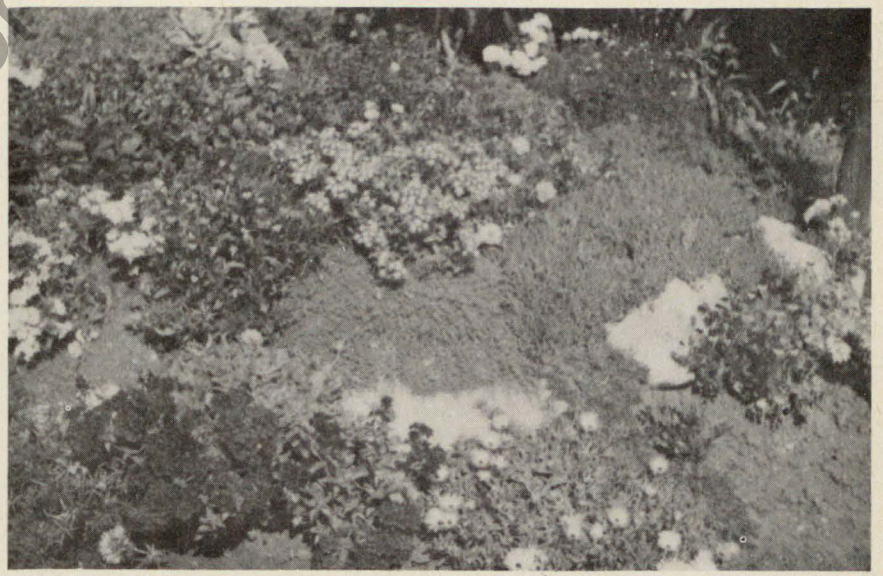
How was Your Garden in '78?

ROBERT STADNYK
Westlock, Alberta

Now is as good a time as any to take time out and comment on the performance of a few of the many varieties of garden plants in our 1978 garden. The following varieties of flowers have proven themselves at one time or another, depending on the conditions of our growing seasons, and some do well regardless:

Aster (Mini-Lady Series)

These are the most outstanding varieties of aster available today. The plants are large flowered, more disease tolerant than most varieties, and earlier blooming, producing huge three- to four-inch mum-like flowers on sturdy 10-inch stems. The compact plants withstand harsh weather con-



"Twinkle" phlox planted in a rockery amongst creeping Mother of Thyme and Ice Plants blooms extensively from early June until freeze-up.

ditions very well. Available in two colors only: rose-pink and a deep blue.

Ianthus (Magic Charms)

A former "All American" winner, ranging in color from scarlet, crimson to salmon pink, and white, with unique speckled bi-colors available as well. One and one-half inch fringed flowers are produced freely from June right up until freeze-up. Withstands all adverse weather conditions. Is very showy planted around trees or shrubs, especially in front of evergreens.

Trailing Lobelia (Blue Cascade)

Large light to medium blue flowers making an ideal contrast to the variety "Sapphire". These make ideal hanging basket and tall planter subjects as they trail down to a length of 8 inches. If grown in a hot dry location, be sure to keep well watered at all times.

Marigold (King Tut)

I have grown these for several years, each year with total satisfaction. There are newer and somewhat more superior varieties of dwarf double French marigolds; however, I still prefer the King Tut for its early blooming ability. Once in bloom, King Tut never quits until a killing frost blackens the plants in the fall. Flowers are tufted and golden yellow in the center surrounded with dark red outer petals making a very contrasting show, on sturdy 10-inch plants.

Mimulus (Monkey Flowers)

Mimulus can be seen growing wild around swamps or bogs in some parts of Europe. They will thrive well in our prairie climate in a damp dense shady area, they prefer growing in "wet" soil. The flowers resemble open-faced snap-dragons about 1.5 to 2 inches across and are uniquely spotted or blotched with maroon over a yellow background. One disadvantage is that they are susceptible to wind and rain damage. However, when the plants are knocked over by the above forces, they adapt and change their growing habit. Instead of growing tall, the plants form roots at each stem joint touching the ground, their growth habit becoming dwarf and carpetting. Clip plants back in late July and by mid-August an abundance of bloom will be produced once more. So, if nothing else will grow in that dense, shady area of the home grounds, try Mimulus.

Nicotiana (Daylight Sensation)

Unsurpassed for fragrance. A few plants mixed in near the back of an annual or perennial border will produce an abundance of star-shaped, sweet-smelling blooms, ranging in color from lavender, purple to rose and white all through the growing season. Nicotiana is noted for its evening fragrance, which is most prevalent on a calm warm evening. During the day the blooms close and the plants look leggy, however, the variety "Daylight Sensation" remains open throughout the day.

Phlox (Twinkle)

Deserves more rave notices than it receives in the seed catalogues! Masses of small star-shaped flowers are produced in such abundance that the plants tend to lay out under periods of rainy weather. Extremely showy compact plants for the front of the border, available in almost every color except yellow, with several color combinations available as well. Spent blooms should be pinched off for a steady flow of bloom.

Snapdragon (Sweetheart)

Appropriately named. Dwarf, 12-inch, hybrid azalea-flowered type of snap, available in a vast color range. Basal branching and wind tolerant. Resembles "Madame Butterfly", but only dwarf. Excellent for cutting.

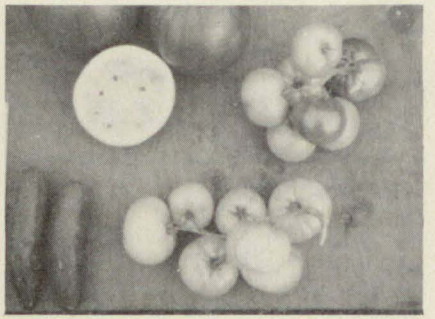
Torenia (Wishbone Flower)

I tried these for the first time this year, with reasonable success. During periods of hot dry weather, torenias must be well-watered otherwise they deteriorate rapidly. They do well in semi-shady areas, producing a good supply of penny-sized sky-blue pansy-like blooms with dark purple blotches and yellow throats. Must be started indoors as the seed is very small and growth is slow.

Vegetables

Here are a few random comments about some vegetable varieties worthy of mention for our prairie gardens.

Corn — One would be remiss not to mention the superior performance of Northern Vee Hybrid Sweet Corn. Actually, any of the "Vee" hybrids do very well in our short growing season; however, Northern Vee has the ability to germinate in "cold" ground, thus preventing the seed from rotting — a problem often blamed on the seed companies for selling inferior seed.



Watermelon — Red Sugar Lump (an icebox type of melon)

Victory hybrid cucumbers, averaging in size from 7 to 9 inches.
Hybrid tomatoes — Ultra Girl

Cucumbers — Many varieties of cucumbers do very well on the prairies. However, if you want a big, uniform, dark green type of cucumber for slicing, Victory is the one that is not only very early bearing (50 days), but is also resistant to a wide span of diseases. Fruits average 8 inches in length but are an improvement over the old-fashioned "Straight 8 inch", as the plants are gynoecious, which means double the yield.

Tomato — Ever wanted an early, large, meaty hybrid staking tomato that is tolerant to cracking and has multi-tolerance to verticillium fusarium and other wilts and blights, and is nematode tolerant? "Ultra Girl" produces very firm tomatoes weighing 8 to 10 ounces, often ripening on the vine. Ultra Girl is the ultimate in an early staking hybrid tomato suitable to the prairies.

Watermelons — For those wishing to try watermelons, Red Sugar-Lump "Icebox" is the variety worthy of mention. Seven- to eight-inch melons are produced, with the flesh being a light pink but sweet as sugar. They are very early, and growing transplants under hotcaps is recommended.

Others — A few of the other vegetables worthy of mention for the prairie garden include Tomato (Rocket, Starfire), Spanish Onion (Chieftain), and Pumpkin (Spirit).

These are a few of the flowers and vegetable varieties which do exceptionally well in our climate. I'm sure you have your favorites, too.

Culture of House Plants

GORDON FINDLAY
Dept. of Plant Science, University of Manitoba

Acquisition

When it comes to acquiring new plants for your window gardens, it is best to get them from a neighbour or from some place where they have been growing under house conditions for a period of time. The reason for this is that plants purchased from a store have usually just been brought in from a greenhouse and tend to go into a state of shock for the first few weeks in your house. They were growing in a greenhouse under optimum conditions (i.e., high humidity and cooler temperatures), and you have brought them into an area where the humidity is probably fairly low and their surroundings are warmer. The filmy leaved plants are more susceptible to this change than the thicker leaved plants. That is why ferns usually drop most of their leaves and philodendron leaves develop large black spots.

Minimizing Shock

To minimize this shock your new plants have to undergo a gradual acclimatization process. Keep them under fairly high humidity conditions by misting them with water in an atomizing bottle several times a day, or cover the plant during the day with a filmy plastic such as a dry-cleaning bag. The frequency of misting or the length of time they are covered can gradually be reduced to acclimatize your plants to your household conditions. If you cover your plants with plastic, be sure no sunlight strikes the plant as it will heat up quite rapidly under the plastic. It is also advisable to try and keep your plants around 65°F as this is probably the temperature at which they were growing in the greenhouse. By following this procedure for the first month your new plants are in the house, your chances of successfully adapting them to their new environment will be enhanced. Also, do not fertilize your plants at this time as you do not want to start them into new growth as yet.

Repotting

In the spring, it is time to consider your plants' foundations as without proper footings they cannot grow. I say spring because this is the best time of year to repot your plants as they are semi-dormant, just getting ready to grow for the on-coming season. During the winter most plants do not grow and so should not be repotted in the fall, as this could stimulate them into winter growth when the light is low and the result is sickly, spindly, plants.

To check the root condition of your plant, invert the plant holding its base and the soil surface with one hand, and tap the edge of pot on a solid object. The roots and soil will slide out intact. If the roots have progressed to the point of filling the pot, and show outside the soil, the plant needs repotting. If the soil ball crumbles, repot in the same container.

If the plant needs repotting, select a pot only one size larger. If the new pot is too large, the soil around the outside tends to sour before the roots reach it and this may kill your plant. A pot with bottom drainage holes to allow the excess water out to prevent water logging is preferred. If you tend to underwater your plants, use plastic pots as they do not dry out as fast as clay pots. If overwatering seems to be a problem, select clay pots that "breathe" and allow more air into the root ball which is essential for a healthy root system.

Crassula (Crassula arborescens)

Once you have the new pot, cover the bottom *completely* with a coarse material such as broken pot or broken plate chips. This is done so that excess water can drain away, *not* to stop the soil from falling out the bottom.

Next, cover this drainage material with peat moss, sphagnum moss or coarse leaf mold. This acts as a sieve to prevent the soil from washing into the bottom and clogging your drainage. Now the pot is ready for planting. Set the root ball in and fill around it with a good potting mixture making sure the original soil surface is at the same level as before so that the roots do not smother. Bang the pot on a solid surface a few times to be sure all the large air pockets are filled with soil, and tamp down with your thumbs. For large rooted plants such as the philodendrons, clivias and rubber plants, the soil should be fairly firm. For finely rooted plants like African violets and begonias, the soil should not be packed down too hard as the tiny roots will not be able to penetrate it.

If you wish to use a container with no drainage, try planting in a pot and setting this pot inside the container. You will have more success with this method. But, if you want to plant directly into a solid container, remember to use at least one inch of drainage material in the bottom. Never plant directly into a copper or brass pot as these metals tend to inhibit plant growth.

Soil

As a general purpose soil, the following is quite adequate:
1 part good garden loam (not clay)
1 part sand (or perlite or turface; not vermiculite)
1 part peat moss (or leaf mold)

For ferns and gesneriads, double the leaf mold. For cacti and succulents, double or even triple the sand. Some people prefer to use perlite as it makes the soil lighter to carry around than when sand is used. Do not gather sand off the beach or roadside as it contains too much salt or alkali. If you must use this sand, wash it thoroughly several times with fresh water to remove the salt deposits. When gathering leaf mold, stay away from oak leaves and spruce needles as they tend to be too acidic.

Scrape away last fall's leaves and collect the two-year-old leaves because they are decayed enough to be crumbly but not excessively decomposed.

Do not sterilize your soil unless you are using it for sowing seeds or for planting in a narrow-necked terrarium. To "pasteurize" soil, put it in a shallow pan to a maximum depth of two inches and bake in a 200 degree oven for two to three hours. It should be moist before putting it in the oven. Another method is to put it into a baking bag, the kind used for cooking roasts, etc. This way, it will not create an odour in your kitchen.

Growing Your Plants

There are two main reasons for mortality of house plants, lack of humidity during the winter, and improper watering.

Prairie winters tend to be very hard on house plants in that our interior humidity is usually far below what most plants require. However, there are several easy methods of getting around this. One is to purchase a humidifier, but it does not actually raise the moisture level high enough throughout the house, as the furnace tends to remove the moisture from the air again. Thus your plants should be grouped around your humidifier.

A simpler method is to set your plants on trays filled with rocks. Then fill the tray with water up to the surface of the rocks. This water will tend to evaporate up around your plants, and maintain them in a more humid atmosphere than the rest of the room. Be sure they are not in a draft from a window or a furnace register. The rocks keep your plants out of the water so that they do not get wet feet, as well as providing a larger surface area for water evaporation. Frequent misting with an atomizer is also very beneficial, or non-display plants can be covered with a plastic hood to maintain the humidity.

Watering

When it comes to watering, the general rule of thumb is: when the top half-inch of soil feels and looks moist, the plant needs no water. When this top half inch is dry, it is time to water. When watering, use enough to wet the root ball from top to bottom (i.e., until water runs out the bottom). But, do not allow this water in the saucer to be soaked back up into the pot as it contains harmful salts washed out of the soil. That is why plants watered from the bottom soon form a white crust on the surface because these salts have not been washed out. If this happens, scrape off this crust and water thoroughly from the top to rinse all these out of the soil.

Type of Water

As to type of water, any tap water is good as long as it has not been chemically softened. Even chlorinated city water does not contain nearly enough chemicals to harm your plants. Remember, thick or hairy leaved plants require less frequent watering than thinner leaved plants as their leaves do not transpire water as quickly.

Fertilizing

Almost all plants require fertilizer because they are growing in a confined space and, once all the food in that pot has been used up, the roots cannot go elsewhere looking for food. Generally, plants should be fertilized with a good general purpose fertilizer every three to four weeks during their growing season (i.e., March to September). During the dull winter days, your plants are more or less resting and so should not be fertilized.

A good general purpose fertilizer for foliage plants is 20-20-20 or 14-14-14. Both should also contain micro-nutrients such as iron, manganese, magnesium, copper, zinc and boron. A good fertilizer for flowering plants is RX-15 whose analysis is 15-30-15. The higher centre figure represents a higher percentage of phosphorus, which helps stimulate flowering. The first figure represents nitrogen, while the end figure represents potassium. These are the three major nutrients essential for plant growth and maintenance. Fertilizer shortages are often indicated by yellowing of older leaves which frequently indicates a shortage of nitrogen. Chlorosis of the new growth signals a shortage of iron.

Plant Problems:

Overwatering — plant remains wilted even though soil is moist. Check drainage in the pot.

Underwatering — scorching and stunted growth. Soil may not be water retentive. You may not be giving sufficient water to wet the entire root ball. Plunge the entire pot in a bucket of water until no more air bubbles rise and then set the pot out to drain.

Curling of the leaves — frequently caused by cold drafts, especially with gesneriads (i.e., African violets, etc.).

Air conditioners — murder on plants because of the cold draft. They also dry out the air too much. Move your plants to a shady protected area outside for the summer.

Tip burn — low humidity or soil which is not water retentive. It is normal on spider plants; just keep snipping off the ends.

Oedema — a small wart-like projection on leaf undersides (begonias) or on leaf petioles (impatiens). It is a signal of overwatering. Also may show up as water droplets on leaf tips.

Air Layering

Some plants such as the Dieffenbachias and rubber plants grow too tall for the home and you wish they would shrink so that you do not have to dispose of them. Well, this is possible by a procedure called air-layering.

Decide how tall you want your new plant to be. If you want a three-foot tall Dieffenbachia, make an upward cut into the stem, half way through, three feet from the top of the plant. Insert a toothpick or wooden match in the slit to prevent it from growing back together. Wrap the wounded area with wet moss then with plastic to keep it wet. Soon roots will grow from the area above the cut. When these roots are about four inches long, cut the plant off just *below* where the roots form, remove the

plastic and pot up your new three-foot plant. The remaining Dieffenbachia stem can be cut into four-inch sections and planted. Each section will grow a new plant. This method can be used for most soft stemmed plants.

With woody plants like the rubber plants, make a double spiral cut on the stem in the appropriate location so that you can peel off a piece of bark approximately one-eighth of an inch wide, three-quarters of the way around the stem. Wrap with moss and plastic as before and the top portion will root. However, the remaining bottom stem cannot be sectioned like the Dieffenbachia. It will send out several new shoots which in turn can be air layered to give you several new plants.

On the Other Side of the Fence

MARJORIE HUGHES-CALEY
Prince Albert, Sask.

The change had to come! After enjoying gardening in Prince Albert for more than sixteen years I realized that in my eightieth year I was slowing down. I managed to plant my garden but my husband's sudden death and a bout of arthritis prevented me from cultivating. When crops ripened I had to get a young unemployed student to gather them for me. No longer could I take gifts of nicely washed vegetables to older friends who had been forced to move to apartments.

Now I am living on the other side of the fence, appreciating to the fullest extent the gifts of gardeners who remember me in my comfortable apartment. Things come in small quantities and well washed except in the case of potatoes which are delivered as I need them in exchange for garden tools I can no longer use. Friends who remember my special liking for broad beans and parsnips see that I get them. My lovely big window brings sunshine to the few house plants I brought with me and I have visions of growing tomatoes on my balcony next summer.

My greatest joy was the fact that the student who helped me during the summer decided to enter a few articles in the local horticultural shows and won prizes too. I propose to give her a membership in our local Society as a Christmas present and to give other memberships to young friends who show an interest in gardening. That is an idea for retired gardeners now living on my side of the fence!

Annuals

MRS. C. W. BEATTIE
Winnipeg, Man.

Choosing Plants

The abundance of printed material available has told us how to grow annuals, either by starting them indoors in March or April, by sowing the seed directly into the ground as soon as the danger of frost has passed, or by purchasing flats of bedding plants from the market gardeners.

But, perhaps we don't pay enough attention to the selectivity of annuals and the purpose for which they are to be used. Are they to be part of the overall landscape plan for your grounds, perhaps only using certain colours? Are you a flower-show exhibitor and, having kept the show schedule from the previous year, plan on growing the varieties listed therein? You may be a dedicated flower-arranger and have in mind certain varieties which serve this purpose so well. You may also remember from your childhood the sweet-scented flower beds of parents or grandparents and just want to grow the same flowers. Whatever your inclination, the variety of annuals from which to choose will fulfill these demands.

Planning

Pre-planning your annual flower seed needs a year in advance, is not only a wise but a very pleasant exercise. All that is required is a pencil, pad of paper and a good pair of feet shod in comfortable shoes. You may begin by attending the field day held at the University of Manitoba early in August each year where experts will be on hand to guide you through the trial plots. Here you can make note of the colour, height and growth habits of hundreds of annual varieties.

You should make frequent visits to the English Garden at Assiniboine Park. The hundreds of different varieties are all named and, again, you can make note of the colours, height and growth habits. Frequent trips are in order here for many annuals do not have as long a life as you might prefer.

There are a great many horticultural and agricultural shows held in Manitoba during the summer months. You could attend and participate in as many as possible, always making note of the winning varieties. You will not only see varieties you might like to grow next year, but will also observe the manner in which the winning exhibitors arranged their entries.

With the arrival of early winter, the advertisements for seed catalogues begin to appear in newspapers and magazines. Send for all of them! Not only does just looking at them help while away many a dreary winter day or evening, but there is a wealth of information contained therein, all helpful to your gardening plans. Last, but not least, order your seed requirements early and enjoy the knowledge that you

Flowers in the English Garden.

are ready to go to work when the robins begin building their nests.

Planting

When planting annuals (either bedding plants or seeds) it is helpful to dig a little bone meal into the soil. This acts as a slow-release fertilizer. Begin your pest and disease-control program early (cutworms just love tender, juicy little plantlets) and continue with it throughout the growing season. Do not allow roots to be exposed to the elements. A mulch of peat moss is easy to apply. Staking is necessary at an early stage if some of your plants are going to be overly tall (with the violent wind and rain storms we experience on the prairies, it is best not to grow them — this is where the height description in the catalogues is so helpful). Keep all spent blossoms removed and you will be rewarded by bloom until late into the season. Most flowers don't like wet faces so try to avoid turning the sprinkler on to water them. Instead, remove the sprinkler head, carry the hose to the flowers and water the roots really well. This will require a bit of back-bending and some time but it is well worth the effort. You will find that it is not necessary to water nearly as often.

Prairie gardeners are probably the greatest optimists in the world. A failure with some annual varieties this year or the loss of them all through the violence of a summer wind or hail storm is very disappointing at the time — but only until the thought of next year's garden comes to mind, and the planning begins anew.

Species Tulips— Neglected Treasures

PROF. DAVID PUNTER
University of Manitoba, Winnipeg

Few things give more joy in our prairie climate than the first flowers of spring. Unfortunately, we are not able to grow all the wide range of spring flowering bulbs that are available to our neighbours in warmer areas. Most prairie gardeners, however, must at some time have used tulips for a splash of colour, usually the Darwin or cottage types derived from *Tulipa gesneriana*. Striking as these man-made marvels are, they tend to divert our attention from their less conspicuous but no less beautiful cousins. This is a pity because there are real gems among the wild species that can hold their own in any prairie garden. What is more, many of them originate from the mountainous regions of Asia Minor where the climate is as rigorous as our own — long cold winters, short springs with plenty of melt water from the snow, followed by hot, dry summers. Thus, they are especially adapted to our conditions and, in many cases, flower exceptionally early, even before all the snow has gone.

Being mostly small of stature, the species tulips are well suited to rock gardens, banks and edges of borders. They may be naturalized among ground covers such as *Phlox subulata* (Moss Phlox), *Dianthus deltoides* (Maiden Pink), *Aubrieta deltoidea* (Aubrietia) and under shrubbery that throws only light shade during the summer. The reasonable prices of many of species make it possible to plant the bulbs in groups of six to eight, a practice which enhances their effect and makes for a striking splash of early colour.

Care and Cultivation

Species tulips require much the same cultural treatment as their domesticated derivatives, but tend to be less demanding. The choice of location is perhaps the key to success with these sun-loving plants. They should be given a site with a south-easterly, southerly or southwesterly exposure where the sun is not intercepted during their growing season and where the soil becomes dry in summer. They will tolerate a wide range of soils including all but the most extreme alkaline conditions of the prairie. As good drainage is essential it is as well to incorporate some peat or compost and some sand or vermiculite into our soils before planting. Feeding will not normally be necessary although a little high-phosphate fertilizer watered in around established clumps at flowering time will promote the formation of vigorous new bulbs for division.

Planting

Tulip bulbs are best planted early in the fall to allow time for root development before freeze-up. The soil should be thoroughly forked over in prepara-

T. kaufmanniana 'stresa'

T. kaufmanniana 'Daylight'

T. humilis

T. turkestanica

tion for planting. Set the bulbs about 8-10 cm apart and 15 cm below soil level under our conditions. This depth will give some protection to the bulbs and also allows for interplanting without disturbing them. Make sure that the bulbs are placed firmly into the soil to eliminate air pockets. Once the bulbs are covered they should be watered thoroughly to ensure that root growth will begin promptly.

Look for flower buds and leaves to appear as soon as the snow melts in spring. If the weather turns particularly hot and dry be prepared to give some water to prevent the flower buds from shrivelling. In most years it will not be necessary to water tulips at any other time. In normal to cool spring weather the plants will bloom for several days, creating a delightful splash of colour. Do not be alarmed if all the bulbs do not produce flowers in the first year. It is quite usual for these species tulips to flower more freely as they become established, unlike their cultivated counterparts which tend to decline with age.

After flowering, the heads should be removed before seed pods begin to develop but the leaves must be left intact to ripen and die off naturally. Either the bulbs may be left in the ground among other annuals or perennials or the plants may be lifted in their entirety to be ripened off in a trench prepared elsewhere in the garden. Once the tops have turned brown and dry they should be separated from the bulb by a gentle pull and discarded or burned to discourage the build-up of pests and diseases. As many of these tulips will multiply quite rapidly under our conditions, it is advisable to lift them every three to five years after the tops have died down. The tops and old roots should be removed gently from the bulbs which are then laid out in a dry, well ventilated place to finish ripening. All the bulbs may be replanted in the usual way or the small ones brought on to flowering size in a separate nursery bed.

Pests and Diseases

Tulips are relatively free of pests and disease problems, the species even more so than the hybrids. Nevertheless, it is sound practice to choose a fresh spot or change the soil when replanting bulbs, to prevent a potential build-up of tulip fire or Botrytis blight. Signs of this disease are stunting, blasting of buds, spotting of leaves and petals followed by grey mould and finally formation of shiny black sclerotia (fungus resting bodies 1-2 mm in diameter) on dead aerial parts or bulbs. Any bulbs with sclerotia should be discarded and burned; early symptoms on aerial parts can be treated by spraying with ferbam or zineb or by drenching the soil with benomyl. Other bulb rots should not present a problem in well drained soils if overfeeding and over-watering are avoided but bulbs or planting holes can be dusted with captan and PCNB if necessary. Aphids should be controlled by spraying or dusting with malathion as they can carry several viruses which may cause flower break, mottling of foliage or general degeneration. Most of these problems can be avoided by careful attention to cultural practices and the use of bright healthy bulbs.

Recommended Species

All the species listed below have done well in our Winnipeg garden. Those which grow up to 20 cm are most suitable for the rock garden while taller species will make a good showing in the border.

Many others are obtainable and well worth trying, including a range of varieties and hybrids which have been selected or bred from *T. kaufmanniana, T. forsteriana, T. eichleri* and *T. greigii.*

The most convenient and reliable source is C. A. Cruikshank Ltd., 1015 Mount Pleasant Road, Toronto M4P 2M1. They supply selected bulbs in good time for planting by the dozen, half-dozen or, in some cases, singles. Prices are mostly in the $2.50-$5.00 a dozen range although a few rarities may be more expensive. A starter collection of 30 bulbs (3 each of 10 species), available at about $8.00, is good value.

In our climate where many of the traditional ornamentals cannot be grown there is all the more need to take full advantage of the range that will thrive. The species tulips are beautiful plants which certainly deserve a place in prairie gardens and it is to be hoped that they will be used increasingly in years to come.

Editor's Note:
Refer to Color Section p. 71a & 71b.

Name	Approximate Height (cm)	Relative Flowering Time	Flower Colour	Remarks
T. humilis (= *Pulchella humilis*)	12	early	Pale lavender-pink	Free flowering
T. violacea (= *Pulchella violacea*)	15	early	Deep red-violet, dark base	Free flowering
T. tarda (= *T. dasystemon*)	15	early	Deep yellow; white tips	Very hardy, increases well, free flowering
T. urimiensis	15	early-mid-season	Deep yellow	
T. batalinii	18	late	Pale yellow	
T. linifolia	20	late	Scarlet, black base	
T. stellata var chrysantha (= *T. chrysantha*)	25	late	Bright yellow inside, red outside	Increases well
T. turkestanica	25	early	Cream inside, greenish outside, yellow base	2-3 flowers per stem
T. kaufmanniana	25	early-mid season	Cream inside, pink outside	Water lily tulip. Increases well
T. praestans	30	early-mid season	Scarlet	Sometimes multi-flowered
T. clusiana	30	mid season	White inside crimson outside	Lady tulip; not free flowering
T. forsteriana	40	early-mid season	Scarlet; base black, edged with yellow	"Red Emperor" Spectacular

Rock Garden Plants

PHIL MATHEWS
Winnipeg, Man.

Alpine Plants for the Rock Garden

Many alpine plants are exquisite miniatures with beautiful flowers and foliage. They grow above the tree line of the high mountains of the world. The rock gardener finds it a challenge to collect and grow such plants in the lowlands of the northern climates, but to do this necessitates the imitation of the alpine plant's natural growing environment such as screes, crevices, rock faces, pavements, moraines, gravel areas, alpine meadows and boggy spots. In attempting to duplicate the natural environment of alpine plants, the technique of rock gardening was evolved.

Other Plants for the Rock Garden

Because many alpine plants bloom in the spring and a fewer number in the summer months, other plants which flower later than the alpines are used to augment and extend the flowering period. Suitable Arctic, sub-Arctic or boreal forest perennials are thus used.

There are disadvantages, however, for such plants are often more vigorous, invasive, too large, or their foliage coarser than the petite alpines. These features are undesirable in small rock gardens but can be used in a large garden. Many good ground covers are also too rampant and cannot be used, unless strictly controlled. Desert cacti are also good in very dry hot conditions but only a few species are hardy enough for the prairies.

Mounded, tufted and trailing plants.

Climate Considerations

The prairie climate, which includes a comparatively short wet growing season, then a long dry summer, running into a cool fall and cold dry winter, closely resembles that of the natural mountain environment of the alpine plant. There is a difference in the sunlight hours because the sun received by the plant in its mountain location is lessened by the shadows cast by peaks on the alpine slopes each day, compared to the long sunlight days in the open prairies. It actually means that the alpine plant prefers about half the sunlight hours that it would receive on the prairies.

However, soil and drainage are often so different between mountain slope and prairie that there must be a close imitation of the alpine habitat if alpine plants are to be grown successfully. Good drainage is a "must," but water must also be present in the subsoil.

The spring thaw and freeze conditions in parts of the prairies, or a thin snow cover, does necessitate some protection of plants by flax straw or snow banking.

The list of plants given are those which have proved hardy, but there are many others not listed which can survive if given the right microclimatic conditions.

The Rock Gardener

The true rockplant enthusiast, of course, will be challenged to grow alpines—the more difficult, the greater the challenge to simulate their natural growing conditions in the screes, moraines, gravels, crags, crevices, pockets, etc. Generally, he will dislike mixing the lowland rock plants, even if they are very attractive, because few are very hard to grow and many use up too much space. The beginner, on the other hand, will enjoy starting with some easy-to-grow lowland Arctic or boreal forest plants, and progress from there to a few alpines as he gains confidence. As his alpines increase in number, so will he reduce the lowland types accordingly.

Annual Plants

These can be used also, but sparingly because they will overwhelm the rock garden. They are useful to provide some flower color after the alpines have finished flowering, or in the beginning stages of the garden.

Shrubs and Sub-Shrubs

Dwarf ornamental deciduous and evergreen shrubs are used as accents in rock gardens, especially large gardens, but the emphasis must be on truly dwarf varieties, or sub-shrubs for small rock gardens. A background of taller evergreens planted clear of, and to the rear of the rock garden "island" is good for general landscaping and as a reminder of the treeline seen on mountainsides. Deciduous shrubs, no matter how tempting, do overgrow their bounds and are not recommended. It should also be remembered that alpine plants grow above the treeline and so shrubs are really out of place.

Choice of Plants

The shape or growth habit — the shape and form of growth is one

Shrubby, tufted and creeping plants.

important classification of rock garden plants and listing A is based on this.

Environment or Habitat

The different growing conditions of rock plants is a means to group different plants. For example, they grow preferably in a scree, or a rock face, or crevice, or moraine, or pavement, in lean or rich soil pockets, etc.

A list of plants by their habitat preferences thus can make a second classification method (List B).

If both A and B lists are used for planting the rock garden, the plant can be given optimum environmental conditions.

List A — Choice by Form of Growth

The literature on rock garden plant classification is apt to confuse, due to some inevitable overlapping of a particular grouping by other groupings, but some confusion can also arise from a misunderstanding of terms — What, for example, is meant by a cushion mound, hummock, clump, tuft, or bun? or again, a mat, carpet, creeper, groundcover, etc.?

The writer has compiled a list of the main headings to include terms which denote similar characteristics.

Hardiness

Lists can be limited to those which are proven to be winter hardy and satisfactory, or recommended by various authors on the prairies.

List A is Groupings According to Form.

List B is a Grouping by Habitat.

As these lists are lengthy, if the reader wishes a copy, please drop a note to the Editor, P.O. Box 517, Winnipeg, Man. R3C 2J3, and a copy of List A or B, or both will be sent to you.

The Special Areas of the Rock Garden

Alpine Meadows:

These are located above the mountain tree line between steep talus or scree formations on the slopes and similar steep slopes or precipices downside to valleys below. They form flat or gently dipping shelves or terraces of some extent. The meadows are composed of finer gritty material with humous rich top soil, clay loams, sandy loams, and even boggy areas.

Mostly the meadows are well drained yet the subsurface is moisture retaining.

Cattle and goats are driven up into these pasture lands in many mountain areas in the spring-summer snow-free season.

Many alpine plants form drifts, swatches and carpets growing amidst the grasses on these meadows.

These meadows are simulated in the rock garden by planting any flatish or inclined area between the rock ledges above and below, but no grasses are planted as these would soon overwhelm the alpine plants. Generally, the taller alpine plants are planted in mixed groupings or drifts. The soil is composed of loamy topsoil mixed with considerable gravel, grit and sand.

Rocky Pasture:

This is similarly formed as the alpine meadow but the top several inches of surface is stony and shaly with six inch blocks scattered over the area. Finer rock particles, sand, and loam occur in between the rocky material.

The basic soil for a rock garden:

It must be open, providing good drainage yet moisture retaining with a neutral fertility. Such a soil can be obtained by mixing one part sharp sand, or fine gravel (⅜ to ¾") with one part loam and one part leaf mould or peat.

Special areas such as a scree will have more sand, gravel or shale added and more loam will give the basic soil the alpine pasture characteristic.

Samples of spreading, creeping and clump plants.

Special pockets of soil in the rock ledges require other mixtures to suit the different requirements of the plants.

The loam of the basic soil should be a fine-grained material which will not lump or cake when dry. If the soil in an area is clay rich, humus and sand must be mixed in. The loam must be screened of stones and roots, particularly quack grass.

If the area soil is too sandy, humus and more clay can be added. The basic soil mix is spread 12 inches thick over all parts of the rock garden, except areas designated as scree, moraine, or rocky alpine pasture. Pockets are trowelled out for the addition of richer or leaner mixtures, as the case may be.

Screes and Moraines

The screes are formed by the tumbling down of large and fine rock material from gullies in the crags above or below the alpine meadows or valleys. They are also known as Talus cones and are fan shaped steeply sloping piles of rock material, finer at the apex but very coarse at the base and sides. These cones are often dry on the surface but the gullies funnel rain and melt-water through the subsurface. Alpine plants which prefer a dry rocky ground for their foliage also tap the subsurface water with long tap roots.

In the rock garden, screes are constructed by laying 6-inch rocks as a rubble in an 18- to a 24-inch deep prepared site below rock ledges to provide good drainage. On top of the rubble two inches of leaves or hay divide a soil-gravel layer above from the rubble, and prevent it washing into the latter. This soil layer is at least 12 inches thick and is a basic soil mix (already described) to which has been added additional leaf mould or peat, a little phosphate and ⅛ to ¾ inch size gravel to produce a mixture of four parts rock material to one of humus rich loam. The top three inches is spread with shaly rock to fan out from gaps in the rock ledge above.

Moraines

These are deposits formed at the sides and end of a glacier. They are rock and gravel piles and have considerable water flowing through them which make them wetter than the screes. However, their construction is similar to that of the screes. They can be located in any area between rock ledges but should be provided with a trickle of water from a buried perforated hose to keep the subsurface continually wet.

Pockets in Rocks

Certain plants can be planted in crevices, and gaps between rock ledges or in joints in pavements and walls. Some require a lean sandy soil, others a humus rich loam, and pockets of this material must then be formed at the planting site.

Alpine Plants

Where to obtain them:

1. Large seed merchants carry packets of alpine seeds (often mixed). These will have to be germinated indoors.
2. Various growers in B.C. will sell seedling plants (one near Victoria has a large collection).
3. From alpine and scree areas in mountain areas. However, the removal of living alpines from National or Provincial Parks is prohibited. At most, a few seeds can be collected.

The Early Spring Garden

MARY TALBOT
Colinton, Alberta

After the long winter, when the snow finally retreats, leaving stretches of brown lawn and bare earth, we all long to see some colour, something bright! And we can — by planning a spring garden ahead we will be rewarded by having flowers days before the trees leaf out, and weeks before the summer bedding plants get into their stride. Here are some of my favourites — all are easy to grow.

If you have a large garden, the golden willow and the red osier dogwood provide the first patches of colour as their twigs take on their springtime hues. However, if space is limited, there are many other plants that add colour to the garden very early. Some of the earliest blooming plants are small bulbs. *Crocus chrysanthus, Scilla sibirica, Muscari* and *Tulipa tarda* are all relatively hardy and must be planted in the fall. Bear in mind that these are small flowers and look best planted in groups. They increase fairly quickly to form larger and larger clumps each year. If one is lucky enough to have a sheltered spot protected by the house on the north and west, these little bulbs will often bloom while the rest of the garden is still under snow. However, for those of us less fortunate, the blue *Scilla sibirica* (Siberian squill) will put on a brave show in the open, undaunted by frost, cold winds or late snowfall. *Crocus chrysanthus* "Snow Bunting" blooms even earlier and although I have not had it long enough to see if it will multiply as rapidly as the Scilla, it seems to be hardy. Certainly it, and other varieties of *Crocus chrysanthus* are worth a trial.

Muscari (Grape hyacinth) does better with a little shelter from the cold winds, the white form, *M. botryoides* var. album, blooming earlier than the more familiar blue. *Tulipa tarda* quickly follows with star shaped yellow flowers borne close to the

Fritillaria Meleagris

ground. At night and on cloudy days these close showing the greenish stripes of the underside of the petals.

Another bulb which blooms about the same time as *Tulipa tarda* is the Snakeshead Fritillary (*Fritillaria Meleagris*). Some years ago I bought six bulbs of mixed fritillaries, one of which turned out to be a white form that has been so easy to grow that it has been a delight. It increases rapidly and every May its white bells show up in shade and sun, in moist and dry spots throughout the garden. It seems to thrive everywhere although it responds to rich woodsy soil by producing bigger bells. From that one solitary bulb, I now have clumps all over the garden. The checkered pink kinds although they do not multiply as fast as the white, do well and bloom at the same time. Fritillaries do not seem to be well known around here as visitors never fail to ask what they are.

Draba repens, an herbaceous perennial, opens its tiny chrome yellow flowers often with the scillas. This plant blooms much earlier and I find it much more reliable than *Alyssum saxatile,* so often recommended for spring bloom. Although the individual flowers are small, they are borne in such profusion that they make a brave splash of colour, lasting almost a month in some seasons. After flowering, the plant forms green mats of tidy foliage and often blooms sporadically in the fall. There is a light yellow native form that is also quite attractive.

Arabis or rock cress, both pink and white, are early flowering plants that are easy to grow. White arabis, yellow draba and blue scilla make a happy combination and the pink arabis is delightful with blue muscari.

Pink and blue, this time together on one plant. *Mertensia virginica,* whose pink tinged buds open into porcelain blue bells weeks before the coarser native *Mertensia paniculata* which, incidentally, is handsome in its own way and attractive in the border.

One of the first wild flowers to bloom is of course *Anemone patens,* the "prairie crocus", and it can be grown on a well drained spot in the garden. It is valuable firstly for its dusky mauve flowers that push through the ground like little hairy "ears" on stalks that grow taller as the flowers develop, and later for the feathery seed heads. *Anemone patens* and other wild plants should be grown from seed and not dug from the wild, a practice which is rightly frowned on by conservationists, and anyone who values our diminishing wild flowers. The seed of *Anemone patens* should be sown as soon as it is ripe, but will probably not germinate until the following spring.

Some other early flowering natives are the violets, the dainty blue meadow violet and the robust white Canada violet (*Viola rugulosa*). Watch this last one or it will take over your plot! Marsh marigold or icing cup *(Caltha palustris)* does well in a moist spot. Its bright yellow flowers and big leaves are cheerful in the spring but remember where you plant it, as after flowering it dies right down as does *Mertensia Virginica*. The same of course applies to the bulbs, so plant them where they will be safe from being speared by your fork later in the year.

Another easily grown native is *Corydalis aurea,* a biennial showing bluish-green fern-like leaves the first year and quite showy yellow flowers the following spring. It grows 10-12 inches high and spreads out to 12-18 inches. It self-seeds freely (too freely for some, but unwanted seedlings are easily pulled up).

Bergenia crassifolia is worth growing for its big feathery leaves and it will flower very early. Unfortunately, its flowers are not frostproof like the early bulbs, draba, etc., and all too often are found drooping and ruined after a frosty night. *Bergenia* is better planted in an exposed location where it will bear its bright magenta-pink flower spikes later in May.

Russian almond is one of the earliest small shrubs to bloom. It is covered with deep pink buds, which open to masses of small pink flowers but are all too fleeting, usually lasting barely a week. The plant also suckers badly and is relatively uninteresting after its brief flowering period, but, if one has room for one or two, they will provide a lovely, if short-lived, spot of colour in early spring.

Alliums are a large group of bulbous or clump-forming plants, most of which start into growth very early as anyone who has a clump of chives in the vegetable garden will know. Most of them bloom too late to be included in a spring garden but their bright green leaves are welcome and *Allium zegdanense* one of the earliest, usually opens its pure white blossoms when the trees and shrubs are coming into leaf. They multiply rapidly and are very attractive naturalized under shrubs, their white flowers showing against the new foliage.

By now, the garden is no longer drab: the grass is green, Iceland poppies, tulips, forget-me-nots and early iris are coming out. The May day trees and Saskatoon bushes all ablow and the lilacs in bud. From now until freeze-up there will be many and more colourful flowers, but none will be more appreciated than the first small blooms of crocus "Snow Bunting" and *Scilla sibirica.* True heralds of spring. There are many other early flowering plants, searching them out and testing them in your own location is one of the joys of gardening.

Sources (All Bulbs):

Mertensia virginica
C. A. Cruikshank Ltd.
1015 Mount Pleasant Road,
Toronto, Ont. M4P 2M1

Allium zebdanense
Skinners Nursery
Roblin, Manitoba

Bergenia plants
Alberta Nurseries
Bowden, Alta. T0M 0K0

Arabis — pink, white seeds
Stokes Ltd.
Box 10, St. Catherines, Ont.
L2R 6R6

Winter Storage of Dahlias

JOHN WALKER
Winnipeg, Manitoba

To be available for planting the following year, the tuberous roots of dahlias must be stored indoors over the dormant or winter period. This storage period may extend from September 30 (in some years even later) to March 31, and two methods of carrying the roots over winter may be adopted.

I favor keeping root crowns intact until spring, rather than divide them into individual tubers for storing.

Taking Up

After the stems are "cut down" and blackened by frost, the plants should be carefully dug so as not to injure or weaken the connections between stems and tuberous roots. Push the digging fork into the ground about 12 inches out from the stems and gently lift each plant from the ground. No harm will result if some soil adheres to the tuberous roots. Next, cut off the stems with secateurs or sharp knife about six inches above the root crown. A tag with the variety name should be securely attached to the stub of one of the stems.

Drying and firming of the tuberous roots (root crowns) may be carried out by placing them in a sun porch or shed protected from further damage by frost. First, turn the root crowns upside-down for several hours to remove any moisture left in the hollow stems. Then, with the root crowns closely packed together in an upright position, drying should be completed within ten days.

Packing

Root crowns may now be packed in an upright position in a carton or other container of sufficient depth to prevent the stems being broken. Excessive drying of the roots in storage will be avoided by placing, *below* and *around* the stems and roots slightly moist peat moss or relatively dry leaves and grass clippings raked from the lawn, to a depth of two to three inches (6+cm). Cartons are then ready to be placed in the storage environment, e.g., basement room where the temperature is below 50°F (10°C), and preferably 40°F (5°C).

Procedure

The following procedure in handling dahlia tuberous roots has been successful for me, as it has been for several years — dates approximately the same as given.

In 1977 dahlia tuberous roots were dug before October 15, packed in flats (two sides, six inches high) as described in preceding paragraph, and flats placed on basement floor. On November 9th, they were placed in an insulated storage compartment where the temperature remained around the 50°F (10°C) mark throughout the storage period.

Bi-colored dahlia with solid color bloom.

As a point of interest, tubers of tuberous begonias have been kept over the winter storage period when treated in the manner described for dahlia tuberous roots.

In preparation for renewed spring growth, the storage containers are taken from the storage compartment and placed on the basement floor around mid-April. Crowns are divided into suitable parts, or individual tuberous roots, each equipped with an active bud (or buds) in the area where last year's stem(s) and tuberous roots come together or are joined. The parts and/or individual tuberous roots are then returned to the cartons or flats in an upright position, and the leaves, etc., again placed below and around them. Dry peat moss is then added in a generous quantity on top of the other material, and all thoroughly moistened.

Additional water will need to be given within a week or ten days and *by the first week of May sprouting will have taken place.* Flats can be taken to the garden, or cool sunroom, where protection against frost damage must be provided, *if* and *when* needed. Water must also be given as needed. If weather is favorable, planting in the garden, *without disturbing the root growth or removing material attached to the new roots,* may begin around the end of May. Firm planting is necessary. Blooms may be expected from Coltness Gem selections by the third week of June.

FALL

Somehow Fall
Is the loveliest season of all.
Spring: An orgiastic burst of green;
Summer: The song of a lark;
But Fall: Ah, Fall!
Leaves of mauve, russet and gold,
Slipping by brown bark.

— *John A. Veliath*

Success with Tree Peonies

BRIAN J. PORTER
Saskatchewan Agriculture
Regina, Saskatchewan

Tree peonies have never been recommended for the prairies because they are not considered hardy enough. In addition to this, they are rather expensive to buy, and this has limited their popularity even in milder regions of Canada.

The tree peony is not really a tree, but rather a shrub with woody stems. In mild climates, these stems overwinter and provide the exotic flowers for which they are famous. When planted in severe climates such as ours, there is great danger that the woody stems will be killed back, and all the flower buds destroyed. In contrast, our beautiful herbaceous peonies, which are so popular here, winter their flower buds below ground level and, consequently, wintering them is easy.

My desire to grow yellow peonies, plus curiosity led me to consider growing some tree peonies belonging to a hybrid group known as Lutea Hybrids. These are hybrids between *Paeonia lutea,* a rather insignificant yellow tree peony (which I had seen growing at the Devonian Botanical Garden in Alberta) and *Paeonia suffruticosa,* the Japanese tree peony, which is usually pink, red, or white. From the American Peony Society Bulletin, I had learned that some of these hybrids had been wintered in North Dakota. More interesting, was the fact that some of these new yellow hybrids were capable of blooming on new shoots from below ground level, should the woody stems be winter-killed!

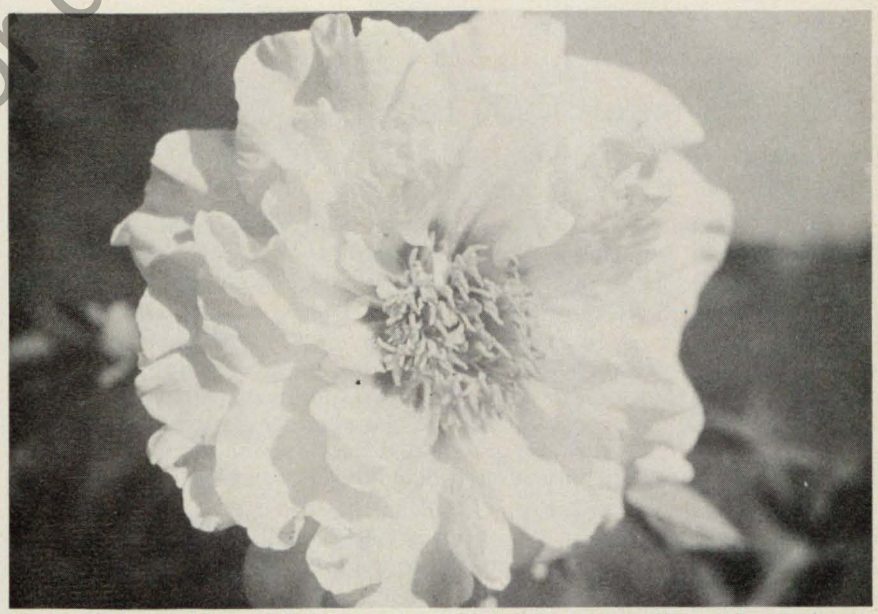
First year bloom of 'High Noon', June 10, 1978 at Regina, Sask.

My First Experiment

In early October of 1977, I planted two of these hybrids from a nursery in northern Michigan. These were "High Noon", described as a tall growing, fragrant, lemon-yellow flower, and "Age of Gold", described as camellia-like, ruffled, cream-yellow, and very floriferous.

These peonies were tagged by the nursery to indicate the proper planting depth, as tree peonies need to be planted quite deep. After planting, there were about six to eight inches of stems above ground level. The peonies were planted in a relatively open, sunny area, and the soil texture was improved with peat moss. As a precaution, I mounded an extra three inches of soil over the crown. "High Noon" received a covering with an old peat moss bag to shed water, plus some garden refuse. "Age of Gold" was partially covered with garden refuse, but the above ground stems shrivelled badly before winter arrived. The lowest temperature in Regina during the winter was —40°C, and snow cover was between six to 12 inches in depth.

In May, the peonies were uncovered, and the extra soil taken away.



First year bloom of 'Age of Gold', June 21, 1978. Flower was approximately four inches in diameter.

"High Noon" was very slow to unfold its leaves, but it wintered to the very tip, except on one stem, and I was rewarded in June with three blossoms, all opening the same day. The color was really a soft primrose, rather than a lemon-yellow, and the fragrance was intense and very sweet. "Age of Gold" failed to winter any of its tops, but a bud just below ground level sent up a vigorous stalk which bore one blossom about a week and a half after "High Noon". "Age of gold" proved to be close to the catalogue description, and very pleasing.

A third tree peony, called "Rock's Variety", which is a selection of *P. suffruticosa*, having white petals with maroon flares at the base of each petal, was also planted in the fall of 1977. This peony is reported to endure —34°C without harm. In fact, I suspect this is the same tree peony which the late Dr. F. L. Skinner grew successfully at Dropmore, Manitoba. This peony had only two inches of stem showing after planting, and it wintered perfectly. It has made negligible growth in height this year, and has not bloomed. Powdery mildew has been noticed on the leaves, but it has not been serious enough to warrant control measures. Hopefully, this peony will bloom in the future.

My first year of success with these peonies has encouraged me to try a few more varieties. If you like to experiment, they are worth trying for their fragrance and unusual colors.

Golden or Yellow Calla Lily

JOHN WALKER

The white Calla Lily is familiar to most gardeners. It belongs to the genus *Zantedeschia*, and is treated as a cool greenhouse plant in our climate. Another interesting species is the Golden or Yellow Calla Lily, *Z. elliottiana*, which can add a lovely bit of color to the summer flower border.

When grown from seed a corm is produced and, under prairie conditions where the growing season is long and the dormant season is long, the cultural procedure to follow for Yellow Calla Lily corresponds with that for tuberous begonias, except that the corms should be placed under conditions where new growth may be stimulated (warm greenhouse or windowsill) around or before the beginning of April. Increase is also obtained by offsets from mature corms.

When given an early start, as suggested, and planted in the garden in a sunny location towards the end of May, blooms (showy yellow spathes about four inches long) may be expected before the end of June. The leaves are oval-heart shaped, around eight inches long and long stalked.

For winter storage, treat the corms in the manner recommended for gladiolus corms.

Flowers: New Varieties of Old Favorites

MANITOBA DEPARTMENT OF AGRICULTURE

Each year, the Plant Science Department of the University of Manitoba grows around a thousand different varieties of flowers, vegetables and turf grasses for the university variety trials. New flower varieties developed by North American plant breeders are tested by Prof. Louis Lenz, his four Canadian and 30 United States counterparts. Winners receive the All America Award.

Among winners and others recommended for "northern" growing conditions, the horticulturist points out developments in five varieties. These have come onto the market in the last few years and are making interesting additions to prairie flower beds.

Zinnia — Two outstanding hybrid series of zinnia are available, known as "Ruffles" and "Peter Pan". They have gold, silver and bronze medals in the All America Selections, and come in a range of colors.

The Ruffles series are vigorous, plants growing 24 to 30 inches high (60-75 centimeters). They branch heavily to produce about two dozen 3-inch (8 cm) diameter blossoms per plant. Fluting of petals, especially in the inner tiers, adds textural effect to the blossoms. In maturing blooms, the light-colored reverse surfaces of petals show as they unfold, adding contrast and variety.

Prof. Lenz particularly recommends the scarlet, cherry, pink and yellow colors of Ruffles.

"Peter Pan" zinnias are half the height of Ruffles, but produce slightly larger 4-inch (10 cm) diameter blossoms. With great uniformity, sturdy stems and large leaves, the Peter Pan series can resemble a low growing flowering hedge. (New blossoms, incidentally, hide older blooms to maintain a fresh appearance.) The best of the Peter Pan series, Prof. Lenz states, are cream, scarlet, pink, plum, orange, gold and princess.

Planting time for zinnias is the last week of April for starting indoors and mid-May for direct seeding in the garden.

Geraniums — Two outstanding geraniums are available, Sprinter Scarlet and Showgirl. Both bloom somewhat earlier than other geraniums started from seed, and on plants about three-quarters as tall. They are tidy plants, being short jointed and basal branching. Apparently, they also produce many more blooms than other geraniums.

Sprinter Scarlet has set the standard for seed geraniums around the world. Flowers are described as "bright, scarlet, geranium red". Prof. Lenz says other Sprinter colors, salmon, white or mixed, also will do well in Manitoba, but scarlet is the most outstanding.

Showgirl is a "sprinter-type" geranium, with bright rose pink blooms and bright green leaves. At 18 inches (45 cm), mature Showgirl is perhaps two inches (5 cm) taller than Sprinter Scarlet.

If started from seed, starting date is mid-March, to obtain blooms from early July until frost. Seedlings should be transplanted to 4-inch (10 cm) pots by May 1, and only planted outdoors in late May for protection from late frosts.

Marigolds — The innovative garden wouldn't be complete without marigold steps. For the bottom step, about 8-10 inches (20-24 cm) high, Prof. Lenz would plant Yellow Boy and Golden Boy. The second step would be Honeycomb, at 12-16 inches (30-40 cm), with its orange-and-red bicolor blooms. The top step would be Honeybee, at 16-20 inches (40-50 cm), with the largest blooms up to 3-inch (8 cm) diameter.

Snapdragon — The Pixie series will fool anyone who thinks snapdragons must be two or three feet tall. The butterfly flower form in a Pixie makes a thick carpet only 6-8 inches (15-20 cm) tall. Pixie colors in Manitoba include orange, pink, red, rose, white, yellow and mixed.

Pansy — In a crowd, the Imperial Blue pansy is an award winner. During the university's "flower-ganza" in 1977, the Imperial Blue consistently drew attention. Only about eight inches (20 cm) tall, the Imperial Blue has flowers of two-inch (5 cm) diameter. Face of the bloom is dark blue, surrounded by a lighter blue edge. A side benefit, the "very striking" flower is much more heat tolerant than ordinary pansies. Indoor starting date is mid-March.

Candytuft

MRS. ANNE LESKIW
Regina, Sask.

What's so outstanding about Giant White hyacinth or Super Iceberg candytuft? Its white fluorescent colour! These two are the varieties that compliment 'Sprinter Scarlet' geranium.

Culture

Sow seed in groups as soon as the ground can be worked; mid-April is ideal. A later planting around the end of May would give consecutive flowers. This seed tends to reseed itself for the following summer. These can be transplanted if desired. I discard the candytuft as it goes to seed, and the spaces will fill in as the geraniums fill out.

Candytuft is great for anyone who doesn't have a greenhouse or fluorescent lights.

How Plants Survive Freezing

L. V. GUSTA
University of Saskatchewan

Freezing injury is a major cause of crop loss, and low temperature is considered to be one of the major factors limiting plant distribution. The diversity of plant types which can be grown on the Canadian prairies is limited by severe winters and untimely frosts. For example, we can not grow certain varieties of apples, pears, peaches, rhododendrons, etc., because of extremely low temperatures in January and February. Some of our junipers and cedars can survive freezing to —40°C or lower, but are killed after a prolonged cold period due to desiccation injury. Many of our woody ornamentals and fruit trees (e.g., apples and pears) can tolerate very low temperatures in midwinter but do not survive on the prairies because they start to harden too late in the fall to avoid severe early frosts. Some plants survive the winter but their fruit and flower buds may be killed by frost in the spring (e.g., plums, saskatoons). These plants start to grow too early in the spring, and are susceptible to late spring frosts. Many of our tender vegetables and small fruits (e.g., tomatoes, cucumbers, strawberries, etc.) are susceptible to these unseasonal frosts which may occur in almost any month of the year.

Cold Hardiness

Within the species, not all plant parts reach the same level of cold hardiness. In temperate trees, the living cells in the wood are often several degrees less cold resistant in midwinter than the bark tissue. The flower buds of some trees are considerably more hardy than the woody tissue, but less hardy than vegetative buds. Leaves of deciduous plants are unable to acclimate and, therefore, are not cold hardy. The crotches and lower part of the trunk of trees are also less hardy than the branches. Roots are able to acclimate to some extent but are the least hardy part of the plant in mid-winter. They are usually protected by the insulating effects of soil and snow.

How Plants Survive Freezing

It is the freezing of water in plants which results in death. Plants do not have antifreeze compounds which prevent water from freezing. Dry seeds can tolerate extremely low temperatures (-200°C) without injury. In plants, the water content ranges from 65 to 90 per cent as compared to only 10 to 15 per cent in seeds. However, drying of plants does not make them more cold hardy.

When plant cells freeze, ice may form either inside (intracellular) or outside (extracellular) of the cell. Intracellular freezing disrupts the integrity of the cell causing death. This occurs in many of our tender plants for example; corn, melons, beans which have little or no frost tolerance, and in our hardy plants when they are actively growing and/or blooming in the late spring and summer.

Plants which tolerate freezing generally undergo extracellular freezing. Ice forms outside the cell along the cell walls. As the temperature declines, water moves out of the cell to the extracellular wall and the cell sap becomes increasingly more concentrated and thus lowers its freezing point. This results in dehydration of the plant and if the temperature goes low enough, the plant will die. Plants are killed at a definite freezing temperature.

Many of our winter annuals, biennials, perennials (e.g., winter wheat, and rye, tulip bulbs, lawn grasses, alfalfa) can only stand freezing to -10° to -35°C. These plants will survive in regions where the air temperature is -40°C or lower because their regenerative growing points are located at or below the soil surface and are protected by residual soil heat and the insulating properties of snow.

Our native trees (e.g., aspen, willow, spruce, red-osier dogwood and paper birch) in mid-winter are extremely hardy and could survive temperatures to as low as —200°C. Native elm in mid-winter can withstand —47°C before there is injury to the wood. Many of our introduced species (e.g., apple, pear, peaches, roses, etc.) originated in warm climates and are not as cold hardy as our native species. Growing these plants in our cold climates will not make them more hardy. It will be only through plant breeding and selection that we will be able to obtain more cold hardy types.

How Plants Cold Harden

In the fall, plants undergo a transition from the non hardy summer condition to the hardy winter condition. This transistion is called *cold acclimation*. Many temperate deciduous species undergo several sequential cold acclimation stages before acquiring maximum hardiness. The first stage of cold acclimation is induced by short days and warm temperatures which causes the plant to stop growing even if the environment is favorable. The short day stimulus is perceived by pigments in the leaves triggering the synthesis of hormones that are translocated to the woody tissue. The second phase of hardiness is hastened by low temperatures and frosts. For the full hardiness potential to be achieved, the plants must be exposed to prolonged frosts. The daily levels of hardiness during this stage are directly related to the external temperature (e.g., warm temperatures deharden plants while low temperatures harden plants).

In evergreen trees and herbaceous plants hardiness is induced by low above-freezing temperatures. Shortening daylengths does not stimulate acclimation, but light is required for evergreen plants to build up food reserves.

Cultural Practices

Plants which are stimulated into active growth generally do not harden as fast or to the same degree as compared to plants which have matured. Excessive application with late summer or early fall of nitrogen fertilizers, water, and pruning may stimulate fall growth and interfere with cold acclimation in plants which do not stop growing in response to shortening days in autumn. This does not mean that water or fertilizer should be withheld in such cases, but timing is important. For example it is advisable to prune and fertilize many landscape plants in the spring rather than the fall, and to withhold heavy late season watering until late autumn when cool temperatures will prevent a late flush of growth and loss of hardiness. Generally, a healthy plant has a better potential of surviving overwinter than a non healthy plant. When possible snow trapping and mulches offer good protection for bulbs, strawberries, etc., but care should be taken against rodent damage.

Through research and good cultural practices, we are now growing many plants not possible in the northern prairies 50 years ago. Through breeding programs and a better understanding of cold hardiness the prairie landscape will continue to change and diversify.

Beet Root!

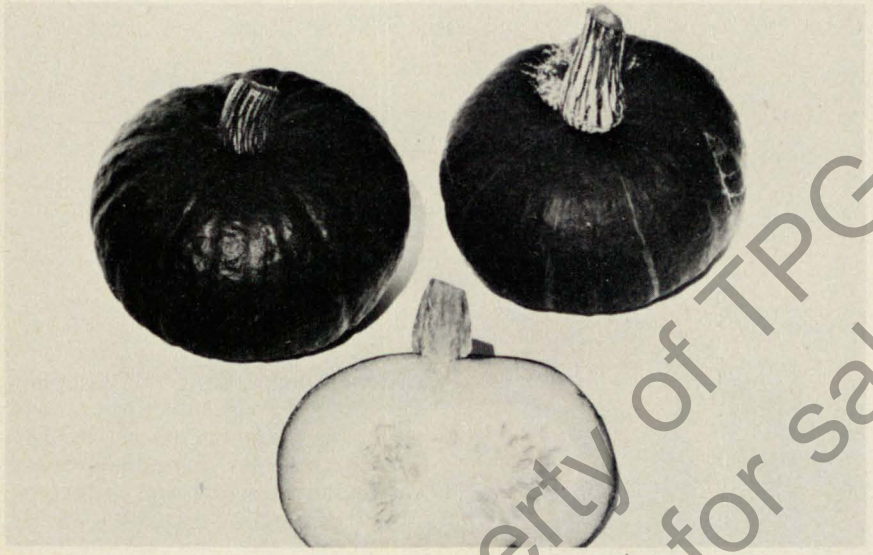
Mrs. Blanche Brown of Dauphin writes to tell us of a beet root which she pulled out of her garden on September 13th. She was pulling beets for supper when one beet kept coming and coming. When at last it was all out she got her ruler and the long root measured 31 inches from the base of the vegetable! It is surprising that the root did not break when Mrs. Brown pulled it, but the ground was damp and it came up quite easily with no special care. This was reported in the Dauphin Herald with the accompanying photo.

DAUPHIN HERALD

Summer and Winter Squash

C. SCHAUPMEYER
Brooks, Alberta

Squash has been well established as a garden vegetable for many years — indeed centuries — in North America. Its popularity on the prairies, however, is relatively new and the following information on summer and winter squash might be helpful to the would-be grower.



Squash, Winter "Sweet Mama" Hybrid All-America Selections Bronze Medal 1979

Description

Squash and pumpkin belong to the vine crop or gourd family, along with cucumbers, muskmelons and watermelons. There is little agreement between vegetable taxonomists as to what exactly are squashes and what are pumpkins since there are at least three species involved and there have been a lot of man-made crosses over the past few hundred years. For our purpose we will define summer squash as the edible fruit of any species of *Cucurbita* (commonly *C. peop*) that is used when immature as a table vegetable; and winter squash as the edible fruit of any species of *Cucurbita (C. pepo, C. moschata* or *C. maxima)* used when ripe as a table vegetable or in pies or for livestock feed. Interestingly, some of the winter squashes and pumpkins make delicious summer squash when picked early and are hard to distinguish by taste from Zucchini or vegetable marrow. To add to the confusion what we call winter squashes are often used in canned 'pumpkin' pie preparations. In fact, many of the common winter squashes are more correctly pumpkins.

The common summer squashes include:

Zucchini: Straight cylindrical fruit, harvested when immature from 4 to 12 inches in length. Larger, more mature fruit can also be used as a baked vegetable. Recommended cultivars include 'Ambassador,' 'Zucchini Select,' 'Diplomat,' 'Greyzini.'

Marrow or Cocozelle: Straight cylindrical fruit, slightly pear shaped, which is harvested when immature from 8 to 14 inches in length; fruit color from creamy white to pale green. Some fruits have alternate strips of pale and dark green.

Scallop or Pattypan: Disc or bowl shaped fruit with prominent ribbing on the edge, harvested when about half grown or four inches in diameter.

Yellow Crookneck/Straightneck: Curved- or straight-necked fruit that is similar in overall shape to a bowling pin. Skin is moderately warted and light yellow in color turning brighter as the fruit matures; normally harvested when about 10 inches long and about 3 inches in diameter at the largest point.

Recommended cultivars include 'Early Prolific Straightneck.'

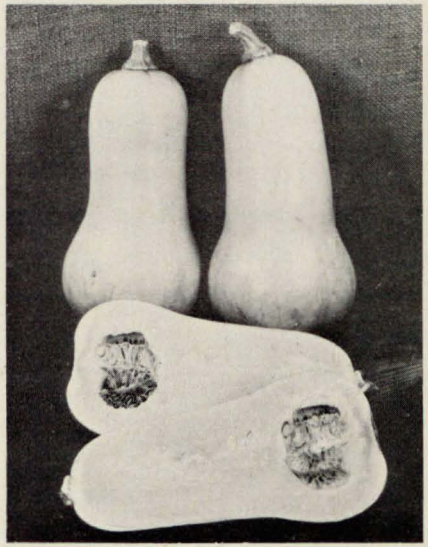
All of the above types of summer squash are available in cultivars that have a bush habit, that is they don't overrun a small vegetable garden with vines.

The common types of winter squash include:

Acorn or Pepper: Widely ribbed fruits are oval to round in shape. They are fully mature when the skin is hard and dark green. Mature sizes are 4-6 inches in diameter. Flesh is light orange.

Buttercup: Fruits have proportions of a round cake tin. Dark green skin has light green or yellowish flecks, and is from 6-9 inches in diameter when mature. A light green-colored cap forms on the blossom end. Mature flesh is dry and is bright yellow-orange.

Delicious: Fruits are top shaped. Skin is dark green or golden and slightly warted or rough. Size ranges



Squash, Winter "Early Butternut" Hybrid All-America Selections Bronze Medal 1979

from 8 to 12 inches in diameter. Flesh is bright yellow-orange.

Butternut: Fruits are bell shaped and about 12 inches in length. Skin is smooth and cream colored, orange colored flesh.

Other winter squashes: Banana, 'pumpkin,' sweet potato, golden nugget, and others.

Culture

All members of the gourd or vine crop family are warm season crops and require the warmest growing spot a gardener has available. Well drained sandy soils tend to produce earlier crops than heavy soils. Soil amendments such as addition of sand or organic matter and the use of plant protectors will help create a warmer environment for squash.

The summer squashes should mature in most areas of the prairies. The Zucchini types will produce fruit under relatively cool conditions and should produce fruit where peas will grow. In the more northern areas they may require hand pollination.

The winter squashes require a full growing season to mature well from seed even in the southern prairies. In the more northern prairies transplants and seedling protectors such as 'hot-caps' will be required and hand pollination may be necessary.

For the avid gardener who likes to get the most out of his or her garden we would recommend using transplants and 'hot caps' for winter squashes. For this extra effort the gardener is rewarded with earlier squash and will be assured of harvesting well matured fruits that will store for several months in a cool dry place.

Planting Outdoors

Squash can be planted directly outdoors after danger of frost which is about May 20 to June 1 in most areas. Seeding can be advanced seven to ten days if seeds are planted under 'hot caps' or plastic covers. The squashes, as with all members of the vine crops family, have weak root systems that are easily damaged. If a gardener wishes to use transplants the seeds should be planted in three inch peat pots filled with a peat moss, vermiculite and compost mixture, about ten to fourteen days prior to planting out date. The transplants can only be set out in the garden after danger of frost has definitely passed or a few days earlier if 'hot caps' or plastic covers are used.

The bush type squashes can be planted 18 to 24 inches apart in the row and in rows three to four feet apart. The vine type, or running type, squashes require more room to wander. Normal plant spacings are 24 inches between plants in rows four to six feet apart. It is useful to plant these vine type squashes in an area where the vines can run and not interfere with other garden operations. We've planted Buttercup squash so the vines can run over a compost heap later on in the year.

Pollination

All the squashes have two types of flowers — male and female. Do not despair if the first few fruits fall to the ground! We find that with Zucchini types the female flowers open up to ten days before any male flowers appear and those flowers drop off because they are not fertilized. The opposite is general with winter squash — the male flowers are open before there are any female flowers.

Because male and female flowers are separate they require insect or manual pollination, and most areas of the prairies have enough insects to take care of pollination. Where insects, notably bees, are not common or are not active due to cool weather it may be necessary to hand pollinate the female flowers. This is done by taking a male flower, (it's the one without the small fruit between the stem and flower) tearing the petals away and 'painting' the inside parts of the female flower with pollen.

As mentioned earlier, the summer squashes should be picked when the fruit is relatively small and immature, that is, the skin is still very tender and there is little development of the seeds.

All the winter squashes should have hard skins before they are picked. Only well-matured fruit will keep in storage for a long time. The flesh of Hubbard, Delicious, and Buttercup should be a bright yellow-orange.

Uses

The squashes are high in vitamins and low in calories and can be prepared many ways. Most recipe books and Department of Agriculture vegetable booklets contain squash recipes.

Our two favorite squash recipes include one for Zucchini and one using any of the three winter squashes, Hubbard, Buttercup or Delicious.

Zucchini with mixed vegetables: Chop one 10 to 12 inch Zucchini into one inch cubes, slice one medium onion, chop one-half green pepper, chop or slice one green or ripe tomato, add all ingredients with some salt and pepper to a covered shallow pan and cook in one-quarter inch of water until tender.

Boiled winter squash: Skin and dice about one cup per serving of Hubbard, Buttercup or Delicious Squash. 'Boil' in about one quarter inch of water for 12-15 minutes with salt, pepper and a bit of brown sugar. When tender, mash (do not drain) and serve. Margarine and milk may be added if desired. Baked winter squash tends to have a drier, more mealy texture; however, it takes 45-60 minutes to bake well-matured squash.

The Joy of a 4-H Garden Club

REG HOFFMAN, *Student*
Esther, Alta.

Having just finished clearing the dead vines, cornstalks and cabbage stumps from my garden, I have a good feeling of satisfaction at having grown and harvested another good 4-H garden of my own. As I tramp along behind the rototiller, readying the soil for my 1979 garden, I am busy in my mind making plans — what I will grow, how I will change my garden plan, what new things I should try. With this year's mistakes still fresh in my mind, it is a good time to do some planning!

I am a 14 year old Alberta farm boy and ever since I was two or three years old I have had a garden of my own, steadily increasing in size from a six foot row of peas, until the past couple of years when my garden has been bigger than Mom's. At first, I grew only the bigger, easy to plant things, like peas, sunflowers, pumpkins, popcorn, and gourds. Gradually I added new things, learned to do my own transplanting, and planted some very fine flower seeds. Everything presented a challenge and I am always trying new things, some practical and some novelties.

What I like about gardening is that there is always something to look forward to. Even in winter I look forward to getting the new seed catalogues, then in April, getting some seeds started, then looking for my first peas to come up in the garden, the first tomato blossom, and on and on until the first ripe watermelon, and getting the last turnip harvested.

I've been in 4-H Beef Club since I was an eight year old pee wee. I had heard of 4-H Garden Clubs, so with some of my friends, we finally talked my sister-in-law into starting one for us. She had several years of girls club experience and has done a great job leading us for two years now. We found about 15 interested kids (almost as many boys as girls) from ten to 16 years old, and formed the Sounding Creek Green Thumbs 4-H Garden Club. I will outline some of our activities of the past year. To have a club, you only need eight interested kids and a volunteer leader.

We re-organize and register in October, and meet at 7:30 the first Thursday of the month at some member's home. This year we have done our garden plans, made our garden signs and labels, and dried arrangements, made a terrarium in a gallon pickle jar, grown two houseplants and exchanged slips, grew our own bedding plants, held two teas, with sales of our bedding plants, plus stuff from our home gardens like strawberry plants, dahlia roots, glad bulbs, perennial roots, etc. These sales were very successful, and provided us with plenty of funds for the year. We also participated in the provincial highway clean-up, which was hard work, but helped our finances. We also took part in the regular 4-H Public Speaking program.

Our Achievement Day is held each year in conjunction with the Oyen Fair. We are given a long table right beside the horticulture section, and we make a very creditable showing. Many of our class are bigger and a lot of our exhibits are better than those of the adults! This is a very good arrangement as a lot of people get to see our work, and we get a lot of praise and compliments on our show. The Fair judges also judge our exhibits. Several of our members also enter the main show and do very well.

This summer our club hired a school bus and we all went to Rumsey to see the Provincial Horticulture Show. That was wonderful to see and we all got a lot of good ideas. I'll bet there will be some great flower arrangements at our Show next year! Many of us have also been going to the Annual Field Day at the Brooks Horticultural Station. That is the place to go to see what varieties of flowers and vegetables are best to grow.

Our club provides seeds (one variety makes for easier judging) for ten vegetables and ten annual flowers. They also give us greenhouse plants for three vegetables and three flowers. We change varieties every year. This spring we were also given one dahlia, six gladiolus bulbs, and a Cuthbert Grant rose bush. We had to start our own bedding plants for three vegetables and two flowers (junior members do less).

Senior gardens are 500 feet of row, and the juniors have 300 feet. We must grow ten feet of each seed issued to us and the remainder is our free garden, where we can grow anything we please. Our gardens can be any shape, few long rows or many short ones (according to the garden spot available).

About a week before our Achievement Day, we have our garden tour. We get three judges and begin the tour at 10:00 a.m. at one end, take along a box lunch for noon, and the cavalcade continues to the last place where we have a picnic together to wind up our day. After the supper, we were presented with our ribbons, which were awarded for best planned garden, best vegetable garden, best flower garden, best free garden, best special project, best commentary, best overall garden, etc. Gardens were judged on — plan, sign, labels, cultivation, weed control, insect control, spacing and thinning, special care (like strings for sweet peas, tying up cauliflowers, etc.) number of varieties (in free garden), etc. Quality of flowers or vegetables was not taken into account on the tour (as this was judged a few days later at our Achievement Day), so members who could water had no advantage over those who could not.

I am looking forward to my next year's garden. We receive different varieties each year. Also this fall we will get tulip bulbs and an amaryllis bulb. Next spring we will have a peony and an apple tree, plus some evergreen trees.

Special projects can be variety trials, or experiments, or a special flower bed, or whatever the member chooses to do. This year mine was beans. I grew nearly 30 varieties — green, wax, broad, pole, lima, dried, horticultural, soya, fava, you name it — I grew it. One girl had 15 kinds of tomatoes. Another had a beautiful

flower bed. One boy had a lot of novelty items. One made a hot bed. I made two teepees for my six kinds of pole beans, out of eight poles, wound around with baler twine, leaving a doorway. In one I stored my garden tools, hose, etc. The other provided a good cool shady place for me and my dog to sit and rest after hoeing, and enjoy some peas, carrots, ripe tomatoes, or what is available for refreshment in your garden at the time. The beans reached the top by mid-August.

I hope these notes might be helpful to some prospective 4-H gardeners, and that they enjoy their gardens as much as I do mine.

In summing up the profits of my 4-H garden, I gained (1) fresh air and a good tan; (2) better muscles, (3) better nutrition (a lot of good eating), (4) pride in my accomplishments, (5) several new friends, (6) plenty of gifts to give (flowers, gourds, ripe tomatoes, popping corn, Hallowe'en pumpkins, etc. to share with my friends, young and old, who came to see my garden), (7) a lot of knowledge that will help me to enjoy my garden hobby for the rest of my life.

I wish you all — Happy Gardening.

To Be A Flower Arranger

To choose the flowers for display
  To look at every blossom
To a novice will appear
  Both arduous and awesome.
To look at every leaf with care,
  To check for scale and blemish,
Decide which period to portray —
  Japanese or Flemish;
To search for branches, rocks and seeds
  By every road and highway,
To gather rushes, moss and weeds
  By every trail and byway,
To trim, condition and prepare
  Each flower, leaf and petal,
To hunt for vases everywhere —
  Pottery, glass or metal,
To study texture, size and shape
  Of flowers, buds and branches,
To blend the colours so that each
  The other part enhances,
To add some beauty to the world,
  To give another pleasure,
This is something free to all
  Man's money cannot measure.

— F. R. SMITH

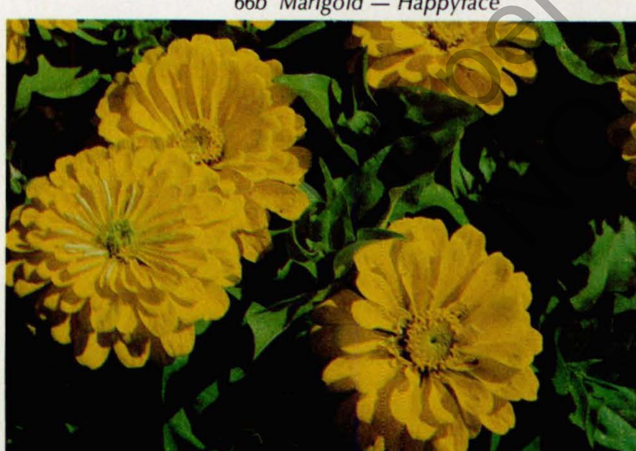
Mostly Annuals!

65a Petunia — Rosy Posy

65b Unique way of drying flowers

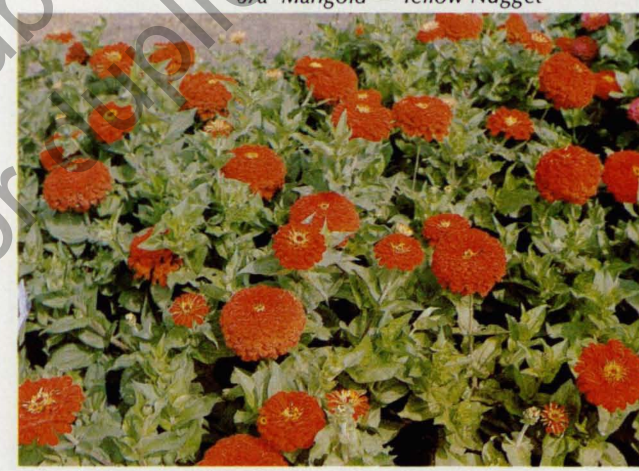
66a Petunia — Happiness

66b Marigold — Happyface



66c Zinnia — Gold Sun

67a Marigold — Yellow Nugget



67b Zinnia — Red Sun

67c Marigold — Orange Nugget

68a Petunia — Brass Band

68b Impatiens and Begonias on the shady side

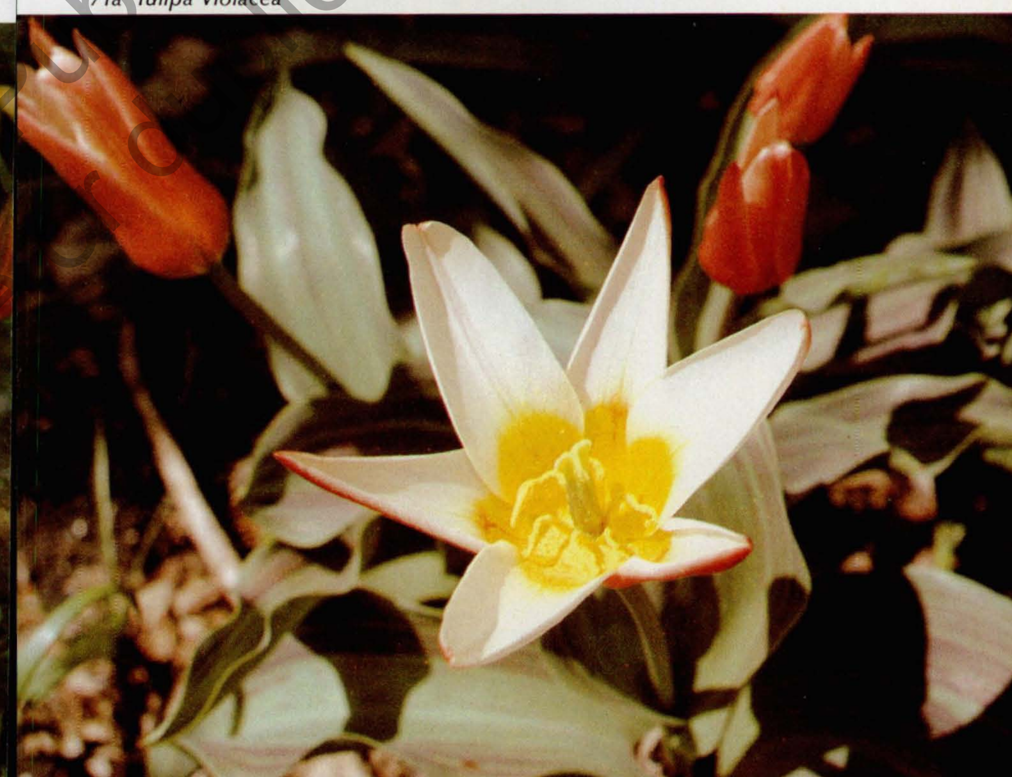
69a Salpiglossis — Splash

69b Phlox — Dwarf Globe

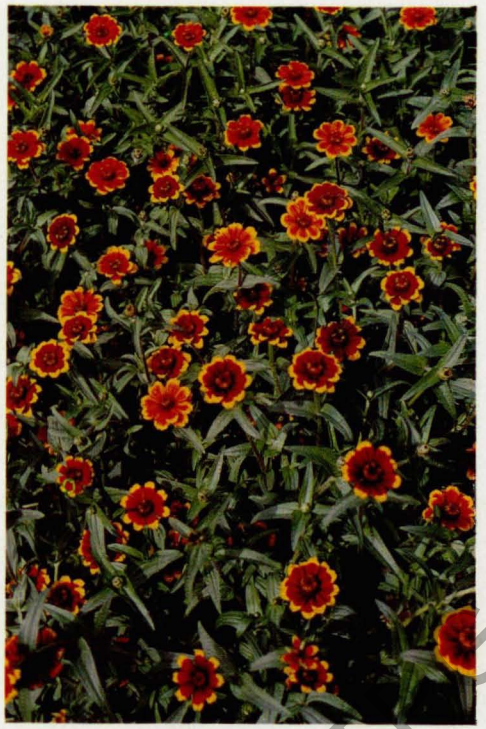
70a Lily

70b Lily — Lemon Queen

71a Tulipa Violacea



71b Tulipa Kaufmanniana — Hearts Delight



72a *Zinnia — Chippendale Daisy*

72b *Gazania — Florist Strain*

73a *Morning Glory — Heavenly Blue*

73b *Verbena — Ruby*

74a Canna — The President

74b Colourful Bed of Tuberous Begonias

74c Dahlberg Daisy — Golden Fleece

75a Rudbechia — Marmalade

75b Gourds — A novelty item

75c Cyclamen, Azalia and Chrysanthemum — A variety of gift plants

76a *Fringed Gentian*

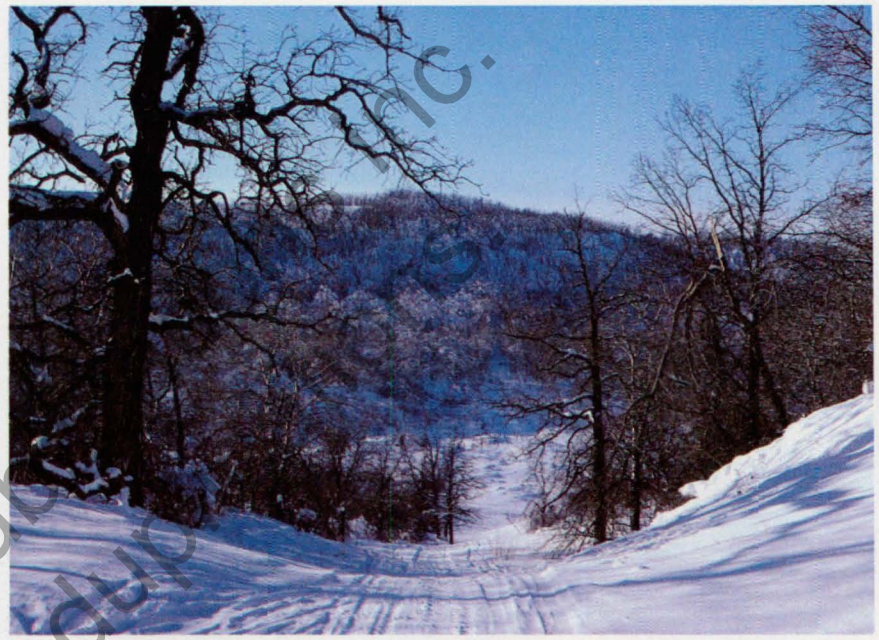
76b *Harebell*

77a *Moccasin Flower*

77b *Bunchberry*

78a Salvia — Catima

78b Matricaria — White Gem



79a Beauty of winter

79b A farm family's patio

80a Park setting — Lethbridge

80b Formal area — International Peace Garden

Cheaper by the Thirteen

MRS. ANNE LESKIW
Regina, Sask.

Growing geraniums from seed is less time-consuming than by using cuttings, and saves the cost of purchased plants. Seed should be ordered early as it takes approximately five months from seed to flower. For blooms the first part of June, germinate the seeds about January 12th.

The variety that I grow and have had success with is 'Sprinter Scarlet.' This color is very showy and almost fluorescent.

Germination

I have read that the seed of 'Sprinter Scarlet' is scarified or rubbed and, since then, have found a great improvement in the germination. Place seed in a dampened paper towel, then enclose in a plastic bag and seal. Set on kitchen counter top where it likely would be warm. If the sun could shine on it for an hour or two, this would speed up the germination. In approximately two days, white shoots should appear. These are the roots, and care should be taken not to injure them. Do not leave them in the towel too long or the roots may adhere to the paper, and at no time should they ever be allowed to dry out.

Soil Mixture No. 1

Prepare a soil mixture of one part each of the following; peat moss, perlite, sterilized leaf mold or good potting soil, and zonolite. Mix well, then dampen.

One and one half-inch tiny paper cups can be purchased at a Florist or Hobby shop. Taking several together, punch a hole in the bottom for drainage, using a knitting needle or ice

pick. Fill with No. 1 soil mixture. Plant one sprouted seed one-quarter inch deep in each cup and cover with soil. Keep the soil damp, but not wet.

I managed to purchase several clear plastic boxes used for storing shoes, these are ideal for tiny seedlings as they help retain the warmth and humidity. Place seedlings in covered boxes where the temperature is about 21°C. As each geranium plant shows through, remove to a slightly cooler area still covered. Set approximately 12 inches below fluorescent lights. The basement is usually ideal for a light set-up.

Fluorescent Tubes

I have several different kinds of tubes and find cool white just as good as any, and these are very reasonable as to cost. I find the artificial color

that results from Gro-Lux is very deceiving. The lights are on for 15 or 16 hours a day, 7:00 a.m. to 10:00 or 11:00 p.m.

Soil Mixture No. 2

Prepare one-eighth part bonemeal, one peat moss, one perlite, two sterilized leaf mold or good potting soil and one zonolite. Mix well and dampen.

Transplanting

Approximately three weeks later, transplant into *WET* two-inch jiffy pots. These come in strips and fit into plastic trays that can be ordered to fit. Fill with soil mixture No. 2. Cover with some soil around and on top of strips so the peat pots won't dry out.

Fertilizer

Twice a month apply fertilizer, using half the strength recommended. I prefer one low in nitrogen, for example, 12-31-14 is ideal. The 31, which is phosphorus, is needed to obtain a good root system, which results in good healthy plants. Usually I alternate different kinds of fertilizers. Fish emulsion can be used as directed. Only one application of 20-20-20, is applied in the entire growing procedure, using scant one-quarter tsp. to one quart of water.

Second Transplanting

When the roots show through the jiffy pots, it is time to plant them into three inch pots. I prefer plastic, as the clay pots tend to dry out more in our average homes. Use No. 2 potting soil mixture. It is much better to increase the pot size gradually as geraniums like to be a bit root-bound.

Water

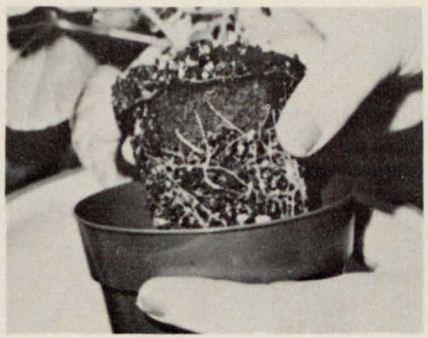
Lukewarm water should be used, either rain water or hard water that has stood overnight. How often should you water? When the pot feels light and the soil is dry to the touch. Usually it averages about twice a week, overlapping a day or two. Water enough so the water runs out of the pot. If by chance some have become too dry and the water runs out of the pot rapidly, water again until the pot feels heavy.

Added Humidity

On the light stands, a sheet of plastic is placed, extending up and over the sides a bit. Three narrow wooden slats are placed on the plastic, one on each end and one in the center. Expanded painted metal sheets are set on top of these slats, therefore, any water running out of the pots will sit in this plastic, thus creating added humidity.

Yellowing of Leaves

When only the two bottom leaves turn yellow and drop off, the secondary leaves take over and this does not create a problem. However, if more are turning yellow, it may be not enough water, too much water, or not enough fertilizer.



Leggy Plants

This could be the result of not enough light or too warm a growing area.

Third Transplanting

Approximately in the middle of April, transplant into four inch pots, using soil mixture No. 2.

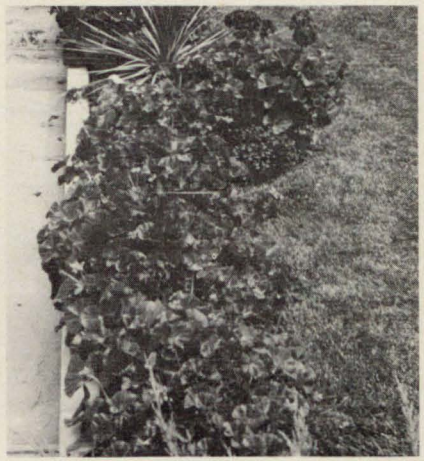
Hardening of Geraniums

At least four weeks of hardening is required before planting outdoors. Plants should be placed in a cold frame, and care should be taken to protect them from the sun and cold as the leaves are very soft and tender. Cheesecloth draped over the cold frame will help filter out the hot sun. If weather permits, plants can be placed directly outside in a sheltered area and set in a garage at night if too cool.

Red Zones on Leaves

This results when the air has been too cold, especially at night. It does take them some time to adjust to outdoor temperatures.

Final Transplanting



This usually takes place around the end of May or first week in June, weather permitting. Make certain the plants are watered well before removing them from the pot. This helps prevent root damage as no roots adhere to the pots.

Geraniums require sun at least half of the day. Space about ten inches apart and stagger your rows, rather than having the plants behind each other. A raised bed is most effective.

With all the time that is saved by not taking cuttings, sterilizing sand, pruning etc., there'll be more time to think about the ideal companion for 'Sprinter Scarlet,' the annual Super Iceberg Candytuft or Giant White Hyacinth Candytuft. It's a beautiful combination.

Have you ever tried air drying of certain garden flowers, roadside flowers with blooms, or attractive seed pods and grains and tall grasses, for winter home decor?

In the home garden the following plants air-dry exceptionally well — strawflowers or everlastings, bachelor buttons or cornflower, amaranthus, bells of Ireland, larkspur, nigella, celosia or cockscomb, statice, achillea (yarrow), baby's breath and monkshood.

From the country roadside, try your luck with any material you find attractive.

The basic principle of any plant drying process is the removal of moisture so that the dried material can be maintained for an indefinite period in a condition as close as possible to its natural appearance. This can be done best by taking your collected materials, tying them in small bundles and hanging them upside down in a warm dry, and preferably dark area, for some two weeks or longer.

Propagation of Cypripedium from Seed

FRANZ MUIK
Nurseryman, Graz, Austria (translated by Susanne Olver)

The Lady's-slipper (Cypripedium calceolus) is perhaps the most beautiful orchid for our gardens. Unfortunately, it has been, so far, impossible to grow them from seed. Reading various publications, one gets the impression that nature won't divulge her secret about the germination of these seeds.

We would like to show here that this is not so, and that it WILL be possible to grow young plants in large numbers from seeds. This is very important in regard to the protection of these endangered species. If sufficient numbers of these plants are available on the market, the wild plants will be better protected than through laws against collecting them. I will describe what work was done in our nursery (in Austria) over the last ten years.

First of all it has to be explained that orchids — our native species too — live in symbiosis with fungi. Only the presence of the mycelium of these fungi enable the roots of these plants to take up water and nutrients. We could prove that only certain organic mulches could be host to the mycelium which is necessary to bring about germination of the orchid embryo. We didn't use any such substances as cocoa milk, banana milk, sugar or yeast. These questionable "aids" do not exist in nature and yet orchids do grow in the wild.

Seeds

Seeds of hand-pollinated Cypripedium calceolus, Cypripedium reginae and Cypripedium macrantha were used. Humus from coniferous forest, enriched with mycelium, at a pH of 5-6 and without clay, was used as a medium. The seeds were seeded out immediately after ripening in September 1973. By April 1975, that is after only 18 months, the seedlings had grown to a length of 2 to 3 cm. In April 1975, a portion of the seedlings were transplanted into well-rotted forest humus, again without clay, and pH of 5-6. About 80 percent of the seedlings survived this early transplant. The other portion of the seedlings remained in the seeding-out flat. The non-transplanted plants grew faster and doubled in size until fall, and showed a well-developed eye by then. In May 1976, two good-sized leaves had grown. We cannot share the opinion

that the seedlings remain underground for three or four years, or that it takes ten to twelve years for these plants to bloom.

Vegetative Propagation

And here are a few pointers on vegetative propagation. All members of the genus Cypripedium can be propagated by division. A well-developed plant can produce annually three to eight shoots. Of these, two or three can be taken off, the best time is early in the spring. It is important that all divisions have roots, and that the remaining parent plant is not damaged.

The young orchids are planted in conifer humus mixed with wood chips, and after two or three years these plants should bloom.

Soil

Usually Cypripedium calceolus grows in calcareous soils but thrives also in acid soils. This is why acid soil was used. Some growers think that each species demands a special soil mix, but this is unnecessary and also makes work more difficult.

Slugs in Our Gardens

C. H. WEBB
Winnipeg, Man.

Of all the garden pests, I think the slug comes very high on the list as being one of the most detestable; a pest that is active mostly at night and leaves a slimy trail in the morning. They hatch out early in the summer from eggs laid in the garden the year before. It appears that they don't need excessively hot weather to hatch, as they like damp, moist places in which to hide in the day time.

The time to look for slugs is when the first green shoots show in the garden. I find them first on my potatoes and horse radish plants. The young ones come out before it is dark and I have found them when they are only one-eighth of an inch long. If you get the slugs at this stage you have a good chance of keeping them under control. As slugs have both sex glands, they are laying eggs all summer. Getting the first hatch is half the battle. I pick them off before it is dark and first thing in the morning, with a spoon, old fork, or trowel, and drop them into a can of crank case drainings.

I also use slug pellets which contain Metaldehyde, wetting the ground first, and covering with grapefruit shells. Metaldehyde may also be obtained in liquid form, to be sprayed around the plants.

Look for them every morning and night, and if you have a kindly neighbor have him put the bait out for you if you are away.

A "Growing Experience" in the Winnipeg School Division

GERALD E. BITNEY
Winnipeg, Man.

Last summer 355 children from ten elementary schools participated in a voluntary gardening program. Potential green thumbers could choose from three different garden kits provided by "The Urban Agriculture Facility", a resource centre located at Aberdeen School. The kits ranged from pumpkin seeds to an advanced garden containing seven different vegetables, marigolds, tomato and cabbage plants. A small fee was charged, ranging from 50¢ to $3.00 for the most advanced kit.

As a culmination of these gardening activities, eight school garden exhibits were held with a total of 770 entries, and 400 prizes donated by the members of the Manitoba Nursery and Landscape Association. The South Winnipeg Kiwanis Club provided two of their members, for each exhibit, to present the prizes to our young gardeners. Judges were: Bill Rhodes; Reg Curle; Jean McMurray; Roger Brown; and Jim Whan, all active members of Winnipeg's Horticulture Societies. A Young Canada Works grant from the Federal Government, provided funds to employ five university students as supervisors of the gardening program.

One of the competitive sections in the School Garden exhibits was an essay entitled "My Garden". The following young writers explain in their own words what gardening means to them.

MY GROWING EXPERIENCE

ANDREA BILACH
Grade 4

Have you ever planted a garden or grown flowers? I have and I would like to tell you that it is a wonderful growing experience.

Last June my school decided to have a Garden Club. I joined the club because I like plants very much and also I wanted to learn how to plant a garden and to take good care of plants.

I was taught to use the right kind of soil, how to plant the seeds in the ground, to give the right amount of sun or shade so that the plants would not die, and also how much to water the plants. I was given seed packages of beets, lettuce, carrots, beans, radishes, onions, sunflowers and crackerjack marigold.

When I started my garden, I first loosened the soil so that air could get in because plants need oxygen to grow. Loose earth also lets the water soak in. I planted my seeds in straight rows and not too close together. Because the ground was so dry I had to water the garden well. I did this every second day except when it rained.

In a few weeks I was excited to see my garden starting to grow. The first vegetables to peek out of the ground were the radishes and lettuce. In another week or so the other vegetables and the marigolds started to grow. Each day I gave good care to the garden as it grew bigger and bigger. Finally some of the vegetables were ready to eat. My whole family enjoyed the garden-fresh vegetables, even my rabbit.

Of all the vegetables I liked the sunflower best. It always looked so bright and happy even on a rainy or cloudy day.

MY GARDEN

NATALIE DAVIDSON
Grade 3

I decided that I would get my gardener's badge for Brownies, so I dug out a little place in the garden and started to plant seeds. I planted some carrots, lettuce, onions, gladiolus and a pumpkin seed I found. All my things turned out very well. As for the pumpkin vine it was almost around the garden, and from it we have two large pumpkins and from school I got two tomato plants. Up to now I have had 16 tomatoes, and hope to have more. Just before we left to go camping I pulled out all my lettuce and when I got back from camping, I had to pull it out again!

MY GARDEN

JAN BLAIR
La Verendrye School, Rm. 26

I began planting in June making my garden. The length of it was five feet by seven feet in a sunny spot in our yard. My dad bought some topsoil and we mixed it with the soil that was already there. I raked and hoed the soil so that all of the lumps would disappear. With a long board, the length of the row I wanted, I took a small stick and made a line for all my rows. After I marked my row, I sprinkled the seeds in the rows. I planted lettuce, radishes, carrots, beets, beans and peas. After I put my seeds in the rows I covered them with soil.

During the summer I watered and weeded and thinned out my rows and leaves popped out of the soil! We put a wire up so that the beans could climb up. Then I put up a small wire fence to keep animals out. Since that area had not been used for a long time the only real harvest was the beans and lettuce. If I put all the carrots together, there would be a regular helping for about three people. The beets were not very good so we had beet greens. The peas really didn't grow at all.

In the last week in August we dug up the garden and prepared the soil for next year. I think planting a garden is fun!

Bulbs — The Second Time Around

SUSANNE OLVER
Supervisor, University of Manitoba Greenhouse

Have you wondered what to do with winter flowering bulbs once they have finished blooming? The bulbs seem to be too good to throw away, but most books tell you to discard them. Also, after flowering, these bulbs usually don't look their best when the blossoms are gone and the foliage has become long and flaccid. Not all hope is lost, though, if you treat your bulbs well and follow a few simple recommendations!

When a bulb flowers it draws on reserves stored from last year's growing period. By the time the plant has bloomed or even produced seed most of these reserves, which were stored in the bulb, have been used up. With that in mind we do the following. First of all we plant all bulbs in a good soil; for instance a mix of two parts loam, one part peat, and one part sand, with some bone meal added for a constant supply of phosphorus. We do not use pebbles (as is often recommended for paperwhite narcissus) or just water (as for hyacinths).

After the rooting period, when the plant starts to grow, we give it, periodically, an applicatin of 15-30-15 fertilizer. Once the flowers are faded, we cut them off, stalk and all, and never, never allow them to set seeds, as this process exhausts the bulb even more. Although the plants don't look their best any more, we care for them diligently by watering and fertilizing, until the foliage turns yellow by itself. Now we lay the pots on their side (under a greenhouse bench or in the garage is just fine), but do not expose them to late frost. This gives the bulbs their well-earned summer rest.

In the fall the bulbs can be treated just like new, store bought ones. Tulip and crocus bulbs can be planted out in the garden, even hyacinths and daffodils can survive in a protected spot, at least for awhile. Paperwhites have done quite well for me when forced for a second time in the greenhouse. None of these particular bulbs produce as many blooms as in the first year, but at least they flower, and supplemented by freshly bought bulbs, can extend the amount of enjoyment you get out of them. Hyacinths can also be grown successfully indoors the second year. Although they will not produce as many blooms they are still as fragrant. Tulips and crocus will produce new, and more, bulbs which will not bloom the first year they are outside, but if nothing untoward happens, like a very bad winter, they will establish themselves and bloom from the second year on, as will Grape Hyacinths and Scilla.

Amaryllis bulbs are sold in many stores for forcing, complete with pot and some peat moss. Why not mix this peat with loam and sand in the

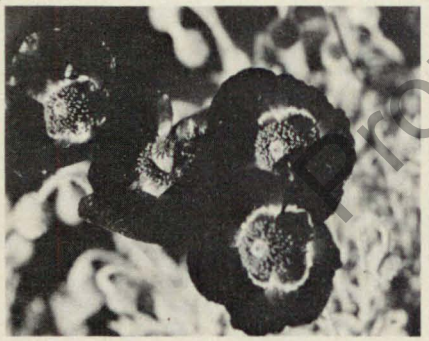
ratio described above, plant the bulb into a six inch pot and let it grow in there. Again, feed it, and after flowering remove the flower stalk. Quite often Amaryllis will set seeds, which would ripen and produce viable seeds. Don't be tempted to grow them, though. The bulbs are so-called F1 hybrids, which means that the next generation of plants grown from them would not be of the same quality as the mother plant. Besides that, it takes about three years to grow a flowering size bulb from seed.

There is another, quicker way of increasing the number of bulbs you have. The old bulb in a year or two will produce young bulbs, which can be taken off and grown on. Do not rest the young bulb until it has grown to flowering size — it will take longer for it to mature. The old bulb should be grown through the summer and rested from late September until some time before or after Christmas. If you have several bulbs, stagger the resting and re-starting time. Do not transplant too often, once every two years is plenty. The resting temperature should be cool but not cold, not under 60°F if possible. Although the recommended resting period is as stated above I found that I could bring the bulbs into bloom almost at any time, by varying the resting time. If the bulbs have to be transplanted, do this after the rest period, and be careful to leave as many of the thick, fleshy roots intact as possible. This is the time to remove the bulblets from the mother plant. If the bulbs get damaged by this operation dust them lightly with a fungicide or charcoal, and let the wound dry off a bit before watering.

There are, of course, many other bulbs and so-called bulbs which could be discussed. Why not do some reading and experimenting before throwing them away — you might get some pleasant surprises!

A Splash of Colour

MRS. ANNE LESKIW
Regina, Sask.



Dwarf Flanders Field poppies can be sown directly outdoors. This poppy is an annual with vivid colour. It's easy to grow, blooms all summer till frost, seed pods unnoticed, minimal care, stands up against our winds, and has attractive foliage. It's well worth growing and something a little different.

Annual Houseplants

SUSANNE OLVER
Supervisor, University of Manitoba Greenhouse

The term "Annuals" is, for most people, associated with bedding plants grown for the garden. There are a number of annual house- and greenhouse plants, though, which are not difficult to grow and will provide a good show of colour for a shorter or longer period of time. Also, besides growing annuals entirely for either house or garden, there is the possibility of digging up some plants still flowering in the garden in the fall, bringing them inside and thus extending their growing season past the first hard frost.

Perhaps the best known annual houseplant is the Cineraria *(Sinecio Cruentus)*. This plant is perhaps not the easiest to grow in the average house since it likes cool temperatures during its growth and needs short days to induce flowering. Also, it is well loved by aphids. These, however, can be easily controlled with periodic spraying of Raid or another pyrethrum insecticide. The seed of Cinerarie should be sown in September and, as mentioned before, grown in a cool, fairly bright location, and not receive long hours of daylight. If these conditions are met it will respond with masses of daisy-like flowers in a rainbow of colours. After flowering, the plant should be discarded, since it is an annual.

February is the time for sowing three charming little pot plants: Browallia speciosa *(Browallia)*, Wishbone flower *(Torenia Fourneri)* and Exacum *(Exacum Affine)* are three annuals, all blue, which thrive in the house. All can be grown in a soil mix of two parts soil, one peat and one sharp sand or perlite.

The seeds are fine and should not be covered with soil when sown. Prick out the tiny seedlings into a large shallow pan or flat, and when they are large enough transplant them, three together into the final five inch pot.

Coleus

Another annual which can be grown at any season, provided it gets enough light, is coleus, with its many hybrids and varieties, in brilliant colours and a variety of leaf-shapes and sizes. Of course coleus, in most cases, can be easily grown from cuttings, but the fun of selecting attractively coloured seedlings from a flat of pricked-out little plants gives an added interest to the grower. Beware, though, of making your selection too early — the cotyledons of these plants are usually mainly green, the first true leaves show some colour and only the second pair of true leaves will, in many cases, give you an idea what the mature plant will look like.

Marigolds, Lobelias

Suitable annuals for digging up in the fall are, among others, small marigolds, lobelias, and particularly the pretty little *Begonia semperflorens,* which, pinched back once or twice when the plant gets straggly, will flower right through the winter. In spring it can be divided, or freshly grown from cuttings and put back into the garden. Some cuttings, however, will not branch and thus not grow into good bedding plants.

Geraniums

Geraniums are, of course, not really annuals but they are grown as such by most gardeners. They will have grown to a large size during a good summer and it might be a problem to fit them into a pot. These plants should be top- and root-pruned so that they fit into a pot not larger than six inches so that they can find a place on the windowsill, preferably facing south. There they will grow and thrive until next season, rewarding such good care with colourful flowers. In early spring cuttings can be taken from these plants for summer gardening.

Marigolds, when dug up, should not be subjected to such drastic treatment but put into their pots with most of their root-system intact. All spent flowers should be removed, and they should continue flowering for quite a while. Like Impatiens, they are subject to red-spider mite infestations, which can be held in check by Kelthane or Morestan sprays, and if the plants begin to look unhealthy they can be thrown away without giving the grower the feeling that he has wasted much — by that time everything outside will be frozen anyway.

Lobelias, compact or hanging, can be kept growing in pots. They, again, like a cool, bright location where they will bloom for years, provided conditions are right.

The Coleus plants from the garden will, in most cases, have reached maturity and are not worth saving. Cuttings, however, can be made and grown easily on the windowsill. The flowering shoots should not be used for making cuttings. In most cases, they will grow poorly, insisting on flowering instead of producing interesting foliage.

This little list of annuals is not intended to provide the reader with a complete enumeration of annuals for the house, but just a reminder that these delightful little plants can give us a lot of pleasure in the home as well as in the garden.

Annuals in the Rock Garden

SUSANNE OLVER
Supervisor, University of Manitoba Greenhouse

A newly established rock garden will, because of the perennial nature of most of the commonly grown rock-garden plants, show a disappointing lack of colour and a lot of bare spots in its first year. There are, of course, more mature perennials available at some nurseries, but at a price. Much easier and less expensive is the use of low growing annuals which can be tucked in here and there. These will make up for what we are lacking in colour in our young perennials.

In the older rock garden, too, one can make use of those plants to fill some bare spots, perhaps left by spring flowering bulbs like tulips, crocus, grape hyacinths and scilla which delight us in early spring but will disappear soon, leaving bare patches here and there. One word of warning, in an effort to make the garden look "tidy," *don't* cut the leaves of those bulbs before they turn yellow by themselves. These bulbs have to restore energy lost through blooming in order to be able to bloom again next year. Simply plant one or several little annual seedlings among them, and cut the bulb foliage off when it starts to become yellow. The annuals will grow anyway, and most of them will flower for the rest of the summer until frost. Some of them will even seed themselves out and come back year after year (often in unwanted places). No need to worry — they hardly pose a problem compared with quackgrass or dandelion.

Selection

When selecting annuals for the rock garden one has to choose wisely, of course, or the rock garden might turn into an annual flowerbed interspersed with stones. Tall plants hardly fit, perhaps with the odd exception in the background of a large garden. It is important that the annual plants keep in proportion with the other ones, which are mostly low or creeping in character. Not all of the plants need to creep, of course, but they should not be overpowering either. Petunias and large marigolds, for instance, have no place in the rock garden, nor do standard geraniums. A few miniatures, placed wisely, can be very attractive, though. Positioning is important, too. A six-inch plant might look like a giant at the foot of the garden. while higher up it will look charming.

Here is a short list of some of the annuals which can be grown easily and will provide colour when you need it.

Ageratum, Scarlet Pimpernell, Dwarf snapdragon, California poppy, Ground pink, Candytuft, Lobelia, Sweet alyssum, Baby blue-eyes, Cupflower, Annual phlox, Rose-moss (Portulaca), Sanvitalia, Silene Armeria, Verbena, and Johnny jump-up.

Annual Flowering Vines

WILLIAM J. EMERSON
Government House Greenhouse, Winnipeg, Man.

Vines are not much used in prairie gardens, which is a pity as they make a colorful addition to it. They have many uses, from covering an unsightly fence, in softening the hard lines of a planter, providing a quick privacy to a patio area, to covering old stumps, garbage areas, etc.

Flowering vines are rather limited in the species that will grow and flower in the prairie provinces, as few will grow rapidly enough to flower before frost. Yet, we are fortunate that there are some, and one of the more colorful is the Morning Glory.

Ipomoea — Morning Glory — quick growing to a height of eight to ten feet; large trumpet-shaped colours in blues, pinks and whites. Morning Glories will grow from outside sowing but are better started indoors six weeks before planting-out time.

Many gardeners have trouble getting the seed to germinate as they are very hard coated. An easy way: Place seed in a small glass or cup. Cover with one or two inches of just boiling water. Let stand until cold; drain, sow seed one quarter inch deep in seed pan. Cover with plastic bag. Place in warm spot such as a frig top. Germination will take place in one to two days. Transplant singly into four-inch pots when true leaves appear. Provide stake to climb on, (does best in sunny area).

Sweet Peas — come in all colours except yellow, and grow from one and a half feet to eight feet — most grow about six feet. They are sown directly outdoors but some people like to start them indoors three to four weeks before setting-out time. When sown indoors, they are sown singly in peat pots or other small pots. One way is in egg shells. Boil eggs; cut top off; eat contents. Make small hole in bottom of egg shell, fill with soil; sow seed. Black seeded varieties should have the outer coat nicked with a knife or small file. Dust seed with nitrogen fixer such as Nitro-Nox — a black powder nitrogen activator that improves germination and growth of most legumes such as peas. Seed should not be sown outside until soil warms up, as cold wet soil will rot seed. Fence wire or string will be required for the plants to climb on. The more flowers that are picked, the more flowers form. Sweet peas require ample water and fertilizer when growing. Red spiders can be a problem; also it is well not to grow sweet peas too long in one spot as a fungus and virus disease will get a foot hold and decimate the row by mid-summer. All diseased plants should be removed and burned. Regular spray program, good air movement will help prevent mildew forming. Bottom soaking rather than top watering (which wets foliage) will also prevent mildew.

Cobea Scandens, Cathedral Bells, or Cup and Saucer Vine — one to one and a half inch bell-shaped blooms, clear green until open, then blooms change to rich purple blue, followed by large plum-shaped fruit, large shiny leaves, height about twenty feet, perennial in warm area. Start large black flat seeds six to eight weeks before setting-out time, sow seeds in usual way, transplanting to four-inch pots — when true leaves form, provide stake to climb on. Rapid grower, does well in sun or partial shade.

Trapaeolum Peregrinum, Canary Bird Flower — belongs to the nasturtium family. Graceful dainty climber with beautiful cut foliage and finely fringed nasturtium-like flowers of rich canary yellow. Likes some shade and moist soil — grows to about eight feet. Can be directly sown outdoors, but flowers earlier if started about six weeks before setting-out time. Sow seed (one or two to a four-inch pot) or small peat pot, transplanting later to four-inch pot. When well developed, provide stake to climb on. This vine is not seen very often, and deserves to be grown more widely. Could be used as a balcony plant, allowing it to drape over balcony rail.

Other annual climbers that are perennial but grown as annuals which could be experimented with, and which may or may not flower, depending on the length of the season.

Quamoclit Sloteri, Cardinal Climber — finely cut foliage, white-throated scarlet flowers, 15 feet tall. Sow indoors eight weeks before planting-out time. Grown for display rather than shade.

Quamoclit Pennota, Cypress Vine (same as above) — colours: white, rose red, Height: 10 feet.

Calonyction — Moon Flower — Pure white, scented flowers five to six inches across; open in evening, stays open till following noon. Height: 15 feet. This would require an early start — six to eight weeks before planting-out time. (an experiment only).

Shorter Climbers — Now for some of the shorter climbers or trailers useful in window boxes: hanging planters, hanging baskets; Use to soften face of planters by draping the front face with colour.

Trailing Lobelia — the most common — flowers in shades of blue with white throat, also almost white and rose shades. Very fine seed. Sow seed about ninety days before planting-out time. The very fine seed should be sown on the surface of the soil; do not cover with soil. Soak seeded pot in pan of water, until surface of the soil is moist. Drain, place in plastic bag, germinate in cool area about (16°C) or (60°F) in light but not direct light. Remove cover when seeds germinate. Transplant singly or two or three to a peat pot or flat. Handle as any other annual. Length; Two and one half feet.

Thunbergia Alata, Black-eyed Susan Vine — comes in orange with black throat — also now in pure white. Length: Five feet. Seed is an unusual shape — round with hole in centre like very small doughnut. Sow one-quarter inch deep about ninety days before planting-out time. Germinate in warm place, transplant into three or four pots when large enough to handle, place along edge of bench or shelf to allow them to drape.

All climbing vines should be well separated from each other in the greenhouse or growing area as they will tangle and eventually be impossible to separate to plant out.

Editor's Note:
Refer to Color Section p. 73a.

Drying Flowers in a Micro Wave Oven

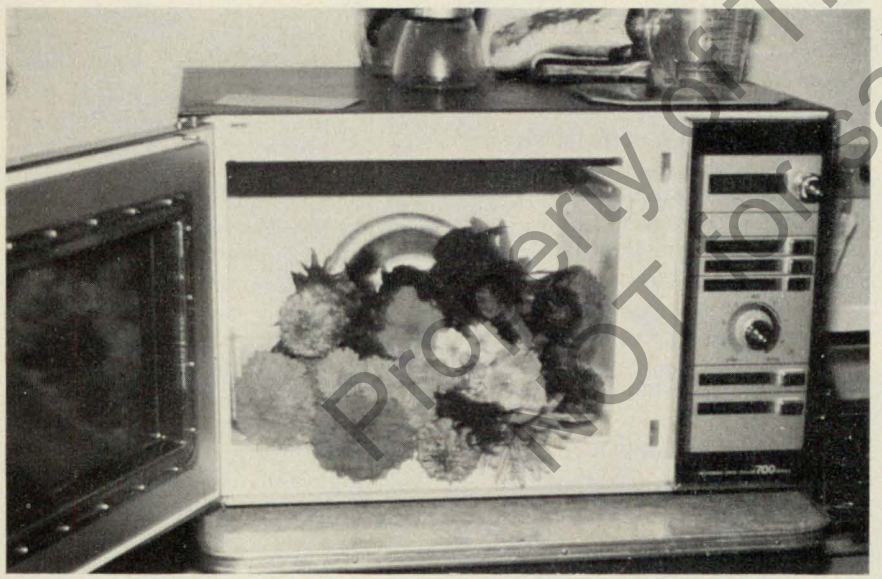
WILLIAM J. EMERSON
Government House Greenhouse, Winnipeg, Man.

Like to dry flowers, and you own a micro wave oven? Here's a quick and almost fool-proof way to achieve good-as-fresh dried flowers and foliage for arrangements!

As with any flowers for arrangements, select only the best flowers that are perfectly fresh and free from blemishes and, in development, at their peak of perfection.

The drying of flowers requires a supportive substance for those flowers that wilt, which is most of them. The drying agents that are most effective are: Silica Gel (Hobby Shops have this). Borax and corn meal. And thirdly, kitty litter. (The Hartz Brand is best as it is made of ground clay and has great absorbing qualities.) For orchids and other smooth surfaced flowers — the silica gel is best. All materials can be used over and over again.

Containers for micro wave drying can be of any size. Pyrex cake pans, cardboard shoe boxes, etc., but do not use any with metal of any kind or quantity, such as staples or wire fasteners.



Drying Flowers

1. Select fresh flowers leaving about ½ to 1 inch of stem.

2. Select container deep enough so drying agent will cover entire flower or flowers.

3. Put ½ inch layer of drying material in bottom. Place face up on base, with a spoon. Sprinkle more drying material gently around and between petals gentle enough so as not to crush petals, but to allow them to retain their natural position on the flower.

4. After flowers are covered, place in micro wave oven. Also place one cup of water in oven to provide moisture. Set time for 1-3 minutes (high setting) depending on flowers, (explanation will follow).

5. After flowers have cooked for required time, remove and leave in drying material for at least 36 hours to cure. Drying material can be gently shaken out of flowers at that time and used over again.

6. Store flowers in boxes. Place a thin sheet of styrofoam in the bottom into which the flower stems can be inserted. For flower arranging, stems can be lengthened with wire and florist tape.

7. If flowers become too brittle for arranging, they can be softened by waving them through a humidifier or steaming kettle to soften them. Flowers dried in micro wave ovens will feel and look more like fresh flowers.

Roses. Use silica gel. Carefully cover roses with gel, sprinkling between each petal until completely covered. Place in oven 2½ minutes. Let stand overnight. More than one rose can be done at one setting.

Miniature roses and small flowers, such as pansy — 1½ minutes in oven will be enough, with 10 hours setting time.

Daisies, small dahlias, zinnias, marigolds, carnations and flowers of that size, 2½ minutes in oven; and, as with miniature roses, 10 hours after ripening time before peeking.

Large mums, dahlias, peonies, and flowers of this order — 3 minutes and 36 hours resting time.

Orchids should be baked in silica gel 1½ to 2½ minutes, according to size, and rest of 24 hours.

Foliage

Foliage of all kinds, both the green and colourful ones, such as croton, can be dried without a drying agent. To dry, place shallow box lid or platter in bottom of oven, place clean paper towel on tray then place your leaves on top. A paper towel between each layer — piling them up, you can use as many leaves as your oven will hold. Set timer for 1½ minutes at high setting. When indicator indicates that "time's up:", carefully turn leaves and towel completely over. Do setting over again 1½ minutes. The total setting time should be 3 minutes. No ripening or setting up time required for foliage and it may be used in arrangements right away.

Micro wave oven drying is so quick that if you do 'boo boo,' there is still plenty of time to try again while flowers are still available, but there is little chance of error if care is taken in covering flowers so as not to crush them.

Editor's Note:

Refer to Color Section p. 65b.

Annuals for Home-featured Problem Areas

A. JANSEN
Horticulturist, Government of Alberta

In planning a garden, we strive for a decorative and perhaps an artistically designed appeal, which in many cases is most likely to be different with every gardener. To me, a good landscaped garden is like a well furnished living room with furniture and fixtures highlighting certain features such as archways, fireplaces, etc. The garden is no different, but perhaps more difficult! With our homes on small lots in the cities, it becomes a challenge to create a decorative and artistically designed garden.

Features, or should I say problem areas, such as archways, sidewalk patterns, fences, high foundations, raised patios and slopes need to be planned out carefully in order to create an attractive sight for the home owner, as well as the passer-by. The selection of plant material is important. In the areas mentioned, of course shrubs and perennials are needed, but for color, especially on the prairies, the home gardener depends on annuals. It's the continuing colour that annuals give us in a very short period of time which make these plants so preferred.

Your choice may involve the free mixing of many varieties or the careful use of a limited number of varieties, but if it pleases you it has served its purpose. I have used a specific or different colour scheme (no more than three colours) every year. Minimizing colors creates a most beautiful effect.

Next to colour selection of annuals, it is important to choose the right heights of our plants for the various areas, specifically:

a) If annuals are used for highlighting a sidewalk pattern, the lowest plants available, such as alyssum, lobelia and the shorter varieties of ageratum, would be preferred.

b) Along the fence, if no perennial border or permanent shrub-flower bed is preferred, planned, spaced placement of some taller annuals, for instance, marigolds or zinnias, bordered by lower sized annuals, would give a pleasing, picture-like effect, which would also enlarge your garden visually.

c) Slopes, either natural or architecturally planned, elevated areas in the garden, need groups of taller varieties of annuals at the top of the slopes and shorter varieties at the base, and carefully planned, colour co-ordinated planting in these areas can be very effective.

d) If archways are to be used in the landscape, plant selection should be such as not to hide the archway. Planting of Morning Glory for instance, on one side only, offset by a planting of tall Snaps on the opposite side, would create a pleasing sight.

3) High foundations or raised patios could be made interesting by planned groups of colour co-ordinated annuals at their different heights, using the taller varieties against the unappealing structures and sloping down towards the front of the flower bed with the shorter varieties.

With these problem areas in the yard, always keep in mind what we like to feature or hide. By using annuals, the prairie gardeners' word for colour, we can achieve a most appealing effect.

Amateur Gardener

ELINORE KENT
Winipeg, Man.

Loving flowers very much and unable to have my own garden, I turned to potted plants. I purchased three tiny plants about one-inch high at my local shopping centre and these, with care and attention, have now reached a height of two feet. I have also started an avocado which has grown to two feet high and has six leaves on it. I have a philodendron that has two separate vines growing over my kitchen cupboard, and I also took the top of a carrot with some green sprouts, and in one day it had ten sprouts!

These varied plants, together with an African violet, which survived being nibbled by a cat I was babysitting, brighten my home and give me pleasure.

However, when summer comes, if friends bring me flowers from their garden, I am very grateful.

Care of Gift Plants

RHONDA KURTZ
Winnipeg, Manitoba

Believe it or not, it is actually possible to keep gift plants alive after flowering, and even have them flower for the next year! All it takes is a little extra care, and some common sense, to prolong the life and beauty of your plant.

Poinsettia

By far, the most popular gift plant at Christmas is the poinsettia. It is a very delicate plant that does not like to be put in a cold draught or near a hot air register. To be at its best a poinsettia should be placed in or near a sunny window. Blooms will keep their bright color for several weeks if the plant is kept moist, (not too wet) in a fairly cool room.

When the bracts begin to lose their color and fall, it is time for the plant to rest. During this time (about six weeks) the plant should be kept fairly dry and at a temperature of about 50°F. Toward the end of the resting period the plant should be pruned back, enabling it to begin a lush new growth. The plant should now be put in a sunny window or set out in the garden where it can remain all summer. During this time it should be watered regularly and fertilized once a month. Bring the plant indoors before the first sign of frost.

In order to have the plant in bloom for Christmas, a short day, long night treatment must be carried out from October 1 to December 1. This treatment entails putting the plant in total darkness for 16 hours per day. This total darkness can be achieved by putting the plant in a closet or cupboard. Total darkness is very important because even the light from street lamps or a passing car at night is enough to offset the flowering mechanism and the plant will remain all green for Christmas.

Azalias

Azalias in bloom are the most attractive of all gift plants. While flowering, an azalia prefers bright curtain-filtered light and a fairly cool night temperature of 40°-45°F, and is very sensitive to draughts. Another important point is that the soil should never be allowed to dry out. After the flowers have faded, they should be picked off carefully. The plant should be watered regularly and fertilized every two to four weeks with an acid-type fertilizer. If the leaves begin to lose their color the plant should also be fertilized with an iron compound.

After the danger of frost, the plant should be placed outside in a semi-shaded area out of the wind. The pot should be sunk into the ground to enable the roots to keep cool and moist. During this time fertilize once a week with half strength, balanced fertilizer, such as RX15, and keep the foliage moist by misting daily. Prune branches just to maintain the plant's shape. Bring the azalia indoors before frost, and keep in a cool room. The plant should flower in one or two months.

Christmas Cherry

The Christmas Cherry, (or Jerusalem Cherry) makes an excellent indoor plant, and it can be kept attractive for many years with no great amount of care. Cherry plants bear tiny white flowers in summer, followed by long-lasting, poisonous orange berries. This plant can be easily maintained in an average indoor environment but prefers cooler night temperatures of 50°-55°F. To keep the berries a bright color, the plant should be put either in full sun or in bright indirect lighting.

Soil should be allowed to dry partially between waterings and fertilizing should be done once a month.

After the fruit has been shed, the stems should be cut back two to three inches. The plant can be put outside for the summer, but will also do well if kept in a well-lit spot indoors. During this time water and fertilize regularly, as well, pinch back all growing tips until late June. This encourages bushy growth. The plant will flower on the new growth in summer.

Cherry plants can easily be propagated from seeds. The seeds should be sown in February or March. Cherry plants are extremely susceptible to nematodes. Symptoms are yellowing of leaves and round swellings on the roots. Any plants with these symptoms should be discarded.

Ornamental Pepper

The Ornamental Pepper plant makes a colorful but inexpensive gift. It bears upright, slender peppers that change color from yellow to orange to red. These peppers are edible but extremely hot. Once the plant has borne fruit, it flourishes at room temperatures. The soil should be kept uniformly moist but not wet. Fertilizing is not necessary. After the peppers have lost their decorative appearance and the leaves fall, the plant can be discarded.

New plants should be started from seed in February. Pinch established plants till mid-July to encourage bushiness. For best results grow plants outdoors during the summer. Fertilizing should be done once a month until the plant flowers. Plants will bear fruit when they are about eight months old.

Christmas Cactus

Another popular Christmas plant is the Christmas cactus. It is a branching succulent composed of many leaf "segments" which have toothed edges. It bears tubular flowers that are usually pink or red. Flowers will last for several weeks at room temperatures, providing the soil is kept moist and the room is well lit.

After flowering the plant should be watered regularly and fertilized every two to four weeks. In the fall, watering should be decreased so the plant becomes quite dry. This, along with the shorter days of the fall and night temperatures of 55°F, are necessities for bud formation. Normal watering can be resumed only after flowers have opened. Increased watering before this time will cause bud drop.

Cyclamens

Although Cyclamens in bloom are among the most beautiful of all gift plants, they are not generally long-lasting in modern homes. They prefer

a cooler, moister atmosphere. During flowering the night temperatures should be kept around 55°F. Cyclamens prefer bright indirect light, and a high humidity. Increased humidity surrounding the plant can be achieved by misting frequently or by placing the pot in a tray filled with gravelly material and water. Soil should be kept evenly moist and fertilizing should be done every two weeks at half the recommended strength.

After the flowers have dropped, the plant should be fertilized at full strength every two weeks while new leaves are being produced. As the leaves begin to die, decrease watering and stop using fertilizer. When all top growth is dead, allow the soil to dry out completely. In early August remove the corm and plant in fresh soil keeping the corm showing above the soil to prevent crown rot. Put the pot in direct sunlight and water well. When new leaves appear, begin fertilizing every two weeks. Cyclamen corms can live for many years when cared for properly, however, the blooms will be smaller than those on young plants.

Chrysanthemums

Potted Chrysanthemums are rapidly becoming the most popular all-occasion gift plant. If kept in a bright, cool place with ample water, the flowers will provide color for four to six weeks. After blooming, gradually decrease watering as leaves die down. During the winter put the resting plant in a cool, dark place, keeping the soil barely damp until spring. Then prune the plant back to about three inches above the soil, and put the plant in a sunny location, (outdoors if possible). Water the plant thoroughly.

When new growth appears, begin fertilizing once a week with light applications of a well balanced fertilizer. Prune and pinch to shape the plant while it is growing actively. Chrysanthemums bloom as the days become shorter in the fall. It is difficult to grow them well a second time, but by following the above procedures they can still provide a great deal of bloom.

Hydrangeas

Hydrangeas, a common Easter gift, produce large clusters of blue or pink blooms, depending on the pH of the soil. An acid soil will produce blue flowers, and a neutral or alkaline soil will produce pink flowers. Hydrangeas purchased in bloom can last up to six weeks with proper care. Bright indirect light and cool temperatures are necessities for keeping blooms fresh. The soil should be kept uniformly moist. Fertilizers are not necessary when the plant is in bloom.

Getting hydrangeas to bloom a second time is difficult because of their dormancy requirement. After flowering the plant should be watered and fertilized every one to two months. The plant should be put outdoors in the summer, if possible. Flower buds will form when night temperatures are 60°-65°F and will continue development through winter dormancy. During this time the plant should be put in darkness for at least six weeks, maintaining the temperature at 40°-45°F. After the six week dormancy period, resume normal watering and fertilizing until plants bloom.

Miniature roses

Miniature roses can be grown well indoors, producing abundant blooms year round. To do their best they should be put in a location where they can get at least four hours of direct sun daily and where night temperatures are maintained at 55°F. The soil should be kept moist and fertilized every two to four weeks when the plant is actively growing. After most of the flowers have faded, continue to water and fertilize regularly. Growth is usually best when plants are placed outdoors in full sun during summer.

Many roses benefit from a winter "rest" period. In our prairie climate, this is best achieved by keeping the plant in a bright unheated room or enclosed porch. Any pruning or repotting should be done at this time. Roses are very susceptible to attack by spider mites. All newly purchased roses should be sprayed with an insecticide called Kelthane to ensure the health of the plant.

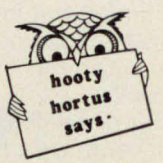
Easter Lilies

Easter lilies are a popular gift, but not too useful if kept after bloom. There are two ways in which they can be held over, neither of which will produce a very large bloom. The first way is to reduce watering until the top of the plant has dried up. After four weeks cut off the top and transfer the bulb to a flower bed outside. It will produce a flower in August. The second way it to keep the plant watered and fertilized until mid summer, then decrease both until the plant has dried up. The bulb should be stored in a cool dry place until November. Top dress with rich soil and begin watering regularly.

The most important rule of common sense to follow for any plant is not to overwater it. Too much water in the soil promotes the growth of certain types of fungi that cause the roots to rot. If you have a plant with suspected root rot; a few waterings with a compound called Captan should alleviate the problem.

Editor's Note:

Refer to Color Section p. 75c.



Eating garden fresh vegetables grown on a high-rise balcony isn't such a bizarre idea any more, thanks to developments in horticulture. To begin with, you could consider two new bush-type cucumber plants — Pot Luck and Patio Pick. Then there are several excellent miniature tomato varieties, as well as miniature egg plants, available.

Common Diseases of Annuals

DR. G. PLATFORD,
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Winnipeg, Manitoba

Annual flowers are an important part of the floral display around a house and in order to obtain maximum performance and pleasure from them the plant diseases that attack them must be controlled.

Hollyhock rust

Leaves, stems and other green parts of hollyhocks are subject to infection by the hollyhock rust disease. Small dark brown raised spots or pustules, about the size of a pinhead, develop on the under surface of affected leaves. Above the spot on the upper surface of the leaf bright yellow or orange spot develops. The pustules contain the rust spores. In order to control the rust, it is necessary to remove and destroy the first leaves on which the rust is evident. Frequent dusting with powdered sulphur or spraying with wettable sulphur, or zineb fungicides is effective in preventing new infections. New leaves as they develop should be treated with the fungicide.

As soon as the flowering season is over the old stems should be cut back to the base and the trimmings should be destroyed rather than put on a compost pile, as the spores can remain alive on the affected parts over-winter, and serve as a source of infection next spring. Do not use seed from infected plants. If the disease has been a problem in previous years the fungicide spray program should begin in the early spring as the new leaves are developing.

Seedling damping off

Seedlings may die shortly after germinating from damping off disease or they may be affected after they have emerged. Affected seedlings wilt and fall over and often show a constriction of the stem at or near the soil line. There are several soil-borne fungi that cause damping off and almost all soils contain one or more of these species of fungi. Pre-emergence damping off can be prevented by treating seeds with a seed protectant fungicide either captan or thiram. Enough fungicide to give a light dusting is sufficient. Seeds should be sown in a soil-less starting medium such as peat moss or vermiculite or soil that has been sterilized. Small lots of soil can be sterilized in the oven. Place the soil in a roasting pan and cover the pan with tin foil. Insert an oven thermometer through the tin foil and into the soil. Heat the soil in an oven until 180°F (70°C) and maintain this temperature for 30 minutes.

Damping off of seedlings in a flat, after transplanting from the starting medium, can be controlled by drenching the soil with the fungicide no-damp or using a solution of two tablespoons of captan in a gallon of water. Seedlings should receive adequate light and, above all, must not be overcrowded and watered excessively.

Powdery mildew of begonias

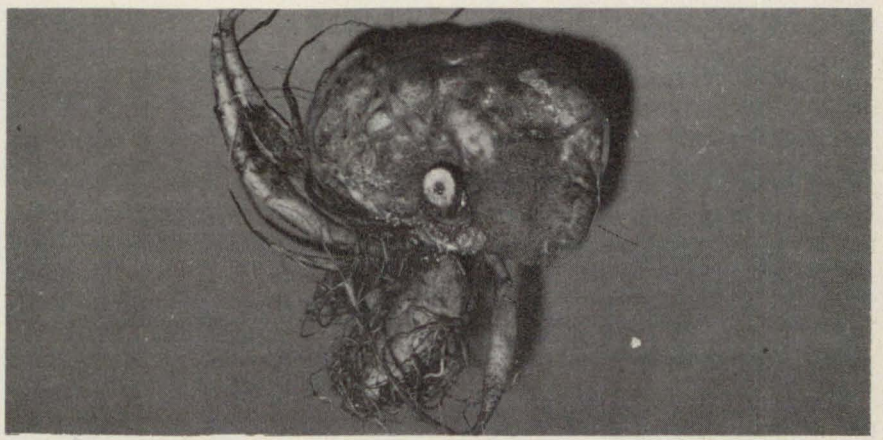
Powdery mildew is a very common disease of all types of begonias. White powdery spots develop on the surface of leaves and flower stalks. The white spots are made up of the spores and mycelium of the powdery mildew fungus. When these white spots appear the plants should be sprayed with benomyl (Benlate) fungicide. Other flowers affected by this disease include zinnias, pansies and chrysanthemums.

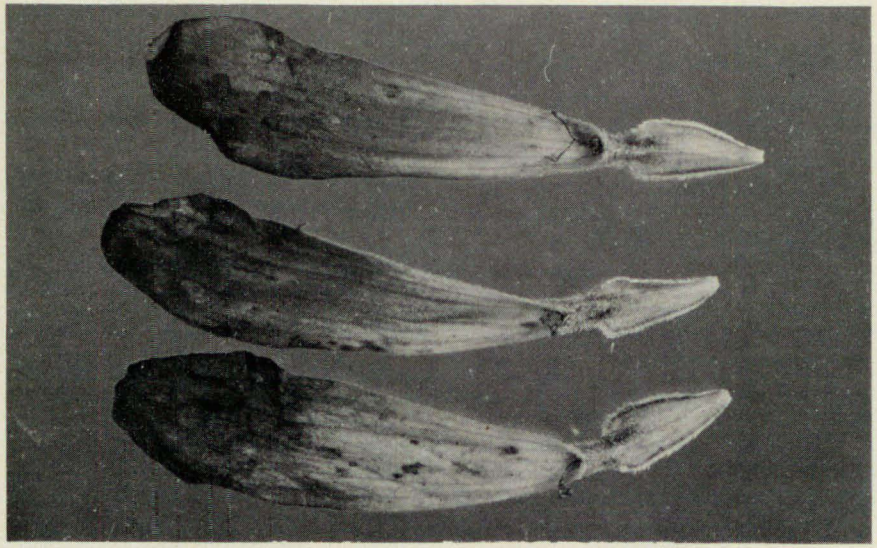
Bud rot of dahlias

Failure of dahlia buds to open is often a result of *Botrytis* bud rot. This disease caused by the gray mould Botrytis fungus is favoured by dull, cloudy and moist weather. The bud develops a soft rot and may become covered with a grayish powdery mould. Young shoots and leaves may also become affected and exhibit a spotting or soft rot. The spores of this mould are windborne and, if weather conditions are favourable for its development, the disease can rapidly spread throughout a planting of dahlias. In order to control the disease, remove all old flowers and other affected plant parts. Spray the plants with benomyl (Benlate) or captan fungicide at least once every ten days during periods of humid weather. The same fungus also causes a blossom blight on other garden flowers such as marigolds, petunias and zinnias.

Crown gall of dahlia

Large tumors or swellings occasionally develop at the base of dahlia plants and on the roots. These tumors are caused by an infection of the crown gall bacteria. Infected plants should be destroyed as soon as they are discovered. Tubers from infected plants should not be saved for planting next year. If the disease has been a problem the location of planting dahlias should be changed and several years allowed before replanting dahlias in the same spot.





Wilt of zinnias

Zinnia plants are very susceptible to a wilt disease caused by the fungus *Sclerotinia.* Affected plants invariably wilt and die with the affected stems showing a white discoloration near the soil line. A cottony growth at the base of the stem, accompanied by the formation of black fungus bodies called sclerotia in the interior of the stem, is usually evident, especially if the disease occurs during periods of wet weather. Wilted plants should be pulled up and destroyed.

Zinnias or any flowers in the *Compositae* or sunflower family should not be planted in the same location more than once every three years to prevent build-up of the disease in the soil. A number of garden plants, such as beans, peas and tomatoes, are also susceptible to this disease.

Aster yellows and mosaic

Yellowing, stunting and malformation of flowers are often the result of aster yellows. Asters, marigolds and dahlias are all susceptible to this disease, caused by a mycoplasma. The mycoplasma is transmitted by leafhopper insects. The disease does not over-winter in the prairie provinces but is reintroduced from southern areas by wind blown leafhoppers each year. There is no treatment that will eradicate the disease from an affected plant. Plants can be protected from infection by frequent applications of an insecticide such as Malathion to control the migrant leafhoppers.

The above plants are also susceptible to mosaic disease. Mosaic disease is very similar to aster yellows and is expressed by an uneven coloration of the plant. Parts of affected leaves may be light green and other parts dark green. This disease is caused by several different types of viruses. Like the aster yellows mycoplasma the virus is carried by insects, usually aphids. Periodic spraying of plants with an insecticide will help prevent these two insect-transmitted diseases; aster yellows and mosaic.

Black stem rot (blackleg) of begonias and geraniums

Begonias and geraniums often exhibit a black discoloration at the base of the stems which causes the eventual death of the affected plant. This black discoloration is the result of an infection by the soil-borne fungus *Pythium.* Infected plants should be dug up and destroyed. Adjacent plants should be treated by drenching the soil around the plant with a captan fungicide solution. Apply at the rate of two tablespoons captan per gallon of water and thoroughly drench the soil around the plant. Repeat the application in ten days time and periodically throughout the summer if the disease reoccurs.

These are some of the common disease problems of annual flowers. The Provincial Departments of Agriculture in Manitoba, Saskatchewan and Alberta have plant disease diagnostic laboratories where samples of diseased plants can be forwarded for diagnosis, and specific control recommendations, based on the disease detected, will be sent out.

The Wild Wild Rose

Of all the flowers
that please the eye
Out in the meadows
The woods nearby
I have a favorite
That I like best
That gives me pleasure
More than the rest.

It does not ask you
For tender care
Deserted fencelines —
You'll find it there
You'll find it also
In the open wood
Or where a cabin
Once proudly stood.

On gravelly soil
Or heavy clay
It puts its blossoms
Out on display.

It blooms all summer
The bumble bee
Visits its blossoms
So frequently.
I love those blossoms
That I behold
With pinky petals
And hearts of gold.
That quietly brighten
The home it chose
With quiet splendor!
My wild wild rose.

Grand Gardens of the All-America Selections

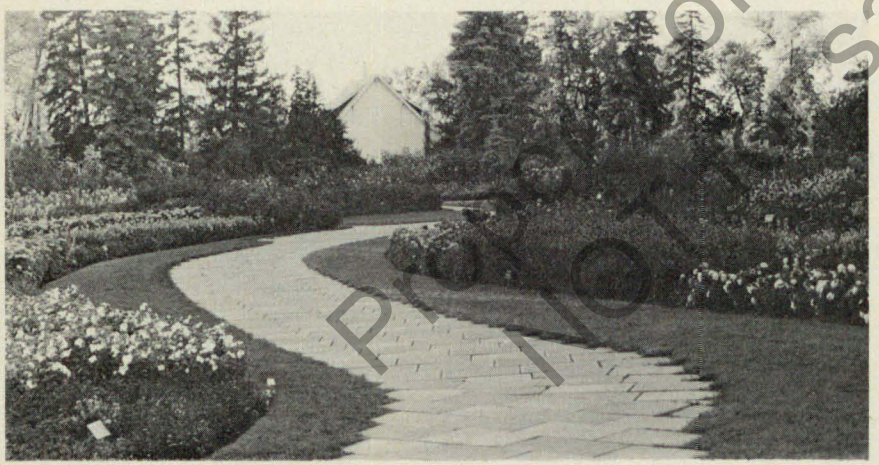
KAREN PAUL,
Winnipeg, Man.

Each year, across North America, new varieties of annual garden flowers and vegetables are tested and displayed in some of the most beautiful, and appetizing arrays to behold. Under the direction of the "All-America Selections," these varieties come to be tested by Mother Nature and scrutinized by experienced judges in an effort to determine their potential performance in our gardens for the future. Only the most outstanding varieties, displaying consistently excellent results in a wide range of climates and conditions can ever hope to achieve the highest honour awarded by the "All-America Selections." Relentless labors by plant breeders and seedsmen must be invested in this seemingly unattainable strive for perfection.

But, just what are the "All-America Selections"? What qualities determine a winner and how can the select few be recognized?

What Are They?

Briefly, "All-America Selections" are the results of many years of testing by an all-volunteer organization, across Canada and the United States. New varieties of flowers and vegetables are submitted to the organization by various plant breeders and seedsmen from around the world. Very specific regulations govern seeding time, spacing, recording of growth and yield data, as well as observation



"THE ENGLISH GARDEN," an All-America Selections Display Garden at Assiniboine Park, Winnipeg, Manitoba.

of environmental information. The plants are tested by experienced and knowledgable judges for their performance and adaptability in comparison with similar varieties already present in the seed trade. Standardized reports are submitted and compiled in an effort to evaluate the overall performance of a new variety across North America. Then, depending on the results, Gold, Silver, Bronze Medals or Honourable Mentions are awarded by the organization to those varieties which are most outstanding. These varieties, bearing the AAS Crest, are released into the seed trade, providing there is enough stock seed available to supply the demand.

The organization supplies many educational services regarding its work, in exchange for a minor assessment on the sales of AAS winners. The bulk of the communication is through volunteers, extension agents, as well as horticulturally related organizations and publications such as "The Prairie Garden."

History

"All-America Selections began in 1932 as the idea of the late Ray Hastings, a prominent seedsman at the time. That year, 101 vegetable and 149 flower entries from around the world were tested and evaluated. The first winners, in 1933, included a Gold medal to "Golden Gleam" nasturtium and "Chrysanthemum Flowered" marigold, the latter no longer in general commerce. "Honey Rock" melon won a gold, and "Imperator" carrot a silver in the vegetable category that year as well.

"All-America Selections" was set up to protect new varieties as they were introduced by the breeders, to offer a reliable network of testing and recognition for these varieties and to offer incentive in breeding programs and an exchange of information on new breeding techniques. At present, more than fifty trial gardens exist, and over that number as display gardens.

The list of AAS winners has grown considerably over the years, making it quite difficult to reproduce. However, the winners can be readily recognized by the AAS crest present on the seed packages of award winners. Some notable winners in the past, which are still very popular, include "Thumbelina" zinnia, the first miniature, "Majestic Giants" pansy, "Carefree" geranium, the "Butterfly" series of snapdragon, and more recently, the "Peter Pan" and "Ruffles" series in zinnia. Popular vegetable winners include "Bell Boy" pepper, "Cherry Belle" raddish, "Ruby Queen" beet, "Salad Bowl" lettuce, as well as "Table King" bush acorn squash.

Since the "All-America Selections" were established, such organizations as the All-America Rose Selections, Inc., the All-America Gladiolus Selections, the "All-Britain Trials" (the British counterpart of the All-America Selections), and the "Fleuroselect

ALL AMERICA AWARD™

ALL-AMERICA AS SELECTIONS

The All-America Selections Crest and logo. The Crest is the identifying mark on all seed packages bearing a winner. The logo is representative of the organization.

Selections" have developed as separate entities.

Choosing a Winner

Criteria for winning entrants includes a very wide scope of character traits, depending on the type of plant being tested. In flowers, tidy plant habit, new shades and colours of blossoms, unique flower shapes, resistance to fading or damage by rain and humidity, resistance or tolerance to insects and diseases, profuse flowering over an extended period, attractive foliage, pleasing fragrance and general hardiness, are but a few of the many traits considered. With vegetables, many of the same characteristics apply but, in addition, fruit size and yield, improved flavour, colour and texture, earlier maturity dates and general vigor are to be considered.

The main criteria for determining an award winner comes from an honest evaluation of the entrant in comparison with the most comparable variety already in commerce, which is grown beside the entrant under the same set of environmental and cultural conditions. The new variety must be sufficiently superior or entirely unique in its own right to merit an award.

Trial Grounds and Judges

Generally, the judges for the "All-America Selections" are drawn from the seed trade, universities and colleges, as well as from public or governmental display gardens. The judges must have several years of experience in plant breeding or in operating trial gardens and/or considerable academic training in the field. A qualified judge must be able to recognize at a glance the traits which make a variety superior to another, as well as have a feeling for what the home gardener and, to some extent, the commercial grower wants in new varieties.

At present, of the 27 All-America Selections Vegetable trial grounds, three are operating in Canada; one at the University of Manitoba, one at Stokes Seeds in Ontario, and another in Quebec. There are 31 AAS Flower Trial Grounds in North America, one at Brooks, Alberta, another at the University of British Columbia, one each at The University of Manitoba and Stokes Seeds, and another in Quebec. It is at these stations where the special problems of growing plants in a short growing season are encountered and reflected in the judges reports. A first-hand look at what is up and coming in the way of new varieties may be observed by attending one of the field days often held by these stations during the summer months.

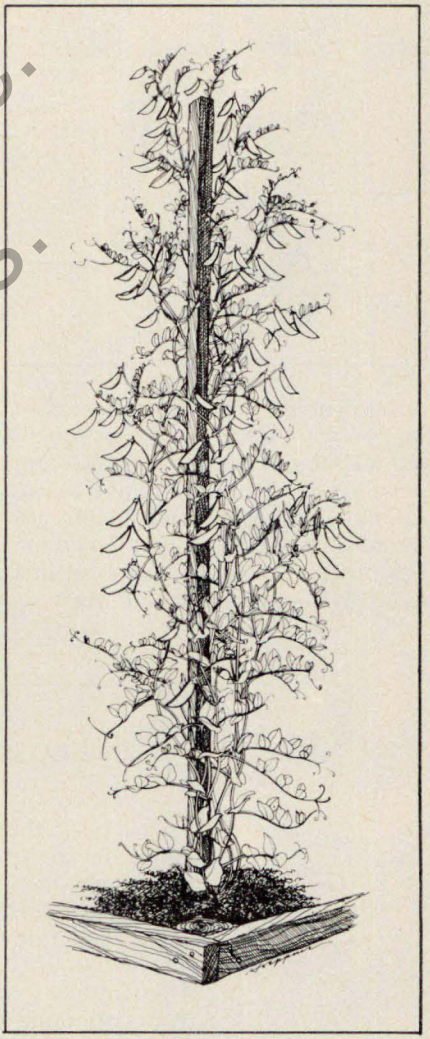
As well as the trial gardens, the "All-America Selections" are displayed in public gardens throughout Canada, the United States and Mexico, with additional representation in England, New Zealand, Bermuda and South Africa. These display grounds offer the public a look at the new varieties in a landscaped garden-type setting. Nine of the 69 display gardens are located in Canada — at the University of Alberta, Edmonton, Assiniboine Park, Winnipeg, and the remainder throughout Ontario.

What's New for 1979?

The award winning varieties for '79 have already been announced and include some spectacular selections. A Bronze medal went to marigold "Queen Sophia," for its unique colouring in distinctive shades of golden-orange-red and its ability to recover quickly after transplanting. A

Bronze also went to nicotiana "Nicki-Red," a dwarf variety with upturned rosey-red flowers, which has shown good resistance to heat and humidity extremes. Pansy "Orange Prince" won a bronze as well, for its large, rich golden-orange blossoms with black faces, held high on sturdy stems. Two varieties of zinnias, "Gold Sun," an early giant with intense yellow blooms stands up well to sunshine and mildew problems, as well as "Peter Pan Gold," a medium sized plant with full sized blooms, both won Bronze medals. An unusual winner was ornamental pepper "Holiday Cheer," a very colourful plant which produces almost round, gold-turning-red peppers, offset by the dark green foliage.

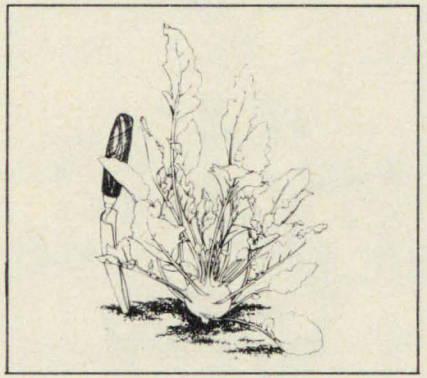
The Vegetable Selections included "Sugar Snap" pea, a Gold medal winner because of its uniqueness. This pea differs from the edible podded or snow peas in that it is best eaten when the pods are full and sweet. Eaten raw or cooked as whole peas they are most delicious. Other winners include a Bronze to "Dutch Treat" pepper, "Saladin" cucumber, "Early Butternut" squash and "Sweet



Mama" squash. As well, "Grand Duke" kohlrabi with a Silver medal was an outstanding winner because of its dwarf plant habit and earlier maturity date.

Possibilities For The Future

Just what will the All-Americas hold for the future? At this time, future



developments depend on the plant breeders, on developing new breeding techniques and on a greater understanding of the genetic and reproductive processes that make up heredity. As well as improving on the obvious objectives of plant breeding as stated earlier, barriers such as biennial bearing habit have been broken in the case of hollyhock "Majorette." A white marigold is currently being tested, as well as many other breeding achievements that we may be growing in our gardens in the near future. Anyone can speculate on the advances yet to come.

IN BLOSSOM TIME

Fruit trees garbed in lacy white,
Blossoms are a rare delight,
Come with me
Oh, please won't you?
Then you'll find them charming too!

Fragrant blossoms everywhere,
Wafts of honey in the air,
They're as lovely
As can be,
Are the blossoms in a tree.

Rows of snowy splendor grand,
Scenic beauty for our land,
They have found
A loving part
And a nook within my heart!

— *Amy Drollich*

Weed Control for the Homeowner

H. R. NELSON
Weed Specialist, Soils and Crops Branch,
Manitoba Department of Agriculture

As we all know, a weed is any plant growing out of place. There are three main types of weeds — annuals, biennials and perennials, and proper identification of the type and species of weed is the first step towards designing an effective weed control program. For example, control of a perennial weed is much more involved than the control of an annual weed.

The root, as well as the top growth, of a perennial weed must be destroyed in order to achieve complete control. Perennial weeds in the seedling stage can be treated the same as annual weeds since there is no established root with which to contend. Biennial weeds should be controlled in the seedling year, besides being easier to control at this stage there is no chance of seed being produced.

The second consideration in weed control is the type of area where the weeds are located. Weeds create problems in lawns, gardens, shelterbelts, around buildings, fencelines and along roadways. The type of control program varies depending on location. More selective controls are required in lawns and gardens than around buildings, fencelines and roadways. Specific recommendations for the different weed problems in the various areas are covered in the *1979 Guide to Chemical Weed Control* and in a new publication, "Weed Control for Homeowners," both published by the Manitoba Department of Agriculture.

Methods of weed control

There are several methods of weed control, including the use of herbicides, tillage (including hoeing), and cultural practices. Herbicides and tillage are fairly well understood, but too often are the only methods used.

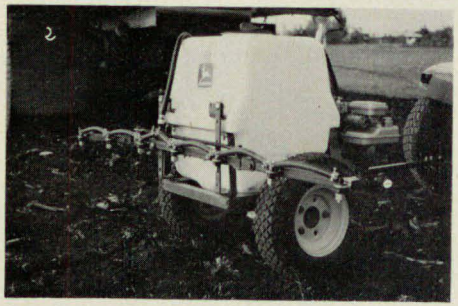
Cultural practices include such things as the fertility program, sanitation to prevent the introduction of weed seeds, watering and mowing of lawns, planting rotation of gardens and flower beds, and the use of tillage. This total management of an area influences the type and the extent to which weeds will be a problem. That is, a well fertilized and watered lawn which is kept mowed will have fewer weed problems than a poorly managed lawn. An effective weed control program begins with good cultural practices and is supplemented with herbicides and tillage when required.

Spray equipment

One of the main drawbacks to weed control around the home is lack of good spray equipment. This is unfortunate because such equipment is available at a wide variety of prices to suit most spraying needs. Sprayers are available from simple watering

Watering can Hand sprayer

Knapsack sprayer



Small trailer sprayer

cans for the relatively less exact applications to small trailer mounted sprayers with gas motor driven pumps.

Extreme care must be taken when applying herbicides around the home to prevent drift onto desirable plants. Low spray pressures and large spray droplets create less drift hazard than high pressure and small droplets. Spray only on calm days. Use non volatile chemicals to eliminate fumes which will drift. For maximum safety, highly susceptible plants should be covered with paper, blankets or a tarpaulin while spraying.

Proper selection of equipment, like proper identification and design of the control program, is essential for best results.

For information on weed identification, control recommendations and equipment for specific weed problems consult your local weed supervisor.

Chinese Lanterns

MRS. F. SMITH
Winnipeg, Manitoba

Chinese lantern is the common name for a hardy perennial, *Physalis, (P. Alkekengi)*. It is also known as Winter-cherry, and in one reference book it was called the Cape Gooseberry. The flowers are not very showy, being rather small and white, and somewhat hidden by the foliage, but the plant is grown principally for its showy lantern-type or balloon-type husks which turn orange-red when ripe.

Chinese lanterns will grow well in poor soil, and should be planted in a designated spot as they are inclined to take over. Plants grow from 18 inches to two feet tall, and I believe there is also a dwarf variety on the market now. Propagation can be from seed, or the established plants may be divided. They develop pods the second year.

The lanterns can be used very effectively in dried arrangements, and they dry quite naturally when hung upside down in a dry basement. To use as an accent in an arrangement before they are dry and brittle, the husk can be divided and turned back to expose the seed ball or fruit in the centre. I have sprayed some faded ones a bright red to use in Christmas arrangements — giving the effect of Christmas bells.

As with many plants in our area, slugs can be a problem and spoil the lanterns for use later on by chewing holes in them. If you are in a slug-infested area be sure to put down some slug bait or control them in some way in order to avoid disappointment when you want to use them for winter decoration or in arrangements.

Some New Ideas for Container Planting

BETTY ENNS
Calgary, Alberta

Container planting is ideal for patio or balcony gardening and pots or planters may also be placed in that bare spot which occasionally shows up in most gardens. The number and variety of containers grows each year, even trees may be planted in the larger cement types.

Window Boxes

There seems to be no limit to the variety of plant material which will succeed in a container. Window boxes have been used for years with such plants as geraniums, dracaenas, marguerites, petunias and trailing lobelia. Why not try something a little different this year? Ivies, small hanging tomatoes, strawberries, fibrous begonias, in fact, any of the annuals may be used for container planting.

Strawberry Jars

Ceramic or pottery strawberry jars make beautiful planters. They usually have eight pockets in which plants may be inserted as well as the top opening. They can be filled with pansies or begonias for shady areas or hanging miniature roses, hanging ivy geraniums, petunias and portulaca for sunshine. We tried portulaca last year and this turned out to be the loveliest of anything we have planted in containers. When purchasing a strawberry jar for this purpose, try to obtain one with fairly large side pockets — planting them is then much easier.

Wooden Planters

Many shapes and sizes of wooden planters may be built. A handyman can build two or three tiers which can be attached to a building, which would enable you to have a cascading mass of bloom all summer long. We have planted ours with mixed colors of petunias, miniature roses and a mixture of ivy geraniums, ivy, dusty miller and blue lobelia. This group of flowers is ideal for a sunny spot, but tuberous begonias, impatiens and the yellow annual calceolaria would be a colorful addition to a shady area.

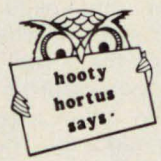
Wall Garden

Another method of displaying hanging plants of all kinds is a vertical or wall garden. This could be an outside divider or windbreak. Construction is of four-by-four posts and two-by-four grids placed in 12 to 15 inch squares. The back is covered with plywood or one by six boards. Fill alternate squares with sphagnum moss or, if you are lucky as we are, you may be able to find natural moss in a swampy area, then cover each square with wire mesh. Wire fencing cut to the proper size, with two-by-two and one half-inch mesh is ideal. Planting is difficult if smaller mesh is used. Do not confuse fresh natural moss with ordinary peat moss, as peat moss is not suitable.

Wet the moss thoroughly before planting and set the plants through the mesh, either directly into the moss or in peat pots. Keep moist at all times and feed often with a liquid plant solution such as 20-20-20. A slightly wider shelf would allow the plants to be left right in their pots and set on the shelves, but this arrangement is not nearly so attractive. This year we have hanging ivy geraniums, blue lobelia, white petunias, schizanthus and a few of the old-fashioned blue felicia which were given to me by a friend; this seed is rather difficult to obtain nowadays. This combination is beginning to make a good showing but is not as far advanced as it should be because of our cool damp weather. This same type of vertical planter could be built in a shady location and begonias, impatiens and the aforementioned yellow calceolaria would be an excellent choice.

Soilless Mix

Container plants do very well in a soilless mix, this may be purchased and used as it is, if only a few planters are to be filled. However, this might prove somewhat expensive if a number of larger containers are to be filled, so mix with half soil and a little superphosphate may be added. Mix very thoroughly before planting; the soilless mix will improve the drainage situation.



Basic Rules for the Culture of Asparagus and Rhubarb

Asparagus

- *Start with at least one year old plants.*
- *Plant in trenches with crowns about six inches below surface of soil, filling in trench after growth has developed.*
- *Cultivate shallowly as roots tend to spread horizontally rather than downwards.*
- *Do NO harvesting the first year, a few spears the second year, with the first harvest the third year, and then only for some two or three weeks.*

Rhubarb

Its culture is very similar to asparagus, which means a prepared fertile soil that drains well, a side dressing of fertilizer in early spring, and NO harvesting the first or second year, with discretion in picking the third year.

Plants will last ten years or more after which they can be dug up, divided, and replanted.

Use of Annual Flowers Increasing in North Dakota

ROBERT G. ASKEW
Extension Horticulturist, North Dakota State University

North Dakotans are becoming more appreciative of the esthetic values of floral plantings of annuals, both for home and public landscape use. Settlement in the 1870's through the 1940's was a period of time in which our people expended their energies eking out a living from the virgin prairies. It was a battle for survival which was subject to the climate and the economic ups and downs in a state almost totally dependent on an agricultural economy. Most just didn't have time or quality annuals to develop beautiful gardens. Periodic droughts, limited water supplies, low quality well water, limited income and lack of wind protection on an almost treeless prairie delayed the horticultural development in North Dakota.

Changes in Home Landscaping

Several things have happened since World War II. Generally, agricultural income has increased, not always by price, but by efficiency. Our towns and cities have trees, our farmsteads are wrapped with windbreaks, and water quantity and quality has improved. Our rural population has decreased while our cities are growing in numbers. Our people have more leisure time to appreciate and to enjoy beautifying their homes and communities through landscape plantings. They take pride in having green lawns, shade trees and flowering shrubs and flowers to complete the landscape scene.

Public Landscaping

A change has also come about in public landscaping as well as in the industrial areas. We need only to look and note that landscape plantings are now placed in the construction budgets for hospitals, schools and industrial parks, etc. Trees, shrubs and flowerbeds are installed immediately, rather than poorly planted, if at all. Before, school grounds were often neglected during the summer months, where now we find most of them well manicured throughout the season. Many of our city parks have added extensive floral plantings to add a touch of elegance to help make each visit a more pleasurable experience.

Beautiful Annuals

The extraordinary colors, abundance and variety of annuals can dazzle the eye in massive public gardens or parks or when used in home yards. The explosive growth of some of our communities demands an instant landscape effect. Annual flowers have filled some of that need and have supplied carefree and glorious color. They have helped to eliminate the drabness of industrial areas and to escape the dreary blight that has destroyed the beauty of some city gardens and roadsides.

Since annuals are spring to autumn blooming flowers, they bridge the gap between the sporadic color periods of the major perennial flowers. Plant breeders, formerly, were chiefly interested in producing larger flowers, new or cleaner colors and different flower forms. Now, they not only seek these ends, but also develop plants that, in size and growth, will fit the exact needs of the gardener to make the best possible showing under existing conditions on his home grounds. We have a wealth of outstanding annual flowers that are well adapted to our region. Although there are dozens of kinds of annuals, the big three, petunias, marigolds and zinnias, are usually the best buy in color for home and public plantings.

The Petunia

The petunia is number one as a bedding plant in North Dakota. Modern hybrids are a far cry from the older open-pollinated types that often reseeded themselves. The younger generation may not recall the rather "drab" colors in many a flowerbed. The dull whites through all shades and mixtures of blues and purples were often seen. We now have excellent petunia varieties in both multiflora and grandiflora singles in a wide range of bright, glistening, true colors in addition to clean whites.

We recommend multiflora single petunias for bedding purposes. They generally produce smaller flowers than grandifloras, but many more flowers per plant. We find the multifloras are wind and rain resistant and thus generally best suited for bedding purposes. However, the public seems to demand the larger flowered grandiflora types, and there are many excellent varieties on the market.

Our evaluations show that these multiflora single petunia varieties are excellent:

Red: 'Comanche Improved,' 'Red Joy,' 'Red Satin'
Orange: 'Orange Bells'
White: 'White Joy,' 'Paleface'
Blue-purple: 'Blue Jay,' 'Purple Satin,' 'Purple Plum'
Pink: 'Pink Satin,' 'Pink Joy,' 'Coral Satin' and 'Rose Joy'

The grandiflora singles of high quality are:

Red: 'Candy Apple'
Dark Red-Wine: 'Burgundy'
White: 'Glacier'
Blue-purple: 'Blue Cloud,' 'Malibu,' 'Mariner' and 'Sugar Daddy'
Pink: 'Ballerina,' 'Happiness' and 'Pink Magic'

Marigolds

The newer hybrid marigolds and zinnias rank second to petunias for color in home and public plantings. These exquisite annuals are now available in plant sizes from six to thirty inches with a good color range. It is easy to design a flowerbed using only marigolds or zinnias. Dwarf marigolds such as 'Lemon Drop' or Petite Series (yellow, orange and gold) can be used for edging. The intermediate varieties near 12 inches; 'Spun Yellow,' 'Showboat,' a rich early yellow, are excellent choices. 'First Lady,' 'Gold Lady,' and 'Gold Galore' fill the bill at the 18 inch level, while 'Happy Face' and 'Golden Jubilee' are tops with an average height of two feet.

Zinnias

The Peter Pan Series of 12-14 inch zinnias are a tribute to modern flower breeders. They have developed this uniform, dwarf plant with medium to large flowers which continually cover faded blooms. The Peter Pan colors are orange, pink, plum, scarlet, cream and gold (1979 AAS). The scarlet, pink and gold may have the edge in color value over the other three.

In my opinion, the two new zinnias, 'Red Sun' (1978 AAS) and 'Gold Sun' (1979 AAS) are the best dahlia-flowered zinnias produced to date. The plants are two feet tall, wind resistant and very floriferous. We have usually recommended the cactus-flowered zinnias because our earlier trials indicated greater flower production than the dahlia-flowered varieties. Our top cactus-flowered zinnias include:

Orange: 'Bonanza' and 'Torch'
Red: 'Firecracker' and 'Redman'
Rose-pink: 'Rosy Future'
Cherry-rose: 'Wild Cherry'
Yellow: 'Yellow Zenith'

Any or all of these varieties can fit into the home or public landscape.

Other Annuals

Certainly we should not totally ignore the many available, colorful annuals such as, geraniums, verbenas and salvias or others. Spike-form flowers, like snapdragons or cannas, offer pyramidal plant form which can reduce the monotony of using all rounded flower forms. They do produce an accent comparable to evergreen shrubs in the general landscape.

Flowerbeds should be planned on paper before the purchase of plants. A little planning can save the homeowner money and also produce a more beautiful and satisfying planting.

Editor's Note:

Refer to color section pp. 66a, 66b, 66c, 67b.

Merit Award to Collet Apple

W. G. RONALD
Morden Research Station
Morden, Manitoba

Mr. Albert Collet accepts Award of Merit presented by Wilbert Ronald on behalf of the Western Canadian Society for Horticulture.

Another milestone was recently recorded in an interesting story begun some 43 years earlier when the Collet family of Notre Dame de Lourdes received a packet of apple seed from the Morden Experimental Farm. This milestone was the presentation of an Award of Merit for Collet apple to Mr. Albert Collet who lives on the original homestead where the Collet seedling was discovered. The April 3, 1978 gathering in Miami, Manitoba of more than 20 family members included Mr. Collet's sister Alice (Mrs. Chappellaz of St. Claude) who was instrumental in helping grow the group of seedlings from which Collet apple was selected.

The full story of the development of the Collet apple was ably told by Mr. Albert Collet in the 1976 issue of *The Prairie Garden*. Briefly the details include the germination of the seed from Morden and the effect of winter cold which after the 1943 test winter left only one survivor in good condition. This seedling was drawn to the attention of the Morden Station staff and, after additional testing, was given the name 'Collet' in 1961 in honour of the family.

Collet apple is highly popular with those who have come to know its excellent fruit quality. In quality it can best be compared with that of McIntosh which may well be one of its parents. Collet apples have good size and colour and store very well. The fruit is excellent for eating fresh or for baking purposes. Trees are moderately hardy and at Morden survive as well as trees of the Breakey apple.

It was certainly a pleasure to see the Collet family accept the first Western Canadian Society for Horticulture Merit Award given for a fruit introduction. The award in some measure recognizes the interest of the Collet family in fruit improvement and the perseverance required to make a contribution to prairie fruit culture. Certainly, it must be with great satisfaction that Mr. Albert Collet and his sister Alice look back in memory to a small packet of apple seed and then look out to see the heavy-laden fruiting trees of Collet growing in the original homestead garden.

Some Uncommon Annuals

H. F. HARP
Prairie Gardener

Prairie gardeners are largely dependent on annuals to maintain a show of color in the garden through the summer months. In most instances they buy ready-to-plant varieties from the Garden Centers and Super-Markets. These run-of-the-mill annuals, petunias, marigolds, snapdragons and such will continue to be first choice for most gardeners, but they are not the only choice.

There are any number of lesser known annuals which may not be as showy as the more popular kinds but they add a good deal of interest to the garden and, besides, many can be sown outdoors where the plants are to bloom.

The perennial lupins are not well adapted to all parts of the prairies; in the southern grass-land areas, where the soil is likely to be high in lime, perennial lupins are problem plants. On the other hand the annual lupins are much better adapted and are easy to grow from seed, sown where the plants are to flower.

Lupinus Hartwegii has a range of bright colors, not as spectacular as those of the Russell lupins but the plants last in bloom much longer.

From South Africa we have any number of annuals, as well as some perennials, which can be flowered the first year from seed. Many of them are compositaes or daisy-flowered plants and many have been much improved by the plant breeders. A notable example is Arctotis grandis; the Blue-Eyed African Daisy with pale violet, dark-centered flowers. The improved varieties are yellow, orange, wine-red, all have contrasting zones and dark centers. From a sowing made in March, plants can be set out in June to flower all through the summer and until the frost comes.

Another daisy-like flower from South Africa is the gazania, a perennial, which may be grown as an annual in the prairie gardens. It makes a compact plant, less than a foot tall with dark-green, glossy leaves greyish on the undersides. The large daisies are yellow and orange with sharply contrasting zones of green and bronze. When I grew gazanias I was so reluctant to see the plants killed by frost that I rescued a few, potted them up and wintered them over in a cool greenhouse. In March the old plants were divided into single crowns for transplanting to the open ground in June.

True blue is not a common color in annuals but there are some, and one of the easiest to grow is Anchusa capensis, another South-African native but not one of the daisy family. The foot-high plants bear flowers similar to forget-me-nots all through the summer from an open-ground sowing made in May. A similar plant is cynoglossum or Hound's Tongue, a bit taller than the anchusa with soft, greyish-green foliage. Phacelia and nemophila are two more blue-flowerd annuals easy to grow from seed sown where the plants are to bloom. Phacelia campanularia is not more than a foot high, the flowers are cup-shaped and true blue. Nemophila insignis, sometimes called Baby Blue Eyes, does best in a moist soil and the plants are tolerant of partial shade.

It would appear that the old fashioned flowers Love-in-a-Mist and Four-O'clocks have lost some of their former popularity; both were once common enough in prairie gardens. Love-in-a-Mist (Nigella damascena) has attractive blue flowers surrounded by feathery foliage and the curious seed pods are appreciated by flower-arrangers.

Four-O'clock or Marvel or Peru (Mirablis Jalapa) is a tender perennial of unusual interest. It makes rapid growth from seed sown in the open ground in May. The plants can be two feet tall with dense, glossy-green leaves and flowers of various colors. The flowers remain open on cloudy days; in sunshine they are closed until late afternoon, hence the common name Four O'clock. The fleshy roots of Mirablis Jalapa was once a source of the medicinal purgative jalap.

In spite of the fact that there are improved forms of dimophotheca, commonly called Star of the Veld or Cape Marigold, it is not often seen in prairie gardens. The new colors are glistening white, deep orange and delicate art shades. The flowers stay open all day whereas some of the other South African flowers, gazanias for example, close in low light.

Gardeners who would like something different to the ubiquitous petunia will find many uncommon annuals in the seedsmen's catalogues and while they may not be as showy as the more popular sorts, they add interest and enjoyment to the summer garden.

Tree of Heaven

(Ailanthus altissima)

J. L. C. HARRISON
Oak Lake, Manitoba

The seed for this plant was picked in Toronto in 1973 and sown at Oak Lake, Manitoba, in the spring of 1974. The root has survived three winters now and has had no special care. The trunk dies to the ground each winter. This Tree of Heaven grew to over five feet by 1976. The plant is very ornamental with compound leaves three feet long.

Apparently it grows to over 100 feet in China, and in Toronto, it is actually used for boulevard trees.

Life After Autumn

ALLAN DAWSON
Winnipeg, Man.

Most amateur horticulturists regard winter at best "a rest period for their perennial plants," and at worst, "dull and unattractive."

Many devote their interests solely to indoor activities, while anxiously awaiting the return of spring's first robin. It is true that the landscape alters a great deal with the coming of the cold and snow, however, many people, including myself, are discovering winter not to be the lifeless time of year that it is portrayed to be.

It is true too, that most trees have lost their leaves but surprisingly, some have not! There is no green as beautiful as the green of a spruce or pine surrounded by a blanket of white, and a sky of blue.

No breath of air feels so clean and pure as the one drawn deeply on a crisp, sunny winter's day. The air is cold, and the wind makes it colder, but once behind a bluff you can feel the sun's warmth on your face and see it sparkle brightly in the snow.

Winter weather on the prairies is often severe, with extremely low temperatures, high winds and heavy snowfalls, and it really is not difficult to understand how we can forget that nature carries on and that beauty in a natural setting can be appreciated by all who care to look.

One of the most enjoyable and healthy ways to take in winter's beauty is on skis. Nordic skiing makes snow a highway into areas that during the summer are inaccessible. Winter brings special magic to the hills and plains not seen at any other time of year.

As spectacular as summer foliage is, with summer gone the wooded areas may be viewed in a different light.

"One is able to see the trees as well as the forest." For example I once came across a thicket of Silver Berry along a ridge in a Pembina Valley wooded area. I had travelled that route several times during the summer but had never spotted them.

As most horticulturists know, foliage is only one small part of any plant's attraction. Winter affords one the opportunity of being awed by tree structure and form as well as bark and fruit colour.

Dogwood

For example the native red-osier dogwood is common to moist wooded areas in Manitoba. Its young stems exhibit a showy red bark that is best appreciated in winter. During the summer amongst the bush greenery and shrubs it is sometimes difficult to distinguish the dogwood's colourful bark but during winter's whiteness the dogwood's attractive redness stands out. However, it's wiry stems can be a curse to the skier or snowshoer. Once tangled amongst them it can be a frustrating job getting out.

Paper Birch

Paper birch inhabits moist, but well drained, lighter soils throughout many regions of Manitoba. It too is noted for its attractive bark colour. The new growth is reddish-brown to bronze in colour while mature bark is creamy white and has that familiar paper-like texture. The colour contrast between the new and old wood is most appealing. The contrast of the two colours with a snow white backdrop, while further contrasted by the cool grey of surrounding trees, is delightful.

American Basswood

Although the American basswood does not have a showy bark its dark shade of grey is also attractive. Young trees have smooth, lightly shaded bark becoming straight, scaly ridges more darkly coloured as the tree matures. I am also attracted to the basswoods' straight, upright trunk (sometimes multiple stemmed) with a pyramidal shaped crown.

It was again winter time when I noticed several clumps of basswoods in my area growing in an unusual location. Normally basswoods grow and do best in moist areas, along streams and rivers. In the Pembina Hills I have found them growing on ridges in areas that I would consider fairly dry.

High Bush Cranberry and Nannyberry

The viburnum family is a large group of woody shrubs including the high bush cranberry and the nannyberry. The native cranberry is familiar to most, growing in moist shady locations. The berries are often collected and used in jellies and sauces. Many a hiker and hunter alike has enjoyed the berries right from the bush. The strong odour of the native cranberry is a well known smell to those who travel in wooded areas in late fall. The berries turn a brilliant orange to red colour in autumn and are rapidly consumed by birds.

The nannyberry has black fruit which is not as colourful as the cranberry but is still very attractive to birds.

Bittersweet

Another plant appreciated best in late autumn and early winter is bittersweet. Bittersweet is a vine, common to wooded areas in the Pembina Hills and throughout wooded areas in southern Manitoba. This plant often twines itself around trees but may remain growing along the ground. By late September bright orange seed pods hang from the vine, later to crack open and reveal scarlet seeds. Because of its colour, bittersweet is sometimes collected and used in dried weed and grass displays. Bittersweet also adds colour to the native landscape. It can be propagated by seed and used as an ornamental climber.

I would caution those who attempt to take seed from the wild not to destroy the seed source. Although bittersweet is not at present an endangered species, other native plants have become scarce due to overenthusiastic people attempting to collect specimens from the wild.

Trees

While travelling in the wooded areas of south central Manitoba you will see many of the common deciduous trees. Despite their naked appearance the elm, oak and poplar trees have much to offer you. With the foliage gone, the varied tree structures may be more readily ex-

amined. Healthy elms will be covered by large buds waiting to bloom in spring. The crowns, if they have room, will be umbrella shaped.

The oaks look, at first glance, more dead than alive. Their crowns tend to look scrubby and unplanned. Although native coniferous trees are not very common to the areas where I travel, they are the dominant trees in forested areas in Manitoba. Without a doubt, evergreen trees add much to a winter landscape, with their lovely green colour.

Winter can be very cruel to almost all living things. This would include both native plants as well as those that have been introduced. Mild weather followed by an extreme drop in temperature can cause frost cracks in trees, later allowing the invasion of insects and pathogens.

Cold weather can freeze the buds causing die back in even the hardiest of plants.

Cold, dry, winter winds can dry out buds and small branches. Blizzard force winds and snows can bend and break branches and sometimes entire trees.

Then again, winter can gently adorn the natural landscape with an attractive blanket of snow protecting small plants and making the woods even more beautiful. After a winter rainstorm the trees sparkle as if enclosed in glass. Branches tinkle in the wind like oriental crystal mobiles. And just as beautiful are the trees after a damp winter evening when the next morning everything is covered in hoarfrost. The landscape takes on almost a magical, dream-like appearance.

So the next time you start to feel a little depressed about the cold and snow, remember there is indeed "life after autumn" and that it **can** be as breath-taking as the first flower in spring.

Editor's Note:

Refer to Colour Section p. 79a.

Horticultural Horizons

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

All gardeners, professional and amateur alike, are indeed fortunate that the late Dr. F. L. Skinner, of Dropmore, Manitoba, was able, before he reached the end of his most useful career, to record for future generations, in "Horticultural Horizons," his own account of his remarkable life's work.

W. A. Cumming, head, Ornamentals Section, Canada Department of Agriculture Research Station, Morden, Manitoba, wrote in his review of Horticultural Horizons: "The average reader will find Dr. Skinner's book fascinating, for it contains a mixture of adventure, philosophy, personal anecdotes and major experiences of his life and work. The amateur gardener will find much sound advice on his gardening problems, particularly on hardy and adaptable plants. The professional horticulturist will marvel at Dr. Skinner's knowledge of hardy plant material throughout the Northern Hemisphere."

Horticultural Horizons (150 pages, 48 colored illustrations) may be obtained at the price of $3.00 from the Office of the Queen's Printer, 200 Vaughan Street, Winnipeg, Manitoba, R3C 1T5.

Flowers Welcome You to Norway

MARTIN E. BENUM
Counsul, Royal Norwegian Consulate for Province of Manitoba

The Commercial Slogan states "Say it with Flowers." When you arrive in Norway, the flowers are obvious. As you drive from the airport or the railroad station to your hotel, you see flowers in the windows of the homes lining the streets. As you enter the foyer of your hotel, flowers are in evidence on the reception desk and the tables around the lobby. Each restaurant table is adorned with colorful cut flowers.

Apple blossoms in Norway.

Spring time is obvious in many ways in a beautiful land such as Norway. The greens of all of Nature's awakening adorn the hills, valleys and mountains. Melt-water cascades down the sides of the valleys into the still ponds along the fjords. Through the greens of new grass, lichens and mosses are myriads of small yellow and white flowers.

In and around each house there are annual and perennial flowers. No dining room table is completely set without fresh cut carnations and daisies. The main floor window-sills are lined with flowering plants seeking out the sun after a long winter.

In the large quay-side market place in the City of Bergen, there is a very large flower market. Bedding plants are displayed by the thousands in the month of May. In each church yard cemetery each grave is planted to flowering plants every spring. Throughout the cities and towns, the squares, parks, public boulevards and buildings are "softened" by thousands of flowers and plants. Street lamps,kiosks, hand railings and train stations support floral hangings.

The Norwegians say "Velkommen" to all especially through the beauty of flowers.

Some Wildflowers of the Whiteshell

G. MALAHER
Winnipeg, Man.

Each year we have some family project when at our summer cottage. One of these projects has been the finding, photographing, specimen collecting, identification, and pressing of the wild flowers of the Whiteshell. By no means could the job be completed in one summer, so now it is a continuing project. It is amazing how it has sharpened everyone's interest, observation and enjoyment of our wild flowers.

Here in the lake country of the Precambrian Shield, nature is somewhat later in accepting the fact that the long winter is over than out on the prairie, for the snow lies longer in the coniferous and mixed wood forest of the area. Once awakened, however, there is a rapid transition as new growth lifts the fallen leaves on the forest floor and delicate green buds begin to show on flowering plants, shrubs and trees. Only in the early days of spring can such delicate green be seen.

Twin Flower — Linnaea borealis

Twin Flower — Linnaea borealis

Soon the sandy floor under a jackpine stand is a carpet of white flowers of the bunchberry. In the moist, moss covered depressions or at the base of sloping rocks down which the moisture runs, is the delicate pink and white Twin Flower, so tiny that many people step past without even seeing it. The blueberry too comes out, its blossoms half hidden among the leathery leaves as if it feared a late frost would spoil its fruiting.

Moccasin Flower

Up among the high rocks along our own private nature trail there is the Moccasin Flower, usually with one single bloom, but one plant has produced five blossoms each year. In one very dry season it shrivelled up, so dry that I feared we would lose it. From a swamp nearby I brought up a large bunch of wet sphagnum moss and wrapped it around the plant. It has rewarded us by still flowering splendidly each year. In the Whiteshell, I have found the best time to photograph the Moccasin Flower is during the first two weeks of June. By June 15th, the flowers are fading and have lost colour.

Water Plants

The earliest of the water plants to bloom seems to be the *Marsh Marigold*, to be found in the deep little valleys between the high rocks,

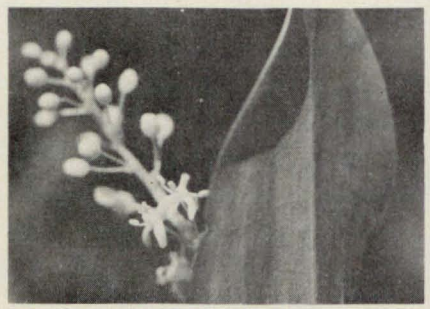
Marsh Marigold — Caltha polustris

False Lily of the Valley — Maianthemum Canadense (also called Mayflower)

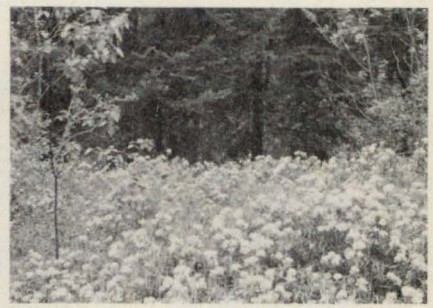
where water trickles down to the nearest lake. Up on the rocks themselves while spring moisture is still available, may be found such things as *False Soloman's Seal* and the *False Lily of the Valley*. Along the edge of the old trans-Canada highway, now P.T.H. 44, and east from West Hawk Lake, the *Hoary Puccoon* shows up with its tight cluster of yellow bloom. Here too may be found the intriguing Yellow Goatsbeard with its peculiar long pointed bracts, and also, if you search diligently among the taller grass along the verge, you will find the dainty little Blue-eyed Grass as well as quite a variety of other wild flowers.

Labrador Tea is everywhere throughout the area and, when in large dense clumps, puts on quite a show during its short blooming period. During the rest of the year it is dull, uninteresting and exhausting to walk through. Occasionally, half hidden, you may see the pink flower of Bog Laurel, adding a little colour to the white blossom of the Labrador Tea.

Hoary Puccoon — Lithospermum canescens



False Soloman's Seal — Smilacina racemosa



Labrador Tea — Ledum groenlandicum

Land Flowers

On the land, nature seems to pause as spring merges into summer, though plants such as the *Wood Lily*

Wood Lily — Lilium philadelphicum

are in flower on the lower slopes and the Harebell is up and in bloom for most of the summer.

Now is the time, as the heat of summer comes on and the water warms up, to turn your attention to the stream banks and shallow bay areas of the lakes. Two varieties of *White Water Lilies* cover the lily pond beside P.T.H. 44 and are to be found elsewhere in the Whiteshell. The leaves are somewhat different in contour and those of the larger variety are purplish in colour underneath.

Along the stream banks are *Spotted Touch-me-Not, Joe Pye Weed,* the Blue Flag Iris, at least three species of Arrowhead, and that most interesting plant the Bladderwort with its small yellow emergent flower, a mass of submerged filament-like leaves adorned with tiny bladders which trap and 'digest' minute animal life which, when absorbed, provide nitrogen to the plant.

In the spruce swamp a short distance north of the C.P.R. track crossing the Brereton Road, *Cottongrass* with its nodding white plume may be seen. The species appears to differ from that found up north on the tundra and the two are illustrated here for comparision.

Two interesting plants found in early July are the *Spotted Coralroot* and the *Indian Pipe*. Both are saprophytic, contain no green pigment and live on decaying vegetation.

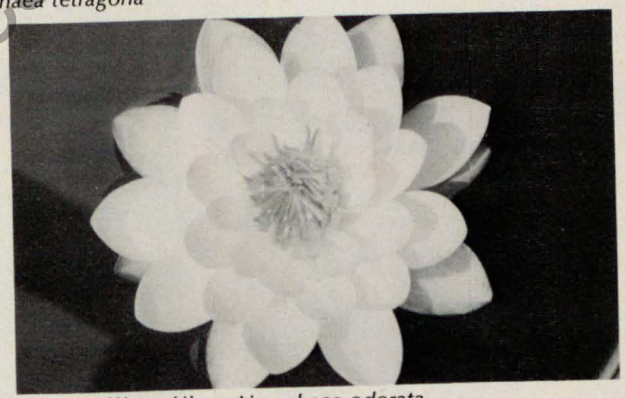
Autumn

As Fall approaches, the most common flowers to attract the eye are the Yellow Goldenrod in quite wide variety. You will also find that old favorite the Fringed Gentian. Look for it in the moist ditches along the roadside when the sun is shining. It seems to have the habit of closing its petals in cloudy weather and is then much harder to locate.

These are some of the wild flowers of the Whiteshell. Space will not allow more in this issue, but perhaps there will be more in the next issue.

Editor's Note: Refer to Colour Section p. 76a, 76b, 77a, 77b.

Small Water Lily — Nymphaea tetragona



Fragrant Water Lily — Nymphaea odorata

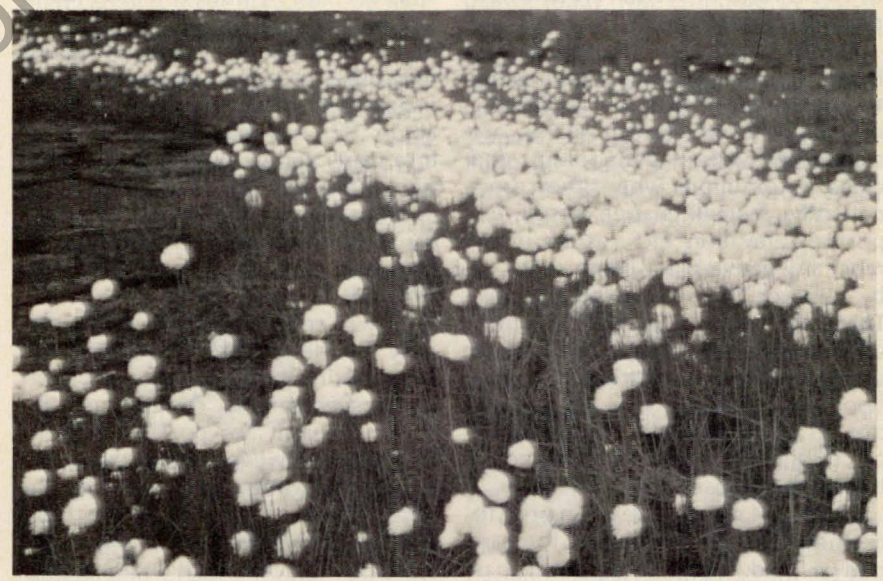
Spotted Touch-Me-Not — Impatiens capensis

Cottongrass — *Eriopthorum sp.*

Indian Pipe

Spotted Coral Root — *Corallorhiza maculata*

Joe Pye Weed — *Eupatorium Maculatum*



Northern Cottongrass — *Eriopthorum sp.*

Food for the Soul

MARGARET JAMES THOMSON
Meri-Bow Farm, High River, Alta. R3

I love to grow things — just about anything. I feel my real interest in gardening followed my first awareness of the close link between good food and good health. The well known nutritionalist, Gaylord Hauser, has put it so well when he says, "What we eat to-day, walks and talks to-morrow."

My one real disappointment with my hobby is the shortness of the growing season. My tomatoes always seem to end up just weeks short of ripening! On the other hand, I face the problem each year of taking up my turnips before a good hard frost has had time to do its "thing," or take a chance on a blizzard settling the whole question for me.

With this in mind, our new home will have a little greenhouse of its own — directly off the kitchen. This has been a dream of mine for years, to be able to garden all year round to my heart's content. An added bonus from this particular hobby is that it can be carried on well into the golden years. Long after the skates have been hung up for the last time and the curling rocks sold, we can still work magic in a garden.

What can I bring to this hobby that might have been overlooked by others? Perhaps nothing but on the other hand, I have made an observation that has added significantly to my own enjoyment, and I should like to share it with you.

Beauty in the Vegetable Garden

For most of my gardening years I have been planting neat little rows of vegetables, followed by equally neat little rows of my favourite flowers. One year I ended up with an empty packet of carrot seed with still half of the row to go. Not wishing to waste a particle of priceless soil, I scrounged around in my seed basket for some type of filler. The only thing I could come up with was a few seeds of calandula which I dutifully planted.

From this rash interuption of my regular planting pattern came a whole new world of gardening delights. Now my cabbages are flanked with my beloved sweet peas on one side and gay marigolds on the other. The wide leaf of the swiss chard form a perfect umbrella for my shade loving pansies. A whole row of the tall variety of sunflower makes an ideal windbreak across the entire west side — a real asset on a hot July day.

What could give greater pleasure than to raise one's eyes momentarily from the onion row to come face to face with a red velvet glad! What sheer delight to find the wee hummingbird completely enchanted with the brightness of the sunflower.

I relax for just a moment and drink in all this beauty — something to sustain me through the bleak months which will surely follow. Once again I am reminded of those delightful lines of poetry — author unknown:

The kiss of the sun for pardon
The song of a bird for mirth
One's closer to God's heart in a garden
Than anyplace else on earth.

Do share your flowers with the rest of your garden and you'll come out the winner. A little for the body — a lot for the soul.

Useful Saskatchewan Publications

EVELYN M. BANKS
Oxbow, Sask.

For those interested, there are many booklets on using vegetables, and wild and home-grown fruits.

Two Saskatchewan publications which I have found most helpful are: *"Using Saskatchewan's Cultivated and Native Fruits"* — Bulletin No. 222; and "Using Saskatchewan's Crabapples" — Bulletin No. 151. These may be obtained for a small charge from: Extension Division, University of Saskatchewan, Saskatoon, Sask.

I have used the earlier editions of both publications for many years and highly recommend them.

"Using Saskatchewan's Cultivated and Native Fruits" has thirty pages of information and recipes. Botanical descriptions of native fruits and varieties for specific purposes, as well as many old and new uses, and recipes, make this a worthwhile booklet.

The newer edition recommends using less sugar in canning fruit, and I make one change in the Saskatoon pie recipe in that I cook the berries slightly before combining with the sugar and minute tapioca.

A free catalogue listing these and other publications may be obtained by writing the Extension Division. There is also Publication No. 1476 *"Fresh Canadian Vegetables"* which is very useful. For a copy, just write: Information Division, Canada Department of Agriculture, Ottawa, Ontario K1A 0C7.

Shade Tolerant Annuals

ARCHIE GAMVRELIS
Maple Leaf Horticultural Services Ltd., Winnipeg, Man.

Success in ornamental plant culture, whether executed by professional horticultural researchers, nurserymen or avid weekend gardeners, requires a fundamental understanding of environmental factors, their interrelationships, and ultimate effects on plant life systems. The four basic factors which have a limiting effect on plant growth and development are: light, temperature, water availability, and mineral nutrition. Furthermore, sunlight tends to exert a dominating influence over the other factors. Therefore, it is critical to understand the association between varying intensities of sunlight (full sun — heavy shade) and the resulting plant performance, namely annuals.

The prairies enjoy relatively clearer skies than eastern Canada, as well as longer days than areas further south, during the summer growing period. However, gardeners in the city or in the country encounter planting sites subject to shade. Planting sites usually experience heavy shade as a result of buildings obstructing the path of sunlight, and partial shade when light is diffused passing through the trees' canopy. The duration of the shade period will depend mainly on the size of the light interfering object(s).

Two approaches may be employed when dealing with shade: (1) avoid shade by removing the obstruction, for example topping the shade trees or demolishing the building, or (2) grow only those plants which are recommended for the area. The second approach is probably more practical and economical as far as bedding plants are concerned. It is also important to note that one can grow sun thriving plants in the shade and vice versa, but it is only when these plants are exposed to the most desirable environmental conditions will they perform to their maximum potential.

On the prairies, the three basic shade tolerant bedding plants are: begonias (fibrous and tuberous), coleus, and impatiens. It should be made clear that these plants are not true annuals but are grown as bedding plants in this part of the country.

Begonias

Fibrous begonias, *Begonia semperflorens*, are herbaceous perennials characterized by having succulent stems and extremely shiny, roundish leaves which may be green or bronze. This plant is exceptionally floriferous most of the year. The flowers being single or double, are available in the colors red, pink, or white. Fibrous begonias tend to be compact with an average height of 35 cm and can be propagated by seed or from cuttings. Begonias are very effective when massed together in flowerbed borders as well as in containers. In the early fall they can be taken indoors where they continue to flower all winter when placed in indirect light. As far as watering is concerned, they dislike wet soils which often results in rotting of the plants. Examples of superior performing fibrous begonias are the Bronze Foliage series and the Glamour series, both available in red, pink, or white.

Tuberous begonias, *Begonia tuberhybrida*, also tolerate shade and are becoming very popular, with several outstanding varieties available. Culture of this plant during the spring and fall is different due to the presence of the tuber.

Coleus

Coleus blumei hybrids are herbaceous perennials noted for their striking foliage and relative ease in growing. The most significant highlight of their foliage is the various color combinations; green, yellow, crimson, mauve, and pink as well as interesting patternings with leaf margins being dentate and often ruffled. The spikes of flowers are not significant and are often removed to maintain plant vigor. The plant's habits can be easily manipulated which may result in a single stem or, by regularly pinching back the apical meristems, an extremely dense spreading plant will occur. The average height of a coleus plant is about 45 cm and is easily propagated by seed or cuttings. In the fall, as was mentioned for begonias, coleus may be potted up and taken indoors for the winter. When placed among other foliage plants, they provide very interesting contrasts. Recommended varieties include; Color Magic, Fiji and Flamenco.

Impatiens

Impatiens is a confusing genus whose several specie forms are collectively known as *Impatiens wallerana*. Impatiens are quickly becoming established as the most effective shade tolerant bedding plants. They tend to be low growing and compact with an average height of 25 cm though some varieties are taller. Their flowering ability is prolific throughout the summer and also when brought in during the winter. The flowers occur in a wide range of solid and bicolors, which often hint a fluorescent quality, and consist of five petals with a spur behind each flower.

Plants can be propagated by seed or from cuttings. Soils should not dry out since they prefer moist conditions. Impatiens, when grouped together along flower borders, create a spectacular show in any shady area. Several superior performing varieties exist as those found in the Elfin, Futura, Grande, and Melody series. Another type of impatiens are the exotic New Guinea impatiens which prefer sunny areas. However, because they can only be vegetatively propagated, availability in several areas may be a problem, but an investigation would certainly be worthwhile.

Throughout this article, there has been no mention of quantifying the varying degrees of shade. The reason being that establishing a uniform unit of measure would be impractical, unless light intensity, duration, and quality can be controlled as in experimental growth cabinets. Therefore, experimentation with plants in different locations should be an important aspect of any serious gardener's routine in order to maximize plant performance. Other bedding plants which may be investigated for their performance in the shade are: ageratum, balsam, clarkia, lobelia, nicotiana, and verbena.

Editor's Note:
Refer to Color Section p. 68b.

The Grandeur of Zinnias

L. M. LENZ
Plant Science, University of Manitoba

The Zinnia is a widely grown annual flower of numerous colors, flower types and sizes, plant stature and equally as many uses. It is a native of Mexico. The word 'Zinnia' commemorates J. G. Zinn, a professor of Botany and is often given the name 'Youth and Old Age,' a reference perhaps to the lasting quality of the flowers.

Zinnias are tender annuals which are started from seed, either indoors during late April for transplanting outdoors after danger of frost, or directly seeded outdoors where they are to grow, about mid-May. The seed germinates quickly in three to four days and the plants develop rapidly, flowering in six to eight weeks. They will bloom continuously throughout the summer until frost. Zinnias thrive best in well-drained, moderately rich soil and hot, dry weather. A fully sunny location is best. They are very susceptible to powdery mildew during damp weather. This durable plant is useful for landscape and garden plantings and, as a cut flower, are useful for bouquets, baskets and arrangements.

Species

The Common Zinnia — *Zinnia elegans* is the most commonly grown and includes the greatest variety. Plant heights range from six inch dwarfs to 30 inch giants, with a range of flower sizes from small button-types of 1½ inches in diameter to giant types up to six inches in diameter. The flower types include the broad flat petalled dahlia flowered type to the fluted or twisted petals of the cactus-type. The flower color may be vivid or pastel shades of purple, mauve, red, scarlet, orange, salmon, rose, pink, white, yellow and sometimes striped or bicolored.

Two other rarer species of zinnias are: the Mexican Zinnia, *Zinnia hageana* growing to 18 inches in height with narrow leaves and yellow, orange or red bicolored flowers. This includes cultivars such as Old Mexico, Persian Carpet and Sombrero. *Zinnia linearis* grows to one foot with single rich orange flowers. 'Classic' is an available cultivar.

There are numerous cultivars of the Common Zinnia available, including the following:

Tall: two to three feet —

Giant Dahlia Flowered — flowers 4 to 6 inches diameter with broad petals.

Exquisite — light rose with deep rose center
Gold Sun — yellow
Red Sun — red
State Fair — mixed colors

Giant Cactus Flowered — flowers 4 to 6 inches diameter with fluted petals.

Fruit Bowl — mixed colors
Rosy Future — bright rose pink
Torch — orange
Wild Cherry — cerise bicolor
Yellow Zenith — yellow

Medium: 18 to 24 inches, 2 to 2½ inch flowers.

Lilliput — mixed colors

Pompom series — mixed or separate colors

Ruffles series (ruffled petals) — Cherry, Pink, Scarlet, White, Yellow or mixed colors.

Dwarf: 12 inches.

Button series (1½ inch flowers) — Cherry, Pink, Red, Yellow, or Button Box (mixed colors).

Peter Pan series (3 inch flowers) — Cream, Gold, Orange, Pink (salmon pink), Plum (plum color), Princess (light pink), Rose Starlet (rose), Scarlet or mixed colors.

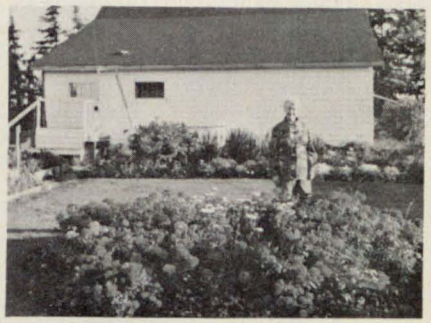
Miniature: 6 inches, small flowers.

Thumbelina (mixed colors), Mini-salmon (salmon-cerise) and Mini-Pink (salmon-pink).

Editor's Note:
Refer to Color Section p. 66c, 67b & 72a.

A Garden Full of Beautiful Annuals

YVONNE MacALISTER
Grande Prairie, Alta.



Mrs. Hazel Thompson and her lovely garden of annuals.

Mrs Hazel Thompson who lives in the Peace River country west of Grande Prairie has proved what can be done there. The Thompsons settled in the Peace River in August 1930, and with determination and a great deal of hard work, Mrs. Thompson's garden now is a joy to everyone who sees it. And the birds enjoy it as well.

Mrs. Thompson won the award from Yvonne's Country Flower Shop for the most outstanding gardener in the area in 1978.

Our best wishes for continued success with her beautiful garden go to Mrs. Thompson.

Featured Topics of Past Issues

Identification
In the 1972 edition of The Prairie Garden an Identification Section features many of our native and cultivated plants, as well as ornamental trees and shrubs. There are full color photos with a complete description of each plant for easy identification.

Perennials
The special feature in the 1973 publication is Perennials. Again, beautiful, colored photos of various plants are shown with identification and cultural information on each.

Landscaping
The 1974 books are filled with articles on landscaping home grounds for beauty and practicability, and the colored section features the many happy results of good landscaping.

World of Bulbs
Many articles, and lovely colored photos of, daffodils, tulips, begonias, lilies, dahlia, et al fill the 1975 issue of The Prairie Garden. There is information on how and where to plant, how to store the bulbs, disease control, etc.

Fruits and Vegetables
As food prices rise many more people become interested in growing their own garden produce, and the 1976 issue of The Prairie Garden features articles and photos on fruits and vegetables which can be grown successfully on the prairies.

Indoor Gardening and Flower Arranging
In today's society where many people live in high rises, and more home-owners turn to a variety of plants for decorative purposes, the 1977 issue focusses on methods of balcony gardening, and care and culture of house-plants. It also features flower arranging, with a lovely colored section to gladden the heart of every creative person.

Gardening Hints for Everyone
The 1978 edition of The Prairie Garden features tips, suggestions, ideas for gardening as a whole. The book is full of the experiences, short-cuts, and knowledge gleaned by amateur and professional gardeners through the trial and error method over the years. For gardeners this book is an invaluable addition to their horticulture library.

For any of these publications, as well as several others, see the Order Form on opposite page.

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International Flower Show

The Winnipeg Horticultural and Gladiolus Societies have announced that the Twenty-Fourth Winnipeg International Flower Show will be held on August 23rd and 24th, 1979 at the Polo Park Shopping Mall.

This beautiful annual event is a highlight of the summer for Manitobans and visitors alike, and there are usually an abundance of entries. Shipping charges to a maximum of $5.00 per shipment are refunded to prize winners; and all exhibits are to be forwarded (prepaid) to arrive at the Polo Park Shopping Mall before midnight the night before the Show. Out-of-country exhibitors are advised to wire ahead and to mark all packages "cut flowers for exhibition — no commercial value."

Mrs. Frances Smith, 1054 Palmerston Avenue, Winnipeg (772-6488), Secretary of the event, informs us that the program and prize list booklets are expected to be available in early April for the coming Show.

PRINTED IN CANADA