THE 1975 PRAIRIE GARDEN

Western Canada's Only Gardening Annual

THE PRAIRIE GARDEN ... 1975

Special Colour Feature:

The World of Bulbs

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The Prairie Garden

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The Prairie Garden

H. F. HARP

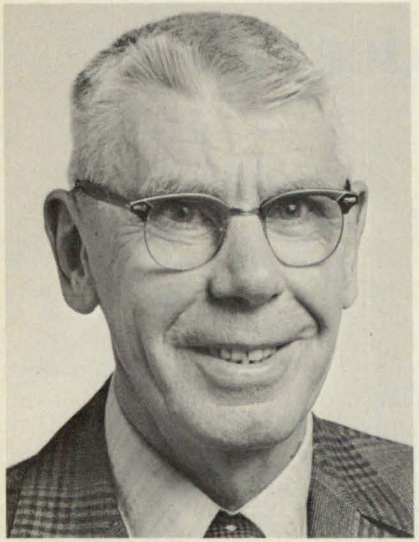
When the Winnipeg Flower Garden was first published thirty years ago few gardeners thought it would become the 'The Prairie Garden' a magazine devoted solely to gardening on the prairies and read by thousands of gardeners both amateur and professional.

The articles in the Prairie Garden are presented by specialists who grew roses, gladioli, dahlias, African violets, or special crops of one kind or another. Then there are also articles by the enthusiastic non-specialists who try to accommodate as many different kinds of plants in their garden as space will allow.

But it is one thing to write and another thing to read, and the full benefit from the vast store of information in the Prairie Garden books is reaped when the books are filed for future reference, indexed, and consulted from time to time. No phase of gardening has been neglected in these books; the culture of trees and shrubs, flowers, fruits and vegetables and the safe use of modern chemicals for the control of pests and diseases.

Gardening information is plentiful; all kinds of books and pamphlets are there for the asking or at reasonable prices, but all the printed matter in the world if of no use until it is read, studied and enjoyed.

The Chairman of the Prairie Garden Committee



Mr. P. J. Peters has been a member of the Prairie Garden Committee for many years, and has acted as Chairman for the past five years.

"Pete" is a man of many parts and is known throughout the province, especially for his beautiful slide presentations. His "Centennial Fantasy" in 1967, "Salute to Manitoba", 1970, "Symphony of the Seasons", 1972, "Floral Salute to Winnipeg's Centennial", 1974 have been enjoyed by hundreds of people. He is currently working on "Symphony of Peace", the story of the Peace Garden.

Pete received his early education in Gretna, Manitoba and later took teacher training in Winnipeg. For 7½ years he taught public school in various Manitoba communities.

During World War II, Mr. Peters joined the RCAF as a wireless mechanic. He was remustered and became an interpreter.

After the war Pete returned to the University of Manitoba to take Agriculture, specializing in horticulture. He received his BSA and was awarded the University gold medal for high standing.

In 1954 Pete assumed the position of Potato Specialist with the Manitoba Department of Agriculture and potato growers on both the provincial and national scene soon called him 'Potato Pete'. He was also secretary of the Vegetable Growers Association for six years.

In 1963, Pete started extension work on fruit and became the horticulturist of fruit crops with the Department.

Three years ago Mr. Peters took over as secretary of the Manitoba Horticultural Association which entails working with the 40 Societies in Manitoba. He still holds this position.

Mr. Peters is Past President of the Western Canadian Society for Horticulture, and is a member of the Agricultural Institute of Canada, the Manitoba Institute of Agrologists and the Canadian Society for Horticultural Science. He is President of the Manitoba Horticultural Council.

Everyone knows his special talent, writing poetry, and he has had a book of his poems published.

This is a thumbnail sketch of the man who pilots the Prairie Garden into production each year. It is a pleasure to work with him.

Phyllis Thomson
Editor

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Many are ugly scars on the landscape

Is your local Horticultural Society interested in beautifying Manitoba?

To obtain advice and trees for these and similar projects, contact the:

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Province of Manitoba
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139 Tuxedo Avenue
Winnipeg
Phone 489-4511 extension 253 or 255

Tuberous Begonias

F. STAN GUGIN

Because tuberous begonias have such exotic blooms many people think they are difficult to grow. Fortunately, quite the reverse is true.

If you can provide your tuberous begonias with a location in the shade, yet with full overhead light and some protection from wind, they will provide you with the most beautiful blooms of any flower. They require good soil and plenty of moisture but are troubled by very few insects or diseases and will continue to bloom from early summer until fall.

The Tubers

The first consideration is to have good tubers capable of producing good blooms. Buy these as soon as they are available and can be taken safely home without risk of freezing or chilling. There are many different types and colors available in both upright growing plants and the pendulous or hanging begonias.

The most common tuberous begonias available in the stores are the Belgian begonias. These are the least expensive. They come in a wide range of colors and are quite satisfactory for bedding. However, they will not give as large blooms as the California hybrids or the British Exhibition types. The Belgian pendulous begonias are not as good as the others as they have only small fragile blooms. The English and California pendulous begonias are magnificent plants, covering themselves with 20 to 50 huge blooms that are spectacular in hanging baskets or pots.

The English Exhibition begonias are perhaps the most outstanding for size, quality of blooms and their beautiful clear colors. These come mainly in the rose form which is also perhaps the most beautiful form. They are expensive but for exhibiting are superior to the other types.

Colors and Shapes

Tuberous begonias come in a wide choice of colors, ranging from purest white through ivory, cream, light and deep yellow, orange, deep crimson, as well as combinations of red and white, pink and white, pink and yellow, etc. There is also a wide range of flower shapes from rose form, carnation flowered, and camelia flowered to the giant ruffled as well as the picotee in the combinations of two colors. There are also single and fringed types and the multiflora begonias.

Planting

The tubers can be planted in a starting medium around the third week of March, not earlier, unless you have a greenhouse, or they are likely to become spindly before they can be set out in the garden. The objective is to have sturdy, stocky six inch plants with a good stout stem and large leaves when it is time to put them outdoors. To attain this you must not start the tubers too early, and it will be necessary to grow them at a temperature of around 65 degrees in good bright light but with little direct sunlight.

To sprout dormant tubers you can bring them out of winter storage temperature to room temperature in late February. When the pink growth buds appear and are about half inch or less in length they are ready for planting in your starting medium. This will be around the third week of March. Time and effort will be saved and the danger of rotting the tubers will be lessened if they are not put into the starting mixture until they have sprouted.

They can be started in flats or boxes, the ideal medium being coarse leaf mold or leaf mold and coarse sand. If you do not have these you can use half peat moss and half coarse sand. Fill the flat or box with your medium and moisten, except for the tips of the shoots. Be sure to leave enough space between the tubers for good root development as this is a most important factor in growing begonias. They grow roots from the top of the tuber as well as the bottom and sides. Place the flat in a warm location with bright light, but shaded from direct sunlight. A temperature of 65 to 75 degrees is about right for starting them.

Care

If you are growing your begonias for exhibition, all of the shoots but one can be removed and the wounds dusted with sulfur or captan. With the pendulous begonias, retain all of the shoots and if they are not branching sufficiently, they may be pinched out at about three inches high to induce branching.

Potting

When the first two leaves have developed to the same size, the plants are ready for potting. If you are going to grow them in pots, plant them now into six to eight inch pots (the bigger the pot the bigger your blooms will be). If you are going to bed them out or put them in your planter, they could be planted now into the largest size of peat pots or a deep flat.

Having the right soil mixture is very important. It should not be heavy and should contain quite a large proportion of humus in the form of leaf mold or peat moss. Here is the soil mixture I use:

7 parts black garden soil
5 parts leaf mold or peat moss
3 parts fine manure (well rotted)
1 part coarse sand
1 part vermiculite

I generally add a few cupfuls of bone meal or fish meal and one cup of Vigoro to a tub of potting soil or one teaspoon of 11-48-0 ammonium phosphate per pot.

A simpler and probably equally good mixture recommended by one firm is two-thirds partly decayed oak leaf mold and one-third coarse sand to which is added one-quarter cup of fish meal to the soil below the tuber but not touching it.

When they are removed from the starting medium the tubers will be well rooted and when carefully lifted from the medium, a ball of peat moss or leaf mold mixture will be clinging to them. Just leave this on and it will protect the new roots. Pot up, covering the top of the tuber with half to one inch of the soil mixture and, of

course, being sure that you have good drainage in the bottom of the pot, and that you leave one inch at the top of the pot to facilitate watering.

Outdoors

Continue to grow the plants in good light until the days become warm outside. I grow all of mine in pots and sometimes have them outdoors by mid May, or the 24th of May if the weather is warm. The advantage of having them in pots is that they can be lifted into the garage or indoors if there is a threat of frost. It is probably not safe to bed them out until the first week of June on the prairies unless you can cover them.

Location

Outdoors they thrive best with full overhead skylight but with little direct sunlight. The north side of a building is good, or north of trees or a hedge. The direct sunlight they receive in early morning or late evening will not hurt them. The pendulous types will stand a little more sun (preferably morning). Too much sunlight will produce dwarfed plants with leaves curled and shiny or yellowed and burned, and small flowers or no flowers at all as the buds may drop off. Having the correct lighting condition is very important in growing tuberous begonias. Some protection from wind is also essential. If you do not have a suitable location one can be built of laths, or a begonia house partially enclosed and covered with plastic or plexiglass will make a good location for them.

Feeding

A weekly feeding program of a complete fertilizer in a weak solution or liquid fish emulsion, after the buds begin to develop, will reward you with larger blooms but be sure not to overfeed them. Too much fertilizer will cause the leaves to roll under at the edges and to turn blue green in color. If the leaves are pale green then the plants are short of nitrogen and require more fertilizer. The largest blooms are obtained when the plants are slightly underfed and the leaves are dark green in color. Most authorities recommend removing the female flowers which are usually smaller and single and borne on either side of the large male bloom. These are removed when they are in bud and as early as possible to encourage larger development of the main bloom. I generally leave them on as occasionally they will be double and they add considerable color to your showing without taking much from the main blooms. They should be removed before they form seed, however.

Remember, when placing the pots or plants in place, to have the leaves pointing to the front of your bed as the blooms will face the same direction as the leaves point. If you are using pots, they can be sunk into the soil up to the rim. Staking and tying each plant with concealed green stakes and twisters or cloth is a wise precaution as they are quite brittle and may be broken by high winds or the weight of the blooms. Mulching of plants in a bed or border with peat moss helps to retain the moisture and keep the soil cool.

Humidity

Begonias are troubled by very few diseases or insects but they do love humidity so if the weather is very hot and dry, a light spraying of the leaves with water will keep them in good condition. Rain water is especially good if a supply is obtainable for watering. Mildew will develop on begonias (a white powdery form on the leaves) under poor growing conditions where the plants were started indoors too early, when the soil is too heavy and remains wet and soggy and where there is poor air circulation. A light dusting with sulfur once a week will help control this.

Sometimes the buds will drop during periods of very high temperatures and low humidity or from shock if the plants have been taken indoors and have spent a few days in a hot dry home or at the flower show. A light spraying of water on the leaves will keep the humidity up and help prevent this. A complete drying out of the plants may also cause buds to drop. Fallen leaves or blooms should not be left on the leaves or this will mark them.

With regular watering and reasonably good conditions, begonias will provide you with some of the most magnificent blooms of any plant. I have had blooms over nine inches in diameter and have read where it is possible to grow them to 13 inches. A window box or planter of tuberous begonias on the north with upright types at the back and pendulous begonias at the front makes a beautiful display. The blooms may be used for cut flowers; they are excellent in arrangements and if floated or contained in a rose bowl they may last a week or more. They are also fine for corsages or boutonnieres.

Digging and Storing

With the first light frost, dig the plants and put them in boxes in the basement. If you have them in pots they may be set in to the garage or indoors when the first frosts occur, then put out again when the weather warms, as we often have a month of fine weather after the first frosts. Sometimes I have had them out until nearly the end of October. Then the pots are put in to the basement for the winter and can be given a little water to keep the plants alive for awhile, then allow them to dry down naturally. The storage temperature should not go below 40 degrees F; preferably between 40 and 50 degrees F. If allowed to go below 40 degrees, the tubers may become dormant and will not start in to growth in the spring.

Sometime during February I remove the tubers from the soil and store them in perforated plastic bags with some peat moss or in a flat of peat moss. This may have to be done earlier under warm storage temperatures and will have to be done sooner when the plants are dug from beds. The tubers must not get too dry or lose too much weight.

They will soon be ready to bring to warmer storage conditions and the pink growth buds will show and you are ready to start the new season. Some of my tubers are more than six years old and they get bigger and better each year. Tubers may be divided or new plants started by rooting the extra shoots that develop on the larger tubers.

Growing From Seed

If you have an unusually green thumb, you will enjoy growing tuberous begonias from seed started in January. The fine seed is screened through one-quarter inch mesh and has been thoroughly soaked. The whole flat is enclosed in a large polyethylene bag, tied closed and placed in a temperature of 60 to 65 degrees with bright light but out of direct sunlight. Extra light will have to be supplied to make 13½ hours of light per day.

No further watering will likely be necessary for the eight weeks which will be required to grow them to the size to be transplanted to a larger flat. This size is reached when the largest leaf is as large as a penny. The

moisture will condense on the inside of the plastic bag and fall back on the soil, keeping it wet. This is an interesting way to grow your own begonias and you will have six inch plants to set out by early June.

If you have a suitable location for tuberous begonias or can build one, supplying them with the right conditions, they will thrive and produce a brilliant display of blooms with very little trouble. Protection from wind and bright sunlight, but with light of high intensity are the prime requisites. Tuberous begonias are one of the few plants that will bloom well and provide a lot of color in a shaded area.

Growing good tuberous begonias can be one of the most pleasurable of gardening experiences.

SALUTE to the TREES

Many a tree is found in the wood,
And every tree for its use is good;
Some for the strength of the gnarled root,
Some for the sweetness of flower or fruit,
Some for the shelter against the storm,
And some to keep the hearthstone warm,
Some for the roof and some for the beam,
And some for a boat to breast the stream,
In the wealth of the wood since the world began
The trees have offered their gifts to man.

Henry Van Dyke, via Peter J. de Wet

Littleleaf linden

Tilia cordata

It is an oval to rounded tree with leaves much smaller than the native basswood. It is a good medium sized shade tree provided that moisture is adequate. A Swedish strain of the littleleaf linden possesses attractive brownish bark and can be grown as a multiple stem or a single stemmed tree. Both are relatively slow growing.

The Care and Conditioning of Cut Flowers and Foliage

JOAN JONES

How often have we seen a beautiful flower arrangement droop and collapse after only a few hours? This often happens at flower shows. The arrangement may be gorgeous when placed in its class, only to be ruined by the time judging takes place.

Here are a few guides to get flowers and foliage to last longer which, I hope, will be useful.

Do buy or gather your flowers as fresh as possible. The younger the bloom the longer it will last. Not all flowers will open from the bud stage once they are cut, although, most bulbous flowers, for example tulips, daffodils, gladioli, iris, open very well from the bud stage. Peonies and poppies will not open successfully from the tight bud stage. Gather these when the bud is almost ready to burst.

Conditioning Flowers and Foliage

Gather flowers and foliage as late in the day as possible. Never put your flowers into cold water, in fact the warmer the water the better.

Woody Materials (chrysanthemums, etc. including shrubs and evergreens)

Crush the stems for a couple of inches at the base before putting them into a pail of deep warm water.

Non-Woody Materials

Cut the stems at an angle so that the ends do not adhere to the bottom of the container cutting off their water supply.

Hollow Stems (Lupins and Delphiniums)

Up-end the stem and slowly force feed with a medicine dropper of warm water. Then place a finger over the end and immerse in water before removing your finger. When it is time to arrange the flowers cut the stems **under water** and, if possible, plug the end with cotton so that the water stays in the stem.

Lilac

Remove the foilage and totally immerse stem of blooms in warm for not longer than 20 minutes.

Soft Pulpy Stems (Peonies, Dahlias, Poppies, etc.)

These stems leak, therefore the ends of the stems should be sealed by searing in a flame or by placing in a few inches of boiling water for about 30 seconds (cover the flower heads while doing this).

Roses

I find that if I crush the ends of the stems of roses and place them in boiling water for 30 seconds (heads may be covered with paper or plastic bag) they last much longer. Even hothouse blooms last longer by this method.

Wilting Flowers

All flowers, including wild flowers, as long as they are basically fresh and only wilting because they have been out of water for awhile, can be revived by placing them in hot water until the water cools.

Tulips

Require only a little water, about three inches, otherwise they will flop over. To keep the stems straight, wrap them in newspaper and put them into water before arranging them. Some curved stems add to an arrangement, so let a few curve as they will.

Sweet Peas like shallow water and hate water on their petals.

Gladioli and Peonies

These can be gathered a couple of days before they are needed which will stop them from opening too far. Roll them carefully in damp newspaper and leave them out of water in a cool place. Arrange and place in water the night before they are required.

Leafy Stems

I find it best to take off as many leaves as possible, as moisture is given off through the leaves by transpiration, thus robbing the blooms of a large amount of their water supply. It is always better to arrange flowers with separate stems of foliage. Lilac and other blossoms wilt very quickly when their leaves are not stripped off. Remove the leaves very carefully to avoid damage to the stem.

Ornamental Gourds

They should only be gathered when fully ripe and the stem withered. Place on newspapers in a warm room, wipe frequently to remove moisture and, when completely dry, paint with clear varnish or one of the modern clear liquid floor waxes.

Foilage

All crisp or shiny foilage should be completely immersed overnight in cold water. By doing this it will remain fresh and crisp. Do not treat soft, furry leaves this way (e.g. Dusty Miller, etc.). These should be treated as flowers and have their stems placed in warm water for several hours before use.

I have tried adding sugar, charcoal, etc. to the water but have not found them to prolong life noticeably in the flowers and foliage. On the other hand "Petal Life", an additive which professional florists use, does seem to prolong life. Use just a pinch dissolved in water in the container in which the flowers are arranged.

Odds and Ends

To kill bacteria in containers, on pinholders, etc., wash carefully in warm soapy water containing a little household bleach. Rinse well.

Do Not try to arrange real flowers and foliage in styrofoam. I have seen this done in some of the shows I have judged. Styrofoam is meant to be used dry, and is for dried materials and artificial flowers and foliage. Soaked oasis and/or a pinholder or crumpled chicken wire **firmly fixed** are the best supports for fresh materials.

Do conceal all the mechanics of your arrangements. A piece of oasis or wire left showing is ugly, and points are taken off in judging.

Do use a leak proof container, and make sure its size and shape suit the size and shape of the flowers and foliage.

Do read the schedule carefully. If it states "Not more than six inches in any direction", make sure that the arrangement is less than six inches any way it can be measured.

Do use fresh undamaged flowers and foliage. They don't have to be prize specimens.

I hope the above will prove useful.

So many times I have judged at a show where there have been some arrangements that have had a lot of time, thought and originality spent on them, only to be spoiled by a droopy flower or leaf, oasis or wire showing OR bad relationship between container, flowers and foliage. Blend your colors well and remember that although the container is not the most important part of the arrangement, it is important. Also, remember that a fussy container tends to fight with and detract from the flowers and foliage.

Why Garden?

FRANCES R. SMITH

One of the first and foremost reasons for growing a garden at the present time would be to cut the high cost of living but, apart from that, nothing tastes better than a few salad greens, fresh vegetables, or a tomato ripened by the sun, and it is surprising what can be grown in a small space. Beans, cucumbers, etc. can be grown on trellises, and many small varieties of vegetables take up little space.

It is reported that we are a race of too-well fed and too badly conditioned people. What better way to get a little exercise and fresh air than by bending, stretching, walking in the garden, living on the results of our efforts, instead of so much prepackaged and frozen food.

We hear much of ecology and pollution. The gardener can do his share towards a cleaner environment by never throwing in the garbage anything which can be put back into the garden. Somewhere there is a place for a small compost where all vegetable and fruit peelings, coffee grains, all leaves and grass clippings can be stored to be used as a mulch or for lightening the soil when it has all broken down.

Working with flowers is an interesting and pleasant hobby, and very few hobbyists will have so much varied and different material as the gardener who raises his own flowers, shrubs, etc. There is always something new to be tried, and it is fun to experiment with new foliage plants, flowers, seed pods and so forth, and to try drying and other methods of preserving materials to work with during the winter months.

For the gardener each season has something of merit. Winter is a time for planning, for thinking back over last year, studying catalogues as they come; spring, of course, has many jobs and it is difficult to catch up on all that needs to be done; one can slow up on actual work a little in August, take time off now and then to enjoy the flower shows or to exhibit, and to visit other gardens. Fall gets busy again, especially if there is freezing and preserving to do. But what greater satisfaction than to see the jars of gleaming jelly or to smell the pickles cooking. Cleaning up the garden can be a pleasant task on a crisp fall day when the leaves are turning colour and the birds are gathering in flocks for their trip south, stopping in their flight to feed on seeds and berries in your garden.

One gets back to nature in the garden, too, even in the heart of the city, and it is a joy to see the birds building their nests in your favorite trees, or to come across a small frog or toad you hope is eating his share of bugs and slugs, and one can forget for awhile the tensions and frustrations of the world.

One of the greatest joys of gardening is the friends one meets when there is a common interest. Gardeners are among the world's most unselfish people, and always glad to share seeds, or perennials if they have an abundance, so it is easy to work up to a nice selection of plants without too much cost. Advice and care of plants is available free from many sources — from a horticultural society, Department of Agriculture or university.

Why Garden?

My garden has no room for strife,
Nor petty cares and woes.
It lightens my heart when a dewdrop
I find in the heart of a rose.
And the soft sweet trill of a song bird,
The perfume that wafts on the air
Gladdens my soul. My life is enriched
By the beauty awaiting me there.

J. McKinnon

TREES

"The forest is a peculiar organism of unlimited kindness and benevolence that makes no demands for its sustenance, and extends generously the products of its life activity; it provides protection to all beings, offering shade even to the axeman who destroys it."

Gautama Buddha: circe 525 B.C.

Insect Galls

A. M. HARPER

Most gardeners and other naturalists are probably familiar with plant galls. Although these growths are numerous, widespread and varied, some people do not understand what causes them and sometimes confuse them with other growths that at times appear on plants.

What is a Gall?

A gall is an abnormal growth on a plant that results from a parasitic attack on the plant. The parasite may be a bacterium, a fungus, a nematode, a mite, or an insect. In reacting to the attack, the plant abnormally increases the number or size of its cells.

Buds, stems, roots, and leaves of plants may be modified into galls of many unusual shapes and sizes but the plants themselves seldom seem to be seriously harmed.

Regardless of its shape, a gall is derived wholly from the tissue of the host plant. The parasite does not make the gall, it simply stimulates the plant to produce the abnormal growth. This growth surrounds the invading parasite with layers of nutritious cells and thus provides it with food and shelter.

Insects that Cause Galls

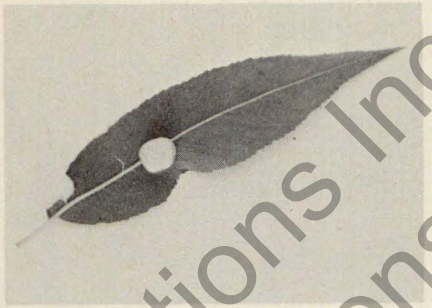
Among the groups of insects that cause galls to form are: wasps, sawflies, aphids, scales, and a few beetles and moths. These insects have evolved the ability to control the growth patterns of plant structures. All gall-causing insects show a preference for certain hosts and most cause a gall of constant size and shape. Most gall-wasps are confined to oaks and roses, gall-sawflies and gall-midges to willows, and gall-aphids to poplars.

Gall Occupants

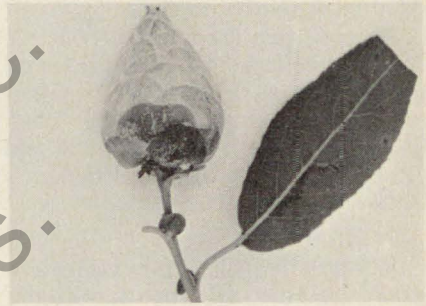
Insects other than the one that caused the gall to form may also inhabit the gall. The inhabitants may produce communities of considerable complexity.

Chalcid wasps may live as parasites on the larva or pupa of the insect that caused the gall. These chalcid wasps may in turn be attacked by parasites of their own (hyperparasites), such as ichneumon and braconid wasps. These hyperparasites emerge from eggs laid by females that are able to find suitable hosts, even though the hosts are concealed in the tissues of other insects hidden within the galls.

Some mites, synipid wasps, flies, beetles, and small caterpillars may colonize the galls, living as lodgers, and eating the food provided by the galled tissues. If one of these lodgers eats too much food, the gall-causer or



1) Willow pea gall

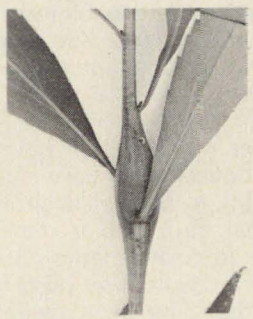


2) Willow cone gall

3) Willow stem gall

4) Willow beaked gall

5) Golden rod ball gall



6) Golden rod elliptical gall

other inhabitants of the gall may starve to death. Some of these lodgers may be parasitized and their parasites may be hyperparasitized. Therefore, one must not assume that the first insect to emerge from a gall is the one that caused the gall. The insect that emerges may be a lodger, a parasite, a hyperparasite, or the gall-causer itself. Birds may eat a gall whole or break it open and eat some or all the inhabitants.

Limited Research on Galls

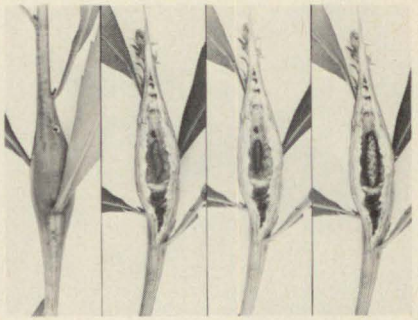
Because galls are of little economic importance at present, little research has been done on them on the Canadian prairies. Some work has been done on poplar galls in Alberta and other work is in progress on rose galls at the University of Saskatchewan.

The Future

Research on galls is interesting and could become very important in the future.

Man has been on earth for over one million years and it has taken him this time to achieve the present level of food production. It is estimated that the world population will increase from approximately 3.5 billion in 1973 to about 7.0 billion people by the year 2000 A.D. The challenge to agricultural scientists, farmers, horticulturalists, and gardeners, therefore, is to at least double food production in the next 30 years. This will have to be accomplished with even less agricultural land than is available now. At present most of the land that can be economically farmed is producing crop and each year thousands of acres of our best land are being taken over for urban development.

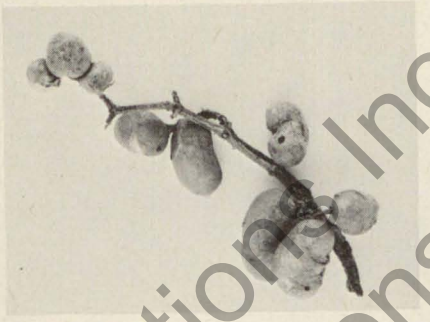
Studies made of galls have shown that various insects have developed the ability to alter plant growth and cause leaf, bud, root, or stem tissue to increase to many times its normal size and do this without seriously harming the surrounding plant tissue or the plant as a whole. Further research into the way in which plant tissues are increased in size may show how man could alter the pattern of plant growth for his own benefit. This would help him to achieve the tremendous increase of plant mass needed to feed further populations of the world.



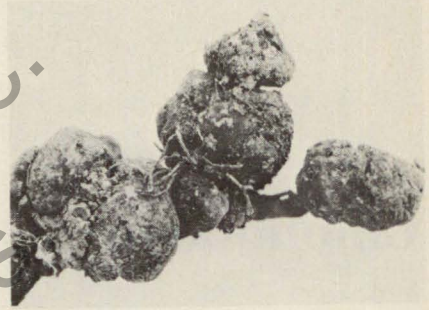
7) Golden rod elliptical gall plate
a) Gall with emergence hole
b) Larva in gall
c) Pupa in gall
d) Parasitized larva

8) Rose spiny leaf gall

9) Rose stem gall



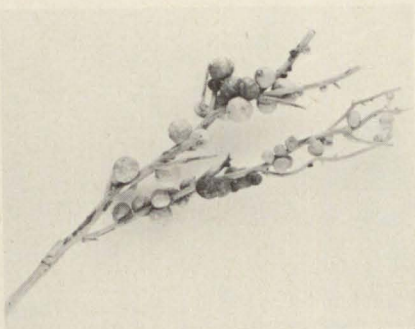
10) Rose globular gall



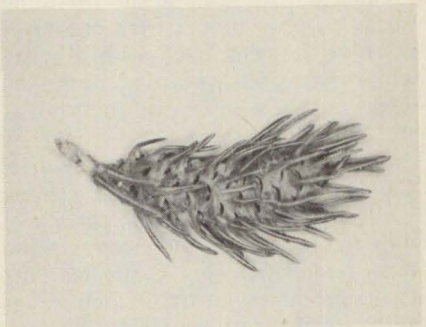
11) Rose root gall

12) Rose interior gall

13) Sage galls



14) Sleleton weed galls



15) Spruce aphid gall

Chionodoxa

MALAK

Chionodoxa were sighted by Britain's George Maw as great sheets of blue backed by snow, high in the mountains of Asia Minor less than a century ago. Thus chionodoxa, a member of the lily family, are popularly known as "Glory of the Snow" and a hundred bulbs or so will produce for the gardener the same impressive carpet of blue.

Chionodoxa seed themselves rapidly and also increase by offsets when naturalised in sunny locations. The small, hardy, pear-shaped bulbs should be planted in September-October about two to three inches deep and one to two inches apart for March-April bloom.

Chionodoxa somewhat resemble scillas but the chionodoxa's cluster of sky-blue flowers, each with a starry white centre, always face up to the sky while the early scillas nod their heads and are deeper blue.

C. luciliae, with six to twelve Cambridge-blue flowers with a snow-white centre and broad linear leaves on each four to six inch stem are the most familiar species. C. luciliae Pink Giant produces sturdy six inch spikes with lovely cattleya-violet flowers. Both can be grown in pots in the cold greenhouse or alpine house.

C. gigantea grows some eight inches tall with fewer flowers to each stem, but each flower is almost two inches across and a beautiful shape of gentian-blue with an ice-blue almost white centre. There are white forms of both C. luciliae and C. gigantea.

C. sardensis, often the earliest to flower, is six inches tall with relatively small flowers of pale but clear blue with a barely noticeable white centre. It is ideal for the rockery and for mass plantings.

Do remember that chionodoxa last well in water and make delightful little floral arrangements in small bowls.

From bottom to top of picture are: *Tulipa Kaufmanniana* — 'Lady Rose', *Chionodoxa luciliae*, *Tulipa Kaufmanniania* (a hardy Tulip species).

Gladioli Diseases

LORNA M. POFF

Plant disease is no respector of persons. Both the neophyte and the experienced gardener have to contend annually with a wide range of diseases that attack their plants with deadly intent. An understanding of these diseases will lead to their early detection and the adoption of appropriate control measures. The three main diseases affecting gladioli are corm rot, viruses and leaf and flower blights.

Corm Rot

Corm rot is the most serious of the three diseaseas. Its symptoms appear as sunken, corky lesions on the corm. Corm rot usually begins in storage as the result of injury through mechanical bruising. It is therefore, most important that the corms be handled carefully when they are being harvested and stored. Successful storage of corms will result from their proper drying and curing, followed by storage under proper environmental conditions. Freshly harvested bulbs should be cured at 75°F. for 10-15 days to ensure suberization of all wounds, and then be stored in a cool, dry cellar with temperatures ranging between 35-40°F. A pre-plant dip of either Captan or Benlate is recommended. Captan, used at the rate of 2 tblsp/gal of water and Benlate at one tblsp/gal of water will help reduce the incidence of the disease.

Viruses

The second main disease, viruses, causes a considerable loss of gladioli and of these viruses, white break is the most common. This virus attacks both the leaves and flowers, producing white streaks on the leaves and white splotches on infected flowers. Severely infected plants may fail to bloom.

Control of this disease includes three basic measures. The first is to dig and burn infected plants as soon as the above mentioned symptoms are noticed. The second is to maintain good weed and insect control. Aphids and other insects are responsible for carrying the virus from plant to plant; therefore, spraying with the insecticide Malathion is strongly recommended. Lastly, a careful sanitation program should be employed at all times. This would include disinfecting shears between cuttings and the careful removal and discarding of all infected material.

Blight

The third main disease affecting gladioli is leaf and flower blight. This usually develops during moist weather, causing infected plant parts to yellow, wilt and die back. Blight can be differentiated from the previously mentioned virus disease, white break, by the symptoms produced on the leaves. White break will produce distinctive white streaks along the leaf whereas blight symptoms appear as spots, giving the leaf a mottled appearance.

Control procedure for leaf and flower blight should include that described above for corm rot. In addition, the plants should be sprayed one or more times weekly during moist weather using one of the fungicides Maneb, Zineb or Captan. Spray the plants at the rate recommended on the label. Begin spraying when the leaves are 6-10 inches tall, or when the disease first appears. Destroying the tops after harvesting will also help to reduce the incidence of the disease.

Chlorosis

Apart from the diseases mentioned, leaf yellowing and general stunting of the gladioli plant may be due to chlorosis. Chlorosis, not a plant disease, is a condition resulting from a lack of available iron in the soil. Plants grown under alkaline conditions, such as our Prairie soils offer, will experience chlorosis. Where this is suspected, you should have your soil analyzed to ascertain the soil pH. Ideally, the soil should be slightly acid (between pH 5.5 and 6.5). Spraying the plants with iron sulphate (1 tsp/gal of water) or adding iron chelates to the soil will ensure a readily available source of iron to the plants, and control chlorosis.

Conrol Program

To ensure a garden of diseases-free glads, a control program such as that outlined below should be followed:

1. Take care in handling corms to avoid injury through bruising.
2. Cure corms properly and store in a cool, dry cellar.
3. Plant only large, healthy-looking corms.
4. Use a pre-plant dip of either Captan or Benlate.
5. Spray the foliage with Maneb, Zineb or Captan, during moist weather.
6. Maintain good weed and insect control.
7. Discard tops of plants after harvesting.
8. Do not plant gladioli in the same bed for more than three consecutive years to minimize disease build-up.

Spring Color In Your Garden

ISABELLE R. YOUNG

"The little brown bulbs went to sleep in the ground
In their little brown nighties they slept very sound,
And Winter he raged and he roared overhead,
But never a bulb turned over in bed.

"But when spring came tip-toeing over the lea,
Her finger on lip, just as still as could be
The little brown bulbs at the very first tread
All split up their nighties and jumped out of bed."

In the spring when we are waiting for the grass to green up and the early flowering perennials to make their appearance, there is nothing quite so showy as the beautiful tulips, daffodils, crocus, etc. when they burst forth in a rainbow of colors. By themselves in a border in the sun, as an edging along walks or naturalized in the lawn, bulbs will find a welcome home.

Fall is the time to start thinking about what you should order and where to put your bulbs. Around the middle of September, or whenever they arrive on the market, you can start planting. Be sure to purchase first-class bulbs — ones that are large and firm, free from disease, cuts, bruises or any odd colored spots.

All bulbs do best in a well-drained soil, and I like to put a layer of sand on the bottom of the hole which helps to prevent rotting. Some well-rotted manure may also be worked into the bottom of the trench or hole, making sure it does not come in contact with the bulbs. There are also special "bulb fertilizers" on the market but, actually, a tulip has all the food it requires right inside the bulb. If you wish, however, you can add other nutrients to the soil before planting. Also, treat with a "Bulb and Soil Dust".

When selecting a spot to plant, do not put too close to the foundation of a house, particularly if it faces south or west, as it is difficult to prevent early sprouting in the spring, with the result they are touched by frost. If the frost is severe enough it could kill the blooms for that season.

Tulips are one of the hardiest and most popular of the spring flowering bulbs. They were cultivated in Turkey before 1550 and the name is said to be derived from the Turkish word "tulbend", a turban, which refers to the shape of the flower. The growing of Tulips in Holland began around 1623. The majority of these bulbs grown in Canada and the United States are produced in the Netherlands.

Tulips, like other spring flowering bulbs, should be planted as early as possible in the fall in order to establish a strong root system before freezeup. As mentioned previously, they do best in a sunny location, but if you are thinking about the lasting quality of the flowers, provide a little shade from the hot, afternoon sun. Plant about six to eight inches deep and six inches apart, firming the earth well below and above the bulbs but, before doing so, apply a little water and nature will do the rest. Plant in groups rather than straight rows, or scatter them to give an informal effect.

When cutting for indoor use do not take more than the topmost leaf, as the rest are necessary to manufacture plant food for storage in the bulbs for the next year's bloom. After they have finished flowering, the foliage should be allowed to ripen and die down. When the blooms start getting smaller (after three to four years) it is time to dig them up, separate and replant them. You will have many more than the number with which you started.

I have grown Daffodils and, while they are not as hardy or reliable as Tulips, they do deserve a place in the garden, if only for a season or two. They add such a bright splash of color when grown in clumps and give as much enjoyment indoors when cut, as they do outdoors. Depending on the size of the bulb, they are planted six to eight inches deep and about the same distance apart. It is recommended that they be in a more protected spot than Tulips.

The Crocus and Grape Hyacinth (Muscari) are most lovely in a border, bed, or rock garden and last for several years. These are planted three to four inches deep and grow in either sun or semi-shade. Snowdrop (Galanthus) and Scilla sibirica both grow around six inches high and are planted four inches deep, and are a delight in any garden.

Gladiolus

J. R. ALMEY

What type of gladiolus should the beginner, or for that matter, one who is already growing gladiolus, use? Should one grow the giants we see at our flower shows, or the small flowered decoratives? It is not easy to use the large ones in the home, but the small ones, with their thin stems, meet this need, and the commercial florist can make better use of them. For flower arrangements they are delightful. The large ones use more space in the garden, need careful culture, staking and more water. Gladiolus are the number one cut flowers.

Gladiolus are classified as to color and size. Information in this regard, to be worthwhile, would use more space than is allowed for this article, and can easily be obtained from Gladiolus Societies.

Bulbs (Corms)

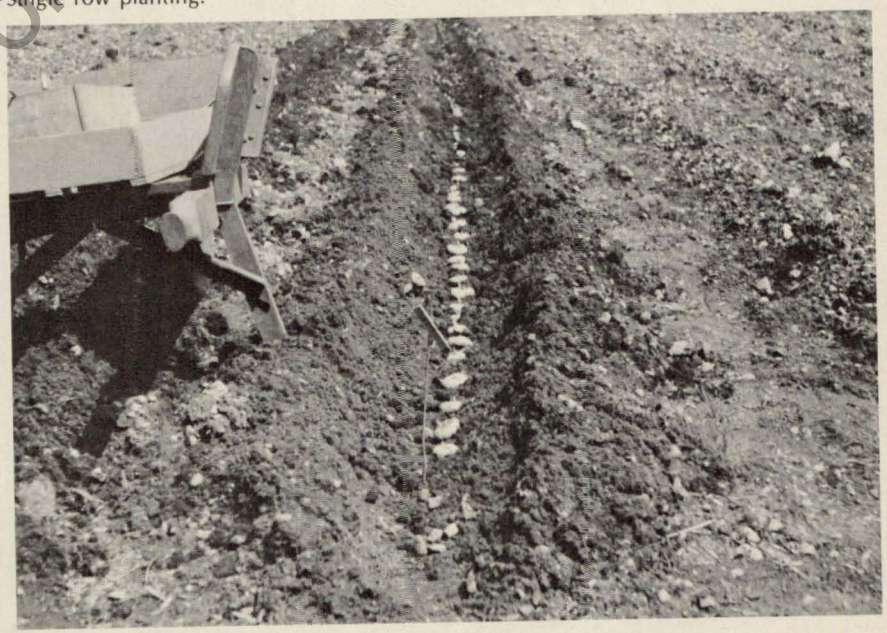
Size, age and health of bulbs are main virtues for good results. No. 1 size are 1½ inches in diam. or larger; No. 2 — 1¼ to 1½ inches in diam.; No. 3 size — 1 to 1¼ inches, reducing ¼ inch on down to No. 6. Retail catalogues generally list them as large, medium or small. Large ones are usually number ones and twos; medium — threes and fours, and small — fives and sixes. For large flowered varieties No. 1 bulbs are a 'must'. For the small decoratives medium sized bulbs can be used successfully. Combined with health, size and age they should be plump and round. A small scar at the base where the old bulb was removed will indicate a young bulb, and young bulbs are usually healthier and more vigorous than flat bulbs that have had several years growth since they were bulblets.

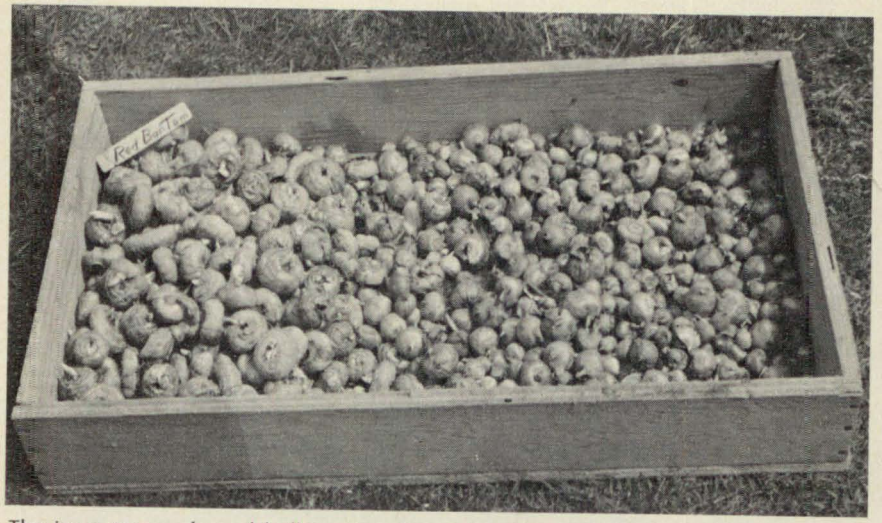
Soil — Location

A reasonably good garden soil, well drained, is suitable. It should be dug deeply as the roots must feed below four inches. Fertilizers, such as barnyard manure, greatly help the physical condition of heavy soils, providing it is well mixed with the deeply cultivated soil. The addition of superphosphate and a form of nitrogen, other than amonium nitrogen, will supply normal food requirements encountered under prairie conditions. The growing plot should be located where they will receive the full day sun. Shade from

Large flowered variety compared with small decorative variety.

Single row planting.





The importance of good bulbs cannot be underestimated. Husk removed from large bulbs. Planting stock from bulblets not husked.

buildings, and especially trees, is detrimental, but at the same time if exposed to strong winds much harm can be done.

Watering

A controlled water supply is a safeguard during long dry periods. When watering give them plenty — ½ to ¾ inches at a time, and not all just close to the plants. Soak the soil between the rows and it will maintain good growth for longer periods.

Insects

Thrip, a small black sucking insect ⅛ inch long, will damage plants severely so that the blooms become worthless. If, at harvesting time, severe infection is evident, cut off all tops close to the ground just before digging, and destroy them. This will reduce and possibly prevent this insect contacting your bulbs as you dig them. If bulbs go into storage with a few thrips on them they will rapidly spread during storage. A Vapona string hung where the bulbs are stored will assure clean bulbs for planting in the spring. If an infection drifts in from a neighbour's garden, weekly spraying with Malathian should be done. Using Malathian will also control Aphids, which often make their appearance in mid-August.

Varieties

The varieties to grow will depend on one's choice of colors, and their use. With the choice of varieties in mind, I would recommend that early in the New Year you write several growers for their catalogues. Price, color and quality will be clearly indicated.

This article can deal only briefly with this fine flower for Western Canada. A book of 236 pages, recently published, "The World of the Gladiolus", is well worth purchasing.

Play Misty For Marigolds

JOHN A. VELIATH

"There are more things in heaven and earth than you and I can dream of . . ."

In the state of Bihar in India, a little village nestles snugly in the heart of acres of paddy. It is customary for the simple folk to gather together at sunset and fill the evening air with the joyful sound of flute, sitar and song. One day an agricultural scientist dropped in for a visit and very alertly observed that the rice plants bordering the village were taller and more vigorous than those farther away. After finding the soil and other factors more or less similar in most parts of the plantation, he came to the stunning conclusion that the plants were music lovers and were flourishing on sitar and flute.

This was the beginning of the tremendous amount of research now being conducted on the effect of sound on plant growth and development. Two well-known workers, Mary Measures and Pearl Weinberger, have shown that yield of Marquis and Rideau wheat can almost be doubled if the plants are treated daily to sound waves of a frequency of 5,000 cycles per second. Weinberger firmly believes that future farm equipment will contain devices for producing sound waves of any desired frequency.

A most fascinating experiment was conducted by the mezzo soprano, Dorothy Retallack. In each of three growth chambers with identical conditions, she placed plants of squash, petunia, zinnia and marigold. The plants in one chamber were treated to a daily diet of classical music, the ones in the second to hard rock, while the third had no music. The results were remarkable. The plants entertained with classical music were much larger than those in the silent chamber. What's more, they had grown towards the source of the music, the squash vines twining their tendrils lovingly around the microphone. The plants treated to rock grew abnormally, either becoming spindly and tall or remaining stunted; the squash vines grew away from the microphone and even tried frenziedly to climb up the wall of the chamber. Moreover, within two weeks, all the marigolds were dead as nails.

A number of scientific explanations have been offered to explain the effect of music on plants, but none are convincing. Perhaps the answer lies somewhere else, in an area man is

too sceptical to explore.

Is it possible that plants are sentient, that they can feel? The famous inventor of the lie detector, Cleve Backster, is convinced that they are. One day, while doodling in his office, he wondered what would happen if he attached the electrodes of his invention to the leaf of a nearby philodendron. Nothing happened at first. He then decided to pour a kettle of boiling water onto the roots. The lie detector registered an alarm signal immediately. The incredible thing was that the plant responded even before the water was poured. The philodendron had read Backster's mind! By placing himself at various distances, he showed that the plant could be made to respond from several miles away.

You may have heard of Edgar Cayce, the sleeping prophet. He had no training in medicine whatsoever, and yet, while in a coma, he diagnosed ailments and prescribed remedies — all in strictly clinical diction. Not once was he wrong. Some scholars believe that Cayce's brain cells could tune in and process the information stored in all the other brain cells in the world. Could plants possess a similar form of cellular consciousness? The basic building block of the plant body — the cell — is essentially the same as that of the animal. Then why must plants be incapable of feeling?

In view of what has been said, there may be more to "green-thumbing" than meets the eye. On numerous occasions I have seen plants thriving in the poorest of growing conditions. Persons who own them are said to be gifted with green thumbs. And that's that. Yet it could be these people are providing their plants with an intangible something the scientific world does not know of or does not care to believe in.

Would you like to develop a green thumb? I offer you some suggestions that may or may not work, but you will never know unless you have tested them. Try developing a genuine fondness for your plants. Feel for them. Grow them for their own sake rather than objects of adornment. If you wish to talk to them, fine. No one need ever know that you do. Regale them with music each day. Choice of music is important. Plants are known to have a soft corner for Indian religious music played on the sitar. So if you occasionally treat them to the rages of Ravi Shankar, they'll probably burgeon and burst all over the place for you. Beethoven and Bach are also beautiful. Graded a notch lower are Mantovanni and Henri Mancini and plants may even relish Duke Ellington in small doses. Country and folk music will not harm them, but neither will they benefit. But under no circumstances, but none, should you play Led Zepplin or Jimi Hendrix. Especially if you have Marigolds around.

As for the hard hearts, cynics and scoffers, I have a word of admonition: Be kind to your fine-foliaged friends, for, a Pinus mugo mughus just might be a relation.

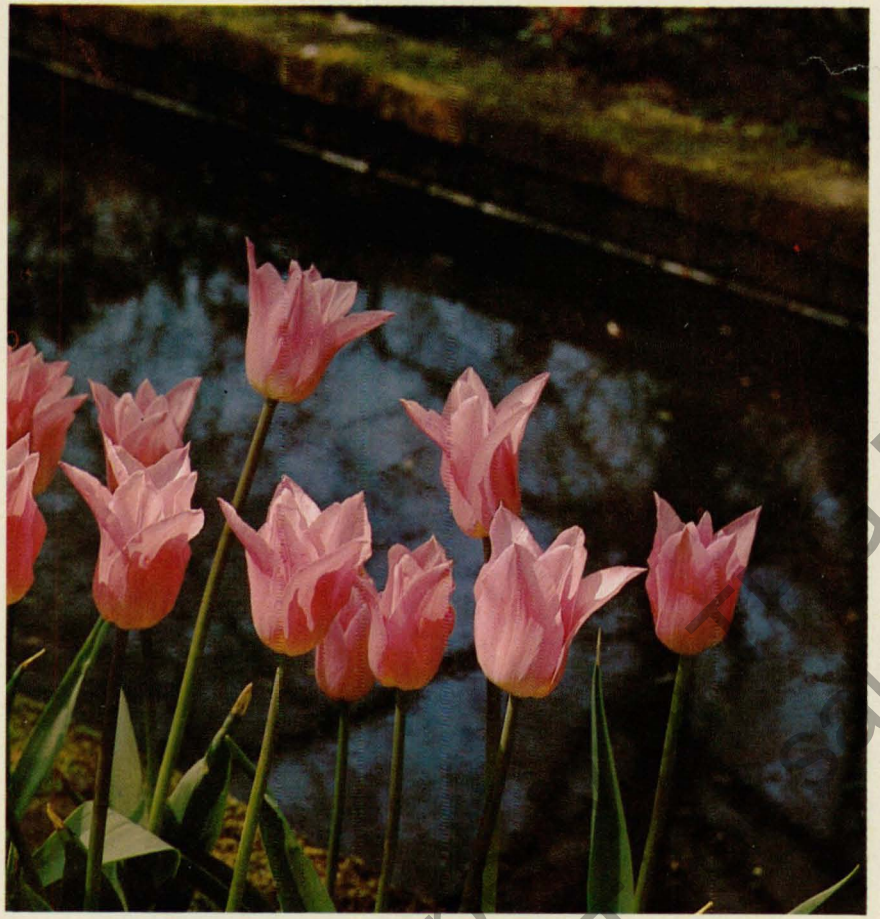
I remember, I remember
The fir-trees dark and high
I used to think their tender tops
Were close against the sky.
It was a childish ignorance,
But now 'tis little joy
To know I'm farther off from heaven
Than when I was a boy.

Poet Hood

Colour Section

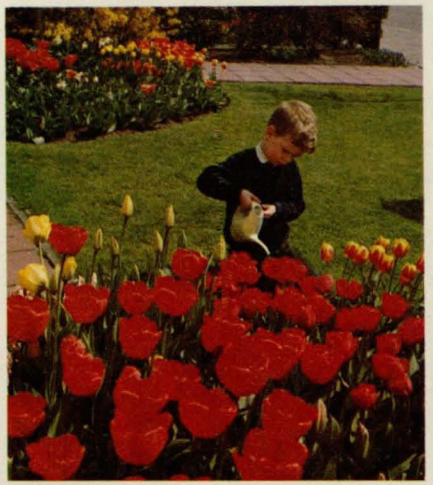
Bulbs

Tulips — Darwin-pink "Pride of Harlem", Darwin-yellow "Golden Age", Triumph-orange, "Princess Beatrix".

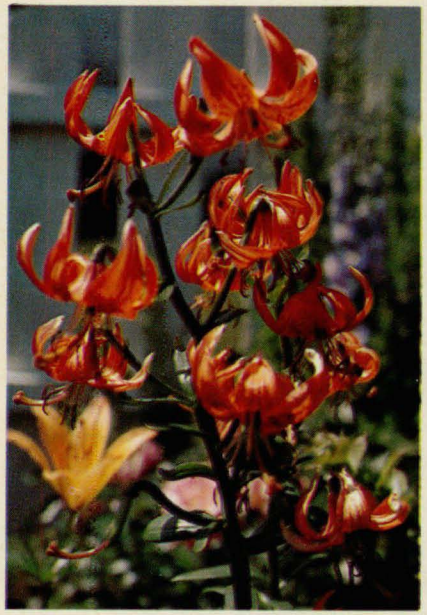


Lily-flowered "China Pink".

A touch of spring while the young people enjoy winter.



The very young enjoy gardening, too!



Several varieties of lilies provide a long season of bloom.

Tuberous begonia can complement other flowers where given partial shade.

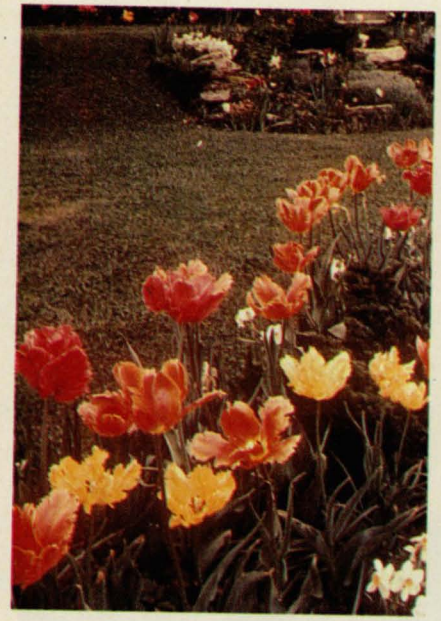
(a) and (b) Two good lily-flowered tulips 'China Pink' and 'May-Time'.

Cannas must be started indoors for a long season of bloom.

(a) and (b) Tulips may be planted among other flowers and/or used in a planter.

Darwin tulip 'Red Reflection' in mass planting.

An attractive idea is to embellish the tulip planting with a ground cover of Forget-me-not.



Attractive English exhibition of tuberous begonia.

Low growing bulbs like 'Crocus' and 'Grape Hyacinth' may be planted on slopes (as in the distance).

Splendid development of California hybrid — pendulous begonia.

Begonia display on a tiered stand.

Tulipa tarda — a hardy, free-flowering tulip species.

Lily flowered 'Queen of Sheba' in bloom mid-June the third year after planting.

Native Moccasin Flower — *Cypripedium acaule*, one of nature's treasurers.

Monarda dill.

Native yellow Lady's slipper — c. *parviflorum.*

White water lily — *Nymphaea* species.

Yellow Cheer — a splendid border dahlia.

Typical woodland scene in spring.

Candlestick Lily — *Lilium dauricum,* a vigorous early-flowering lily.

King Alfred — a reliable forcing daffodil.

Blooms in early June on Van der Hoef double tulip in fourth year after planting.

Flower Record — a short trumpet daffodil for forcing.

Mass planting of tulips — National Capital Commission, Ottawa.

A fine display of tuberous begonias in a shaded area, e.g. north side of building.

Fruit Growing In The North

P. J. PETERS

Fruit growing in Western Canada is a risky business. The farther north you go, the greater the risks. The greater the risks, the greater the determination of growers and hobbyists to prove that fruit can be grown. In the absence of the necessary research the information gained through experience by these hobbyists, if shared with others, can be a boon to those who are interested in this phase of work.

Wind shelter becomes very important as you go farther north. A well-protected area has a micro-climate of its own. This means that fruit trees should be planted in the most protected spot of the garden. Another major consideration is soil. Most fruit trees and tender fruit varieties must have good internal drainage. They do not tolerate wet feet, yet need frequent watering. Most fruit varieties are susceptible to high salt content.

There are few varieties of fruit that are completely hardy for northern conditions. The trick in fruit growing is to plant the hardier varieties in the right locations and to use all the tricks of the trade to help these varieties to grow and fruit. Low level fruit growing could be a title for this paper. The suggestions presented are for people who have the inclination, the time, the ability, and the perseverence that is needed to grow fruit in the north.

Is there any way in which fruit can be grown more successfully? What about better varieties? We believe that "espalier" is the answer. Russia is doing some successful work in this area. Let's take a quick look at "espalier".

Espalier is a French word derived from the Italian "spalliera", something to rest the spalla (shoulder) against. "Espalier" may describe any plant trained flat in one plane — a two-dimensional tree or shrub as it were, with height and width, but almost no depth.

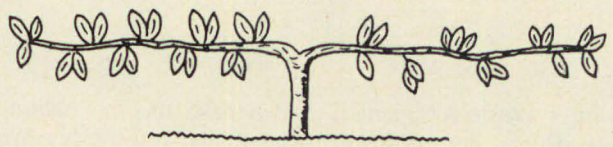
This is not new. The Romans espaliered fruit trees against their walls. France, Spain and England have espaliered fruit trees, flowering trees and shrubs for beautification for centuries. Russia is using this method for fruit production on orchards. Our interest in this method stems from an interest in overwintering more none-hardy material.

Anything that becomes covered with snow will usually overwinter. To grow fruit trees in the north, espalier them as low as possible against a south wall or against an evergreen or dense

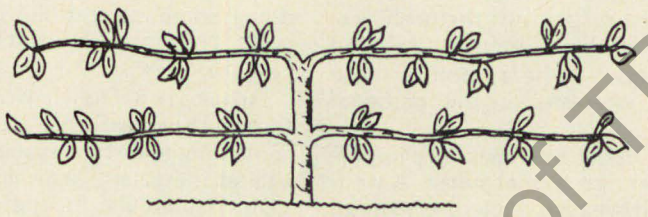
herbaceous hedge.

The simplest espalier pattern is that of the horizontal cordon, either single or double as illustrated. The single cordon is best for overwintering, as it is easy to throw up a foot or two of snow to cover the cordon.

Horizontal Cordons



Single



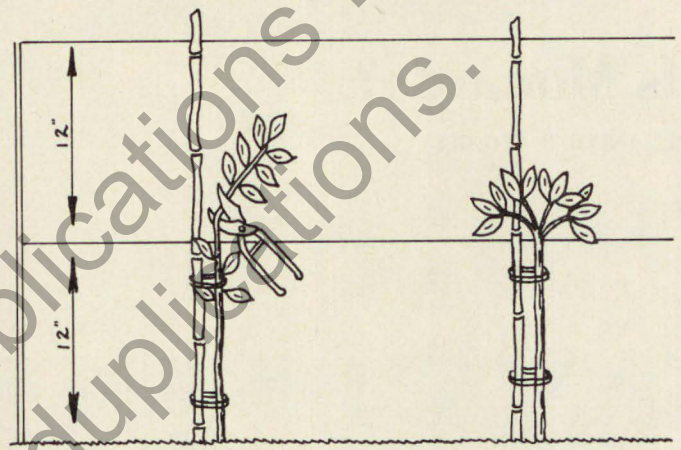
Double

We suggest that Manitoba growers try and espalier a stembuilder tree, known as "Nertchinsk". After the cordons begin to establish, the tender variety is budded onto the "Nertchinsk". We use the "Nertchinsk" to incorporate stem hardiness to our espaliered cordons. Study "Stembuilders for Prairie Orchards" (Publication No. 460, Manitoba Department of Agriculture).

We further suggest that interested parties obtain the book by Harold O. Perkins called "Espaliers and Vines for the Home Gardener". This is published by D. Van Norstrand Company (Canada) Ltd., 25 Hollinger Road, Toronto 16, Canada.

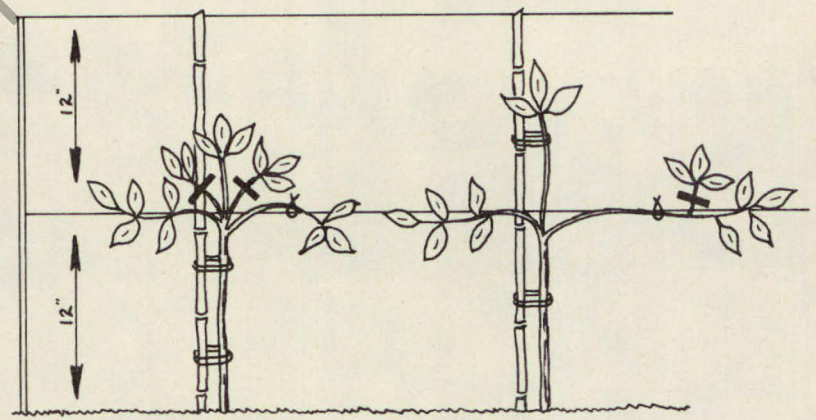
Espalier work offers the opportunity for poetic expression through the use of ornamental plants. It can become an absorbing hobby.

Basic Pruning Steps For Espalier



cut to height of first cordon

wait for new shoots



train three best shoots on bottom cordon; prune excess

allow one center shoot to continue; pinch offshoots on horizontals

What Is Monarda?

H. H. MARSHALL AND B. B. CHUBEY

You may have heard of a flower by that name or is it a perfume crop? Monarda could be either.

The genus *Monarda,* named after a Spanish physician, Nicholas de Monardes, includes nearly 20 North American species. Their closest well known relatives are *Salvia* or sage. Both groups include showy flowered species and others that are valued as flavorings for food or for pleasant scents in perfume. Their wide distribution and variety of appeal has led to Monarda having many common names such as Bee Balm, Oswego Tea, Fragrant Balm, Wild Bergamot, Horse Mint or Wild Sage. Since there are so many common names, the scientific name Monarda is much less confusing.

Our first interest in the group was as a perennial flower. Hybrids come in a wide range of white, pink, scarlet and purple shades. The large two to three foot plants bloom freely in late July. 'Souris' (red-purple), 'Neepawa' (light red) and 'Miniota' (white with pink tip on flowers) are some that have been released to nurseries.

Monarda is also of interest as a possible source of flavorings or scents. The foliage bracts and flowers are generously dotted with small beads of aromatic oils, probably to discourage excessive grazing by animals. The kind of oil varies widely and over 25 components have been identified. Well known scents such as thyme, lavender, lemon, geranium and eucalyptus are found in mixtures or sometimes nearly pure.

Many species grown for flavorings or scents produce a small fraction of one percent of the valuable oil. Monarda strains have been tested with more than one percent, but most give somewhat less. The plants are large, vigorous and drought tolerant so quite large yields per acre are possible. Some of the oils retail for many dollars per pound. The same equipment used for dill oil production can be used to handle Monarda. Weeds can be controlled with herbicides.

Monarda is a useful hardy perennial flower. It may also become a source of perfume. As a species it could be bred to produce more than one type of perfume or flavouring, all from basically the same plant. If this is not enough, the seed contains a high percentage of oil that has the same composition as linseed oil. This oil could not be produced as a by-product of the aromatic oil and probably would not compete with flax, so is of minor interest only.

Monarda is or may be several things.

LEFEBER

How a New Tulip is Created

MALAK

Lefeber might be identified as the super sleuth of the flower world. He has spent many months over the years roaming the mountains of Russia and Persia in search of wild spring flowers.

For a foreigner to be given permission to travel free in Russia after the First World War was in itself a high tribute by the Russians to the Dutch achievements in the horticultural field and, in particular, to Mr. Lefeber himself.

The Russians are known for their love of flowers. Lefeber was invited numerous times to exhibit his flowers. One time at a dinner party and between toasts, Mr. Lefeber was granted one favour. Two days later, he returned to be given permission to roam the mountain regions of Russia in search of flowers.

On one of these trips, he discovered a tulip one-quarter inch in size which he acclimatized in his native Holland soil for five years (planted and replanted the bulbs). From that tiny flower came many of the great flowers that have made Lefeber and Holland famous, i.e. Madame Lefeber (Red Emperor), the Darwin Hybrids like Jewel of Spring and President Kennedy.

To appreciate the meaning of introducing a new bulb, only when one million bulbs are available from one variety is it considered as ready for marketing. It usually takes 25 years from the time the first crossing takes place.

The sequence of producing a new flower is as follows:

1) crossing of pollen and stamen of two selected flowers

2) from 60 to 120 seeds may be obtained.

First year All these seeds are planted.

2nd to 5th year The seeds have become tiny bulblets which are replanted every year. It is on the fifth year that a flower forms and at this time there are some 4,000 new tulips. An immense job in itself, for the hybridizer, is to select and evaluate. Of all these he might select a handful, or perhaps only one which he thinks is really fine.

6th to 10th year The selected bulb or bulbs are replanted and allowed to multiply. This is the time of final decision. Will the bulb perform dependably, keeping its characteristics? Will it produce in sufficient quantity to be economically profitable if introduced into the market?

10th to 25th year Developing adequate stock — now the attention of the bulb grower is directed toward increasing the yield to the one million bulb mark. This bulb, then, is considered established and marketable.

The famous Red Emperor was produced from a wild Russian tulip and a Darwin (red and yellow). Mr. Lefeber considers that the wild varieties, as found in the mountains, remain more beautiful in most cases than anything a hybridizer can produce.

How much does it cost to produce a new bulb? Obviously, a fortune. But Mr. Lefeber is an expert and he is able to single out the best and thus reduce the time and labour to a minimum. He claims his bulbs have not cost him anything because, somewhere along the line, he has been able to sell one bulb of a new flower for anywhere from $200 to $2,000. A well-known variety, called Oriental Splendour or Margaret Herbst, which he registered in 1949, sold for $200 per bulb when it was first made available to other growers.

There is a famous Red Emperor anecdote — Mr. Lefeber was asked by his wife if he had named the tulip for her. He said, "Yes dear, but don't tell my mother". His mother asked him the same question and his answer was the same but, "Don't tell my wife".

The first time he was invited to exhibit in Russia, he showed only one flower, a most unusual thing as they usually show hundreds, and he was awarded the first prize!

Compost — How and Why

DAVID R. EDIGER

In the past decade, the topic of waste recycling has enjoyed a vastly increased popularity amongst many sectors of the population. The object of recycling is, of course, to divert discarded materials from the waste stream into some form of reutilization process. To many people, recycling consists only of depositing bundled newspaper and flattened tin cans at the neighborhood recycling depot. The rest of the process then becomes somebody else's responsibility.

Anyone with a rudimentary knowledge of natural systems knows that the concept of recycling is by no means a new innovation. Nature has been efficiently recycling its own wastes since the earth began. Animal wastes which fall on the ground are decomposed by natural biological processes. The decomposed wastes are then assimilated into the soil where they aid in replenishing the nutrients required for proper soil fertility. The same general process also applies to dead plant and animal matter. Efficient recycling of soil nutrients is essential if the soil is to keep up its role in sustaining life on this planet. The fact that the soil cover on all land areas of the earth averages only seven inches stresses the need for the recycling of essential nutrients.

Farmers and backyard gardeners have been aware of the benefits of composting for many years. The main purpose of this article is to outline the processes involved in composting and to provide some suggestions on proper composting procedure.

Process

One source defines composting as "a biochemical degradation of organic wastes to a sanitary, nuisance-free humus like material". While this definition is reasonably accurate, it tends to oversimplify the processes which occur during composting. Raw organic matter is considered to be unstable in that it is subject to attack by micro-organisms. These micro-organisms may include bacteria, fungi and moulds. During decomposition, complex organic compounds are broken down into simpler forms which can then be recycled into the soil structure.

During composting, living organisms feed upon the organic material and develop cell protoplasm from nitrogen, phosphorus, carbon and other nutrients. When organic material is decomposed in the presence of oxygen, the process is termed "aerobic". The aerobic process is most desirable in that it takes place more rapidly and results in a less offensive compost pile. Anaerobic conditions, which occur in the absence of oxygen, result in a lower decomposition efficiency and odors produced by gases such as methane and hydrogen sulfide.

Composting

Composting takes place essentially in four stages. The first is known as the mesophilic stage because mesophilic (intermediate) bacteria are the most active organisms in the decomposition process. During this stage the simple carbohydrates such as sugars and starches are broken down. Due to fact that mesophilic bacteria give off heat during the decomposition process, the temperature of the compost pile will rise to approximately 105°F.

As the temperature of the pile reaches 105°F, the activity of the mesophilic bacteria decreases, and the decomposition process is taken over by thermophilic (heat-lowing) organisms. During the thermophilic stage, the temperature of the compost pile should rise to 140°F — 160°F. It is in this stage that the major decomposition activity takes place. The high temperature will be maintained as long as there is a high level of bacterial activity. Once the majority of the organic material has been digested, the population of thermophilic organisms will decrease and the temperature of the compost pile will show a corresponding decrease. Figure I shows a typical temperature curve for a properly established compost pile.

After the thermophilic activity has subsided, the cooling-off period commences. During this phase the less readily degradable materials, such as cellulose and lignin, are attacked by the mesophiles. Due to the decreased level of decomposition activity, the temperature of the compost pile will continue to drop during this stage. The cooling-off stage also allows for final digestion of intermediate decomposition products, such as the oxidation of nitrite and nitrate.

The final or maturing stages begins when the temperature approaches normal outdoor conditions. Due to the slow reaction rate during this stage no significant temperature fluctuations occur. The maturing phase finishes off all the incomplete digestion processes, and produces the final compost.

Although numerous factors must be considered in determining the length of time required for complete composting, the following schedule would be roughly applicable at optimum conditions.

TABLE I DURATION OF COMPOSTING STAGES

Stage	Time Required (days)
Mesophilic	3 - 6
Thermophilic	10 - 15
Cooling-off	10 - 30
Maturing 0 - 90 (depending on application of finished product)	

Factors Affecting Compost Pile

There are many factors which can affect the operation of a compost pile and the quality of the finished product. One of the most important factors is the ratio of carbon to nitrogen in the raw organic material being used in the compost pile. Micro-organisms involved in composting require more carbon than nitrogen in order to complete the digestion process. If too much carbon, or not enough nitrogen is pre-

sent, the composting process becomes more time consuming and less efficient. In some cases, the application of a nitrogen-deficient compost will result in the humus "robbing" nitrogen from the soil. Most studies have indicated an optimum carbon-nitrogen ratio, often written as C/N, of 30:1, or more simply, 30. Table II gives the C/N figures for some of the materials often applied to a compost pile.

TABLE II
C/N VALUES FOR COMPOSTABLE MATERIALS

Material	%N	C/N
Grass Clippings	2.4	19
Raw Garbage	2.15	25
Meat Scraps	5.10	—
Tomato	3.3	12
Turnip Tops	2.3	19
Whole Carrot	1.6	27
Potato Tops	1.5	25
Whole Turnip	1.0	44
Sawdust	0.11	511
Newspaper	Nil	—

Moisture Level

The moisture level in the compost pile is another important consideration; since water serves as a means of transportation for nutrients and soluble gas within the pile. If the moisture level is too low, the matabolic activity of the micro-organisms is decreased, and complete decomposition may not be attained. On the other hand, too much moisture may result in water filling up the void spaces between the organic particles. This will promote anaerobic decomposition, and all of its accompanying problems. Most experts recommend a moisture content of 50-60% for natural aerobic composting.

The temperature curve shown in Figure I is another significant factor. Although it is highly unlikely that actual composting conditions will produce a smooth, continuous curve, the general pattern should be evident. A sustained temperature of 140°F or higher is necessary for two reasons. First, the thermophilic bacteria are most active in this temperature range and hence will provide a more complete degree of decomposition. Secondly, high temperatures will ensure the destruction of undesirable elements such as weed seeds, fly eggs, and disease causing organisms. In order to ensure complete destruction, the temperature of the compost pile should remain above 140°F for approximately seven days. These high temperatures only occur during aerobic digestion, and thereby stress the need for avoiding anaerobic conditions, which occur in a lower temperature range.

Your Garden

To this point, you may be wondering how all this technical information relates to your garden. Indeed, to some of you it may be about as useful as last week's news. Many people, however, have been ardent advocates of composting for years without really understanding the details of the digestion process. Of all the forms of crop raising, the backyard garden puts the most intense demands on each square foot of soil. Because of this fact, garden soil requires the greatest degree of maintenance to ensure proper growing conditions.

Humus (organic) content in soil is a necessary component for proper plant growth. When the soil is intensely cultivated, it tends to lose this organic content and becomes infertile. When this point is reached, no

quantity of chemical fertilizers can restore the original conditions. When compost is applied to the soil, it essentially replaces the lost humus. Compost aids the soil in the following ways:

a) It aids in aggregation of small soil particles, to produce a soil structure with proper water-holding capabilities. When the humus content is low, the soil takes on a sand-like formation which will not hold water and is subject to erosion action.

b) It aids in nutrient exchange, i.e. it holds phosphorus and nitrogen in a form that is available to higher plants. These forms are relatively insoluble thereby increasing the chances of nutrient leaching from the soil.

c) Apart from phosphorus, nitrogen and potash, compost also contains trace elements necessary for optimum plant growth and decreased susceptibility to disease.

From the above points, it is apparent that finished compost could more aptly be described as a soil conditioner than a fertilizer. Application of good compost to the soil is preferable to applying chemical fertilizers, in that compost aids the existing natural systems as opposed to imposing an artificial set of conditions.

How To Start a Compost Pile

The only step remaining here is to describe how all this data can be translated into a working situation. Compost begins with a pile of raw organic waste matter. When selecting the materials to be included in the pile, consideration must be given to factors such as C/N and moisture content. If a material is included with C/N value substantially above 30, it should be balanced by a material with a low C/N ratio. Similarily, if very wet materials are included, a compensating quantity of dry material should be added. It is rather difficult to ascertain whether the moisture content is actually in the range of 50%. The pile should, however, appear damp if the moisture content is within the proper range.

In order to ensure complete decomposition, the material for the compost pile should be cut into pieces approximately 2 to 3 inches in size. This will allow adequate surface area for attack by micro-organisms. However, if the material is cut too small, it restricts the flow of air through the pile and will promote anaerobic conditions. After the materials have been cut up, blending may be necessary if the various components have substantially different C/N ratios and moisture contents. This is easily accomplished when the materials are being piled.

Size and Shape

The size and shape of the actual compost pile is also an important aspect. The pile must be self-insulating to the extent that it can maintain the high temperatures required in the thermophilic phase. In order to accomplish this, the pile should take on a profile approximately like that of a coal pile. A height of at least three feet is considered essential to limit heat and moisture loss. The material should be piled loosely enough to allow air passage through the pile.

Once the pile has been placed, the decomposition process will begin almost immediately. From this point temperature measurements should be made daily to assess the activity of the pile. A marked upward trend in temperatures curve should be noticed within the first two to three days. The peak of the temperature curve should be reached in six to eight days, and

this temperature should then be maintained for four or five days. Temperature readings should be made approximately half way between the outer surface and the center of the pile. Failure of the pile to reach temperatures of 140°F, or better, indicate that either the pile has gone anaerobic or the moisture content has dropped below acceptable.

Turning the pile at appropriate intervals is necessary to achieve proper decomposition. When the pile is turned, it should be done in such a way that it is essentially turned inside-out, i.e. the material from the centre of the pile moves to the outside and vice versa. Since the most active decomposition takes place at the centre of the pile, turning ensures that all materials are subjected to this higher rate digestion. Since the pile tends to settle, turning also loosens the particles and maintains adequate aeration for aerobic conditions. If the temperature of the pile drops unexpectedly, it may be due to excessive moisture loss. This is easily rectified by spraying the pile briefly with a garden hose. Care must be taken, however, not to saturate the pile. The intervals for turning the pile will be determined from the temperature. Through the mesophilic stage, turning is not required, as the population of micro-organisms must first be allowed to reach adequate proportions. During the peak of the thermophilic stage, the pile should be turned two or three times. Two turns should be sufficient in the cooling-off range. Once the pile has returned to near ambient conditions, it should be matured for a month or more. One turn may be required half way through the maturing period. Figure I shows the points on the temperature curve where the pile should be turned for optimum digestion efficiency.

If all these steps are taken, the finished product should have the texture and aroma of fresh humus. A final shredding may be necessary if the compost pile contained a high percentage of coarse fibred material.

Composting is a practice which can be beneficial both to your garden and to your environment in general. It is hoped that the information in this article may help to improve the quality of your compost. Don't forget to tell your friends and neighbors.

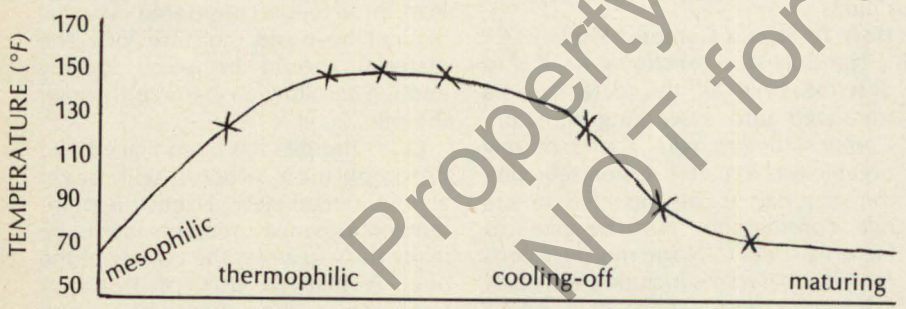


FIGURE I

TYPICAL TEMPERATURE CURVE

NATURAL AEROBIC COMPOSTING

x — denotes turning of pile

Raising Roses

MRS. VERNON C. NELSON

About five years ago my husband and I began to grow roses here in Zahl, North Dakota, and found they grew very well. Our first venture was with Super Brownells and Polyanthus. We later added Hybrid Tea Roses, Floribunda and Grandiflora.

In planting, my husband digs a very large hole so that the root is not crowded, and uses about one-third peat moss, one-third barnyard manure and one-third of our very good soil. Then we water them well while there is the indentation around the plant. The next morning, or several hours later, the dirt is mounded to eight inches or so, until they start new growth. This is to protect them from the elements. We water them well once a week and fertilize with "Three-Way Rose Care" twice during the summer (very early when they have budded out, and then again late in July).

In the fall, the crown is covered first with a little soil, then straw is piled on them thickly all around, and a little soil is put on top to hold the straw down. We do not cut the roses down in the fall as we feel we save more of the plant by waiting until spring to prune.

We also feel we have an ideal location for roses as they are planted in a long row with a lilac hedge as their protector from the cold west wind — both summer and winter. We had 29 roses a year ago (1972-73) and we saved all of them that winter. This last winter was very cold but out of our 40 roses, we lost only one!

My favorites are the Floribundas as they are so showy and they blossom most of the summer. I have also had very good luck with Europeana, Spartan, Fashion, Gene Boerner, Redgold and Vogue. My New Sunspot seems to be doing very well and has beautiful blossoms. They are all very lovely, each rose an individual, and we have derived much satisfaction and enjoyment from them.

Hyacinths for the Prairie Provinces

ELIZABETH PARKIN

Hyacinths are the harbingers of spring, their sweet perfume and delicate colors precede even the daffodil family; with the exception of the Paper Whites. Their cultivation is associated with trials and tribulations from blind bulbs and lank weak stems indoors; to complete winter kill when growing outside. Good results encourages one to grow more the following year.

Growing hyacinths outdoors is usually only undertaken by the real enthusiast who is prepared to find the best place for their cultivation. Occasionally a bulb which has been used for forcing planted outside in just the right location will do very well.

In common with all bulbs, hyacinths require a well drained soil but need extra protection. They will grow successfully by the house basement wall preferably on the east or west side. The snow on the south side of a house melts quicker and may expose the leaves to fluctuating temperature with possible loss of the shoot. The accompanying photo shows hyacinths growing on the south side of Mrs. Vi MacDonald's home in Regina but the area is protected by another house very close to it.

Later flowering varieties should be chosen, and although many catalogues recommend second size bulbs for outdoors, the extra vigour from the first size may be beneficial in the prairie regions. Carnegie (white), Delft Blue (medium blue), Eros (pink) and Amerstadam (carmine pink) are some of the varieties available. Mixed varieties seem to give a better show outside than a bed of one color.

The bulbs should be planted as early in the fall as possible. Unfortunately, the Dutch bulbs often do not arrive until the end of September. September 15 is an ideal time to plant. This enables the bulb to root into the soil before the ground freezes, if it does not root, the bulb will rot. They should be planted so there is a minimum of 5 inches of soil above the bulb, but should not be twisted into the soil as this damages the bottom of the bulb and prevents the roots growing. The bulbs are then well watered in; and after freezeup mulched with leaves or straw which will be removed as the leaves emerge in the spring. The mulch must not be left on too long. Hyacinths planted amongst evergreens will also gain some protection. It should not be necessary to stake flowers outdoors. After flowering, remove the flower but keep the rest of the plant growing vigorously by water, as necessary. Do not remove the leaves until they have died down as they provide the nutrients for the flowers next year. This is the reason why bulbs grown inside often do not flower the following year.

Forcing hyacinths into bloom indoors is the most satisfactory way to use these lovely flowers, and is very simple if the following guide lines are followed.

Hyacinths need two very different temperature periods to do well. The first period must be cool, the second warm. To reverse this is to invite failure. But first consider, varieties. There are many shades, different colors, white, cream, yellow, blue, pink, red and deep mauve. The varieties will be marked; early, mid and late season. Do not try to flower late season varieties at Christmas, in fact use "prepared" bulbs for this purpose. These bulbs are specially treated to flower early but do not pot these immediately when received as every day's delay will retard flowering. Besides the usual one spike type of flower there are also multi-spikes such as miniature or Roman hyacinths. These are very dainty and delicate. There are also specially treated multiflora hyacinths in many different colors. The cultural treatment is the same for all types.

Potting, which should be done as soon as the bulbs are received, is very simple. Use a container with a drainage hole and a well drained soil mix. If mixing your own soil, use one part of soil, one part peat moss and one part sand (by volume). Bulb mixes are available but they are very light in weight and sometimes the heavy plant will topple out. A rich soil is not needed as all the food is in the bulb for flowering. This is why hyacinths can

be grown in specially designed glasses holding water only. The bulbs can be grown separately in a small pot or three or more in a larger pot but spaced so they are almost touching. If colors are mixed in one pot, be prepared for uneven flowering. The bulb should be planted to half its depth with nose sticking well above the soil. A space should be left for watering which should be done immediately after potting and at any time the soil begins to dry out. Do not keep the soil soaking wet all the time. For the next six to eight weeks, the pot must be kept in a cool place which has a temperature of approximately 42-46°F. where the roots will grow. Light is not needed at this stage. If the house basement is not cold enough, it may be possible to divide a cool corner off using plastic, making sure the temperature is right by using a thermometer. The pots can be buried outside, using peat moss or leaves, as long as the frost will not move down to the bulbs but this is a

little risky on the prairies. If flowering bulbs are very important to you, an older refrigerator might be the most suitable thing to use.

The hyacinths will be ready to bring up to the living quarters into light and a warmer temperature when there are a large number of white roots. These can be seen pushing out of the drainage hole or by knocking the plant out of the pot. The upper shoots should be ½ to 1 inch tall. The bulb will need watering regularly, starting immediately it has been brought into the warm temperature. The bulb growing in the hyacinth glass should be given the same temperature variation. If staking is necessary, do not use an ugly one such as a knitting needle. Use a suitable length of wire which can be bent into a flattened hook at the top to fit around the stem just below the flower. This can be pushed right into the bulb or soil; if you intend to continue growing the bulb on after flowering and then planting outside in a well chosen area for possible flowering the following spring.

Nature's Garden

G. W. MALAHER

"To learn something new, take the path you took yesterday." So said John Burroughs, but it is unlikely he had nature trails in mind; yet how true it is of a woodland path.

Nature's Garden is constantly changing, from day to day, week to week and from season to season. Reverse your route on the trail you took yesterday and it is a new experience. The views are different and things hidden as you approached from one direction are easily seen as you retrace your steps of the day before.

No established nature trail is necessary and indeed there are many advantages in exploring nature's garden where evidence of man does not exist. There is a sense of adventure in leaving behind the sights and sounds normally encountered, but many fear to leave the road and for them a well marked trail provides a good solution. A brochure covering some of the things to look for helps to create interest and encourage the powers of observation.

To cover a nature trail once is to realize only part of its interest potential and changing beauty with the seasons. Nor should the trail be covered fast for then it becomes merely a hiking trail. There is much to see and much to observe. Observation is the key to full enjoyment.

The first green leaves of trees and plants in the early spring are a delicate green not seen later in the season and have a special appeal in the consciousness that winter is over and nature is again responding to the warmer soil and moisture from the melted snow. Small streams and creeks run full and the music of tumbling waters replaces the frozen stillness of the rapids.

Mid-June is the best time to search for and locate — but not to pick — many of our woodland flowers. The Prairie Crocus, or Pasque flower as it is properly called, has already heralded the early spring and only the leaves and withered blooms remain where yesterday there was a carpet of mauve on the prairie hillside or sandy soil of the open woodlands. But in the woodlands many species are just pushing through the leaf mould or are coming into bloom. In the Precambrian rock country particularly, a leisurely walk along a nature trail can be most rewarding. On many a rocky hillside the Moccasin Flower can still be found bowing its regal head in splendor. The tiny blossom of the

Little asters line the path in the late summer season.

Twin Flower pokes its head some two inches above its creeping tendrils and carpets the shady areas. In more open woods, where underbrush is thin, the white blossom of the Bunchberry spreads like flakes of late fallen snow across the forest floor. The Yellow Pintonia, Wintergreen, Bearberry, Starflower, Yellow Lady's Slipper and many others may be found in blossom. The Blueberry has passed its best showing and the fruit will soon be forming.

Strangely enough, many flowers are also showing in the cold waters of the swampy areas. Nature trails seldom lead through these wet areas, but should you put on those rubber boots and follow a winter road or game trail through the black spruce and tamarack swamp you will be well rewarded, and there are a number of such areas within 50 miles of Winnipeg. Here one may find the exotic Pitcher Plant growing in profusion and, if you are lucky, you may see the tiny but beautiful and quite rare Arethusa Orchid. The little Round Leaved Sundew grows here too but is so minute and merged with the surrounding mosses, that good eyesight and some knowledge of what to look for are required. The White Fringed Orchid thrives where the water lies at the surface and the Showy Lady's Slipper can still be found along the margin of the bog. Patches of blue Mertensia occur in the nearby dampest portions of a stand of poplar, and appear in some numbers where found.

As spring gives way to summer, many flowers emerge along the streambank; within the shallow waters of the stream itself and in the muskeg ponds. The tall Joe-Pye-Weed grows in dense clumps at the water's edge. The blossom of the Spotted

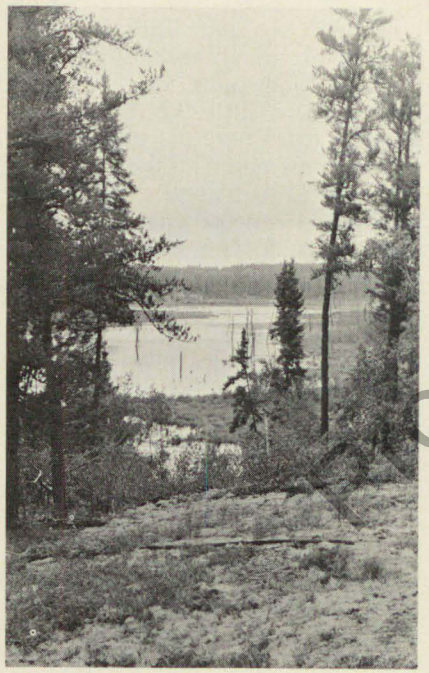
Touch-me-not hangs like a pendant jewel, the reflection sparkling in the water. This plant seems to greatly favor growing in the mud plastered on the upstream side of a beaver dam.

On the far bank a Blue Flag rears its graceful head above the sedges and the first blossoms of the White Water Lily begin to show where the stream enters a quiet pond. To see these in detail you either use your field glasses or record them through the telephoto lens of your camera.

Back there on the Trans Canada Highway, beyond your powers of hearing, the cars roll by at 70 miles an hour; their occupants oblivious of many things to be seen along the verge. In the wide tree bordered ditches many sun loving flowers are to be seen. There is color there if you look for it and you may find the Harebell, Blue-eyed Grass, Black-eyed Susan and later on, the Fringed Gentian, the Goldenrod and many others.

In the woods the flowers of spring have turned to fruits. The red berries of the Bunchberry are everywhere and the yellow blossom of the Clintonia has changed to large deep blue berries.

Changing of the birch leaves to a pale yellow, particularly in the dryer situations, heralds the insidious creeping on of autumn. Soon the glory of nature's garden changes from its flowers to the vari-colored panorama of grass, shrubs, and trees. Now is the time to stroll again through the woods, along the river valley, or drive through our prairie parklands. The opportunity may be short for the cold, driving winds of October soon scatter the leaves to form a mulch for next year's growth and the renewal in spring of nature's garden.



Beaver pond — a small creek has been dammed and its valley flooded. The trail follows the edge of the valley.

The creek ripples and gurgles its winding way to larger waters.

The nature trail breaks out at the top of the cliff.

Freesia

W. H. GRAY

Of all the Dutch spring flowers, the Freesia is one of the most highly scented, even a single pot may fill a room with a pleasant fragrance. They have narrow, sword-shaped green leaves and clusters of funnel-shaped flowers, in white, yellow, pink, lilac, blue, orange, mauve and purple shades, supported by wiry stems, 1-1½ feet long. Some support should be supplied to keep the blooms erect. Small twigs placed in the pot do an ideal job and do not look unattractive.

The Freesia, like all Dutch spring-flowering bulbs, can be grown either indoors or outside. In Manitoba, we seem to have much more success when growing them in pots for winter or early spring bloom. In some other areas, they are planted outdoors and, grown much like the Gladiolus, blooming in late summer or early fall.

Potted Corms should be potted from mid-September to mid-October. The soil mixture used is three parts loam, one part leaf mould (or peat moss), one part well rotted manure and one part sand. The pot should be clean and good drainage supplied. Six-eight corms spread evenly in a 5-inch pot is ideal. The corms should be just under the surface of the soil and the soil packed firmly but not too tight. A space of ¼-½ inch should be left between the rim of the pot and the soil, so sufficient water may be supplied when needed.

Water well and then keep soil moist, but never allow pots to become water-logged. Place pots in a semi-dark, cool area until the root system has been established. Then bring the pots into full light and fertilize every week until the buds show color. The best temperature for the growing season is between 60-70°F.

When the blooms start to fade, gradually reduce the supply of water. After the foliage withers, shake the soil from the bulbs and store them in a dry place until time to pot for next season. The smaller corms should be planted together so they can develop into flowering size for the following year.

Starting from Seed — Freesia can also be started from seed. The seed should be soaked in warm water for 24 hours and then handled like any annual. It usually takes almost a year before the seedlings will produce flowers.

Outdoors — In planting outdoors, the corms should be placed in a sunny location in the garden, if possible where they will get some shade from the mid-day sun. Plant the corms in September, placing them four inches apart and at least two inches deep. Plant in groups to provide a better showing in spring. Start fertilizing as soon as the snow melts until the buds start showing color. For best results when planting outdoors in Manitoba, use "treated" corms planted in the above manner in the spring. After the foliage has withered, the corms may be lifted and either stored until next spring or potted as mentioned above.

For the most satisfaction, I would suggest using pots and avoid the strong possibility of disappointment in outdoor plantings.

Crocus

W. H. GRAY

Crocus have always been associated with early spring even though there are some varieties which bloom in the fall or, in some parts of the world, in winter.

We on the prairies have been very successful in raising lovely plantings of Crocus and, like most Dutch spring-flowering bulbs, they are very easy to grow. They can be grown indoors or outside, but when raised indoors need a little special care. When planted outdoors, they will start to grow as soon as the snow melts and, in many cases, will show growth while under the snow covering.

Outdoors — When planting outdoors, the corms should be planted in a sunny location for early bloom, or in shade or on the north side of the house for later bloom. Plant the corms four inches deep and five inches apart in early September. Water well and keep soil moist until the ground is frozen. There is no need for heavy fertilizing, although bonemeal could be added to the soil before planting.

After the blooms are withered, the foliage remains and should be watered and fertilized until it starts to dry-off. The plantings need not be disturbed for three - four years, at which time the bulbs may be lifted in the fall, separated and replanted as above.

Pot Culture — In pot culture, the pot should be clean and good drainage supplied. The soil mixture should be three parts loam, one part leaf-mold or peat moss, one part sand and one part well rotted manure. In early September, place five corms in a five-inch pot and cover with about one inch of soil. The soil should be packed firm but not too tight. Leave about one-half inch between rim of pot and top of soil so sufficient water may be added. Water well and keep soil moist at all times. The pots should be placed in a cool, dark area (about 40°F). When pots are well fiiled with roots, bring up to the light.

Some people like to place the pots in a cold frame until about January 15, then move to a light and a warmer area.

After the blooms wither, keep watering and fertilizing lightly in order to get some strength into the corms for better bloom the following year. As the foliage begins to dry, place the pots in a dry area and cease watering. In September, shake out the corms from the soil and re-pot as mentioned above.

The best varieties for spring bloom are: Peter Pan — white; Pickwick — striped blue and white; Yellow Giant — golden yellow; and Remembrance — dark blue.

Snowdrops

MALAK

Everyone knows these bulbs as "snowdrops" although botanically they are classified as "galanthus", meaning "milk flower". These members of the amaryllidaceae family are native to the Eastern Mediterranean but are perfectly hardy and easy to grow in Canada.

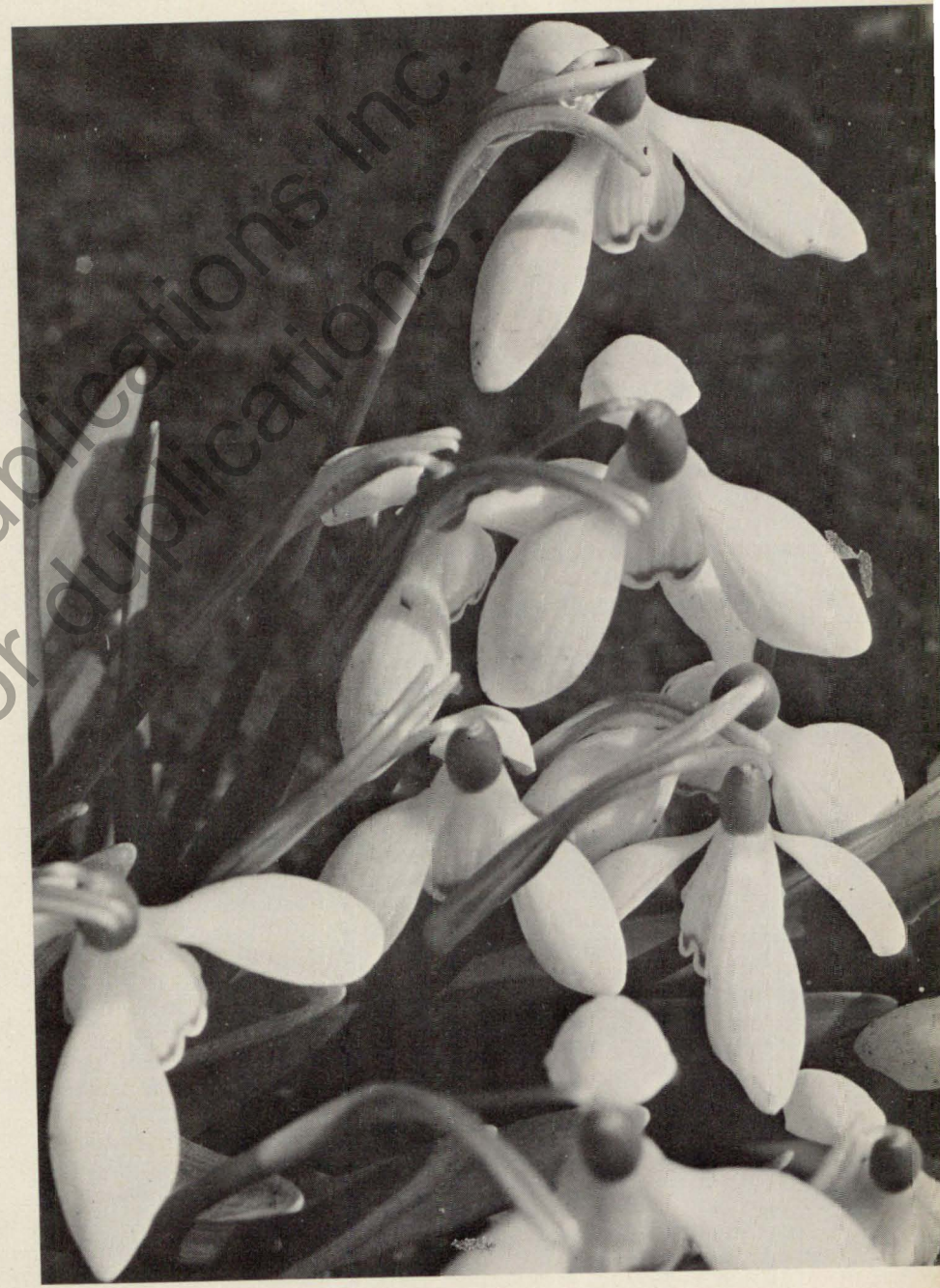
The pearl-like buds of snowdrops emerge as early as January, the long outer segments of the frosty white flowers open in the shape of an ovoid bell, revealing the inner tube with each of its three segments tipped with a semi-circle of emerald green. The flowers are prolific, neatly set among green leaves, and give pleasure for weeks on end.

Like winter aconite rhizomes, the tiny snowdrop bulbs should be out of the ground as short a time as possible. Planting time is on arrival in September or October. Planting depth is four inches in light soils to six inches in heavy soils. They flourish in fairly solid, damp, heavy but well-drained soil. In planting, the bulbs should almost touch each other.

Snowdrops spread rapidly by bulb division and self-seeding. When clumps become too thick, they should be divided immediately after flowering before the foliage changes colour. As snowdrops do well in sun or partial shade they can be planted with winter aconites, between paving stones, beside terrace steps, almost everywhere you can find a square foot of space in beds, borders or rockery. Snowdrops are delightful in window-boxes and outside containers too. And they can be naturalised in grass. Ideal as intimate cut flowers snowdrop foliage should never be taken along with the blossoms but left to ripen naturally.

Galanthus nivalis is the common single snowdrop creating white carpets as early as January. G. nivalis flore-pleno is the exquisite double form, also six inches tall. Both can easily be grown in pots for forcing indoors in relatively cool conditions. Plant September-October about two inches deep and close together in pots with ordinary compost, and keep well watered.

G. elwesii produces distinct and beautiful single flowers of globular shape on seven inch stems. The white blooms are marked a rich emerald green. This species can also be gently forced in the home or greenhouse.



Daffodils

MALAK

The official classification of daffodils or narcissi does not divide the genus into large and miniature plants but such a division is of great value to the gardener in making the most effective use of daffodils.

For it is the miniatures of the family, mainly the species narcissi and their hybrids but also some varieties from the other classes or types, which can add a new dimension to the garden by brightening rockeries, cheering up terraces, putting sparkle into window-boxes, contributing to alpine house color and creating an unsophisticated effect through naturalising. In brief, all the miniatures are ideal for the rockery, for outdoor containers of all kinds, for the alpine house and for naturalising in grass. What's more, you can have miniatures in flower from February into May.

Cultivation of miniature daffodils is identical to that of large daffodils except that the bulbs need not be planted quite so deeply — three to four inches of covering soil is sufficient for all but those with stems over 12 inches in height — and bulbs can be spaced, according to application, from four to six inches apart. Containers, like garden soil, require good drainage and planted containers should be protected from severe frosts by a wrapping of newspapers or sacking.

The miniatures listed below are arranged according to height and each species and variety is prefaced with a number indicating flowering time; i.e. (1) very early, from February; (2) early, from March; (3) medium early, from late March or early April; and (4) late, from mid-April into May. Most will be available from your local bulb supplier but it may be necessary to approach major suppliers for some of the rarer species.

Very Low

2 bulbocodium conspicuus, the Yellow Hoop Petticoat, rich golden yellow flowers with rush-like foliage, 6 inches tall
2 bulbocodium citrinus, soft lemon-yellow flowers, 7 inches in height
2 bulbocodium obesus, deep orange-yellow flowers, dark rush-like foliage, 5 inches tall
1 bulbocodium tenuifolium, bright yellow flowers, 5 inches tall
4 canaliculatus, three to four sweetly-scented white flowers with golden-yellow cup, 6 inches in height
1 lobularis, rich yellow miniature trumpet, 5-7 inch stems
1 minimus, smallest trumpet narcissus, golden-yellow 2-3 inches tall
2 nanus, clear yellow trumpet, 4 inch stems
2 triandrus albus, Angel's Tears, multi-flowering silvery-white, 7 inches tall
2 watieri, pure white crystalline flower, 4 inches tall

Low

2 campernelli (odorus), single or double, multi-flowering golden-yellow flowers similar to those of the jonquil, scented 9-10 inches in height
4 jonquilla single, golden-yellow, fragrant flowers, 12 inch stems
2 cyclamineus February Gold, yellow trumpet reflexed petals, 12 inches tall
2 cyclamineus March Sunshine, yellow and orange, 10 inch stems
3 triandrus April Tears, multi-flowering corn yellow, 10 inches tall
3 triandrus Liberty Bells, multi-flowering deep golden-yellow, 12 inches in height
3 triandrus Moonshine, multi-flowering creamy-white, 9 inches tall
2 W. P. Milner, sulphur-white trumpet, 8 inch stems

Medium Low

1 cyclamineus Peeping Tom, long rich golden-yellow trumpet, 15 inches tall
2 jonquilla Golden Perfection, golden-yellow flowers, 13 inches in height
2 jonquilla Golden Sceptre, large sweet-scented golden-yellow flowers, 14-15 inches tall
2 jonquilla Trevithian, grapefruit-yellow flowers, free-flowering, and sweetly-scented, 15 inch stems
2 triandrus Shot Silk, multi-flowering silvery-white flowers, 14 inch stems
3 triandrus Thalia, pure white clusters of flowers, 14 inches tall

Tulips Indoors

MALAK

Tulips are surprisingly easy to force indoors for flower from Christmas onwards, provided gardeners do not attempt to rush things and ensure that the tulip bulbs are given ample opportunity to develop root systems.

The best time to pot tulips for indoor cultivation is between September and mid-October using fresh soil or loam mixed with sand or leaf-mould. Tulips should never be potted in old potting material or soil from the garden in which tulips have been planted the year before.

Use six-inch diameter pots, taking eight to ten bulbs. The planted pots should be placed in a cool or shaded spot in the garden and covered with about six inches of clean soil, in which the top growth is allowed to grow until it has attained a height of at least three to four inches. This will take at least 10 to 12 weeks. At this stage they may be brought indoors into a dark room at a temperature of not over 60 °F to allow the stems to lengthen.

After two to three weeks, they may be removed to the light, but should be kept shaded from the sun. If necessary, they can be covered with paper for a few days. Tulips should never be hurried for if allowed to grow slowly, the blooms attain their normal size and coloring and last a long time. Avoid bottom heat and draughts and keep the pots or bowls well-watered once you bring them indoors. The highest temperatures for tulips in their last stage is 68 to 70°F. While early tulips should be well-watered, Darwins like being kept a little on the dry side.

As a general rule, tulips for indoor cultivation should not be brought into the home for forcing before mid-January. With succession planting, you can have all kinds of tulips flowering indoors for several months. Choose from the easy forcing varieties available. Each variety recommended has the appropriate time to bring the tulips indoors for forcing. Stem lengths are given in inches in brackets.

SINGLE EARLY TULIPS
Bellona (15) golden yellow, last two weeks of January
Brilliant Star (12) scarlet, from mid-January
Dr. Plesman (14) orange-red, last two weeks of January
Keizerskroom (13) red and yellow, last two weeks of January
Pink Beauty (13) pink and white, second week of February

DOUBLE EARLY TULIPS
Electra (11) cherry red, second week of February
Marechal Niel (11) yellow and orange, second week of February
Mr. van der Hoef (11) golden yellow, second week of February
Orange Nassau (11) orange-scarlet, second week of February
Peach Blossom (11) rosy pink, second week of February

MENDEL TULIPS (for forcing from late January)
Apricot Beauty (16) salmon, tinged red
Athleet (18) pure white
Krelage's Triumph (24) crimson-red
Olga (18) violet-red, edged white
Pink Trophy (20) pink, flushed rose
Sulphur Triumph (22) primrose-yellow
Van der Eerden (19) glowing red

TRIUMPH TULIPS (for forcing from mid-February)
Crater (18) carmine-red
Edith Eddy (20) carmine-red, edged white
Garden Party (16) white, edged carmine
Kees Nelis (20) blood-red, edged yellow
K & M's Triumph (25) orange-scarlet
Orient Express (22) vermilion, tinged carmine
Princess Beatrix (24) orange-scarlet, edged yellow
Prominence (21) dark red
Reforma (18) sulphur yellow
Topscore (24) geranium-red, from mid-January

DARWIN HYBRID TULIPS (for forcing from late January)
Apeldoorn (24) orange-scarlet
Beauty of Apeldoorn (24) yellow, flushed magenta
Dover (26) poppy-red
Gudoshnik (26) sulphur-yellow, tinted red
Jewel of Spring (26) sulphur-yellow, edged red

DARWIN TULIPS (for forcing from mid-February)
Aristocrat (30) soft violet-rose
Demeter (28) plum-purple
Golden Age (26) buttercup-yellow, edged salmon
Insurpassable (28) violet
Mamasa (22) golden yellow
Pink Supreme (22) deep pink, merging to rose-pink
Prunus (24) rose -pink
Queen of Bartigons (25) salmon-pink
Queen of Night (30) deep velvety maroon
Rose Copeland (27) fuchsia-rose

LILY-FLOWERED TULIPS (for forcing from mid-February
Aladdin (20) scarlet, edged yellow
Mariette (24) deep satin rose
White Triumphator (26) pure white

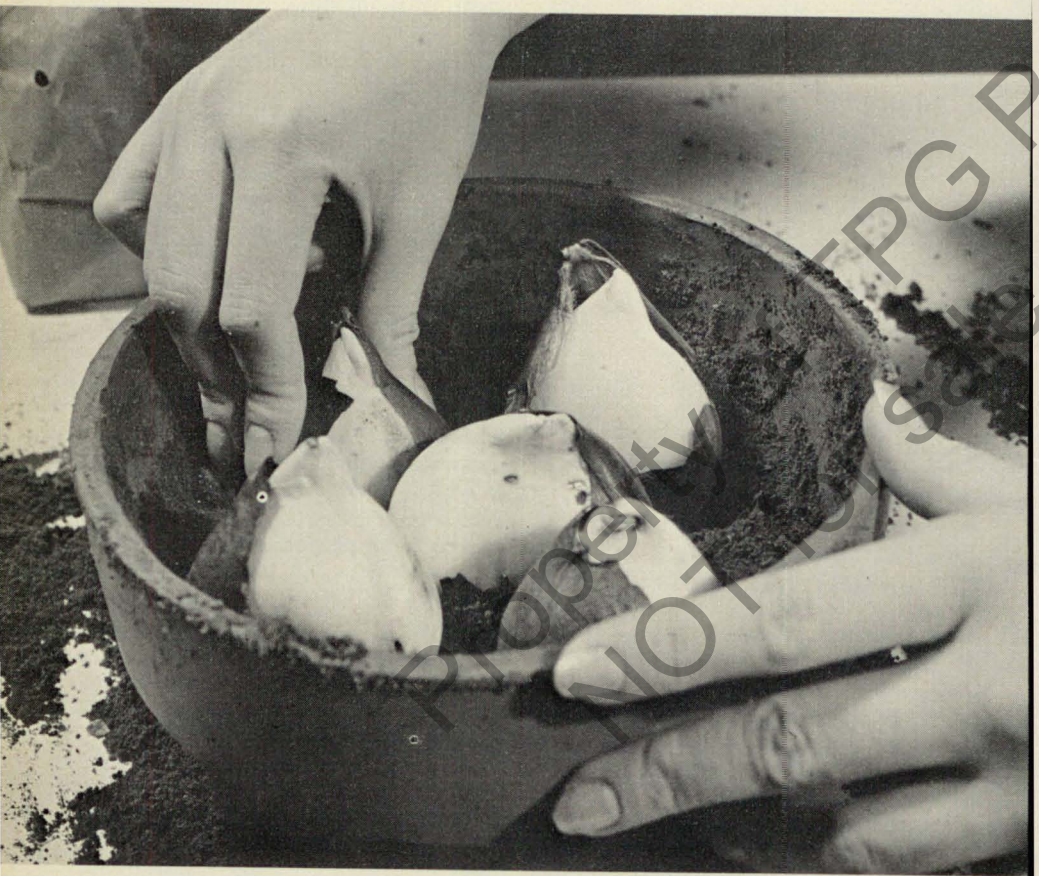
There are a few varieties of early tulips which may be forced to bloom for Christmas, but special care is required for success. These are specially prepared bulbs which must be planted in pots or bowls before the middle of September and plunged in the coolest place in the garden. In the

event of warm weather during this period, the plunge should be watered sparingly but if the weather turns cold and wet, it is advisable to cover the plunge with a sheet of material to prevent excess water reaching the potted bulbs.

The potted bulbs should be brought into the home about December 1 and placed in the dark in a temperature of 65°F. When the plants have grown another inch or two, the pots or bowls can be transferred to a light room where a maximum temperature of 68 to 70°F can be maintained.

Varieties available in Canada for Christmas flowering include:
Brilliant Star (12) bright scarlet
Brilliant Star Maximus (12) Post Office Red
Christmas Marvel (14) cherry pink
Joffre (10) yellow

Planting tulips for forcing indoors.



Acidanthera

MALAK

Acidanthera, native to the Ethiopian highlands, is a tender member of the iris family, producing from late July or August into October 5 to 6 pure white butterfly-like flowers on each 18-36 inch stem. The fragrant blooms, each touched with dark maroon at the centre, open in succession over a period of two weeks or more. The foliage resembles that of the gladiolus. The blooms are superb as cut flowers and will last a long time if picked in bud.

For best results, plant the corms about mid-May in a rich, sandy loam in full sun, about 3-4 inches deep and 5-6 inches apart, in sites sheltered from the wind. The flowers are resistant to rain and are particularly attractive in a bed of mixed summer-flowering bulbs. The corms should be lifted for frost-free winter storage, except in the warmer parts of the country. When replanting they will appreciate a top dressing of leaf-mould or thoroughly decomposed manure.

Control of Diseases Affecting Tulips, Hyacinths, Narcissus and Daffodils

G. PLATFORD

For purposes of disease identification and control, the above bulbs can be grouped into three categories as follows:

1. Tulips and Hyacinths
2. Narcissus and Daffodils
3. Indoor Forcing of Bulbs

Diseases of crocuses have been omitted from this article because strictly speaking they are corms. The diseases encountered when growing crocuses are similar to diseases of gladiolus.

TULIP AND HYACINTH DISEASES

DISEASE AND CAUSE: FIRE (Botrytis)

SYMPTOMS:

Bulbs Black fungus bodies (sclerotia) form on bulb husk.

Leaf, Shoot — Emerging leaves and shoots twisted and rotted. Small, yellow brown sunken spots on leaves with water-soaked margin. May be covered with grey mould.

Flower — Similar sunken spots on flowers as leaves. In extreme cases, bud fails to open. Bud may be covered with grey mould.

CONTROL:

Remove husks at planting time especially if evidence of black sclerotia. Drench shoots at emergence with Benlate 50% WP or Captan 50% WP. Repeat spray when flower starts elongating. Destroy affected foliage after bloom.

DISEASE AND CAUSE: BULB, CROWN AND ROOT ROT (Fungi and bacteria)

SYMPTOMS:

Bulb — Two distinct types: (1) Fungus rot — dry, chalky or powdery decay; musty odour. Decayed area covered with white, blue, black, pink or grey mould. (2) Bacterial rot — soft rot, musty, foul smelling.

Leaf, Shoot — Plants often fail to emerge. Leaves stunted, yellowed, collapse and rot at the base.

Flower — Flowers fail to develop.

CONTROL:

Fungus Rot — Examine bulbs at planting time. Discard those with extensive areas of decay. As a precaution, dust bulbs with Thiram, Captan, or Benlate. Dig up any bulbs that fail to send up shoots in spring. Remove some of the surrounding soil. Replace with fresh soil. Drench areas with Captan 50% WP, 2 tablespoons/-gallon. Avoid overwatering and excessive fertilizer especially high nitrogen.

Bacterial Rot — No chemical treatment effective. Severity increased by bulb mites. Avoid overwatering and heavy fertilizer.

DISEASE AND CAUSE: Flower breaking and mosaic, several different viruses.

SYMPTOMS:

Bulb — No obvious external symptoms. Bulb size often reduced.

Leaves, Shoots — Mosaic mottled appearance. Areas of dark and light green.

Flower — White streaks or dark streaks depending on particular virus.

CONTROL: Some ornamental tulip varieties, for example peppermint type tulips, are natually infected with viruses. Avoid planting this type of tulip next to solid colored tulips. Virus spread by aphids. Consult insect recommendations. Cucumbers, gladiolus, and lilies also subject to same virus disease affecting tulip. Weeds in flowerbed can also be source of virus disease. No control for infected tulip. Dig up and destroy as soon as detected.

DISEASE AND CAUSE: WINTER INJURY

SYMPTOMS:

Bulb — Bulb may be intact or rotten. Often poor root development. Shows up usually first spring after planting.

Leaves, Shoots — Shoots twisted and abnormal.

Flower — Poor flower development if at all.

CONTROL: Plant bulbs early enough in fall to allow for good root development. Most severe in heavy clay soils with poor drainage and tendency to fluctuate in moisture supply. Improve soil drainage and water retaining capacity by adding peat moss vermiculite. Water well in fall. Repeat in early spring as shoots emerge.

DISEASE AND CAUSE: FROST INJURY

SYMPTOMS:

Bulb — Not affected.

Leaves, Shoots — Numerous small oily brown spots. When severe appear as broad bands of dead tissue. Torn ragged appearance.

Flower — Usually frosts at flowering time are not severe enough to cause damage. Very heavy frosts early in spring when shoots elongating may distort developing blossom.

CONTROL: Tulips unless in very exposed site not usually damaged. Provide protection from frosts with blankets. A light bulb under plastic sheet will often provide enough warmth to prevent frost damage. Hyacinths must be given much more protection than tulips.

DISEASE AND CAUSE: SUNSCALD OF TULIP

SYMPTOMS:

Bulb — Bulb rots in severe cases.

Leaves, Shoots — Twisted and abnormal.

Flower — Petals show desiccation at upper margin.

CONTROL: Plants in a southern exposure adjacent to house most prone to this type of injury. Snow melts early and the soil becomes excessively dry. Not enough moisture present in soil for plants to replace moisture lost from leaves and petals. Keep plants well watered in early fall to promote good root development. Improve moisture retention capacity of soil.

NARCISSUS AND DAFFODILS DISEASES

DISEASE AND CAUSE: Fire, Bulb, Crown, and Root Rot refer to section under Tulips and Hyacinths.

VIRUS DISEASES: MOSAIC

SYMPTOMS:

Bulb — No external symptoms. Affected bulbs often smaller than healthy bulbs.

Leaves, Shoots — Mottled dark green, light green.

Flower — None or dark streak on flower.

DISEASE AND CAUSE: FLOWER BREAK

SYMPTOMS:

Bulbs — No external symptoms. Affected bulbs often smaller than healthy bulbs.

Leaves, Shoots — None.

Flower — White streak on petals.

DISEASE AND CAUSE: DECLINE WHITE STREAK, PAPER TIP, VIRUS DISEASES.

SYMPTOMS:

Bulbs — No external symptoms. Affected bulbs often smaller than healthy bulbs.

Leaves, Shoots — White gray or yellowish white streaks often blossoming on leaves and flower stalks. May wilt and collapse.

Flower — Tips of flowers dry up and become papery.

CONTROL OF VIRUS DISEASES:

Destroy infected plants. No curative treatment available. Control aphids which act as vectors to spread virus particles. Control weeds.

DISEASES ENCOUNTERED IN FORCING BULB INDOORS

DISEASE AND CAUSE: FIRE

SYMPTOMS:

Bulb — Black fungus bodies (sclerotia) form on bulb husk.

Leaves, Shoots — Emerging leaves and shoots twisted and rotted. Small yellow brown sunken spots on leaves with water-soaked margin. May be covered with gray mould.

CONTROL:

Low humidy of most homes during winter precludes this disease but may develop under humid greenhouse conditions.

DISEASE AND CAUSE: BULB ROT

SYMPTOMS:

Bulb — Soft mushy rot of bulb.

Leaves, Shoots — Abnormal development.

Flower — Fails to develop.

CAUSE:

Overwatering of potted plants with no provision for drainage. Insufficient cold period to allow for root development. Rapid shift from cool to warm temperature when bringing bulbs out to bloom.

CONTROL:

Cut back on water especially if no drainage holes in pot. Allow at least six weeks cold treatment for bulbs to root at 45-50°F. Bring plants up to room temperature gradually. Move into room at 60°F for flower development and only into warm room while plants are on display.

DISEASE AND CAUSE: FLOWER STALK COLLAPSE (Unfavorable Environment)

SYMPTOMS:

Bulb — None

Leaves, Shoots — Flower stalks develop water soaked areas and collapse.

CONTROL:

Rapid change in temperature.

Flower — Flower stalks collapse. Prevents blossoming.

DISEASE AND CAUSE: BUD BLAST (Unfavorable environment)

SYMPTOMS:

Bulb — None.

Leaves, Shoots — None.

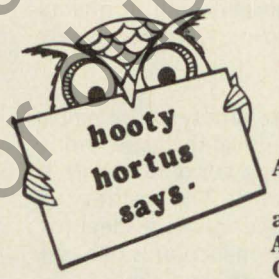
Flower — Buds turn brown and dry up before opening.

CONTROL:

Narcissus will bloom without prolonged cold treatment but keeping bulbs cool the first few weeks after planting will allow for good root development. Bulbs will then be able to cope with fluctuating soil moisture.

To avoid disease problems the following precautions should be followed:

1. Select the largest bulbs available free from any sign of decay.
2. Dust bulbs with Captan, Thiram, or Benlate plus suitable insecticide before planting.
3. Use sterilized soil whenever possible when forcing indoors and always use clean pots. Dirty pots harbor disease organisms.
4. Follow recommendation for particular bulb with regard to time of planting and depth of planting outdoors. Similar recommendations for indoor forcing should be followed.
5. Allow several years between renovating an old bulb bed and planting new bulbs.



ANNUALS TO SOW OUTSIDE

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

New Vegetables for the Home Garden

GEORGE LUTHER

Each year for the past many, vegetable variety trials have been conducted by staff of the Plant Science Department, University of Manitoba. At one time these trials were restricted to varieties of only a few crops that might be adapted to commercial production (e.g. sweet corn, onions or potatoes) but during the past four years, because of renewed high interest in home grown vegetables, the trials have included literally hundreds of entries involving as many as thirty different kinds each.

Following are some of the newer more unusual and/or high quality kinds that I think will be of interest to home gardeners who want not only something different but with high quality as well.

It is pointed out that some of these newer varieties will not be available from local seed firms yet, but your inquiries may prompt their appearance in catalogues or on seed stands in the near future.

BEANS — **Limelight** is a new variety of common bean that is similar to the Lima in that the immature seed is eaten rather than the pod. Time of harvest is vital — pods are picked when the seeds are well formed but while the pod is still a bright green. If the pods start to lose color the bean will be over mature and tough. When harvested in prime condition the beans are tender and high in quality for canning, freezing, or eating freshly cooked.

BEETS — **Cylindia** variety as the name indicates is cylindrical in shape and is still in prime eating condition when 8 inches long and 2½ inches in diameter. Its shape makes it ideal for slicing and its internal color is rich red with texture uniform and tender.

GREEN SPROUTING BROCCOLI — **Premium Crop** was a silver medal winner in the All American trials a short time ago and well deserves the honor. The terminal buds are large, compact and smooth with flowers slow to open. Color is a rich dark blue-green. After the terminal bud is harvested, axillary buds develop progressively to provide a long harvest period.

CABBAGE — **Savoy Ace** — a wrinkled leaf type producing compact heads to over 7 lbs. A recent All American winner and should be in catalogues before long.

CARROT — **Gourmet Parisienne** — has a nugget shaped root growing about 2½ to 3 inches in length and 2 inches in diameter. It is early and because of its short length produces relatively better in shallow, tight soils. While the roots were light in color and showed some internal greening, their quality when cooked directly from the garden was excellent.

HEAD LETTUCE — COS or ROMAINE — Ordinary crisp head or butter head lettuce are sometimes difficult to grow because of rapid deterioration of the heads during hot dry weather. Several of the Romaine types have maintained their high quality even during the hottest July weather last summer. **Lobjoits, Valmaine** and **Parris Island** are varieties to look for.

PARSLEY — The varieties **Darki, Cruppa** and **Bravour** have been superior in quality producing crisp, tight growing leaves that maintain their quality for long periods after picking.

SPINACH — Spinach is another crop that can be frustrating to grow unless seeded very early. Bolting (seed head production) often occurs before plants reach a satisfactory size for harvesting. Out of sixteen varieties **Nores** and the older variety **Long Standing Bloomsdale** were superior to all others.

TOMATO — **Summit**, a bush type produces smooth, deep globe high quality fruit which average about 4 ounces each. A distinct feature of this variety other than its fruit quality is that the first four clusters are produced well off the ground and hence the fruit rarely comes in contact with the soil.

SWEET PEPPER, — **Earlired**, while not a very new variety continues to be the earliest of all red sweet peppers and for that reason should be considered by any gardener interested in this vegetable.

WATERMELON — A new variety, **Yellow Baby** should soon be available on the stands. It is early and has high quality yellow (rather than red) flesh. Highly recommended.

Vegetable Gardening is "In" Again

W. ANDREW

The big farm vegetable garden; the vegetable patch on an urban or suburban lot; the vegetables grown on a rented plot; the vegetables in planters on a patio or apartment balcony, or even parsley, chives and radishes in a window box have become an "in" thing. Probably not since the "Victory Gardens" of the early forties have so many people grown so many vegetables. Housewives are seeking fresher more nutritious products than can sometimes be bought in the supermarkets, whole families are looking for "back to the land" projects, and inquisitive students and enthusiastic hobbyists are seeking the challenge and satisfaction accruing from the growing of vegetables.

In addition to providing nutritional, social and psychological benefits, a well planned and well maintained vegetable garden can considerably reduce the family food budget. Data available emphasizes the space allocated to a good vegetable garden is the most lucrative space on a general farm. Farm families who believe they cannot compete with the vegetable growing specialist at the price level the specialists receive, are forgetting that if they don't grow their own, they must purchase them at the retail price level, not at the level received at the farm by the market gardener or truck farmer. Certainly the cost of home grown vegetables is less than the price paid to bring them home from the store.

Should the foregoing comments appear to justify involvement in a vegetable garden, and you are a rank beginner, the awareness of a few basic principles may help. The first step is a plan.

Planning the Vegetable Garden. This, to many individuals, is the easiest and most pleasant part of growing a garden. It may even represent the total accomplishment of the less ambitious minority!

Plans can vary from a simple list of what kinds (species), to very detailed map-type presentations. We suggest that the beginner keep in mind:

A. The location or the site

1. As near the home as possible. Easily accessible for working at odd times and for harvest. Gardens on the back forty or on a lot several blocks away frequently do not get the attention that one in a more convenient location would get.
2. If there is any choice in slope or exposure keep in mind that a south or southeast slope is usually ealier and warmer.
3. The area should be well drained. If it is not, open ditches, tile drains, raised beds or ridges should be considered.
4. Light is necessary for plant growth. The site chosen for a vegetable garden should get at least five hours of direct sunlight per day. Trees in close proximity shade the garden and compete for nutrients and moisture, but they also provide much needed shelter if they are not too close.
5. The garden should be close to a water supply. In almost any area of the Canadian prairie provinces the addition of supplementary water has proven beneficial.

B. Choosing the Crops

1. Consider the size of the garden. If it is small, concentrate on the highly perishable crops, e.g. peas, sweet corn, leaf lettuce, asparagus. They are much better fresh from the garden. Vegetables with trailing vines e.g. cucumber, squash occupy more space. Most root crops store fairly well and are generally available from outside sources.
2. Consider the preferences of the family. Allocate the major portion of the area to vegetables of proven popularity but try a new one now and then.
3. Consider the climate — In many areas of the so-called prairie provinces the growing season is somewhat short for such vegetables as melons, lima beans, eggplant and sweet potato.
4. Consider the ease of growing. Lettuce, snapbeans, carrots, tomatoes are fairly easy to grow. On the other hand, problems appear to arise more frequently in the production of celery, escarole, limas, cucumbers.
5. Consider "Succession" cropping so that early maturing species might be followed by others in the same space e.g. radish followed by beans, or leaf lettuce followed by spinach.
6. Consider "Successive" cropping — by making use of cultivars (varieties) that mature at slightly different dates or plant the same cultivar at successive dates. A couple of heads of cabbage each week from the middle of July on is so much better than 30 heads in early or late August with nothing before or after.
7. Consider "Companion" cropping — Considered by many to be an even better use of space than successive or succession cropping. Grow rapidly maturing crops between rows or plants of slower growing crops. e.g. radish or green onions between tomatoes or late cabbage. The advantages of the extra production must be weighed against the possibility of more difficult pest control, more difficulty in cultivating to control weeds, and the addition of higher levels of fertilizer and water than for a single crop.

C. The Layout

1. Group crops according to size. Small growing ones together, large growing ones together.
2. If rows run east and west, put the tall growing plants on the north side.
3. If there is a slope, run the rows across it or along the contour.
4. Plant sweet corn in several short rows rather than long single rows to promote pollination.
5. Put permanent plantings or perennials such as asparagus and rhubarb

at one end or one side of the garden so it won't be necessary to work around the patch continually.

6. Adjust the spaces between the rows to the type of cultivation. e.g. close for hand cultivation and adapted to the equipment if mechanical cultivators are to be used.
7. Longer rows are usually easier to cultivate than short rows with fewer turns for the wheel hoe, garden tractor or big equipment.
8. It has been suggested that if you don't like weeds, plant the crops in alphabetical order. The weeds will then be close to the back row!

Once the planning has been done you are ready for action. Obtain a provincial or local list of recommended cultivators and purchase cultivars adapted to your needs (freezing, storing) and conditions.

Don't take gardening too seriously to begin with. It should be something to enjoy. Many vegetables will grow very well on their own simply as a consequence of seed being put into the ground. Don't be overawed by the experts. Don't be discouraged by mistakes. Everyone makes mistakes — even the experts. There will be many little ones and occasionally some big ones. Call or write your Department of Agriculture; the Departments of Plant Science and/or Horticulture at your University; Federal and Provincial Research Stations and, to some extent, parks departments (although they are usually better qualified in the fields of ornamental horticulture then they are in vegetable crops). Join a Horticultural Society or Garden Club or assist in the establishment of one if there isn't one in your community. Asking questions of neighbors with vegetable growing experience can flatter your neighbor — but don't make a nuisance of yourself.

As the garden begins to flourish, here are a few practical hints to consider.

To get white cauliflower curds, tie the leaves together at the top or bend some down toward the curd to shade it from the sun. Unshaded curds will be more creamy yellow than white.

To lessen splitting of cabbage heads when they have matured, give the heads a twist to break some of the small feeder roots.

Swiss Chard, as a greens crop, can be harvested from the outside in over a fairly long period. Because of its perishability it is generally not available from supermarkets. It is much better for summer growth than spinach.

Leaf lettuce will be ready to eat sooner and is more nutritious than the crisp head lettuce.

Regardless of how nicely you space out the seed of red beet or chard, some thinning will be necessary. The "seed" you sow is really a small dried "fruit" that usually contains more than one "seed".

The shape of carrots is generally influenced more by cultivar than by growing conditions. If you prefer long, slender slightly tapered carrots, don't buy and seed a short, fat cultivar.

Reduce the temperature of sweet corn immediately after harvest to retain the sweetness and do the harvesting in the cool of evening or morning rather than in the heat of the day.

Vegetable gardening is really a rewarding experience!

"A GARDEN is a work of art — using the materials of Nature".

Scilla

W. J. EMERSON

Scilla are one of the earliest flowers to appear in the spring and, if planted thick enough, will provide a carpet of colour. Scilla Siberica are the hardiest of the family and are blue or white in colour. Scilla Campanulata, which comes in blue, white and pink, are not so reliable.

Scilla are mainly for outdoors although Siberica will force indoors.

They should be planted where they can be left for several years, at the edge of shrub borders, in rock gardens and in other areas which receive spring sun. Summer sun or heat will not effect them. They go dormant shortly after flowering and by about mid-June they will have disappeared.

Bulbs are fall planted five to six inches deep in groups, three or four inches apart. No special care is required other than to water them after planting, if they are dry. Mark areas where bulbs are planted because they are rather hard to find after planting. They are quite dark in colour and they will, given time, naturalize themselves, spreading into undisturbed places in the garden.

Truly a welcome spring gem of a plant.

Dahlia Culture

W. GILLESPIE

The first consideration in successfully growing Dahlias is to select a satisfactory site. Dahlias require sun and the best results will be obtained in a location where there is full sunlight in the morning hours and shade in the afternoon.

Soil Preparation

The time to prepare the soil is in the fall and there is nothing better than good barnyard manure spread over the soil three inches deep. Add four pounds of superphosphate or five pounds of bonemeal with one pound potash to 100 square feet. Mix this thoroughly in the soil. There are more failures with Dahlias through neglect of proper soil conditioning than any other factor.

Planting

Fertilizer is needed at planting time. I get a little earlier start by planting the tubers in milk cartons. Cut out one side of the milk carton and punch holes in the bottom. I use a mixture of soil and peat moss. Put about an inch and a half of the soil mixture in the carton. Place the tuber in this soil and fill the carton level with the soil mixture. Keep in basement until they are a couple of inches tall, then transfer to a cold frame outside. Do not plant until about June 7, when the danger of frost is past.

Cultivation

Cultivate twice a week in the early part of the season, lightly, close to the plant while the rest of the ground can be cultivated more deeply. When the buds appear, I put down a mulch of grass cuttings about three inches deep around the plants.

Watering

In the early part of the season watering once a week is sufficient. Later when the buds come I pour on the water in quantity. I have raised buds so there is no problem with drainage. About July 15, I give the plants a small handful of a complete fertilizer. It is raked in with a small hand cultivator and well watered.

Disbranching and Disbudding

I allow only one stem to grow. I pinch out the top when there are three pairs of leaves. This method results in shorter plants with less chance of being blown about by heavy winds. On some plants I allow four or six side branches. When flower buds appear, I removed all buds except the centre one, leaving the centre bud if four or six blooms are required.

During the growing season, the secondary growths appearing in the axils of the leaves can be gradually removed so that all food will be diverted into the production of blooms desired.

Insect Control

Malathion will take care of most insects. In hot, dry, weather the Dahlia is attacked by red spiders but Kelthane will take care of them. Spray a couple of times every four days. I have found plants that are well watered have less trouble with this pest.

Digging and Storage

When hard frost blackens the plants, leave them in the ground for a week. Do not cut them off until you are ready to dig them up and bring them into the basement right away. I split large roots and let them dry a little. Dust with a mixture of lime and sulphur, store in metal containers without any packing, and cover with heavy material. Look them over often during the winter.

Top removed at x.

Buds (b) on lateral removed so that 6 larger blooms will be allowed to develop.

Top removed at x.

Terminal bud (a) removed for more even development of several blooms on each lateral.

New growths (c) appearing in axils of leaves should be removed when they appear.

The Wonderland of Bulbs

C. A. CRUIKSHANK

For ease of culture and sheer beauty, Dutch bulbs have no equal indoors or out. Anyone who has visited the famous Keukenhof Gardens at Lisse in Holland will be a bulb enthusiast for life. These gardens are part of an old baronial estate, with woodlands and a small lake. About 70 acres are planted with many millions of bulbs by the leading growers in Holland. The best time to visit the gardens — easily worth a trip, the third Saturday in April, there is a really magnificent floral parade with scores of floats decorated with masses of bulb flowers.

Most of the growers maintain booths at the gardens, and orders may be placed for delivery in the fall. It is necessary to obtain an import permit from the Plant Protection Division of the Department of Agriculture, Ottawa. There is no charge for the permit, which must be produced with invoices when clearing Customs at destination. Shipments must be accompanied by a certificate from the Dutch Department of Agriculture that the bulbs have been inspected and free of disease. Or, if in Holland in the fall and bulbs are part of your baggage, you can carry the permit with you. It is less complicated of course and usually more satisfactory to purchase your bulbs from Canadian importers. When bulbs are received, the package should be opened to permit a good circulation of air and kept below 70 degrees until planted.

Planting Time

Most bulbs should be planted as early as possible to give them a chance to make some root growth before winter sets in, though Tulips will often survive when planted quite late, with little or no root growth before frost. Daffodils on the other hand must be planted early enough to start some root growth. Lilies are unique in that they may be planted even when there is frost in the ground, with no harm to the bulbs, with the sole exception of the popular Lilium Candidum (Madonna), which should be planted in August and September. Lilies are late-ripening bulbs and seldom available until quite late in the fall.

Some varieties of Tulips have very delicate skins which easily peel in transit. If the bulbs lose their skins no harm is done if they are planted as soon as possible, but if not planted they deteriorate more quickly and should not be left in storage for long.

Double Early Tulips are unusual in that the skins are very tight and are seldom lost.

If Lilies arrive too late to be planted in the fall they may be kept for spring planting if given proper care, for example, wrapped in moist sphagnum moss and kept cool during winter. If lightly frozen, so much the better. But Tulips, Daffodils and most other bulbs that cannot be planted in the fall should be discarded. Tulips are rugged and stand low temperatures, but most other bulbs require a good mulch of leaves or straw to overwinter. Daffodils in a happy location will last for many years, but Tulips after the third year begin to deteriorate, and it is best to replace them with new bulbs. Exceptions are some of the species or miniature Tulips such as Tarda, which will last for many years and will increase.

Rodents and Disease Control

Squirrels and field mice have a fondness for some bulbs, particularly Tulips and Crocus. A plan to counteract their activities, which has proven effective, is to plant a bulb of Fritillaris Imperialis (Crown Imperial) in the Tulip or Crocus bed. This, oddly enough, keeps them at bay. Animals never attack Daffodils, seeming to sense their poisonous qualities.

Tulips, if planted in the same location for several years, may be attacked by botrytis, indicated by blasted or deformed blooms and streaked sickly foliage. It is best, therefore, not to plant in the same location for at least three years. If, due to the location, it is desired to plant in the same bed without rotation, Brassicol, a soil disinfectant, may be used and will eliminate botrytis. It should be mixed with the soil about two weeks before planting.

Indoor Culture

There is an increasing interest in growing bulbs indoors, no doubt due to the increase in apartment living. Tulips, Daffodils, Crocus, Hyacinths and most other bulbs must be kept quite cold, perfectly dark and gently moist until there is a top growth of at least 3½ inches (Crocus when the shoots get quite stout, but not more than an inch or two of growth) when they may be brought to the light, but not bright sunshine for a few days, until the shoots lose their pale appearance. A few bulbs do not require this routine and may be placed directly in the light. One of the most popular is the Amaryllis, which is probably the showiest and most spectacular of all bulbous plants. The bulbs are not cheap, but will last for many years if given proper attention. Immediately after the bulb has finished blooming is the time it needs special care. Do not cut off the leaves, but keep them growing vigorously and feed the plant with a good fertilizer every three weeks until the next fall. They may be planted outdoors in the garden when warm enough in spring. Bring indoors before frost in the fall, rest without watering for a month or two, then start into growth again.

Narcissus Paperwhite and its yellow counterpart, Grand Soleil d'Or, are popular, and possibly the easiest to grow, for they can be grown in pebbles and water and placed at once in the light. They must not be started until after October 15, and if purchased in quantity they may be planted at intervals for a succession of bloom for many weeks. If started in mid-October they will bloom in about six weeks; started as late as January they will often bloom in two weeks. They are a 'one-shot' proposition as

they cannot be forced a second season, and after blooming should be discarded.

Other bulbs that may be grown in light immediately are Freesias and Grand Duchess Oxalis. The trick with Freesias is to grow them under quite cool conditions until the flower sheath makes an appearance, otherwise there will be leaves but no bloom.

Hyacinths, due to their fragrance, have a special appeal. They are sold in several different sizes but even the miniatures or fourth-size bulbs will give quite a nice showing, but only with smaller spikes. No matter how early started, it is usually not possible to have Hyacinths blooming by Christmas, unless the specially prepared bulbs are used. These bulbs are harvested earlier in Holland and given a special heat treatment at varying degrees, then kept in cold storage. They will bloom two weeks earlier than untreated bulbs. White Roman Hyacinths, which come from France not Holland, produce a number of small sprays instead of a central spike and, if started early, will bloom by Christmas. If special planters, sold for the purpose, are used, Hyacinths may be grown in water, but must be given the usual time in a dark and cold location. The base of the bulb should just touch the water.

Most Daffodils, of all types, are excellent subjects for pot culture. One variety, February Gold, is unique in that it can be grown in pebbles and water like the Narcissus Paperwhite, but given the usual long period in the dark. It is a yellow trumpet Daffodil, flowers smaller than most, but very profuse — even the smallest bulb will bloom.

Tulips on the whole are not quite as easy to grow as Hyacinths and Daffodils and only the varieties that are recommended for forcing should be used. General de Wet, orange and gold and fragrant, is the most popular. Apeldoorn, a red Darwin hybrid and Karel Doorman, a red and yellow Parrot Tulip are recommended.

When growing indoors the pots should have a drainage hole, or if fancy bowls without a drainage hole are used, bulb fibre or a porous mixture of peat moss and soil should be used. It is important to have good ventilation while rooting and a constant moisture content, not bone dry one day and overwatered the next day.

Second Season

With the exception of Amaryllis, bulbs cannot be forced a second season, but where the climate is mild enough, Daffodils and Hyacinths, after blooming indoors, may be kept for garden planting in the spring and will give several years of service.

Every enthusiastic gardener should have a good bookshelf for references. There are many good books on bulb growing, but the best we have seen for some time is "Bulbs" by Roy Genders, published in England. It is a large book and expensive ($17.50) but is a goldmine of information and well worth the price.

"Climb the mountains and get their good tidings,
Nature's peace will flow into you as sunshine flows into trees.
The winds will blow their own freshness into you and the storms their energy, while cares will fall off like autumn leaves."

John Muir, naturalist

Muscari or Grape Hyacinths

W. J. EMERSON

Bulbs of Muscari are small and purple in colour and the flowers are blue or white. One form of Muscari, Armeniacum, has double flowers. Muscari have many small flowers on a stem and several stems from a bulb. They have grassy like leaves and are reasonably hardy when planted in sheltered places. They can be forced indoors to six or eight inches tall.

They seem more at home in outdoor culture in sheltered areas or in rock gardens. Bulbs are fall planted, six inches deep and several in a group. Some winter protection is required to hold snow cover and they should not be disturbed for several years after planting.

After flowering, like nearly all spring flowering bulbs, they die down and disappear. Care should be taken not to dig them up when dormant. They should be left in place for several years or until the group becomes over crowded. They should then be transplanted when in dormant stage only, and August or early September are the best months.

They do not do well in an overly wet spot unless they are well drained. This is why they do so well on rock garden situations.

Paper White Narcissus (*Polyanthus Narcissus*)

J. WALKER

NARCISSUS TAZETTA

This bulb is not hardy outdoors but can be successfully forced to bloom during the winter when grown in a bowl or other suitable vessel containing a layer of pebbles 1.5 to two inches in depth, and sufficient water to cover the tops of the pebbles. A bowl large enough to accommodate three or four bulbs should be used.

Paper white narcissus blossoms are produced in clusters of four to eight and are fragrant. For successful blossom production the bulbs should be purchased as soon as they are available in the fall. To postpone time of blossoming the bulbs may be stored dry, in a perforated polybag in the refrigerator for two or three weeks prior to forcing.

The base of each bulb should rest firmly in a hollow between pebbles and be immersed in the water about one-quarter inch. Strong roots must be allowed to develop in a dark, cool place (45 degree F) (7.22 degrees C) after being placed in the bowl, before the bulbs are exposed to normal indoor light. Within a few weeks strong flowering stems will soon develop and additional water must be supplied as required.

A Hundred Years of Horticulture

J. P. de WET

The coming of the white man wrought many changes in the ecology of the plains of Western Canada. Many of the trees and shrubs that now grace our homes and surroundings have a native origin. The name "prairie" (the French word for meadow) was applied to the western plains by the early French explorers; it seemed appropriate to a treeless landscape. They did not consider such land suited to agriculture and failed to discover the richness of the prairie soil built up over the centuries. But this land, nevertheless, was the home of trees and shrubs which under cultivation have been the parents of many of today's prized plantings around rural and urban homes, on city and town streets, and in public parks.

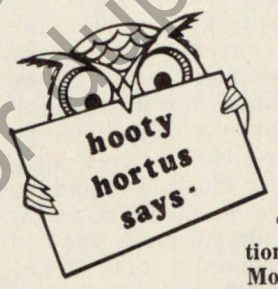
Along streams, in ravines, in wooded valleys, and on hillsides grew a wondrous collection of hardy trees and medium and low-growth shrubs, some fruit-bearing, named in the province's Department of Agriculture "Current List of Trees and Shrubs Recommended for Planting in Manitoba". They are: Trees over 30 feet, Green ash, American basswood (linden), Shubert chokecherry cultivar (f), American elm, Bur oak, Pincherry (f) and cultivars (f) Jumping Pound and Stockton, Siouxland poplar and White spruce. Tall or treelike shrubs over ten feet high, Silver buffaloberry (f), Blackfruit hawthorn, Nannyberry (f), and Serviceberry (saskatoon f). Medium sized shrubs, five to ten feet tall: American (highbush) cranberry (f), and Redosier dogwood. The (f) following some names indicates fruit-bearing.

The early settlers found wild roses blossoming among the abundant plant growth on the land to which they had come: The Arctic or Prickly rose, Alberta's floral emblem — the Prairie Wild rose, North Dakota's floral emblem — the Hudson's Bay or Smooth rose, and the Wood's rose.

They were not cultivated for themselves but, chiefly the first two, are among the parents of many of today's popular hardy shrubs. Breeding of these modern roses has included as well, native roses from Austria, France, Europe to West Asia, Japan, North China, Turkestan, Siberia, the Maritime Provinces and Newfoundland, and garden roses. Frank L. Skinner's 'Betty Bland', introduced in 1925, was a cross between Hudson's Bay rose and a hybrid perpetual. His 'George Will', 'Will Alderman', and 'Wasagaming' were crosses between the Japanese Fruiting rose, the Arctic rose and a hybrid perpetual. Georges Bugnet's 'Therese Bugnet's' parents are the Arctic rose, Skinner's 'Betty Bland', and two native roses from Northeast Asia and Siberia.

William Godfrey's 'Prairie Youth' had the Prairie Wild rose among its seven parents. Bert Harp included all four prairie wild roses in his breeding; his 'Prairie Dawn' received the Western Canadian Society for Horticulture's 1959 Award of Merit. Henry Marshall's 'Assiniboine', which received the W.C.S.H. 1965 Award of Merit, and his 'Cuthbert Grant', recommended by the Manitoba Department of Agriculture for planting in 1970 — Manitoba's Centennial Year, both had the Prairie Wild rose among their parents.

Space limits further detailing notes, but one must add that today's many Potentillas or Cinquefoils, are descendants of the species *fruticosa*, native on the prairie, shores, rock outcrops and clearings in the south three-quarters of the province. John Walker's 'Coronation Triumph', introduced and named in commemoration of the Coronation of Queen Elizabeth II in 1953, received the W.C.S.H. 1967 Award of Merit.



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

Amaryllis, Cyclamen, Gloxinias

GORDON FINDLAY

AMARYLLIS

Within recent years, the amaryllis has become a very popular pot plant due to its spectacular flower stalk. The bulbs are usually purchased in the fall or early winter, already planted in pots. All one has to do is water it and wait until the flower stalk appears. The problem arises after the bulb is finished flowering. What does one do with the bulb?

Frequently, the flowers are in full bloom before the leaves show very much growth. Therefore, all the energy to produce this large flower stalk has come from the bulb itself. That is why it appears shrivelled by the time the flowers have faded. If you want it to flower again next year, the bulb must be built up again after the flowering period is over. Once the flowers have finished, remove the stalk so that energy is not expended in producing seed. One may think that they can obtain seeds, however, the results are almost always very disappointing because the modern day amaryllis is a hybrid produced by crossing different varieties to obtain the large flowers. Therefore, the new seedlings will not compare with your present flowers at all. They will be smaller and not nearly as colorful.

After the flower stalk is removed, the bulb must be kept actively growing by frequent fertilizer applications and plenty of water. RX-15 is a very good fertilizer for this purpose. Feed the plant according to the directions approximately every three weeks. During the summer the pot can be sunk out of doors in a shaded location. By August, the bulb should be fairly plump and ready for a rest. Bring it indoors and gradually withhold the water until the leaves die down. At this time, lay the pot on its side and allow the bulb to rest at about 50° until mid-winter. When the fleshy surface of the bulb appears green about January, it is ready to begin another year's growth. This is the time to remove it from its original pot, knock off the old soil without damaging the fleshy roots, and repot it in a mixture of loam two parts, leaf mold one part, and coarse sand one part with a sprinkling of bone meal. The pot should be approximately three inches greater in diameter than the bulb and the bulb should protrude well above the surface of the soil. Firm the soil with a potting stick and water moderately until new roots have formed, as excessive water will rot the bulb. Soon it will begin growth and if the bulb stored up sufficient food the previous summer, you will be rewarded with one, or maybe even two flower stalks.

CYCLAMEN

The Persian Cyclamen has become a popular plant for Christmas and Easter gifting.

The plants are raised from seeds sown in the fall of the previous year. The seed germinates quite erratically and so it is best scattered sparsely on a flat of sterilized soil and then covered with approximately ½ inch of sphagnum moss. Within six to eight weeks, and for the ensuing two months the seedlings will appear. As soon as they are large enough to handle, they are potted separately in small pots of one part loam, one part leaf mold and one part sand; care being taken not to bury the small tubers. They must be kept growing in a cool moist atmosphere (45° to 50°F). As they grow, they must be repotted regularly until the end of summer, when they are in the five or six inch pots in which they will bloom. Over this period, they benefit greatly from weekly dilute applications of a good, high analysis fertilizer (20-20-20 is very good). One must also keep a watchful eye for cyclamen mites which make tiny webs on the plants and may slow down or even kill the young plants. A good miticide will kill them but frequent syringing with a fine water mist will keep them in check.

Once the buds begin to form, the hearts of the bulbs must not be wet when you are watering, as this tends to rot the buds before they open. It takes approximately 18 months from seeding to blooming, but remember the cyclamen is a cool house plant and will not thrive under warm conditions.

When the flowering period is over in the spring the plants are usually replaced with new stock raised from seed each year because young plants have larger flowers than the older plants. However, if you wish to keep the original plants, they must be watered until the tuber is dormant. At this time the pots are placed on their sides allowing the tuber to rest until early August when it is repotted and growth is commenced for another season.

GLOXINIA

Gloxinias may be started in three ways: bulbs, leaf cuttings or by sowing seeds.

The easiest method is by purchasing the bulbs. They are started into growth in February or March by planting the tubers in damp moss; their surface not being covered. At 65° to 70° they quickly root and when the shoots are one inch in length the tubers are potted separately in well drained, five or six inch pots in a mixture of one part loam, one part peat and one part sand with some leaf mold added. The surface of the tubers should be level with the soil surface. The soil is then kept moist but not waterlogged. Weekly fertilizing is very beneficial and once the buds are visible, fertilize twice weekly. Bud dying is usually due to lack of food. Once the flowers are opened, discontinue feeding. When blooming is finished, gradually withhold the water until the plants die down. Store the pots on their sides in a warm place until February when the tubers are removed from the pots and replanted as before.

Gloxinias can also be started from leaf cuttings or from seed. To prepare a leaf cutting, take a mature leaf and trim the petiole off smoothly, remove

the top half of the leaf blade and insert the end of the remaining portion about one inch deep in a moist mixture of one part sand and one part peat. Keep in a warm, moist spot until rooted, and then plant in a good soil mixture. Soon you will have a new young plant which should be treated the same as above.

Modern day seed production has made it possible to produce beautiful flowering plants from seed relatively easily and at a low cost. The seed is sprinkled lightly on a sterilized starting medium in February. The seeds are very fine and so do not cover them and always water by setting the seed pan in a saucer of water. Set a pane of glass on top of the pot to keep the soil surface moist and set in a light place. In 10 to 15 days, the seed will germinate. When large enough to handle, repot the seedlings into a flat. As they grow, pot them up separately into four or five inch pots and treat as above. Frequent fertilizing is very beneficial and promotes faster growth. In about eight months the plants will be flowering and you will have several plants for the price of one tuber.

DEER

When the deer come down to drink
Their antlers shake the dark red cherries;
The moss in which their small hooves sink
Is gemmed with scarlet partridge berries.

The bucks with proud heads lead the way
Through rocky glade and ferny hollow;
The does, with dappled fawns at play,
As softly as their shadows follow.

Among the oaks a squirrel chirrs;
A porcupine, the lubbard — lurches
With rattling quills among the firs;
A blue-jay scolds among the birches —

Then all is still. A furtive mink
Alone steals out through bush and cumber
To watch the deer come down to drink
And feed where water-lilies slumber.

Arthur Guiterman

THE WINTER STORAGE OF TENDER BULBS, TUBERS AND CORMS

H. F. HARP

The large variety of bulbs, tubers and corms used during the summer as bedding plants often presents a storage problem when winter comes. The tuberous begonias, dahlias, gladiolus, cannas, and the others, all highly susceptible to frost damage, must be lifted and given frost-proof storage if they are to be grown successfully the following year.

TUBEROUS BEGONIAS

Where these showy plants are used in window boxes and sheltered beds they can be protected from light frosts by covering with newspapers or other material. When this is no longer possible carefully dig the plants with the soil adhering to the roots, pot or replant them in deep boxes and place them on the basement floor in plenty of light. The successful storage of tuberous begonias depends to a large extent on the proper ripening of the bulbs. To ensure this, water the plants sparingly while in the basement cutting off the supply when the leaves turn yellow. When the tops of the plant separate from the bulbs at the slightest touch they are ripened and may be removed from the soil. Store them at 50°F. in boxes of dry peat, Vermiculite or Perloam.

CANNAS

The plants are lifted soon after the first killing frost removing excess soil from the roots and cutting off the tops to leave stubs three inches long. Lay out the roots on newspaper in the basement; leave them for a week or so then pack them away. Use slightly moistened peat or a half mixture of peat and sand in boxes deep enough to hold the roots with an inch of the storage media over them. Cannas will likely rot if stored too wet and too cool; it stored too hot and dry, the roots will shrivel. Inspect them every two or three weeks dampening the peat if required. Once during the period of storage the roots should be examined for disease; cutting out bad portions then treating the wounds with dusting sulphur before returning them to storage. Recommended storage temperature is 50°F.

DAHLIAS

After the stalks are killed by frost they should be cut off three inches above the ground. Dig the roots a week later. Dahlia roots are easily

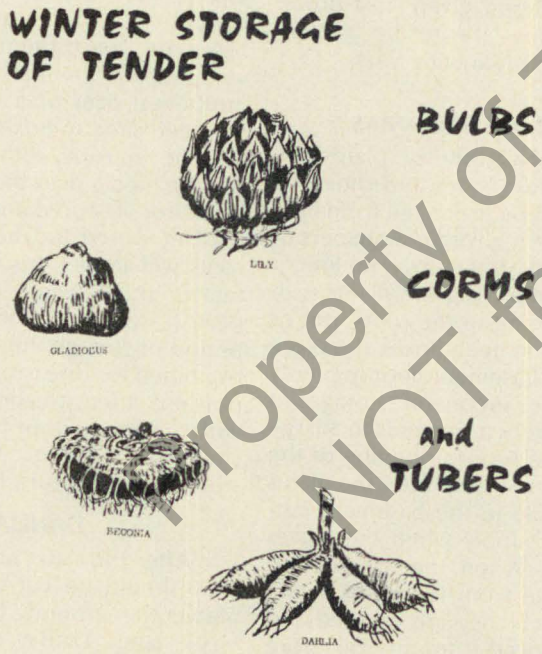
damaged so dig and handle them carefully. From the 'neck' portion of the fleshy roots next year's growth buds are initiated. Roots with ruptured necks are useless.

Set the newly dug plants in the sun for a few hours and then on the basement floor for a week or two before packing them for winter. Dahlias store best in boxes of dry sawdust, peat or Perloam; plastic bags are used for storing root divisions. Roots which have been divided into planting-size pieces are dusted with sulphur then placed in plastic bags and packed in boxes of sawdust. Periodic inspections are made to check humidity, dampening the storage media if the roots are shrivelling. The recommended storage temperature is 45°F. with medium humidity.

GLADIOLUS

Gladiolus corms (bulbs) are dug in late September or early October, preferably on a warm, sunny day. Dry the corms in the sun for a few hours then cut the tops off leaving a stub an inch in length. The best ripening conditions are provided by high temperature (80, 85°F.) and a free circulation of air around the corms.

Small quantities of corms can be ripened and stored in shallow trays stacking them one above the other to save space. The bottoms of the trays should be made of lath or fine chicken wire to ensure good air circulation. Place pieces of 1 x 2 inch lumber between each tray when stored one above the other. When the corms are dry, clean off the remains of last year's corms and other debris



then dust with 'Captan'. The recommended storage temperature is 40-50°F. with the relative humidity 50 to 75 per cent. Monthly examinations should be made from December until May for shrivelling caused by excessively dry air or premature shoot growth caused by dampness.

MISCELLANEOUS TENDER BULBS AND ROOTS

Anemones (St. Brigid)

The fleshy roots are dug in late August or early September, gradually dried off and stored in the manner recommended for dahlias.

Caladiums

Used as porch plants or as bedding plants in shady areas caladiums are tender to the lightest frost. They are taken indoors when the first frost threatens. Dig the plants with soil attached to the roots setting them in boxes on the basement floor. The fleshy roots are dried in the same way as the tuberous begonias then stored in boxes of dry peat in a warm cupboard where the temperature is maintained at 60-65°F.

Calla Lilies

There are several kinds of calla lilies used either as potted plants or for summer bedding. The ripening process is the same as recommended for tuberous begonias except that the storage temperature is a little higher (55°F.). Potted callas can be stored in their pots after they have been gradually dried out. Store the pots on their sides on the basement floor. Callas used as bedding plants are dug up after the first light frost, replanted in boxes of peat then stored in the basement.

Tigridia (Shell Flower)

The tigridias, being more tender than the gladiolus are planted a bit later and harvested a bit earlier, otherwise they require the same treatment. The best storage temperature is 50°F. Cool, damp storage will cause the corms to rot.

Tuberose *(Polianthes tuberosa)*

These sweet-scented, late-blooming bulbs are dug up and potted or boxed after the first light frost. The bulbs are stored in dry peat when the top growth has died down. The recommended storage temperature is 40-50°F.

Ranunculus — various forms of R. asiaticas (The Persian Buttercup)

These have tender fleshy roots which are stored over winter in the manner recommended for dahlias. They are harvested in late August or early September and stored in dry peat kept at 45°F.

Vallota (Scarborough Lily) **and Sprekelia** (Jacobean Lily)

These are used as porch plants flowering in late summer. The bulbs are ripened by gradually withholding the water supply. When the leaves are yellow store the bulbs in their pots where the temperature can be maintained at 45-50°F.

Zephranthes (Zephyr Flower)

Small bulbs, used as pot plants and rock garden subjects. Plants in the open ground are potted in September following the first frost. By restricting the water supply the leaves turn yellow and the bulbs ripen. Store them in soil kept barely moist at 40-45°F.

Canada Department of Agriculture, Research Branch
Experimental Farm, Morden, Manitoba
(Reprinted — courtesy Manitoba Department of Agriculture)

Achimenes

W. H. Gray

Excellent window garden plants of slender growth, with brightly colored, funnel-shaped flowers in summer. They belong to the Gesneria family, Gesneriaceae and are found wild in Mexico and Guatemala. The colors of the blooms range from white through pink, salmon, rose, pale mauve and carmine. The dwarf type of Achimenes, which is of more compact growth than the ordinary kinds, is especially well suited to pot culture.

TO START

They grow from rhizomes (root stocks) which are small, scaly tubers or tubercles. They are started in February in a soil mixture of equal parts of loam, leaf mold or peat moss and sand or Turface. Place three rhizomes in a three inch pot, just under the soil surface. Make the soil firm but not too tight. Keep soil moist but do not allow to become waterlogged. When the pot becomes fairly full of roots, it can be moved into a five or six inch pot.

A light feeding with a liquid fertilizer once a week is helpful until flower buds begin to form. Cease feeding while plant is in bloom. Some people like to start their rhizomes in a flat or large pot and then split them when they start to grow. This system works well, but there is always a danger of damaging the root system if one is not very careful. Do not place in direct sunlight, especially when the plant is in bloom. Keep water off foliage of mature plants. Achimenes do very well if planted in baskets and hung in a window or greenhouse.

CARE

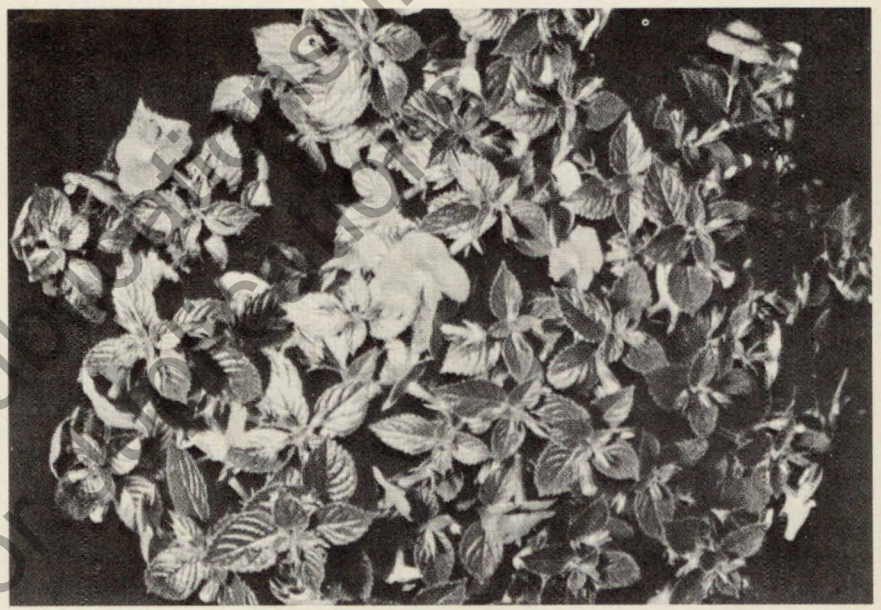
After the plant blooms, gradually reduce watering. Remove withered flowers and leaves and store in a dry cool place until the new growth starts in February. Water sparingly until plant is well advanced, and then treat as above. Achimenes need re-potting only every two years. However, each year the pots should be checked to make sure they have good drainage.

SEED

Achimenes can be raised from seed sown in February, in a mixture of equal parts loam, leaf mold, peat moss and sand. Place mixture in container making sure it is level and firm, leaving 1-1½ inches from top of soil to top of container. Make the soil quite moist before spreading seed evenly on top of soil. Then sprinkle a little of mixture over them. Place a pane of glass over the container. Do not cover glass with paper, etc., as the seeds germinate best in light but not direct sunlight. As soon as seeds have germinated, remove glass and, when plants are large enough to handle, pot separately into 2½ inch pots. The plants will not bloom until the following year.

The rhizomes multiply fairly rapidly and should be taken from soil and repotted every two years. This is still the most popular method of propagating new plants. The new shoots can also be started in the spring. When the new shoots are one inch long, they are removed with a clean, sharp knife and placed in a container filled with sand. Keep warm and moist until roots are formed, then pot separately into 2½ inch pots and grow as suggested above. These, of course, will not bloom the first year.

Reprinted — Courtesy Manitoba Department of Agriculture



Exhibiting Gladiolus

A. J. STRACHAN

There are no hard and fast rules to exhibiting Gladiolus. I believe that each exhibitor develops certain practices and techniques in preparing Gladiolus for show, just as exhibitors of any other article, be it flowers, fruit, domestic manufacture or livestock, develop their own program to produce top quality exhibits in their chosen field.

In order to have good spikes of Gladiolus to exhibit, it is necessary to begin with good corms of good varieties, and by good varieties I refer to varieties of known exhibition quality, sufficiently early so that they will bloom at show time. There is little use of selecting late varieties, or even some late-midseason varieties, and expecting blooms at exhibition time in our prairie region, unless one is prepared to go to special treatment and effort to have these dandies bloom earlier. If you are a real "Glad Nut" of course you will give it a try. Corms of named varieties should be purchased from a reliable cataloguer. It is not likely that corms purchased in a chain store or similar outlet will produce exhibition quality spikes.

To produce good exhibition spikes, Gladiolus should be planted where they will receive as near full sunlight as possible. Planting from 3-6 inches deep, depending on soil type and size of corm, with the deeper planting on the lighter soil types. Deeper planting will help to hold the plants upright and fewer crooked spikes will result.

Spacing of the rows and the corms within the rows will depend on several things, such as space available, size of the variety, available water supply and the equipment to be used in tilling, etc. If the grower feels that fertilizer is required, then a fertilizer low in Nitrogen should be used, such as 11-55-0 or 10-30-10 or, better still, where it is available, well-rotted barnyard manure will add both fertility and organic matter.

It is the writer's opinion that the most important ingredient in growing exhibition Gladiolus is a good supply of water. In many seasons in our area it is not necessary to supply additional water as mother nature usually supplies a sufficient amount. However, in a season such as 1974, in our area it was absolutely necessary to supply additional moisture. Glads can use, to good advantage, about one inch of rainfall or equivalent water supplied per week. An overdose of either nitrogen or water will cause the spikes to stretch too much and good placement of the florets on the spike will be impossible. Some varieties, such as Vicki Lin or Neon Lights, will amply repay for an additional supply of water.

There are many of the Glads today that will grow to a height of five to six feet and it is necessary to support these heavy plants in order to keep them upright and prevent the spikes from crooking. I usually try to stake any prospective show spike, that is a spike with 20 buds or more from a vigorous plant. A stake is placed at the back of the plant so that the florets will open away from the stake. The spike is tied to the stake, being careful not to tie the upper portion too tightly because if it is tied too tightly and the spike is growing rapidly, this will cause it to crook overnight. I like to tie the lower portion to the stake with twistems and use the centre core of toilet tissue rolls to keep the upper part of the spike growing correctly. The roll is placed over the stake and the spike which can grow up inside the roll, but still remain straight. It can be moved up as the spike grows.

As the spikes are growing very rapidly about show time, an inspection of the patch morning and evening is advisable. Especially in the evening after a hot sunny day when many of the spikes will have curved over in the heat. If not cared for there will often be a crook in the spike when it straightens up in the cool of the night. However, by placing the thumb on the front of the spike and the first two fingers at the back of the spike and just below the thumb then draw the hand slowly straight upward, the spike can be quickly straightened and will remain upright.

In the daily evening inspection errant florets can be pushed into place as they will be easier to work with at this time than in early morning when they are very crisp.

Spikes for exhibition should be cut when three to four florets are open. These should be placed immediately in water. The spike should then be tied on a stake to keep it straight or to take out any small crook. This will also allow the exhibitor to bring the florets into proper position when necessary by placing small wads of cotton batten or small bits of toilet tissue behind the errant floret, being careful to move the calyx with the floret. After this process, the spike should be placed in a cool place to open further for the show or, if it is too far out, it may be held in a temperature of 45 to 50 degrees, at which temperature it will open slowly.

We usually move our spikes to the shows tied to the stakes and in water. It is possible to carry spikes long distances in this manner.

Once at the show the final dressing of the spike is done. The spike is removed from the stake and all cotton or paper props removed and the spike placed in the container in which it is to be shown. Loose pollen should be removed either by blowing it away or by using a soft camel hair brush. Florets should be placed one overlapping the other as they ascend the spike. A final inspection should be made to be sure that all props have been removed and the spike is ready for the show bench to await the judges appraisal.

Fireblight

G. PLATFORD

Fireblight is a destructive disease of ornamental trees and of concern to both horticulturists and homeowners. Many ornamental trees and shrubs of the Rose family are attacked. Different species of trees are attacked and, consequently, fireblight is normally associated with these tree species. However, the disease also appears commonly on hawthorn and mountain-ashes, while less commonly on saskatoon, spirea, rose and cotoneaster.

Symptoms: The leaves near the growing tips and the flowers suddenly wilt, turn brown and black, and appear as though scorched by fire. The twigs and sometimes larger branches are blighted and when the infection occurs on large trees, huge cankers can develop on the trunk and branches.

Cause: Fireblight is caused by the bacteria, Erwinia amylovora. The bacteria are spread from tree to tree by bees, flies and other insects as well as splashing rain. The bacteria multiply rapidly and in this manner hundreds of blossoms can be contaminated within a short period of time. The bacteria penetrate and infect the blossoms and then continue down the fruit spurs, twigs and even branches, killing the tissue as it progresses.

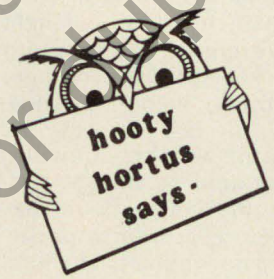
Control: Blighted twigs should be pruned well below the infected areas and burned. This practice should eliminate a lot of the inoculúm, the primary source of bacteria for spreading the disease. The pruning must be done carefully so as not to infect the healthy areas of the branches. This entails sterilizing the pruning tools with a solution of sodium hypochlorite (Clorox) 4:1, denatured alcohol or a quatenary ammonia disinfectant.

There is a formulation of antibiotic now available for fireblight control. Its active ingredient is streptomycin and has been effective against fireblight. The antibiotic should be sprayed when the trees are in the early-bloom and full-bloom stages. Poor control is achieved if the spraying is delayed until the petal-fall stage. The antibiotic is not capable of killing fireblight bacteria deeply embedded in the tree, but it does prevent the infections from becoming firmly embedded if applied at the correct time. Less streptomycin will be absorbed by the plant if it rains a couple of hours after application. Rain a couple of days later will cause little effect.

The preventative measures described above will suffice for most ornamental trees and shrubs. Additional treatments will be necessary to control the cankers developing on the trunks and branches of larger trees. The cankers should be removed surgically.

The surgical method involves cutting into the healthy bark about 4 inches around the canker while the tree is dormant and cutting out the bark within the cut zone. The resulting wound must then be disinfected with a hypochlorite solution: 1 part hypochlorite to 4 parts water and followed with an application of wound dressing. The above treatment works well on small cankers but is not recommended for larger cankers, extending around more than half of the affected branch. The best procedure for larger cankers is to completely remove the affected branch.

Effective control of fireblight is only achieved when the disease is detected and treated in the early stages. If the above recommendations are followed, the incidence of disease will be greatly reduced.



Lilac Bacterial Blight and Twig Canker

Description: During wet, rainy, mild springs (but not during dry ones) the young leaves, shoots and flowers of lilac suddenly develop water-soaked spots which rapidly enlarge and turn brown, then black. Black stripes on the young shoots and black spots on the leaves soon merge until whole branches may be darkened. The symptoms resemble those of the fireblight disease of pears or late-frost injury. White-flowered varieties are said to be more susceptible than those with colored flowers, but none is immune. The organism that causes this blight also is reported to cause cankers, or to infect fruit, of many other plants, including apple, plum, pear, flowering stock, rose and bean.

Control: The plants should be thinned enough to allow good circulation. Diseased shoots should be pruned out when the plant is dry, with repeatedly sterilized shears. Spraying with Bordeaux mixture, 2-2-50 of 4-5-100, in the early stages of the disease has been suggested. Spraying twice with Agri-mycin, as new growth develops, may be tried experimentally. One should avoid application of excess manure or of high nitrogen fertilizers.

Narcissus (Daffodils) in the Garden

W. J. EMERSON

Narcissus, or more commonly known as Daffodils, come in many forms — from the Poetaz types, having many small flowers on a stem to the large trumpet flowered single stems type, such as King Alfred. They also come in colours from white, white and yellow and through combinations of yellow, orange and white.

Narcissus are much more hardy on the prairies than one would expect, and if given proper care, will last for years with the clumps increasing in size.

Outdoor planting should be done as early in the fall as bulbs can be obtained. They should be planted in groups rather than single bulbs, and in sheltered areas with good snow cover. Along the house foundation is ideal.

Dig a hole 18 inches across and one foot deep and place a couple of inches of coarse clean sand in the bottom of the hole. Arrange half dozen or so Narcissus bulbs around the edge and one or two in the centre. Fill the hole with soil, water well after planting, and water now and then until freeze-up. They should be moist but not saturated. The bulbs should be planted at least eight inches deep from base to bulb, and light cover such as evergreen boughs, corn stalks, etc., may be placed over them after freeze-up to help hold snow cover.

The Narcissus will be showing through the ground soon after the snow is gone and cover should be removed, therefore, as soon as possible. Spring frost does not seem to hurt the new growth, and if location is dry, watering may even be needed.

After flowering, let plants die down naturally and remove any seed pods. They will have almost completely disappeared by July. Annuals can be planted between clumps, thus filling in the blank space left by the disappearing Narcissus. Or, when first planting bulbs in fall, some of the lily varieties could be interplanted with the Narcissus, thus providing a succession of flowers. If this is done, a larger hole may be required or less Narcissus bulbs needed. You will not need to disturb them for many years or until clumps become overcrowded.

The physical aspect of soil

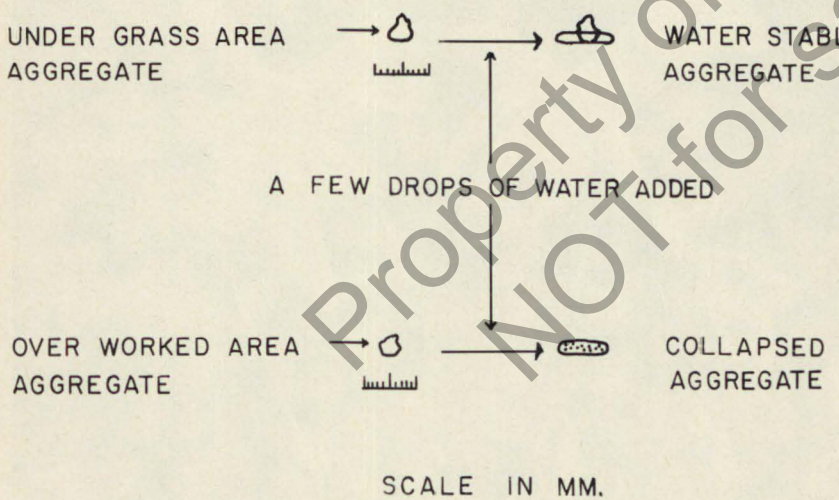
The Whole Story

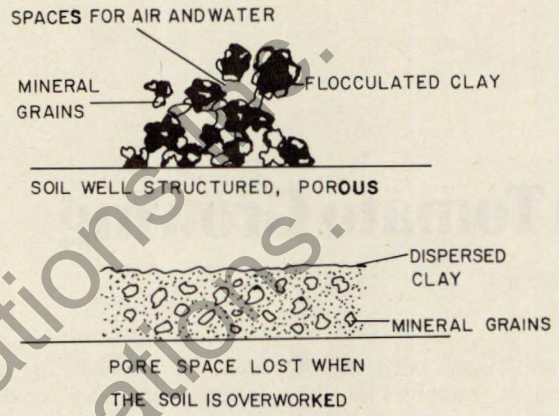
L.P. SPROULE

The astute plantsman realizes what his Provincial Soil Testing Laboratory can do for him with respect to soil testing, but what of the physical aspect of his soil?

Only the gardener himself can determine the state or trend of the structure of his own particular soil. He should remember that it would be almost impossible to find two soils that are exactly alike because of the tremendous number of environmental factors that have played a part in shaping each one. He alone must evaluate the structure of his oil.

There are many kinds of soil structure, but the one we commonly like to find in surface soils is called granular, or crumb. Surface soils that have been in sod for a few years show this kind of structure. Under continuous cultivation the granular or aggregated condition of the soil deteriorates (Figure 1). In coarse textured soils the sand grains occur as separate individuals with pore spaces around the particles, and these particles do not normally form aggregates very well to begin with. In fine textured soils a deterioration in structure is





particularly serious because the increased compaction results in poorer drainage, poorer aeration and impaired ability to withstand puddling.

The only practical method of changing the trend of your garden soil structure for the better is to add organic matter. You do not have to subscribe to "organic gardening" to appreciate organic matter.

To ensure a return to the granular type structure, retire the garden to sod for three or four years. The action of the living grass roots along with their soil micro - organisms, organic tissues, and their ability of increasing the frequency of wetting and drying cycles in the root zone, play an important role in creating stable, granular structure.

In attempting to diagnose soil structure and aggregate stability, the home gardener can apply several tests.

First, carefully examine surface soil structure. Are the granules mostly less than 1 mm. in diameter? If so, then too great a proportion of the aggregates are in erodible fractions.

Next, do the aggregates pulverize easily when the soil is worked? Or collapse during a rain? (See figure 2).

Select aggregates within the 1mm. to 4mm. size range from the cultivated garden area and other aggregates from an old established sod area. Place one to four aggregates, depending on their size, in a teaspoon and apply a few drops of water (enough to allow the aggregates to sit in a small puddle of water). After ten minutes of elapsed time, you will note that the aggregates collected from the sod area are still intact. They are water stable. How do the aggregates from your cultivated garden area compare?

The objective of maintaining good soil structure is essential; it is not the full story, but it is the 'other half'.

Bush Tomato Growing

T. A. SANDERCOCK

Tomatoes have always been one of the most popular vegetables in the home garden and as such have received a great deal of attention. Plant breeders have spent more time working with this plant probably than most other crops. From the breeding programs have come a variety of types, shapes and sizes of fruit, as well as different patterns of plant growth. These include the indeterminant (staking) types that continue to produce fruit as long as weather conditions are favorable. While at the other end of the scale, we have the determinant (bush) type that only grows so large and then terminates production. It is the bush type that I would like to discuss briefly in this item.

The bush type tomato has gained a great deal of popularity in recent years. This is mainly because it does not require attention compared to that of the staking type. No time is required in constant pruning to keep it growing to one stem and there is no need to provide it with a stake to keep it from sprawling all over. It grows quite compact and takes up only a relatively small area of the garden.

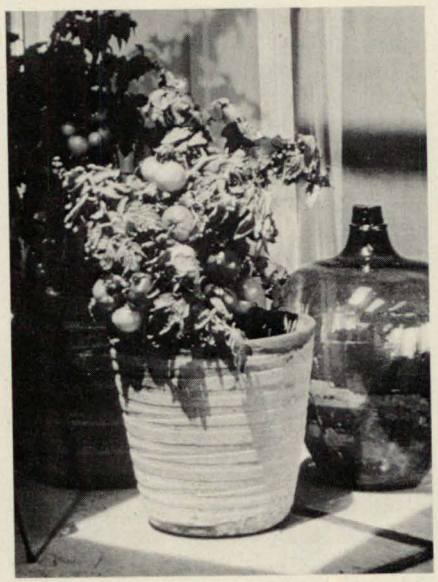
It might be noted, however, that there is a difference in the bush types. Some of these do grow quite vigorously and will spread over a considerable area if allowed to do so. Other varieties are very compact in their manner of growth, especially those of recent origin, and can be confined to a minimum of space if so desired. Dwarf varieties, as some of the more compact forms are called, can be grown in an area of less than two feet square and still produce fruit weighing five to six ounces, which is an average weight of fruit from staked plants. Then there are also extremely small plants that will produce an abundance of small tomatoes about the size of cherries. These are often called pattio tomatoes because they can be grown in small containers on the balcony of apartment blocks where space for garden is not available. The fruit, even though small, is very tasty and can be eaten directly off the plant over a considerable period of time.

The growing of the bush type tomato is not any different than that of the staking types up to the time that they are to be placed in the field. When placing them in the garden, more space will be required within the row, but less between rows to that of the staking types. For the average sized bush type tomato popular in Manitoba at the present, an area of two feet within the rows with three feet between rows will be adequate for optimum growth. If you are growing the cherry or pattio type varieties, the area can be reduced to 1½ feet by 2 feet.

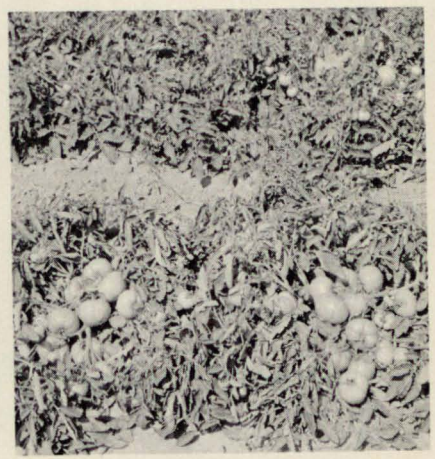
One of the disadvantages of the bush type tomato is its tendency to allow the fruit to lay on the ground and to become marked under heavy moisture conditions. However, this can be overcome if the plant is supported with a small stake at the point where the first fruit cluster is formed. If firmly held at this point, the majority of the fruit will hang freely without touching the damp soil. Gardeners situated in heavy soil areas will need to be more concerned about this factor than those on the lighter soils where drainage is more adequate.

The selection of a suitable variety will no doubt be one of trial and error until you find one that suits your specific needs. If you are interested in the large fruited varieties, I would suggest you start with the old reliables such as Manitoba, Starfire and Bush Beefsteak. These have wide adaptation and have been well accepted by most gardeners. If you would like to experiment you might try the variety Cannonball. This is a new variety just released by the North Dakota State University and showed considerable promise in 1973 in the Winnipeg area. For a much earlier crop and a smaller plant type, I would suggest you try varieties such as Early Sub-Artic or Sub-Artic Midi. These produce fruit averaging 1½ to 1¾ inches in diameter and ripen a week to two weeks earlier than the larger fruited types. If your preference is for extremely small fruit, then any of the varieties listed under cherry tomatoes in the local seed catalogues will be quite satisfactory.

Patio tomato.



Bush type tomato.



Independent Study Opportunities Opens Up Areas of Horticultural Pleasures For The Amateur and Professional Horticulturist

C. A. McNINCH

There are many professions and trades that offer challenges to the creative instincts of men and women but I know of none that offer the variety of creativity that can be found in gardening. Perhaps the architect, the land planner, the interior decorator, the artist or musician delve into the same creative instincts and resources, but they are specialists and lack the variety of scope for challenge. The fact and simplicity of the matter is that we cannot all attain professional prerequisites, but we can all become gardeners. As gardeners we learn to use the artist's and architect's appreciation of design and beauty, the architect's and land planner's knowledge of function and societies' needs, the interior designer's manipulation of space and the musician's understanding of sound to create mood and atmosphere.

We must recognize the garden as a place in which to live and, like a building or room, it has a floor made of earth, stones and water, a ceiling made of sky and overhead branches, and walls made of hedges, fences and buildings. It is up to the gardener to sculpture the earth, to utilize and alter the space, to create traffic patterns, use areas, enclosures, views and vistas. The gardener who becomes dissatisfied with his creation merely re-designs it, re-shapes it and can alter it to suit his desires. He can re-adjust bits and pieces in the garden, add to or delete from it, and usually at little cost, or at least in keeping with his pocket book as his budget allows.

The garden designer's materials are both animate (living or soft materials such as plants) or inanimate materials (hard or non-living materials such as concrete, stone, wood). The hard or construction materials once selected and in place do not change but may need some maintenance. The soft or plant materials once in place continue to grow, change colour on a seasonal basis and require continual care to be

maintained in a healthy state and in a form suitable for the all-over aesthetic qualities of the garden. The proper selection of the plant materials for any design pattern and site is essential for the success of the project. It follows then that the true worth or stature of a gardener both amateur and professional may be measured by his knowledge of plant material, physical characteristics of plants, plant preferences for soil, light and moisture and plant hardiness.

There is certainly a great deal of fun to be enjoyed in working about the garden, pruning and caring for plants. Even after a day of gardening it is often refreshing to pick up a book on soils or plants to see if what you have been doing might be altered or improved, or having the satisfaction of knowing that what you have done is correct. A text on soils may be extremely popular. The soil that supports the plant and offers a media for nutritional exchange must be tilled, receive soil additives and be properly amended to hold food and moisture for the nourishment of plants. Reading about the more contemporary concepts of soil management, coupling this information with practical experience and skills can only result in improved gardening.

Few will relate the observant gardener to a research scientist and yet this is what he really is when working in his own out-door garden laboratory. He is continually doing research work of an applied nature, he learns through experience and trial and error, and is continually carrying on thousands of experiments. Few would question the statement that our best ecologists are amateur gardeners. Is it not true that a bird feeder or a bird bath might eliminate the need for a particular insecticide and that birds invited to the garden not only control insects but add motion, colour, beauty and sound to the garden environment?

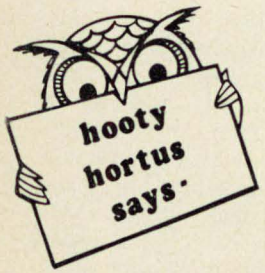
The striking phenomena about architects, artists, musicians, land planners and interior decorators, or at least those whom I have met, is that they are all amateur gardeners. They enjoy playing with the art forms and experiences encountered in gardening. One gardening facet that intrigues them is the study of plant breeding, to learn how plants reproduce themselves and to be able to plan a breeding program with some idea of what the objectives are and with some reasonable hope of realizing the objectives. Nothing is as exciting or apprehensive than collecting seed from a known plant parent and cross producing the seedlings, and caring for them to blooming stage.

The most important thing about gardening is that it can be entered into on any scale – large or small. As a garden enthusiast you need only a window sill; a small backyard can be a joy forever. As a professional horticulturist your pursuits may be in landscape design, landscape contracting, floriculture, fruit or vegetable production, greenskeeping or park horticulture. Whatever your horticultural objectives may be, I assure you that we are all just like the plant outside your kitchen window. With light and nourishment we will grow. I think of light as energy and as learning experience. As light or learning continue to be used we will continue to grow; if the learning ceases we stand still.

Continuing one's learning is an everyday thing. Practical experience, seeing, hearing and reading can all provide

learning experiences. Evening classes, short course programs and getting together over the garden fence will all help.

In 1960 an Independent Study program was launched at Guelph. We are proud that the first subjects available were in horticulture and we continue to be pleased with the numbers enrolling in the program each year. One of the most popular courses offered was designed specifically for the home gardener and covers such subject areas as: Soils, Botany, Plant Propagation, Landscape Design, Landscape Construction, Floriculture, and Fruit and Vegetable production. It is a flexible program in that registration may be made at any time, the study outlines are made available and the garden enthusiast completes the program at his own time and convenience. There is no cut-off date and if the gardener wishes he can take several years to complete the study. There are assignments to submit but no final examination to write. The objective is to get as much material to the student as possible – to direct the student's reading and to be able to help him with the difficulties encountered. If you are interested and would like more information regarding the courses offered (and I wish to say that in addition to the Home Gardener's course we offer opportunity to study more than 50 specialized horticultural courses) write to: Independent Study, Office of Continuing Education, University of Guelph and request the Independent Study Calendar in Horticulture and Home Gardeners Brochure.



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

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

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

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

Peony Blight

G. PLATFORD

The disease Peony Blight is caused by a fungus called "Botrytis". This disease is very widespread occurring wherever peonies are grown. There are two different phases to the Peony Blight disease:

1. A crown rot and blackening of newly emerging shoots.
2. A blackening of flower buds, brown discoloration of flower petals and leaf spotting.

The two different phases of the disease are caused by different species of the fungus. The species causing the first phase occurs only on peonies. However, the Botrytis species causing the damage to the flowers and leaves occurs on over 100 different types of plants. Almost all garden flowers are susceptible. In addition, strawberries, tomatoes and onions are susceptible to this latter Botrytis species.

Control: The basal crown rot and shoot blackening of peonies can be controlled by good sanitation. All infected parts and old decayed stems should be cut off and destroyed in the fall. Where the disease has occurred the previous year, a fungicidal drench of Benlate 50% WP at the rate of 1 tblsp/gal of water will help to eradicate the disease. Apply in early spring as young shoots are emerging. Repeat the application two weeks later.

The bud, blossom and leaf blight phase is more difficult to control because of the widespread occurrence of the fungus. All fading blooms from any flowers in the vicinity of the peonies and all the old peony blooms themselves should be cut off. The fungus can survive on almost all above ground dead plant parts of the peonies, but prefers the floral parts. If the weather is damp during the spring, protective sprays of Captan 50% WP at the rate of 1½ tblsp/gal of water or Benlate at 1 tblsp/gal of water are essential for good disease prevention and eradication.

A complete control program consists of:

1. Cutting down old stalks in the fall.
2. Drenching young shoots with Benlate in the early spring.
3. Spraying developing buds with Captan or Benlate.
4. Picking off the withered blossoms.
5. Spraying in mid-summer with Benlate or Captan to control the leaf blight stage.

Good sanitation and timely applications of the correct fungicide is important for control of Peony blight.

Commercial Mint?

B. B. CHUBEY

The products obtained from the plant kingdom in which the odoriferous and flavoring characterisitics are concentrated are known as essential oils. These products are also termed ethereal and volatile oils in contrast to mineral oils and edible oils of animal or vegetable origin. Essential oils form a very important part of the materials available to the flavor chemist for the formulation of flavors. Essential oils are volatile at room temperature and evaporate completely when heated.

Essential oils from dill and mint are obtained by steam distillation. A current of steam is passed through the plant material which is heated in a still. The oil is vaporized and is led through a condenser along with the steam. Both oil and water are condensed and the condensate is caught in a special receiving container which separates the oil from the water. The oil, being lighter, floats on top of the water. The outlets in the separating device are so arranged that the oil is drained from the water surface and the water is drained from the bottom of the receiving container.

Dill oil – Dill oil is steam distilled from the aromatic dill herb *(Anethum graveoleus)* which is well known to most gardeners as a hardy annual growing 2 to 4 feet in height. The dill herb is widely used for flavoring pickles and as seasoning for meats, poultry, fish and sauces. The successful use of dill oil as a substitute for the herb requires that the oil possesses the same flavor as the herb. Since the leaf oil and seed oil are quite different, it is essential that the oil be distilled from the herb harvested at the stage at which it is used for pickling. To accomplish the harvesting and distillation at exactly this stage is therefore a prime concern of the grower. The harvest as a rule is carried out when the umbrella-like seed stalk just turns amber in color. At this stage the plant is richest in carvone, the principal flavoring constituent of dill oil. Most of the seed would shatter while harvesting if allowed to mature on the plant and would result in a poor quality oil.

Commercially, dill is sown directly in the field with a beet or bean drill early in the spring in rows about 22 inches apart. The crop is ready to harvest in 90 to 100 days. It is harvested and placed into windrows using a grain swather. The herb is allowed to cure in the field for a day or two and then distilled with equipment similar to that shown in Figure 1. It requires from 2½ to 3 hours to exhaust the charge. The yield ranges from 50 to 100 pounds of dill oil per acre. There are several varieties of dill, some of which are not suitable because they yield less oil or oil of poor quality. Mammoth Long Island is the main variety grown for dill oil production. At present the dill oil production in North America is concentrated in Oregon and Washington State. Studies carried out at the Morden Research Station indicate that excellent quality oil with good yields can be produced in southern Manitoba.

Tub ready for distillation. The dill weed is chopped up and blown into the tub with a silage cutter.

Mint Oil – Several species of mint can be grown but the most common commercially grown species are peppermint *(Mentha piperita)* and spearmint *(Mentha spicata)*. Peppermint flavoring is one of the flavorings which has been found readily acceptable by the consumer. The major uses of the oil are: chewing gum flavoring, flavoring of dentifrices, flavoring of candy, pharmaceuticals and alcoholic beverages such as cordials and liqueurs. Relatively little of the fresh and dried herb is used for flavoring purposes. Mint oil is the volatile oil distilled with steam from the fresh above ground parts of the flowering mint plant, using the same distillation equipment as for dill oil. Generally speaking, the mint plant contains the maximum amount of oil when the plants are in full bloom. Yields of up to 75 pounds of mint oil per acre are possible. Mint plants are perennials and are propagated by means of underground rootstocks (rhizomes) and by surface runners.

Main production areas in the U.S.A. are the Mid-West states (Michigan and Wisconsin) and in the North-West (Oregon and Washington). Mint is not grown commercially in Canada at present although research at the Morden Research Station indicates that good quality mint oil can be produced in southern Manitoba. Studies on mint production are also underway at the University of Saskatchewan. The main problem anticipated with mint production in Canada is winter survival. Research on proper cultural practices in growing mint is required if the mint industry is to develop and survive in Canada.

Light In the Night

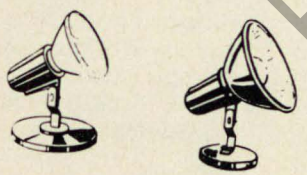
DARLENE DONALDSON

The key to landscape beauty is light . . . a matter of personal choice . . . a reflection of your desires and creative imagination. Every home has at least one area that is deserving of night time display. It could be a garden setting, a stately tree, a cluster of gayly coloured shrubs, or a picturesque pond. To make your highlighting decision, follow this simple rule: If a view is beautiful by day, then it will be equally beautiful if lighted by night.

Homeowners everywhere are captializing on this decorating technique, and with careful inspection of your home's surroundings, you'll find natural spots where light can make the difference.

LIGHTING EQUIPMENT AVAILABLE

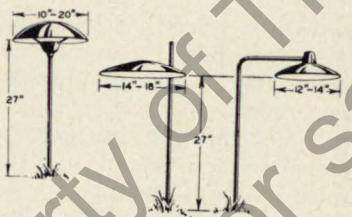
ADJUSTABLE HOLDERS: for PAR-38 projector lamps and others. For projector lamps with coloured bulbs, with spike for ground placement, cover plates for outlet boxes and attachment clamps.



ENCLOSED FLOODLIGHTS: ("handy floods") use from 100-300 watt bulbs.

MUSHROOM UNITS: At any height for general lighting on terraces, with 4 to 5 ft. stems; circulation areas; flowers and plants.

Every manufacturer's equipment varies in design and lighting value. Whatever you choose, consider installation, appearance, circuit capacity and cost.



LAMPS AVAILABLE

– **Projector (PAR) Lamps:** 75 and 150 watt self-contained spot and flood-lighting lamps. Compact, convenient; reflector does not deteriorate from dirt and needs no protection from weather. Available in many colours. PAR-38 Dichro-Colour spot lamps give a narrow beam of highly saturated colour.

– **Reflector (R) Lamps:** self contained spot and flood lighting lamps. Need protection from weather, available in several wattages and colours.

– **Inside frosted Lamps:** familiar household types. 15 and 25 watt lamps may be used outdoors without protection; higher wattages need shielding from moisture.

– **Tinted Lamps:** in two delicate colours, household wattages. Yellow "bug-lites" have less attraction for insects.

– **Mercury Lamps:** blue-white light flatters most foliage. Available in PAR bulbs recommended for landscape lighting. Require special sockets and auxiliary ballast for proper operation.

– **Christmas Lamps:** in varied colours. Outdoor types can be used without protection, for year round operation.

– **Fluorescent Lamps:** in weather-proof fixtures, for use where lines of light are desired to light vertical surfaces such as fences, hedges.

ADEQUATE WIRING

Adequate wiring, either permanent or temporary is essential, though permanent wiring has a number of advantages.

It makes installation of lighting equipment easy, avoids hazard of temporary wires stretched across walks and yards, and allows full use of electrical equipment approved for outdoor use by day as well as after dark. Underground wiring offers maximum safety and convenience. Wire of types USE or UF now can be buried without enclosing in conduit or lead sheath. Weatherproof outlets can be installed on permanent structures, on conduit anchored in the ground or on switch-boxes designed for outdoor use.

Most outdoor lighting equipment has up to 12 feet of weatherproof portable cord. Some lighting fixtures have built-in outlets to connect additional units. Plugs and sockets on cords are usually molded in rubber, to keep the cords weatherproof. Present Electrical Codes require that cords on equipment and cord sets have grounding connectors and plugs.

If you plan to install permanent wiring, consult your electrical contractor. Regular inspection, of temporary wiring especially, will detect potential hazards.

TIPS FOR INSTALLING OUTDOOR AND GARDEN LIGHTING

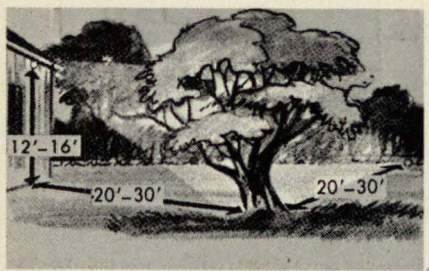
1. Turn off electricity to install equipment or replace lamps.
2. Work in dry garden.
3. Don't overload house lighting circuits when planning your garden lighting . . . permanent garden lighting should have a special circuit.
4. Install permanent wiring to approved electrical inspection standards.
5. Keep light sources out of viewer's eyes.
6. See that floods won't annoy neighbours or passing motorists.
7. Don't try to light everywhere in the garden . . . concentrate on interesting features and make changes with the seasons.
8. Give your garden lighting a "background" . . . often a lighted tree or trees will serve.
9. Use coloured light sources with discretion and only after trying out the effect.

10. In locating floods for driveways, avoid low mounting that will shine in the driver's eyes. Often a post light is more appropriate.
11. Plan your outdoor lighting for safety too . . . for walks and steps.
12. Remember, garden lighting is like decorating . . . you must please yourself. Experiment to get the effect you like.

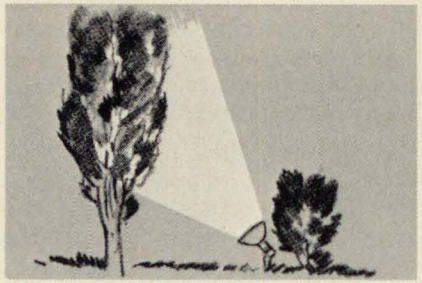
LIGHTING FOR TREES

The type of tree, its size, location and the effect you desire will help determine the lighting plan. Use 150 watt PAR-38 spot flood lamps. Alternate 200 watt enclosed floodlights.

a) **Focal Point:** light the tree from two or three directions, to avoid a "Flat" appearance. Spotlight at least one area for highlight effect. Use floodlights from the other directions to emphasize the shape of the tree. Experiment with locations and distances from lamps to tree for the best effect.



b) **Background:** on slender trees, such as poplar, place floodlamps on ground, 6 to 10 feet apart, 3 to 6 feet from tree. Shield lamps from eyes in hedge or other planting. Aim toward upper or lower part of tree for effect desired.



c) **Canopy:** Mount floodlamps either at tree base or in tree, above eye level. Aim either up into tree or at lower foliage to reflect light down from foliage.

LIGHTING FLOWERS

Floodlighting: 150 watt PAR-38 floodlamps, one lamp per 750 sq. ft. of area. Alternates: enclosed floodlamps; allow 2 or 3 tenths watts per sq. ft. Placement: In trees, on house or other buildings, 16 to 24 ft. above ground. Aim to light entire area, including sections lighted by other units. Units should be well shielded from view.

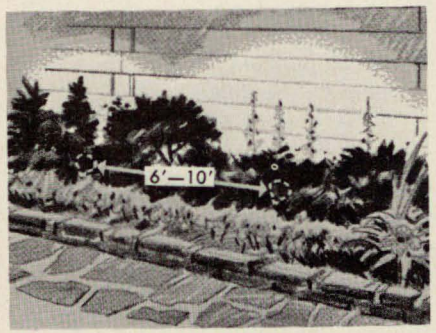
Lighting Open Flower Beds: Use mushroom type metal reflectors: 25 or 40 watt bulbs. While most such units take larger sizes, too much brightness on flowers may be undesirable, unless garden area is floodlighted.

Placement: In beds, bottom of reflector 12 to 24 inches above flowers. Each unit provides 6 to 10 feet circle of light.

Overall floodlighting at low levels is recommended, so that the garden area presents a unified picture. Lighting in each flower bed provides attractive "spotlight" effects.

Lighting Flower Beds with Background (fence or house): to silhouette flowers, use 75 or 150 watt PAR-38 floodlamps.

Placement: on ground, 2 to 3 feet from base of background; 6 to 10 feet between units.



COLOUR TIPS

White light alone displays colour in your garden; but many subtle and fascinating effects can be obtained with touches of coloured light.

The same hue as the object lighted, will heighten that colour. Tints create a more natural effect than stronger, more saturated colours. White and highly saturated coloured flowers, and gardens with mixed colours, look more natural with white light.

When mixing coloured light, colours will dilute. When red, green and blue, for example are mixed in proper proportions, a white light will be produced. However, the shadows created on the object will take on very unusual and attractive colour combinations not created by ordinary white bulbs.

Yellow and low-wattage incandescent lamps tend to deaden the colour of grass and foliage, which is enhanced by green or blue-green light and cool white and daylight fluorescent lamps. Mercury lamps add dramatic touches of bluish green, and are especially attractive with blue spruce and birch trees. Cool colours, generally, will add depth to your garden picture.

Colour can be obtained by using cover glasses in various colours which attach directly to the rims of PAR lamps.

Discover what outdoor lighting can do for your home. Manitoba Hydro has an excellent booklet entitled "Light for Living Outdoors." For your free copy, contact the local Manitoba Hydro office in your area. For installation requirements and lighting information, see your local supplier or electrical contractor.

Junior Gardening

ANNE JOROWSKI

The success of our Junior Garden program depends on two things: Enthusiasm and Involvement. Enthusiasm is contagious and soon spreads to all who are working with you. We try to be an integral part of our community and work towards beautifying its parks, public building grounds, and our own back yards. What pleases the eye, pleases the senses. In this way we try to add this aesthetic pleasure to all those who pass by. It is not trivial to suppose that a child's garden might change the world; a single marigold, a little row of carrots or beets, a small plot where no weeds grow – can be the model for our Earth!

The East Kildonan Horticultural Society begins to make plans in March through our school division. The superintendent of schools is contacted and our program outlined to him. He, in turn, sends a memo to all school principals. In April the principal of each elementary school is phoned, reminding him that our members will be bringing entry forms which are to be filled in by interested children, and returned. For every entry received, we supply the Junior Gardener with six packages of seeds. The cost of these seeds is 60 cents. The Kiwanis of East Kildonan pays 50 cents and each child pays the remaining ten cents.

In early June the young gardeners participate in a park planting program with our Society. Here we get excellent cooperation from our Parks Board. We design the flower beds, purchase the flowers from our local greenhouses, and make all the arrangements for a planting date. This is usually on a Saturday. We roll up our sleeves and all work together with amazing results. We have planted as many as 50 dozen flowers in one morning!

Of course, we can't have all work and no play – after all, they are still children and we all like our rewards. A few "breaks" with plenty of goodies for all to enjoy is in order. In this way over 225 dozen flowers were planted in East Kildonan's parks and public building grounds in one season. Beautiful blossoms for all to enjoy.

In planning this program, we try to select Juniors, or a class of school children, who live in the immediate vicinity of the park. This gives the children a sense of pride in beautifying "their park". It also substantially cuts down on vandalism. Youngsters have a way of doing their own policing and with better results when they are involved. "I'll break your little arm if you touch these flowers – I planted them." It really works. Nothing like defending your own work. While we don't win them all, to date our average has been over 90 percent. Not bad for six years!

Bedding plants and willing workers.

When East Kildonan built a new fire station our Society offered to do the landscaping around the building. Dr. W.R. Leslie designed the plan and we purchased the trees and shrubs. Before work began, a group of Cubs from a local church spent an evening pulling weeds in preparation for planting. Then, with the help of our Public Works Department, the firemen and our members, the trees and shrubs were planted. Each spring our Society plants annuals to further add color and beauty to a public place.

In July, members of our Society visit each Junior Garden for preliminary judging. We usually have approximately 75 gardens. These are divided so that each group of two judges visits seven or eight gardens. We praise each participant for their efforts and try to comment on something they have done well. If necessary, we suggest ways for improvement. The two best of each group are then submitted for a final judging. This is usually done by our M.H.A. director and one member of the E.K. Kiwanis. They select three winners, and give honourable mention awards to several other worthy of recognition. The names and pictures are published in our local newspapers. Also, the school which these juniors attend are asked to make

an announcement of their achievements. Praise and recognition cost no money but it certainly makes the youngsters feel good!

Last year we tried something new. A week before the flower show, Mrs. M. Partridge, our very artistic executive member, held a flower arranging and exhibiting class in her yard. Each Junior member was asked to bring a container and some flowers. They were shown the basics of flower arranging and given an opportunity to try their own skills. The enthusiasm and concentration were intense. After an hour or so, the results were amazing. Beautiful arrangements of which all were justly proud. They were also shown how to prepare their vegetables for the show and various things usually looked for by the judges.

The following week, the flower show entries were overflowing with original and clever designs. We were very proud of their selection. I know the judges had a difficult task in selecting winners.

Labor Day weekend, our Society entered a float in the East Kildonan Country Fair Parade. Usually two juniors are asked to ride on the float. Large dahlias and gladiolus are supplied by our members and given to senior citizens along the route. This year our entry took First prize in the non-commercial class.

In September the Society holds a large corn and wiener roast for all who entered the Junior Garden Competition. The evening is planned with various fun games and activities, with plenty of goodies to eat and drink. This is our way of saying "thank you" to all the boys and girls for their enthusiastic efforts throughout the spring and summer.

In October we were guests at a dinner given by Kiwanis of East Kildonan. Trophies donated by them are presented to all winners of the competition.

How many of us today remember someone who took the time to show us, as children, the great rewards of growing things?

It has been the fate of our generation to be caught in the great ecological squeeze. We have no choice but to halt pollution, starting in our own back yard and continuing until our entire environment is clean and able to support mankind. Whether we ourselves succeed is yet unknown, but we must do our best, and we must take our children by the hand and show them the way.

Planting in the park.

Sprekelia

The botanical name of the one species of this Amaryllis genus Sprekelia formosissima, native to Mexico and Guatemala, is tongue-twisting and somewhat off-putting, but the Jacobean lily or Aztec lily or St. James lily — call it what you will — is well worth cultivating.

It used to be grown in greenhouses only, but the plant adapts itself perfectly to garden cultivation in Britain but in Canada, should be considered an indoor plant.

It is related to the Hippeastrum or Royal Dutch Amaryllis but differs from it in that it always has a solitary flower. The large oval, long-necked bulbs with black tunics produce several long leaves about one foot tall, and one or two 18-24 inch pink stems, crowned with a truly gorgeous crimson-red flower, exquisitely shaped, and enclosing a bunch of golden stamens in the throat.

In the greenhouse or house, Sprekelia should be planted just like Hippeastrum in 5-6 inch pots in a good house plant soil mixture 3 parts loam, 1 part sand, 1 part peat moss or leaf mold, leaving the top half to third of the bulb exposed. Planting time in pots is February for late April or May bloom. Water freely from the time growth begins until September, then keep dry. Top dressing is necessary annually but re-potting every three years is sufficient. It, like the Amaryllis, does not like to have its roots disturbed.

Tulips Outdoors

E. W. TOOP

For brilliant color in your garden prior to the bedding plant season there is nothing to surpass the tulip. With judicious planning and proper choice of species and cultivars the season of bloom can be stretched over a five week period. During the time that we were involved with the Netherlands Flower Bulb Institute's tulip testing project (see The Prairie Garden, 1966, p. 82) the flowering season of the 155 cultivars and species included in the test ranged from about mid-May until the last week of June. This was for bulbs planted in fairly exposed field plots in Edmonton. When planted in the protected surroundings of a landscaped city lot the blooming period can be advanced by several weeks. In fact, if the bulbs are planted near the foundation of a home with a heated basement, the plants will emerge so early in the spring that they run the risk of being cut back by severe frost.

There are two main categories of tulips available in the trade: the so-called Garden Tulips or Dutch Tulips and the Species Tulips (including their varieties and hybrids). The Garden Tulips are derived mainly from two sepcies, *Tulipa suaveolens* Roth. (the Duc Van Thol Tulips) and *Tulipa gesneriana* Linn. (the Common or Late Tulips). These Garden Tulips are further classified into various divisions based on growth characteristics, season of bloom, and flower form. Figure 1 shows the parentage and interrelationship of these various classes of tulips.

In addition to the Garden Tulips there are several species and their varieties and hybrids which are available from bulb nurseries. When I surveyed various research and educational institutions across the prairie provinces a number of years ago, two particular species were consistently mentioned as ones that were fully hardy and could be maintained with a minimum of care. There were *Tulipa tarda* and *Tulipa kolpakowskiana*.

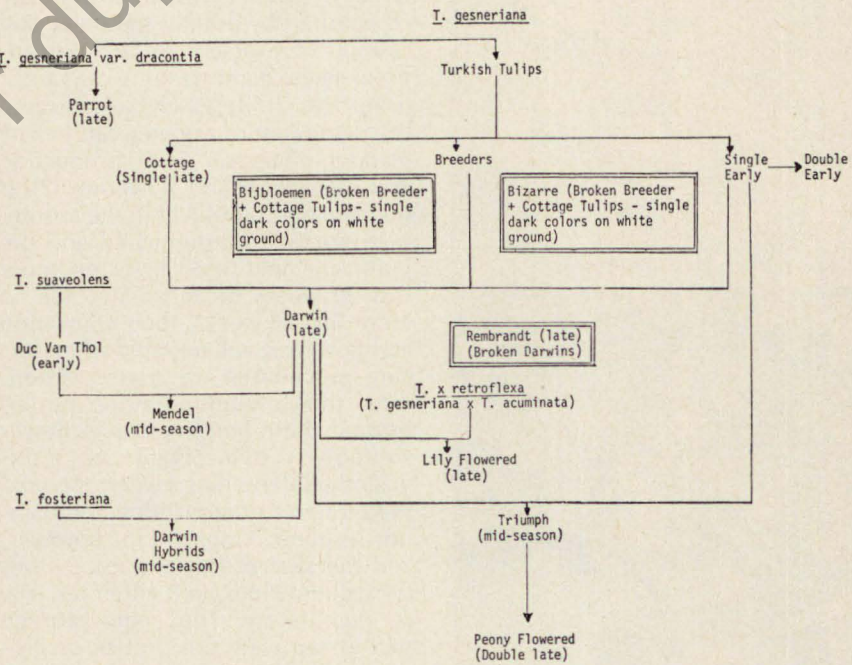
Tulipa tarda is well known and produces a brilliant effect when its white-tipped yellow star-like blooms fully open in the sunshine. *Tulipa kolpakowskiana* is slightly taller than *T. tarda* and the type usually sold has yellow flowers with broad carmine red stripes on the exterior of the petals.

Red Emperor, which is a variety of *Tulipa fosteriana* is one of the better known species tulips but does not always perform well on the prairies.

It has been my experience that how well a particular tulip cultivar performs is more a function of the environment than of the cultivar itself. During the approximately seven years that we kept records on the performance of three successive plantings of over 150 cultivars and species, very few, if any, individual kinds could be singled out as being consistently superior. In general, most of them performed well the first spring after planting, provided they were planted deeply enough. How well they continued to multiply and flower in subsequent years varied considerably from one planting (experiment) to another. Seasonal differences in weather from one year to another seemed to be the cause for this inconsistency in performance.

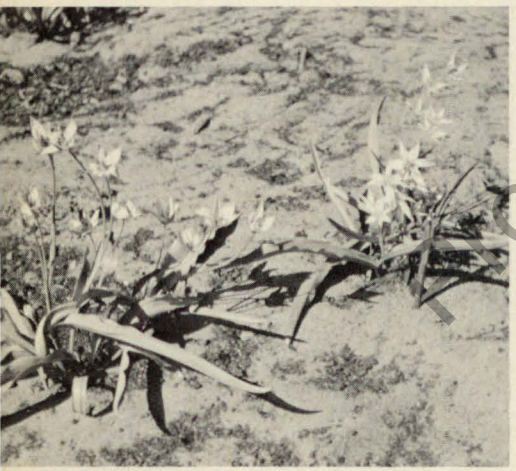
Before outlining some of the cultural practices that are recommended in handling tulips, I think it is worthwhile to consider the life cycle of the tulip bulb and some of the conditions that favor the various stages of growth. Many of the tulip species and, in particular, the species from which our garden types have come, are native to the mountainous areas of Turkey and Iran where the winters are cold and the summers are

FIGURE 1 — Parentage and interrelationship of Garden Classes of Tulips



Red Emperor and Tulipa Kaufmanniana.

Tulipa Kurkestanica.

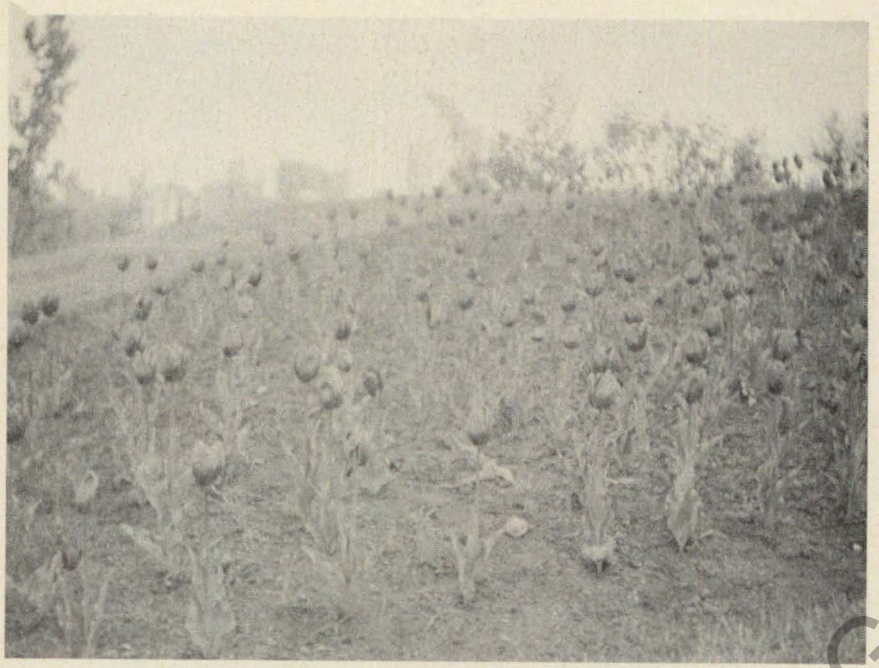


hot and dry. Flower initiation occurs after the foliage dies down (early summer) and before autumn. In the tulip's native habitat this coincides with the hot dry season. Experimental evidence (2) indicates that lifting bulbs after foliage senescence and giving them warm temperature treatment speeds up flower bud initiation. Flowers will initiate over a wide range of temperature (48°F — 82°F)but the optimum range is 63°F to 68°F (2). Therefore, lifted bulbs should be stored at room temperature, if possible, over the summer months. If left in the ground, the soil should be allowed to become dry and warm.

Tulip bulbs require exposure to cold temperatures before actual flowering will occur. When bulbs are forced this is commonly accomplished by potting the bulbs and storing them at 40° to 50°F for approximately eight to ten weeks prior to forcing (3). Research has indicated that temperature regimes can have a marked effect on bulb production and elongation and flowering (2). If the daughter bulbs within the mother bulb are well differentiated and the bulbs are held at 50°F for no more that 20 weeks or 36°to 37°F for no more that 30 weeks, then elongation and flowering will be rapid when forcing procedures are started. Extending the low-temperature period beyond these limits results in flower abortion. If the organs are insufficiently differentiated when the cold period starts, or at planting, they cannot respond. Bulbing can, however, and the start of this process inhibits subsequent elongation either partially or completely. Thus cold storage started too early can reduce or prevent elongation in the same way as too long a period of low temperature. No flowers result in either case.

Ivory Glory (single late).

In outdoor plantings of tulips in Edmonton it has been our experience that deeper planting reduces the incidence of failure to flower. No doubt this is related to soil temperature. At depths of seven to eight inches (or even more) from the top of the bulb to the soil surface the bulbs are in soil that will not fluctuate in temperature and will cool down slowly throughout the winter. Shallow planting at depths of only three to four inches can lead to more rapid cooling of the bulbs and fluctuations in termperature as well. Furthermore, shallow planting tends to encourage the production of



many small bulbs of non-flowering size.

The question is often asked, should tulips be lifted and replanted each year. We have found that annual lifting is not necessary provided the bulbs are planted at least seven inches deep. What does happen, of course, is that the bulbs multiply, the total number of flowers produced in the planting increases, but flower size decreases. Furthermore, if the bulbs are planted shallowly the daughter bulbs form even closer to the surface and easily become exposed through erosion of the soil or from frost heavage. Lifting the bulbs each summer and replanting helps to keep bulb sizes up. With either procedure, however, it is recommended to purchase only top size bulbs for initial planting.

Another advantage of lifting bulbs is that they can be stored at the optimum temperature (68°F) for flower initiation. However, it is very important, whether the bulbs are lifted or not, to allow the tops to mature and die back naturally. In order to facilitate the planting of bedding plants as summer replacements in tulip beds the tulips can be dug as soon as the flowers have faded and heeled-in to a holding area. When the foliage has become senescent (old) they can be lifted again, cleaned and stored for the remainder of the summer.

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Sprinkler Systems For Home Lawns

N. A. KORVEN, P. Ag.

Nothing beautifies a home more than a lovely green expanse of grass around it. What a difference from the sidewalks and cement of downtown! As one drives from the business area to the residential area of a city or town, the carpet of green around each home rests the eyes and relaxes the spirit.

Lawns do need some care, however, and a well managed lawn requires a good sprinkler system. One inch of water per week, or a total of 22 inches during the growing season is needed. This means that, in addition to normal rainfall, approximately 12 inches is required from a sprinkler system to maintain a lawn in a healthy vigorous condition.

The first step in considering a sprinkler system is to become familiar with the component parts. These are: (1) a pressurized water supply; (2) underground piping to transport water; (3) sprinkler heads to distribute the water; (4) valves to control the application of water. Each component is dealt with in more detail below.

(1) Pressurized Water Supply

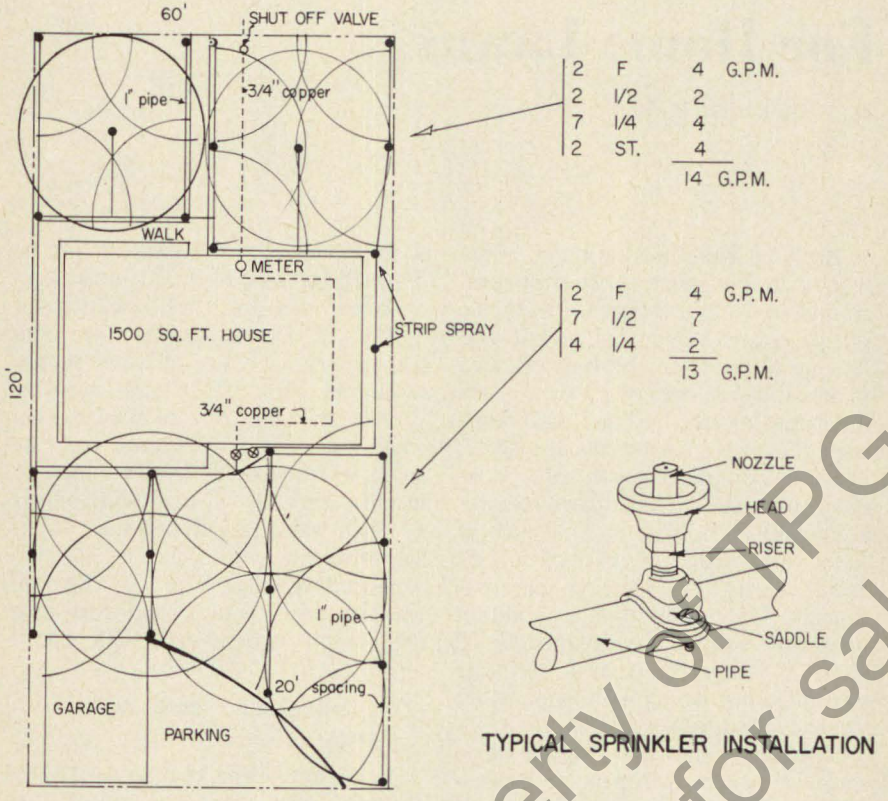
The standard one-half inch water service on a home lot is too small to operate a sprinkler system efficiently. A minimum size of service should be 3/4-inch for 2,000 - 3,000 square feet of landscaped area; and one-inch for 3,000 - 5,000 square feet of landscaped area. The size of water supply should be chosen to fit the sprinkler system and this can only be done when the system is designed prior to any construction. If you attempt to install a sprinkler system with only a 1/2-inch water service, sprinkler coverage problems will occur. The 3/4-inch water supply will provide 12 - 15 g.p.m. (gallons per minute), and one inch will supply around 20 - 25 g.p.m.

(2) Underground Piping and Accessories

For home lawns, the standard polyethylene plastic pipe is quite satisfactory. The minimum size necessary is 3/4-inch or 1-inch, to keep pressure losses to a minimum. The pipe should be placed in a trench at a depth of 6 - 8 inches. Saddles and risers (nipples) are attached to the pipe to transfer the water from the pipe to the heads.

(3) Sprinkler Heads and Nozzle Tips

The pop-up head is recommended for lawns as it allows the sprinkler



TYPICAL SPRINKLER INSTALLATION

TYPICAL SPRINKLER REQUIREMENTS FOR A RESIDENTIAL LOT.

spray to clear the tips of the grass.

There are many types of nozzle tips which may be used on home lawns. These are: standard spray (circular or square pattern); stream spray (circular); strip spray (rectangular). Heads are also available to provide part circle or square patterns. The stream spray heads will cover a larger area than the standard heads under the same pressure.

The approximate application rates for various heads are listed as follows:

Standard, full circle 2.0 g.p.m. at 25 p.s.i., coverage 24 feet diameter

Standard, half circle 1.2 g.p.m. at 25 p.s.i., coverage 12 feet radius

Stream spray, full 1.9 g.p.m. at 25 p.s.i., coverage 40 feet diameter

Strip spray 1.2 g.p.m. at 25 p.s.i. coverage 6 x 34 feet.

Spacing of heads may be 20 feet for stream spray heads and 15 feet for standard and strip spray heads.

(* p.s.i. Pounds of pressure per square inch.)

(4) Controls – Valves, Blow-Out Assemblies

Valves are required in a sprinkler system as water services are generally too small. The area is divided into sections, with a valve to control each one. Blow-out assemblies, wyes, and tees are necessary to blow out the lines in the fall, to ensure that no breakage occurs from winter frosts.

DESIGNING THE SYSTEM

An accurate plot plan to scale is required before commencing to design the system. Indicate the location of shrub beds, garden area, trees, and lawn area on such a plan.

The next step is to place the heads where required, keeping in mind that complete coverage should be the ultimate goal. Flower and shrub beds may be watered separately from the lawn area which will require extra pipes and fittings. Draw out the pattern of the heads, using a compass.

The sprinkler system may be sectioned off by means of valves. Generally speaking, two valves are sufficient, one for the front and one for the back lawns. Each section should have similar total water application rate as expressed in gallons per minute.

A typical layout of a sprinkler system with coverage is shown on the attached plan and may be used as a guide in preparing preliminary plans.

Consult with local sprinkler system dealers for information on availability of materials and for guidance in installation.

A well-designed underground sprinkler system will do a more uniform job of distributing water onto the lawn – and much more easily. Proper designing, along with a good installation job, will ensure this overall result.

"FLOWERS are loveliest where they grow,
Love them, enjoy them, but leave them so.
Jewels of sunshine, gems of shade —
Why do you pick them, to wither and fade?
Flowers are loveliest where they grow,
Love them! Enjoy them! But leave them so!"

F. M. Bonner

Allium

The allium genus is that peculiar clan which includes smelly alimentary species like onion, garlic and chives and decorative ornamental species which add a new dimension to the floral splendors of the garden from May to July.

Although more or less alike in form and flower, they provide infinite variety of color and size for the gardener to choose from, from purest white to the deepest purple as well as cream, yellow, pink, red, and blue. The smallest allium is only a few inches tall while the tallest soar over two feet and you can have alliums blooming freely in the garden from May into July.

Their lovely flowers are massed together in a ball which is solid or tasselled. These hardy bulbous plants will thrive anywhere and live forever. They flourish in ordinary soil in full sun or half shade. They are some of the easiest bulbs to grow. Just plant them in the Autumn covering the bulbs two or three times their own depth. Smaller varieties can be planted two inches apart and the taller ones about six inches apart. Then all you have to do is wait for the abundant flowers to appear. The bulbs need not be lifted and replanted until they become overcrowded and the flowers tend to become sparse. They will spread freely without special attention.

Allium aflatunense carries dense round heads of lovely purple-lilac starry flowers in late May and grows two or three feet tall. It is a good variety for the border and is a long-lasting flower. A. karataviense, first introduced from Turkestan in 1876, is a distinctive species with broad, flat and mottled leaves. The scapes are only eight inches tall but they bear dense umbels of gorgeous pink to rose-colored flowers from about mid-May and bloom profusely for a long time. Excellent in the rockery, they also do well in pots. A. rosenbachianum, from Bokhara, is a very large species with stems all of three feet tall and produces massive heads of purple-lilac flowers in May and into June. It is particularly striking when grouped near rhododendrons or inter-planted with ornamental trees. All the following species flower in June.

A. albopilosum from Turkestan produces large heads, up to ten inches in diameter, covered with star-shaped lilac flowers with a metallic sheen. The handsome plants, all of two feet tall, look superb en masse and are favorites with flower arrangers. Another charming two foot tall species is A. azureum from the Altai Mountains with compact heads of lovely cornflower-blue. Only half the height but an old garden favorite is A. Moly or "Golden Garlic" from southern Europe, fine for naturalising as it spreads rapidly. It produces compact umbels of bright yellow flowers set off by broad, glaucous leaves.

A. neapolitanum grandiflora, also 12 inches tall, is distinguished by its mild scent. In southern Europe, it is grown extensively for cutting but is also splendid when naturalised and can be grown in pots under glass. It boasts big beautiful white flowers grouped in loose umbels.

Among the latest to flower, in July, are A. sphaerocephalum with handsome heads of crimson maroon on two foot stems and A. pulchellum, with pyramidal-shaped heads of violet-pink flowers emerging from pointed buds on sixteen inch stems.

The so-called Autumn Crocus is also called "Wonder Bulb", as it will bloom from the dry bulb without soil or water if placed on a window-sill or desk. Often it is in bloom when still displayed for sale in garden centres, or soon after arrival.

Actually this fine flower, although it does resemble a crocus, is not a crocus but is a member of the lily family. Bulbs are usually available in August, and must be planted as soon as obtained, or immediately after they have finished blooming.

The bulbs should be planted 3 to 5 inches deep, and because the floppy leaves which appear in spring should be allowed to ripen undisturbed, the location of the planting should be marked, so that when the garden is dug at that time, the bulbs will not be damaged. A good, well-drained soil is required in a sunny or semi-shaded location.

The flowers, either in single or double form, are rose, mauve, purple or white in color, a number to each bulb, and they resemble crocus. One of the best varieties to grow is "Water Lily" which has enormous fully-double flowers of a rosy-mauve color. "Violet Queen" has deep purplish-violet colors with white centres.

In some parts of the world the Colchicum is grown for medicinal purposes, the corms collected during the summer, sliced and dried. The poisonous material obtained from them is used by plant breeders in order to cause dwarfing of plants. If the pollen or egg cells are treated with Colchicine, very often the plants resulting from this seed treatment become giants in size.

Gladiolus Thrips

A. J. KOLACH

The summer of 1974 has been an ideal one for development of the gladiolus thrips in many areas. No doubt the hot weather during most of early and mid-summer created an ideal situation for a build-up of several generations of these insects. Consequently, the severity of the damage to glads from their persistent feeding was extreme. It is fairly well recognized that thrips on gladiolus are an annual threat to the proper growth and development of the plant. Basically, the insect is quite small and therefore often goes unnoticed. The unthriftiness of the plant is usually the first sign of their presence and often a bit too late.

Plants attacked — gladioli, iris, lilies
Type of injury — three types

a) foliage assumes an unhealthy, silvery appearance and eventually turns brown.

b) flowers become deformed and assume a spotted appearance. Often there is a lack of bloom associated with heavy infestations.

c) corms become sticky with rough surfaces. Germination of corms can be affected and resulting plants lack vigor and may not produce flowers.

Life History and Appearance

Adult thrips are very small and slender being only about 1/16 of an inch long. Eggs are laid in tissues of the growing plant. After a week the eggs hatch into very tiny yellowish nymphs. Complete development from egg to adult can be as rapid as two weeks under ideal weather conditions. The adults overwinter on corms in storage.

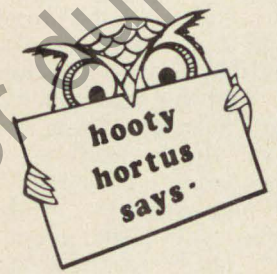
Control

Corms, either when stored or purchased, should be dusted with an insecticide prior to setting out. This will prevent an early build-up of the thrips, however, this is not in itself a complete control, because thrips from other nearby gardens can move in during the summer. An effective corm treatment is dusting with 5% Sevin dust. This can be done in a paper bag where shaking of the corms and dust will ensure good distribution and coating of the dust on the corms.

During the summer, when leaves and flowers show signs of thrip damage, or when the tiny thrips are seen, a spray of malathion at the rate of three teaspoons of 50% liquid formulation per gallon of water will provide effective control.

The keen gladiolus fancier will know all about thrips, and will be using a treatment schedule, such as suggested, to keep his glads in a healthy state. The new gladiolus grower may be reluctant to use an insecticide until an experience with a thrip problem convinces him/her of the seriousness of the pest.

To be sure of growing thrip free glads it is important to be able to recognize the insect or its damage and to begin a control method as early as possible, preferably starting with the corms either in storage or before they are set out. There is no doubt that this pest under favorable weather conditions can seriously impair proper growth and development of glads, and the grower has the means at hand to deal with them.



The Ixiolirion belongs to the same family as the Amaryllis, and originated in Syria. It is one of the last blooming bulbs in the spring. Like most spring-blooming bulbs it should be planted in the fall about 3 inches deep, and 3 inches apart for best effect. They prefer a sunny sheltered location, and light well-drained soil.

The plants grow to 12 inches in height and produce a tuft of narrow, grasslike leaves. The flowers are produced on slender, wiry stems about 18 inches long. The flowers are tubular in shape and the most popular variety, I. montanum "Pallasi", has lovely deep blue flowers, others have a lighter blue.

The Ixiolirion are reproduced by making use of the small bulbs or offsets found around the old bulb.

In our part of the country a mulch over the bulbs in the fall after planting will assist in providing some protection during the winter and tend to keep the soil from drying out. The bulbs are quite inexpensive to buy, but should be purchased as soon as available in the fall and planted in good time.

The Ixiolirion is not too well known but it is worthy of being grown by more gardeners.

Canna Lily

ROGER BROWN

The Canna Lily, if grown properly, is a very stately looking flower. They like a lot of water and a well-enriched soil; a sunny position is preferred if they are to be grown well.

There are several varieties on the market today, giving us a wide choice of colour and height. The height will range from the smaller Phfitzer Dwarf strain of three feet to the taller Wyoming and Kate which will grow to a height of seven feet. One of the older, and still the best red, is President. This variety will grow four to five feet high, with large green foliage which by late July will produce a big red flower head. A new variety, with the same growth habit as President but with a pink flower, is Rose Cavallier.

Cannas, when dug in the fall, should be left with the soil on the root for three to five weeks, and stored upside down in the basement. This will enable the roots to dry slowly, as it is important that they do not dry too much or too fast. When they are dry, the soil should be cleaned off and, using a sharp knife, cut up, making sure that each division has a good eye on a substantial rootstock.

One of the best methods of storing is to dust them with sulphur and pack them in dry peat-moss. Using a black plastic garbage bag, put a layer of peat-moss in the bottom and then a layer of the cleaned roots; continue in this manner until the bag is no more than two-thirds full. Leave the top of the bag open and make a regular check to see if they are drying out too much, if you find this is happening, close the bag a little. Keep them in a cool part of the basement, a temperature between 40 to 50 degrees will keep your roots in excellent condition until planting time.

The planting can be started at the end of February or the first two weeks of March. Four or five inch pots are ideal for planting in. Put one good root to each pot using a regular soil mixture. The eye should be no more than two inches below the soil level. Water sparingly until growth has started, once the plants show signs that they are growing, regular watering is needed so that they are always moist.

Only when the danger of frost is over should you plant them outdoors as they freeze very easily. The planting distance will vary depending on the variety you are growing; the smaller Phfitzer strain can be planted about fifteen inches apart, while the taller

President and Wyoming or Kate should be planted eighteen to twenty-four inches apart.

After they are planted out into your flower beds they will require a great deal of water. If they get this and lots of sunshine, you should have no trouble in growing some very good Cannas.

VARIETIES

President — Red — four to five feet
Rose Cavallier — Pink — four to five feet
King Humbert — Red — four to five feet
King Humbert — Yellow — four to five feet
Richard Wallace — Yellow flecked red
Wyoming and Kate — five to seven feet, good for background. Large bronze foliage with small orange flower.
Phfitzer Dwarf Strain — Primrose Yellow — three feet
Phfitzer Dwarf Strain — Cherry Red — three feet
Phfitzer Dwarf Strain — Chinese Coral — three feet
Phfitzer Dwarf Strain — Shell Pink — three feet

WHAT A TREE THINKS
(North Dakota Outdoors: March 1844)

Of all the things that I might be
I had to be a lousy tree,
A tree that stands out in the street
With little doggies 'round my feet.
I'm nothing else than this, alas,
A comfort station in the grass.
I lift my leafy arms to pray,
Please, little doggie, go away!
A nest of robins I must wear
And what they do gets in my hair.
Of all the things for me to be
I had to be a damned old tree!

American Elm
Ulmus americana

This tree has been considered the leading shade throughout its native range. Its growth habit gives it a most distinctive umbrella shape. Its steady growth, long life, relative drought resistance winter hardiness and ease of propagation (seeds) are factors favoring its usage not only as a shade tree but also as a shelterbelt and boulevard tree.

Dwarf Iris

MALAK

Most gardeners are familiar with Dutch, English and Spanish iris but the dwarfs of the clan which flower months before their bigger sisters, provide the richest colors of all hardy spring flowers and are as enchanting as butterflies but are rarely cultivated in Canadian gardens.

Yet they are remarkably easy to grow. The secret of cultivating them is simply to keep them moist while they are growing and dry and warm during their summer resting period. For maximum impact they should be planted in autumn about four inches deep and four inches apart in semi-shaded positions where their rich colorings are more pronounced and their flowering period lengthened.

The easiest dwarf iris to grow indoors are the reticulata and danfordiae species. Plant the bulbs in pots in October two to three inches deep and about three inches apart, using any good potting compost. Place the pots in a garden plunge or cool cellar for eight weeks before bringing them into the living room, where temperatures should not be allowed to exceed 50-55°F. For a few days after bringing iris in from the plunge or cellar, cover them with tissue paper to facilitate their gradual adjustment to light.

There is a wide choice of dwarf iris available to Canadian gardeners. I. bakeriana from Asia Minor has slender lavender-blue standards and unusually marked falls of ivory heavily dotted purple, is about four inches tall, has stiff leaves distinguished by eight ribs, and flowers early in February.

I. danfordiae from Eastern Turkey has slightly scented lemon-yellow blooms with dark green-grey spots down the throat. The dainty flowers on three-inch stems appear in late February, last well even in bad weather. The bulb frequently produces many little offshoots which themselves flower in three to four years.

I. histrioides major from Northwest Persia boasts pure royal-blue flowers with a golden crest on three inch stems, flowering as early as January. It does well in rockery nooks or terrace plantings and can be grown in pots or pans in the alpine house.

The fragrant I. reticulata with rich velvety blue-purple blooms with an orange-gold splash on the falls appears from February on five inch stems. It has long, stiff, erect filiform leaves with four ribs. Native to Southern Russia and Persia it is ideal in a rockery, combines well with I. danfordiae, and can be easily grown in pots indoors. Among the named reticulata hybrids available are:

Cantab, four inches tall, cobalt-blue standards and deep blue falls with orange tongues.

Clairette, six inches tall, clear violet-blue standards with ivory falls marked gentian-blue.

Joyce, five inches tall, uniform clear blue with ivory tongues.

J. S. Dyt, six inches tall, reddish-purple with sword of orange on falls.

Hercules, five inches tall, bronze with orange blotch on falls.

Springtime, six inches tall, soft blue standards, violet-purple falls.

Wentworth, six inches tall, purple-blue standards, pansy-violet falls with yellow blotch.

Odd flower out is I. tuberosa, officially reclassified as Hermodactylus tuberosus, but it has been cultivated since 1574 as the "Snake's Head Iris" or "Widow Iris". It produces a green velvety flower speckled purplish-brown on eight to ten inch stems from April. It is grown exactly like other bulbous iris and the narrow almost tuberous bulbs can also be grown indoors in pots for February or March bloom.

Basswood

Tilia americana

A medium to large tree native in the eastern part of the northern plains. The ovate leaves are quite large up to 6 inches in diameter. This species makes an excellent shade tree provided that moisture is adequate. It is characterized by fairly good autumn coloration.

PHOTOGRAPHIC CREDITS

Malak — Pp. 23, 33, 34, 35, 64, 65, 73, 75, 78, 79, 89, 111.

F. Weir — P. 36
W. H. Gray — Pp. 37, 38, 39, 40
F. Stan Gugin — Pp. 40, 41, 48
E. W. Toop — P. 42
H. H. Marshall — P. 43 (bottom)
G. W. Malaher — Pp. 43 (top), 44, 45
J. Walker — Pp. 45, 46, 47

We Are Looking For Authors

The Prairie Garden Committee is looking for authors who are interested in writing articles for the Prairie Garden. We like articles from amateur gardeners telling us about their gardening experiences. They may cover any phase of horticulture such as house plants, ornamentals, flowers, fruits or vegetables. Articles on nature, wild flowers, birds and insects will also be considered. Where possible, black and white pictures will help to make the article better and improve the image of the Prairie Garden.

The Prairie Garden is a labor of love. Authors will receive a complimentary copy of the Prairie Garden issue in which their article appears. They will also know that they are contributing to the value of this publication.

So, if you like to write, or know of someone who does, let's hear from you. Send your contribution to The Editor, c/o The Prairie Garden, P.O. Box 517, Winnipeg, Manitoba, R3C 2J3.

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Plants are the most important things in the world. They provide the one means of synthesizing energy. On them all life lives. And, production is a precarious undertaking.

"Sunshine is delicious, rain is refreshing, wind braces up, snow is exhilarating; there is really no such thing as bad weather, only different kinds of good weather." — John Ruskin

"We need a tonic of wilderness, to wade sometimes in the marshes where the bittern and the meadow-hen lurk, and hear the booming of the snipe; to smell the whispering sedge where only some wilder and more solitary fowl builds her nest, and the mink crawls with its belly close to the ground.

"At the same time that we are earnest to explore and learn all things, we require that all things be mysterious and unexplorable, that the land and sea be infinitely wild, unsurveyed and unfathomed by us because unfathomable.

"We can never have enough of nature!"

Henry David Thoreau

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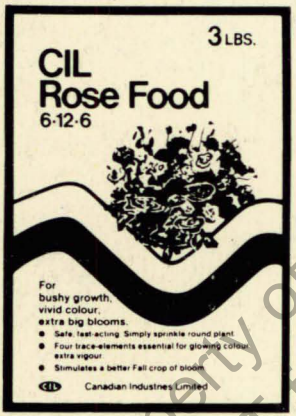

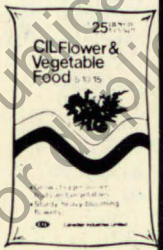

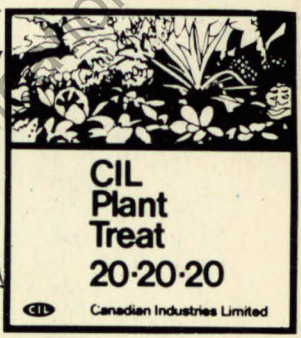

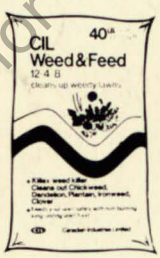

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