THE 1978 PRAIRIE GARDEN

Western Canada's Only Gardening Annual

SPECIAL COLOR SECTION

Gardening Hints for Everyone

$3.00

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The Prairie Garden

WESTERN CANADA'S ONLY GARDENING ANNUAL

WRITTEN BY AND FOR WESTERN GARDENERS AND HOMEOWNERS

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FLORAL ARTISTRY FOR BEGINNERS

Be an Artist with Flowers

YOU, TOO, can be an artist — not with paints and brushes — but with flowers. All you need are a few basic ingredients: the flowers, containers (which can be anything from a vase to a bean pot or jelly jar), holders . . . and a copy of "Floral Artistry for Beginners."

Written and illustrated by Fran Partridge, one-time farm wife and Manitoba painter who specializes in florals and portraits, and Evelyn Scarth, herself a prize-winning gardener now living in Victoria, B.C., this 36-page booklet explains how to go about it. Its simple instructions and clear illustrations make it easy to create the kind of artistic flower arrangements you've always admired.

It also contains a section that explains four different methods of drying summer flowers for wintertime pleasure.

"Floral Artistry for Beginners" is published by the Manitoba Horticultural Association and costs $2 a copy which includes postage and handling. Orders of ten or more books may be obtained for $1.50 each. Write Floral Artistry, P.O. Box 517, Winnipeg, Man. R3C 2J3 (no c.o.d. orders) for your copy. — *Reprinted Courtesy The Country Guide*

SEND FOR YOUR FREE

Prairie Garden Index, 1967-1977

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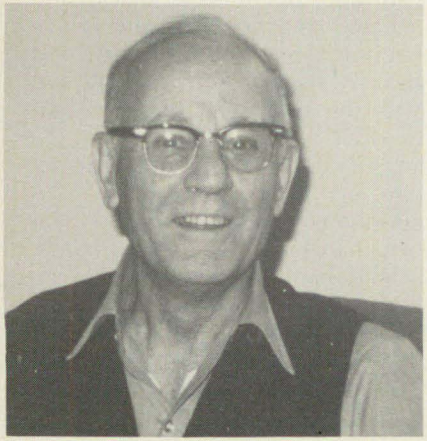
The index is a complete listing of articles, grouped under common headings, which have appeared in The Prairie Garden from 1967 to 1977.

David R. Robinson



by A. G. ROBINSON
Dept. of Entomology
University of Manitoba

Dave Robinson of Saskatoon, well-known prairie extension horticulturist, and frequent contributor to the Prairie Garden, died on June 9, 1977, at the age of 71 years. The esteem in which he was held by fellow workers and associates was recognized by honorary life memberships in the Saskatoon Horticultural Society, Saskatchewan Horticultural Association, the Saskatchewan Agricultural Graduates' Association, the Western Canadian Society for Horticulture and the Canadian Society of Rural Extension. In his honor, the Saskatchewan Horticultural Association established in 1973 the David R. Robinson Award in Horticulture.

Dave was born in Belmont, Manitoba in 1905, coming to Saskatchewan in 1906. Public and High School education was obtained at Wooler Rural School and Buchanan High School, and in 1928 he graduated in Agriculture from the University of Saskatchewan. For the next ten years he worked for the Department of Horticulture (at almost no salary because of the depression), sold nursery stock for Weaver's Nursery, did part-time farming and, in spite of the adversities of the depression years, maintained a cheerfulness and a continuing interest and faith in prairie horticulture. After Active Service with the Royal Canadian Artillery from 1941 to 1943, his abilities were finally rewarded with an appointment as Horticultural Specialist with the Extension Department of the University of Saskatchewan and, eventually, to a position as Associate Professor of Horticultural Extension.

His work with the horticultural societies in Saskatchewan is well-known, and during his twenty years with the University the number of active societies increased from 13 to 41. Due mainly to his efforts are the mailing services — the Gardener's Guild, and the quarterly — the Gardener's Bulletin. At one time the mailing list for the Gardener's Guild included 3,200 names, extending to all parts of North America and beyond. There were ten mailings a year. In addition, Dave acted as Provincial Secretary to the National Farm Radio Forum from 1949 to 1959; since 1944 as Secretary to the Provincial Fruit Show; and from 1952 to 1973 as Secretary-Treasurer to the Saskatchewan Horticultural Association. He was much in demand to judge at regional or Society fruit, vegetable and flower shows, and countless miles were travelled in the summer and fall to attend these shows. And many more hours were spent instructing at horticultural short courses throughout the province.

It is difficult to decide where his main interests were, but they probably inclined towards fruit growing on the prairies, especially apples. Dave owned a vacant lot on Temperance Street, next to his home, which was a veritable jungle of individual experimental plants of fruit, vegetables or ornamentals. As one walked through this garden with him he could tell you where he had obtained each plant, varietal names, and the special virtue of the cultivar which had interested him. Usually it was something very hardy and drought-resistant. For several recent years he maintained an active personal program of breeding and selection of new lily varieties.

In addition to his horticultural interests, he was an organizer and secretary of the Saskatoon Boys Pipe Band, at one time active in the work of Cubs and Scouts, elder of his church and, just prior to his retirement, he developed a deep interest in archeology. Not many persons know that during the last few years of his life he underwent at least six major operations for a serious illness. Despite his short stature he had tremendous stamina, and a determination to live, which helped him to "recover" after each operation. Even after his last operation, he was making plans to go out with the Saskatoon Archeological Society on their next "dig". Dave Robinson is an inspiration to all who are interested in the propagation of fruit, vegetables and ornamentals on the prairies, and he will be sorely missed.

When green tomatoes have been left on the plants in the late summer garden until they have been subjected to much below 10°C (50°F) for any extended length of time, proper ripening will not take place even though they are taken into the house and held at ideal ripening temperatures.

So next year, remember, don't wait until the nights get too cool before picking the green tomatoes still left on your plants, for ripening indoors. The best ones to choose are relatively mature fruit with a bright waxy appearance.

Thirteen°C (55°F) is an ideal temperature for gradual ripening over a period of from two to six weeks. Light has nothing to do with this ripening process but by increasing the holding temperature up to a maximum of 21°C (70°F) you can speed up ripening.

New Methods of Tomato Growing

WILLIAM EMERSON
Government House Greenhouse,
Winnipeg

Many changes in tomato varieties have taken place in the past years, along with new methods of culture.

Tomato plants are native of the tropics where ample moisture and heat is available and so here on the prairies we must provide them with these needs. We should remember that for every time a tomato plant is exposed to a temperature below 8°C (45°F) one week will be lost in fruiting. The biggest mistake the average grower makes is starting his plants too soon; also planting them in the garden too soon. The first and second week in June is often early enough for outside planting. Wait until night temperatures hold above 8°C.

After seeding the seeds about mid-April keep seeds at temperatures of 21°C — the top of the refrigerator is a good place; place pots in plastic bags until seed germinates. The plants should be kept warm and not allowed to dry out nor to become sodden with water. As soon as seedlings are large enough, they should be transplanted to small individual pots planted with seed leaf just below the surface. When they have outgrown the pot, they should be moved again to larger containers, such as large juice cans. Cut the sides from top to bottom and bind with wire to make it easy to transplant to the garden; also 'three-quart' milk cartons make excellent containers with a few holes cut in the sides near the bottom for drainage. At every transplant, plant an inch or two lower than the last time. Tomatoes are stem rooters and the more stem in the soil the larger the root system will be.

Tomatoes can be kept outdoors in warm weather, but brought in to a warm place if cold weather threatens. Container-grown plants may be in flower or have fruit on them when planted in the garden. For those of you who buy your plants, a good plan is to buy them early and plant them in containers as above, until spring planting-out time is right. Bought plants should have good green stems; purplish stems indicate chilling and plants may not respond quickly. Tomatoes do not have to be frozen to be injured.

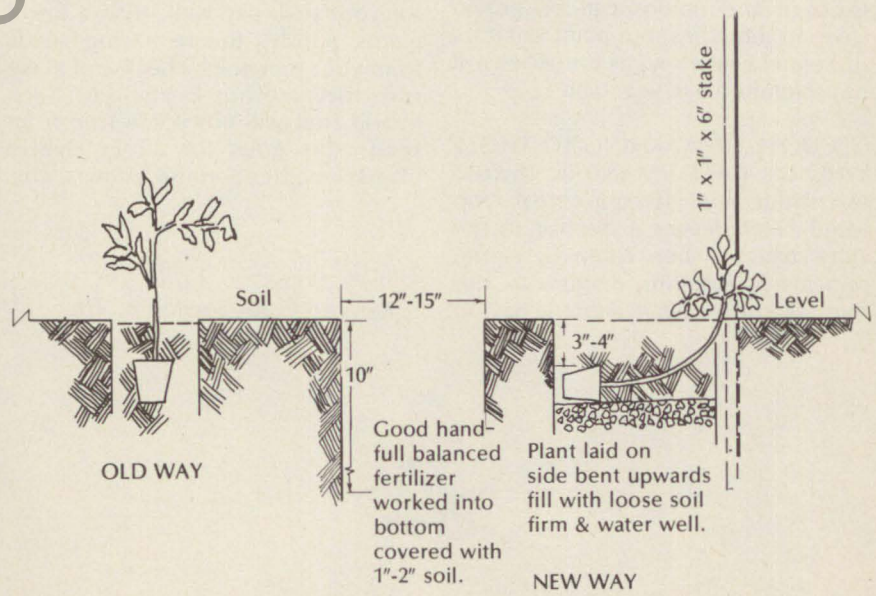
Planting in the Garden

The site should be sunny, but try to avoid the south side of a garage or building as the extreme heat will burn the fruit and also the soil dries out quickly.

A rectangular hole rather than square should be dug about a foot deep and 12 to 15 inches long; eight to ten inches wide. The taller the plant, the longer the rectangle should be. Work a good fistful of balanced fertilizer into the hole. Cover with a couple of inches of soil; remove plant from container (if using juice can, cut wire, fold out) If plant is allowed to dry out to almost wilting stage, it will bend easier without breaking. Place plant on its side with soil ball furthest away from you in hole with top to the stake. About two-thirds of the plant should be in the hole; fill with loose soil; firm with foot; water well. Leaves which will be covered with soil may or may not be removed. Plants should be two to three feet in the row. (See illustration for planting details.)

Moisture

Tomatoes must be kept moist at all times for a good fruit set. Syringe plants and flowers with water daily. If tomatoes become too wet, then dry, blossom end rot is induced which is not a disease, but a symptom of lack of care. (Blossom end rot is the black spot that appears on the blossom end and gradually increases in size, spoiling the fruit.) Lack of even moisture also brings on cracking of the tomato



as it bursts its skin with every heavy flush of water.

Staking

Where slugs are a problem, staking is a 'must'. Staking tomatoes is preferable to allowing them to grow bushy. You will obtain less tomatoes with staking but more ripe ones. Pruning is easy if done weekly. All that is needed is to remove the sucker or branching growth that appears at the base of a leaf near the main stem. Always tie main stem to stake just below fruit set. Do not remove leaves from main stem. Each plant should set up to five to six trusses of fruit. Top the plant in late August, that is, cut the growing top out of main stem.

Marigolds planted with tomatoes provide a bonus. Not only do the tomatoes bear more fruit, white fly is also kept off the tomatoes. Marigolds planted along the border of the vegetable garden add color. Cauliflower, cabbage and onions can be grown close to tomatoes, but plant Kohlrabi or Fennel well away, as tomatoes will not tolerate these vegetables.

A NOTE OF WARNING TO THOSE WHO USE CATTLE MANURE: The use of trichlor acid (TBS), a cereal crop weed killer, leaves a deposit in the straw which, when eaten by cattle, remains in resulting manure — nothing is known what effect it has on

meat and the milk of the cattle. The use of manure from cattle who have fed on trichlor bensoic acid is **fatal** to tomatoes and it will remain despite efforts to clean up the soil and will continue to kill tomatoes for many years after use. Before using manure, check to make sure above chemical has not been used.

It is better to grow enough plants for your own use well, than a lot of plants poorly. Before saving seeds from your tomatoes, check and make sure they are not F_1 Hybrids. Such hybrid fruit will not come true from seed; this goes for all F_1 Hybrid plants, whether petunia, zinnias, etc.

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

Short Courses and Field Days

THOMAS B. KRAHN
Alberta Horticultural Research Centre

Those horticulturists who do not maintain a constant day to day association with horticultural researchers or extension specialists, can be easily left behind by rapidly changing horticultural knowledge and technology. For this reason and others, most research institutions conduct regular mass extension programs using such tools as Field Days and Horticultural Short Courses.

Field Days

Field Days can be designed to do many things, but the primary objective is to supply the everyday citizen with up to date ideas, information on new varieties, and exposure to new production techniques.

To illustrate this point, consider the Alberta Horticultural Research Center's Annual Field Day; a well-planned, major event for Alberta horticulturists. This field day, held the last Friday in August every year, offers tours of research plots, displays of varieties, equipment and demonstrations of such topics as flower arranging, pruning and house plant care. Every visitor has an opportunity to participate, to talk to research scientists and to have specific problems answered.

Specialized field days are also common, e.g. Nurserymen's field days, Vegetable Growers' field days, etc. These days are directed, of course, at specific industries and would not be of great value to the average amateur horticulturists.

Short Courses

Short courses are used in much the same manner as field days in that they attempt to extend research information. Generally held in the winter, they deal with very specific topics such as making best use of your home greenhouse or market garden. Topics are limited only to the research and extension staff available.

Short courses are convenient and scheduled to the participants' requirements. They may be short (one evening), or relatively long (one week). A popular approach is every Tuesday evening for four weeks. Short courses are only offered when there is a demand for them.

Are Field Days and Short Courses valuable; do they provide the necessary service?

Success varies with each event conducted but, without a doubt, they are two of the more effective means of providing the amateur horticulturist with up to date horticultural information.

The next time your research institution advertises a field day, go and see for yourself. I am sure you will agree it is time well spent and that you do indeed pick up one or two new ideas, making Field Days and Short Courses all worthwhile.

Junior Gardening

EDWARD SHAW
Winnipeg

Junior gardening offers much enjoyment to the enthusiast. From my garden, a mere 10' x 12' plot, I get much more than the obvious vegetables and flowers. I get the satisfaction of watching seeds, planted by my own hands, grow into plants to bear bloom and vegetables. But to achieve this, much work must first go into the garden. From my years of junior gardening, I offer these tips to the new junior gardeners, which I hope will help them in their gardens.

1. Before actually getting started on your garden, plan out what you are going to plant, how many rows of each, and how they are going to be placed in the garden.

2. Dig the garden with a fork, making sure all the lumps of soil are broken up. This year I had a lot of trouble with exceptionally hard lumps that wouldn't break up. If this happens to you try, as I did, watering the lumps and then hitting them with a hoe. Perhaps sand or peat moss can be added to keep the soil loose. Roots will not develop properly if the soil is not cultivated.

3. To obtain straight rows, tie a piece of string between two sticks and place sticks at the ends of the row. Now just pull the hoe along the string to the depth specified on the seed package.

4. Do your planting on a day when there is not much wind, otherwise your seeds might not end up where you had intended them to be. Don't be too sparing with your seeds. You can always thin your plants, but it is not easy to transplant. If you are using fertilizer, don't let it come in contact with the seeds.

5. Within a week or so the seeds sprout up. Remember to keep the garden cultivated, weeded and watered.

6. Keep the plants thinned out, especially beets and carrots, unless you are purposely growing some thick. In our Horticultural Society Shows we have a category in which figures are created from vegetables. Each year I leave a small part of a row of carrots unthinned. When it comes time to enter into the Show, I have all sorts of twisted and humorous carrots with which to work.

At first the garden looks so barren, with only a few marker sticks standing where the future rows will emerge, but finally your efforts are rewarded with beautiful flowers and crisp vegetables. Nothing can quite compare to the taste of a carrot right from the ground!

Another rewarding experience is the competitions at a horticultural fair. Try to get your entries of uniform size and freshness. Remember it's not always the biggest vegetables that win. It takes a bit of effort to prepare for a horticultural show, but in the end it is all worth while. It gives the junior gardener a great feeling of accomplishment to see that red ribbon on his plate of beans or vase of marigolds. It is an experience, I think, that should be enjoyed by all who have the opportunity to own a garden.

In choosing hardy flowering perennials for your garden border give thought to their flowering periods as well as their beauty.

A number of lovely herbaceous perennials on the basis of their flowering periods are: May to June — bleeding heart, oriental poppy, globe flower.

June to July — iris, peony, columbine, painted daisy, campanula.

June to August, — lychnis, monarda, coral bells, delphinium.

Late August to October — garden mums, asters, and Michaelmas daisies.

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.

Flower Arranging Without Inflation

FRANCES SMITH
Member, Winnipeg
Horticultural Society

In these days of ever rising costs it is nice to know some hobbies can be enjoyed with very little expense. Flower arranging is one of them

Containers

Containers, ornaments, etc. may be picked up for a few cents at a second-hand store, thrift shop, or one of the increasingly popular garage sales, and it is surprising how many good containers can be found around the home — jam pots, colorful coffee mugs, teapots, cups and saucers — the list is endless.

Flower Frogs

Window stripping for sealing out the winter's cold makes quite a good florist clay for holding flower frogs in place in the containers. A gentleman I know makes his own flower frogs by hammering galvanized roofing nails (they won's rust) into pieces of hardboard the size and shape he requires. He fastens these to his containers with florist's clay.

Local Grasses etc.

Don't forget interesting weeds, driftwood, unusual branches, seed pods, stones, shells moss, etc., any of which may be picked up when you are on an outing. Grasses and other materials may be picked from the roadside and ditches. If you are interested in flower arranging, or would like to become interested, you will always be on the lookout for anything unusual.

Research

There are many books in the public library on all aspects of this hobby — interesting, informative — you will enjoy browsing through them and will pick up many helpful hints. Also, there is a new flower arranging booklet out "Floral Artistry for Beginners", which covers all the basics and is reasonably priced.

I haven't said anything about the flowers themselves so far. I hope you have room to grow a few for fresh cut flowers. Many may be dried successfully, and will last for quite a long time. Flower arranging groups present an opportunity to exchange ideas, make new friends, and learn more about the art of arranging flowers. To enjoy this pleasant hobby, expensive containers and flowers are **not** needed.

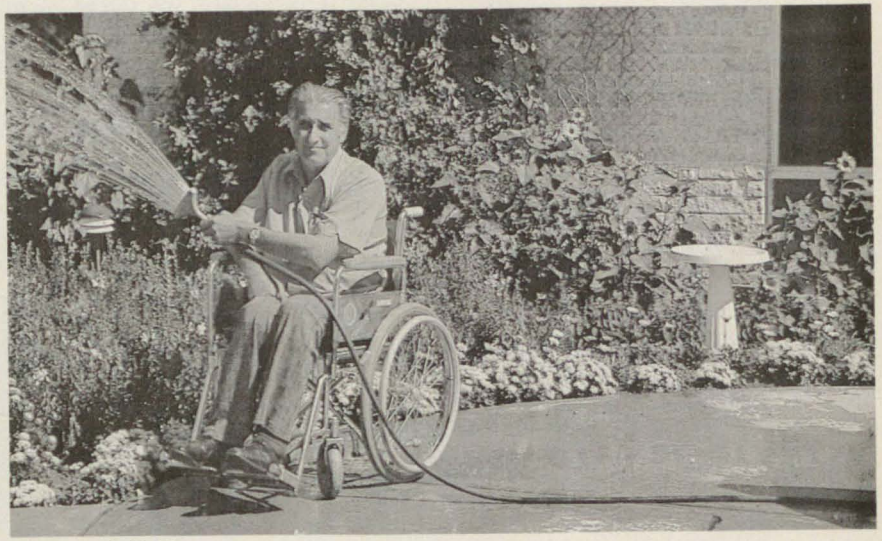
Therapeutic Effects of Horticulture

LORRY GANS
Director,
Manitoba Horticultural Association

What a pleasure it has been to interview Mr. Joseph Sidak a resident of the Lutheran Personal Care Home, and be able to share with you how horticulture has fulfilled and become an interesting part of his life.

Joe was born in the Interlake district of Manitoba in the town of St. Martin. As a young boy, after his father died, it was his responsibility to maintain things in an orderly fashion around the farm. When he was ten his family moved to Winnipeg and Joe was soon busy doing odd jobs as a grocery boy, but always concerned and concentrating on living and growing things about him.

In the late thirties, as an employee of the Canadian National Railways, and probably because of his love for



Mr. Joseph Sidak

plants, he was offered a position in the greenhouse to supply flowers and bedding plants to the many stations from the lakehead to points west.

In 1945, Joe became ill but continued with this work between visits to the Rehab Hospital in Winnipeg, however, when confined permanently to a wheel chair in 1950 he returned to St. Martin to live with his sister. Despondent — Never!! He was again to be close to the land he so loved, and his job now was to look after the garden. Yes, pick peas, gather beans, and even hoe and cultivate the potato patch. The only vegetable he could not harvest was cabbage, not for lack of energy but only because it matured later in the fall and the cold weather did not permit him in the fields.

Cars would often stop when passing along the road-way and people would ask Joe if he was in need of help, only to be told, with thanks, that he enjoyed working in the garden, and that he also split wood and pumped the water into the trough.

In 1970, when the Luther Home was completed, Joe Sidak was one of its first residents. One of the attractive features of the Home is an inner courtyard, used for sunshine and planted with flowers.

As a project, the West Kildonan Horticulture Society and West Kildonan Kiwanis planted the courtyard for two seasons; Joe Sidak could not resist the temptation to become involved in its care. With help of the administrator Mr. Gelhorn, artificial lights, and seeds were purchased, and once again Joe was in his glory. In 1973, the entire garden was grown by Joe. "What a colorful, breath-taking display!!" was a comment often heard.

The Luther Home was so inspired, it was decided to purchase a greenhouse in order that plants could be started and grown under ideal conditions. This made Joe very happy — after 20 years he once again was able to do the work he loved so much.

During winter months Joe keeps busy propagating plants for next season. House plants and terrariums are also made available for visitors, friends and staff to purchase as gifts. This helps pay for some bulbs and seeds for next season, as well as giving pleasure.

As long as the good Lord will allow Joe Sidak to be with us, Joe plans to continue growing plants and flowers to share with us all.

Editor's Note:

Refer to Color Section p. 74a and 74b.

Is a Greenhouse Expensive?

WM. B. HUTCHISON, P. AG.

Nowadays, there is a greenhouse to meet every pocket book. The selection ranges from aluminum structures with automatic ventilation, to wood frame and open door. What you spend to build and to operate a greenhouse depends a good deal on how handy you are with tools.

A greenhouse should be attached to a home or garage for year round ease and pleasure. A satisfactory foundation is required, and in some soil areas this means pilings. The local building code, which you receive when you get your building permit, will give you guidelines.

The following ideas will assist you in your selection of site, structure, and fixtures. Suggested costs are guidelines when you contact a contractor or supplier. An area of 10 x 15 feet, for a lean-to greenhouse is suggested, and this is the size which will be used in this article.

Location: Any site is suitable if there is usable light, although northern exposures are a disadvantage in the winter in terms of heating and light levels.

Servicing: Examine the best method of heating and bringing water to your structure. A fuel tank versus electrical heat or gas must be considered. Certainly, an under-floor water cistern can save space and be of use for rain collection, or holding water at 68° for watering.

Construction: Details and plans are widely available, some of your success will depend on the ability to interpret and modify for your site. Storage, workspace and leisure sitting space also should be considered. Foundation requirements for a free standing or lean-to can be met by a pole footing and a treated wood grade beam. This system, when covered to prevent fumes from entering the greenhouse, will compare favorably to a concrete grade beam reinforced and building blocks. The foundation must safeguard against heaving and soil settling. An estimate for foundation cost might be $400.

When the footings are completed, side walls are built to the level required for placing your kit or own design, using 2 x 4 plywood, concrete block or brick for a finish. Insulation is valuable to 24 inches below the soil line. If windows located at this level are opened there is some increased ventilation during the hot days of summer.

Costs for the structure and covering will range from $2,100 for aluminum and glass, to $200 to $300 for wood, paint and plastic. Labor to

construct your greenhouse is your time, with a helper.

Ventilation should be automatic to prevent heat build-up when you are away. A controlled temperature system may cost $200 installed, and does not include a water/pad cooler or air conditioning. Of all the problems I meet in discussion with unhappy owners, ventilation is the most crucial. Many problems encountered reflect under-ventilation. Also beware! The garage form structure with the poly roof is the worst design for overheating in February, with condensation dripping on furniture and plants.

Heating can be considered the next most important area of study. The system you settle for should maintain 55°F at night, and air movement for efficient and uniform distribution is needed. A fan with either a unit heater, or perimeter piping using hot water is suitable. Cost for a boiler and pipes using a gravity hot water system is about $850, plus installation.

The amount of heat required depends on size, materials and location. In the structure we are considering 40,000 B.T.U./hour are necessary. The calculation is based on a formula available in the building literature. The exact calculations for this determination are given by the Standards for Greenhouse Calculations prepared by the National Greenhouse Manufacturers Association. Consideration as to using the central heating system from your home is valid, plus supplemental heating from electrical radiants around the perimeter. Quite often used, is the six foot, 1500 watt baseboard heater, available from electrical contractors, costing $32.00 plus. Electric heat alone can be considered expensive — check with your Hydro office for rates and heating techniques.

Covering: The type of covering you use can save fuel dollars. If the covering is airtight and if a layer of poly is used during the winter as a second covering, a saving of 40% is reported to be achieved.

Glass costs 30 cents per square foot, fiberglass 48 cents per square foot, and poly three cents to four cents per square foot, and factors such as maintenance, light transmission during the winter, and whether you wish to see outside when working with your plants, must be considered.

Our imaginary greenhouse might cost $80 per month during January and February if glass covered, electrically heated, and with no effort to conserve energy at night.

Saving Fuel

Conservation and living with the bounty Mother Nature provides are two things we are learning again. Heat build-up in the greenhouse can be circulated into your home, which results in saving fuel. Also, some of this heat may be stored in a cistern beneath the floor, either in the water or by using a rock heat collector. The size of a collector will add dollars to your construction costs, but will help hold down operating costs.

We now have the technology to use the greenhouse as a solar energy collector. Many of the new solar heated homes being designed show a greenhouse attached as a collector on sunny days, thus operating will cost owner only at night and cloudy days. Fortunately for us, the prairies are not a cloudy region, so we can reduce costs if heat is saved. For example, think of a tea cozy.

As long as there is not a snow load on the glass that requires melting off, reducing heat loss makes sense. Commercial growers use a reflective cloth which is pulled over the crop at sunset. This principle can be applied to your house and help keep the heat next to your plants, cost would be $1.00 per square foot or less.

Furnishings can vary, from a ground bed, to raised and tiered benches, with a setting to enable you to admire your handiwork. Allow room to walk comfortably, consider screened openings, glass shelves and soil bins using plastic garbage pails. Old boards, a chair, and some wire for hanging pots can keep costs down in this area. Or, you can chose redwood benches, and wrought iron furniture, which can run into a pretty penny!

All in all, a good greenhouse is a pleasure, and with proper planning you will have a structure suited to your needs.

From the many opinions available, in summary we have:

Foundations	$400
Sidewalls	$ 50-$300
Structure	$300-$2,100+
Heating	$150-$850
Ventilation	$ 60-$300
Furnishings	$ 50-$600
Subscriptions	$3.00/year

Monthly operation is approximately $10 per month during summer to $80 per month during winter (not using energy saving devices). Maintenance costs must be included as well. But consider the produce you can grow! For a green future, it depends on you.

Suggested Reading List.

1. Agdex 731-1
   Alberta Agriculture
   Communications Branch
   Edmonton, Alberta
2. "Small Greenhouses"
   British Columbia Department of Agriculture
   Horticultural Branch
   Victoria, B.C.
3. "Plastic Greenhouses"
   Ministry of Agriculture and Food, Ontario
   Toronto, Ontario
4. "Under Glass"
   Lord & Burnham Co. Limited
   Box 114
   Irvington, New York, 10533

Have you ever found leafless yellow stems looking a bit like copper wire coiled around some of your garden plants? It is Dodder, a strange parasitic annual weed.

These plants start life from seed in the soil and when they first come up are normal small leaved green vines that twine around and cling tightly to the nearest plants. In early July these young "dodders" push sap-sucking "roots" into the stems of the host plants. With no further need for their original ground roots or leaves, they discard them. Then as sap-sucking parasites they continue to grow, develop and again develop seed.

There is no means of control, except to pull pull, pull, the moment you find them, so that they do not have the chance to develop further seed to infest your garden area.

Growing Ferns in the Home

BETSY THORSTEINSON
Indoor Gardener, Winnipeg, Man.

The Victorian era was the golden age of fern growing. In England, ferns were all the rage, and everybody who was anybody had indoor ferneries in which tropical species were grown. Fern hunters were sent out to search the world for new species, and over one thousand varieties were offered for sale in catalogues of the time.

Since those heady days, ferns have certainly declined in popularity, only to be supplanted by the indestructable diefenbachia and philodendron. A lot of tropical plants are so robust they look plastic, something of which a fern could never be accused. The fern's delicate leaves and elegance of form are, however, often in contrast to their vigorous constitutions. Some of their number are among the easiest and most satisfactory house plants to grow. Besides, when you're trapped in the house in the middle of a prairie winter, it's nice to have at least a small reminder of a shady forest glade. If you understand fern growth and needs, and grow a few successfully, perhaps you too will get 'hooked', and want to try more of the approximately 10,000 identified species.

Humidity

The most important factor in growing ferns indoors is humidity. Ferns like at least 40% humidity and if this requirement is met, the rest is easy. There are many ways of increasing the moisture content of the air: grouping plants, misting, putting pots over a tray of water, humidifiers, etc. This problem has been dealt with thoroughly in other articles. (See the section on humidity in my article, *Keeping a Varied Collection of Plants in the Home*, and also *Humidity Control for Healthy House Plants* by T. J. Campbell in the 1977 issue of The Prairie Garden).

In winter, when humidity is at its lowest, it would help enormously to lower the thermostat (it would also help the heating bills). Lower temperatures mean higher relative humidity. Transpiration and evaporation slow down and plants don't dry out as fast. So, if you can stand a house at 68°F or 65°F rather than 75°F, you probably can share it with ferns.

Watering

The rule of thumb with watering most ferns you will encounter is 'moist but not wet', because frequency of watering is dependent on temperature, light, and activity of the plant. Observe the plant. Feel the soil surface. If it is dry or dry one-half inch down, then water.

The following are some symptoms of poor growth due to underwatering and low humidity:

1) new growth cupped under
2) newest growth dried
3) brown areas between leaves — leaf margins scorched
4) older fronds yellow quickly

When a plant is suffering from overwatering:

1) growth is poor — slow
2) new growth is small and weak
3) plant turns a sickly yellow
4) plant suddenly wilts and the soil is moist

If your fern has these symptoms knock it out of the pot and check its root system to see if its rotted away. Young actively growing roots are light brown with yellowish brown tips. Older roots are dark brown or black. When there are lots of young roots its a good sign. You can often save the plant, if its roots are rotten, by cutting away all the dead roots, removing the sour soil, and replanting it in a smaller pot.

Light

Ferns are shade plants. That means about 200-600 foot candles of light which they will receive from a north, east, or a sheltered west window or, in a spot well back from a south window. If growing under artificial light, a double, four foot flourescent unit provides plenty of light.

You can tell a lot about your plant's light requirements by gauging its response in certain light situations. With too little light the fronds are spindly and have a "stretched out" appearance, are few in number and are apt to sicken and die early. When they are getting low but adequate light, plants are larger and more luxurient, the fronds broad, and often a deep green colour. In optimum light conditions the fronds become firmer, thicker, and there is good spore production. These plants are less inclined to show adverse reaction with environmental change. When ferns get too much light the growth is hard and small, the fronds are yellowish green and bleached looking and sometimes have brown margins.

Potting

There are a few rules to observe when potting ferns. Always use pots with drainage holes. In fact, it wouldn't hurt to increase the number of holes. Never overpot; if in doubt, err on the side of too small rather than too large. If the fern dries out too fast for you, double pot it with sphagnum moss in between the pots. Remember, ferns are used to growing in crevices in rocks and in small pockets in humus. In general, the diameter of the pot should be about one-third the height of the fern (from the soil level). When repotting an old fern, whose growing crown is quite high from the surface of soil, remove all the old leaf bases and plant the fern deeper into the soil so the crown is at soil level. All dividing, repotting and transplanting is best done in the spring, just before active growth.

Soil

A good soil for ferns is one that will hold moisture, provide aeration and support for the roots, and either provide nutrients, or be receptive to their addition. There are lots of soil recipes you can use; develop your own favourite.

The following are three good ones:

1) Two parts soil, one part peat

moss, one part perlite, one part vermiculite or sand, and a little charcoal.

2) Equal parts peat moss, perlite and vermiculite, plus a little charcoal.

3) Equal parts peat moss and washed builder's sand, with a little charcoal added. This one is simple and excellent. If you can find it, you can add one tablespoon of hoof and horn to each gallon of the mix.

The last two recipes are soilless. They will have to be accompanied with a fertilization program one-half strength every two weeks. For ferns that require very good drainage you can add another part or two of ground bark or perlite. It is also a very good idea when you are mixing these soils to moisten the peat moss a day or two before with warm water.

There are some ferns that require a more basic (as opposed to acidic) soil. To their soil mix you can add a little ground limestone, limestone chips or dolomitic lime.

Fertilizer

Since ferns are sensitive to the improper application of fertilizers, you should use "low burn" fertilizers (usually organic) with a low percentage of highly soluble salts. Some examples are: fish emulsion and Blue Wale. It is also better to use liquid rather than dry fertilizer.

Nitrogen is the nutrient most needed by ferns, so the fertilizer you choose should be highest in nitrogen. Each fertilizer has a sequence of numbers on the label, for example, 12-6-6. The first of these numbers is percent nitrogen, the second the percent phosphorus, and the third the percent potassium. The fertilizer should have all three to be considered complete.

It is better to use fertilizers according to manufacturer's direction, but only one-half strength. The frequency of application depends on time of year, and the activity of the plant, but usually you should fertilize ferns every two to four weeks. Do not fertilize at all during the months of October, November, December and January, unless of course you are growing the ferns entirely under lights. Many of the ferns stop growing and go into semi-dormancy over the winter months. The temperatures are lower and there is also less light. Under these conditions ferns do not need the extra nutrients.

Watch your fern's growth for some clues as to frequency of fertilization. If its fronds are a pale green, not a rich vibrant green, it probably could do with some extra feeding.

Pests

Ferns are not subject to many pests. Probably the best control is frequent washing under a faucet, or dipping in soapy water and rinsing afterward. For stubborn infestations insecticides will have to be used. Use wettable powders rather than emulsions as sprays, and use them at half strength. I find that putting the fern in a sealed dry cleaning bag with a vapona strip for a day, or a day and a half is effective. You should take care not to breath the fumes or touch the strip. To save the strip for another time you can wrap it tightly in tin foil after you finish using it.

Propagation

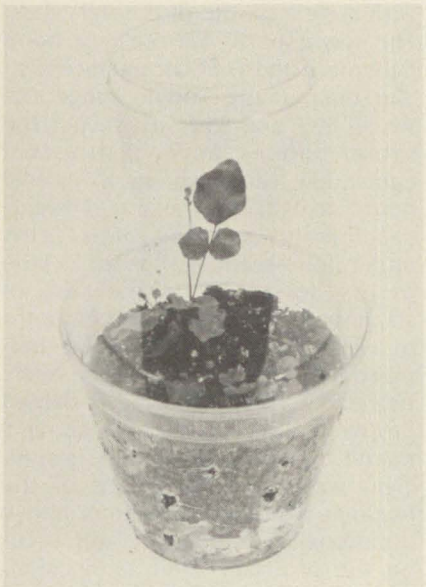
Ferns can be propagated in a number of ways. Older plants with multiple growing crowns can be divided and each crown put in a separate pot. This is best done in spring. The Boston fern and most of its cultivars produce green root-like runners called stolons. These can be guided and pinned on the surface of an adjacent pot filled with soil and presently a new fern will appear. Ferns with rhizomes, (thick stems that grow along the surface of the soil), such as Hare's foot (Polypodium aureum) and Davallia can be propagated from these rhizomes. They are cut in pieces at least three inches long and the ends are dusted with captan. The pieces can be thrust diagonally into the potting medium to one-third the length, or just pinned on or half buried in the surface. Then, wrap the pot loosely with a plastic bag and keep the soil damp until new fronds appear.

From Spores

If you really become a fern enthusiast, you may want to grow ferns from spores. It is perhaps the only way to obtain some of the uncommon ones.

To start, collect one of the fertile (spore bearing) fronds of a fern and place it in an envelope for a week to dry. The spores will appear as a fine dust at the bottom of the envelope. Brown coloured fern spore can remain viable for from one to forty-eight years, so you don't necessarily have to sow immediately. When you are ready to sow, shake the spores from the envelope onto clean white paper, roll the paper into a funnel and gently tap the spores out to distribute them evenly on a sterile medium. In my general article on House Plants in the 1977 Prairie Garden, I mentioned sowing the spores on peat pellets expanded with boiling water and then cooled. You can also sow them in clay pots filled with a half peat and half perlite mix, through which boiling water has been poured twice. Both these mediums should be covered while they are cooling to avoid contamination. You can cover the pot with saran or glass, the peat pellet with a clear plastic disposable glass. The sown spores are put in a warm light place and kept constantly moist. The temperature should range between 60°F and 85°F. If you put the spore cultures under flourescent lights they can have up to twenty hours of light. By the way, I highly recommend growing baby ferns under flourescent light. After as little as two weeks, or in the case of staghorn ferns, as long as six months to a year, the spores will have germinated into the first stage of the fern's two part life cycle, the heart-shaped prothallus. Most ferns take about a month to germinate. If there is sufficient water on the surface of the medium (you can spray from above occasionally), fertilization will occur on the prothalli. After fertilization, the second part of the life cycle begins and a tiny fern forming the familiar crosiers will appear at the corner of the heart. When this stage happens you can transplant the prothalli, singly, or in small clumps, to a plastic margarine container filled with sterile planting medium. The tip of a knife blade, or a two-tined lobster pick is a useful tool in this delicate operation. For drainage and aeration I burn holes in the bottom and smaller ones in the sides of the container with a cheap soldering iron. I fill the bottom with pieces of the styrene trays used in supermarkets. The top is covered with saran to increase humidity.

Another container incubator that I use for baby prothalli and ferns is a combination of regular size, and "old fashioned" size disposable clear plastic glasses. I burn drainage holes with the soldering gun in the "old fashioned" size glass and fill it with styrene chips and then the growing medium in which the baby ferns are

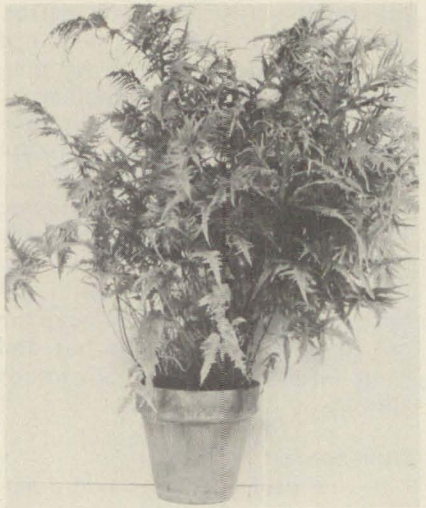


A baby fern incubator

planted. The regular size fits neatly over the lot to form a little greenhouse. When the baby ferns get crowded they can be transplanted again into small pots (or you can use the plastic glasses again). I use one of the small (approximately 12" x 8") plastic seed flats to keep all of my baby fern containers together. I pack damp sphagnum moss or vermiculite between the pots to increase humidity. An excellent way to provide a large incubation chamber is to put this flat and other pots of baby ferns into a 10 or 15 gallon aquarium, covering the top with glass. From this environment the ferns, when large enough, should be slowly acclimatized to the air of your home by gradually slipping the glass lid off.

Ten Recommended Ferns

1) *Pteris cretica* — This was a favorite Victorian fern, and there are an astonishing variety of cultivars still



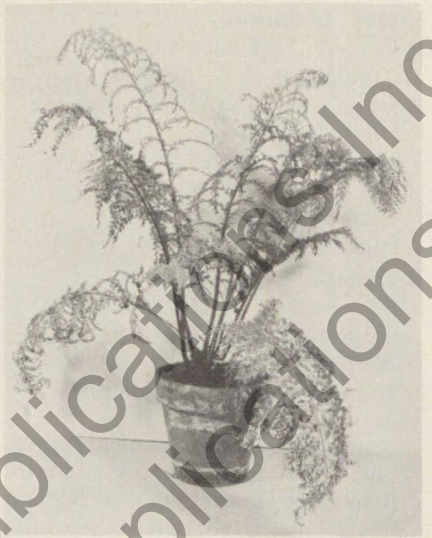
Pteris Cretica cv. Rivertoniana

around today. This is a good one to try from spores, as they grow quickly and easily. Medium light.

2) MAIDENHAIR FERN *(Adiantum)* — This is one of the most beautiful of ferns, with dark wirey stems and graceful light green finely divided foliage. It is also fast developing from spores and amazingly resilient for its delicate appearance. It hates to be overpotted. There are many species and varieties of this fern. Low — medium light.

3) MOTHER FERN *(Asplenium bulbiferum)* — This one has finely divided fronds and looks sort of like a carrot top. It has the habit of producing little fernlets along the edges of its mature fronds, hence the name. Place the little fernlets in soil and you can give these fern to all your friends. Easy to grow. Low light.

4) HARE'S FOOT *(Polypodium aureum)* — This fern is a beauty. It has a rhizome thickly covered with light brown hairs, hence its name, and its lobed fronds take on beautiful bluish shade. It is hardy, stands



The motherfern (Asplenium bulbiferum)

lower humidity, and grows easily, if a little slowly, from spores. There is also a more fancy crested variety. Medium light.

5) BOSTON CULTIVARS *(Nephrolepis exaltata)* — The old standby comes in a large variety of shapes and textures. It likes bright light and well drained soil. The stolons may be wrapped around the base of the plant, inside the pot. The finely divided variety "Whitemanni" is particularly beautiful.

6) HOLLY FERN *(Crytomium falcatum)* — A sturdy plant with dark green, stiff, leathery fronds, it will stand low humidity. It comes easily and quickly from spores. Medium light.

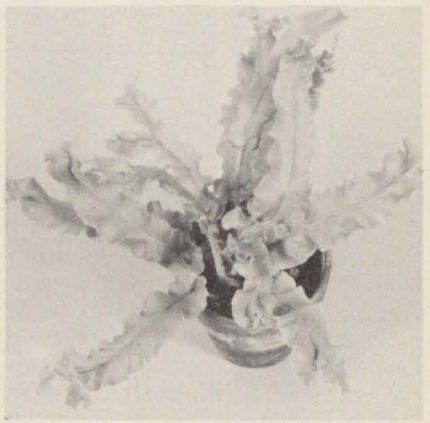
7) STAGSHORN FERN *(Platycerium bifurcatum)* — A very exotic looking epiphyte (grows in trees). It produces two kinds of fronds — one kind at its base to collect humus and moisture, and a forked kind that arches gracefully out from this base. They like a

Stagshorn fern — Platycerium Bifurcatium

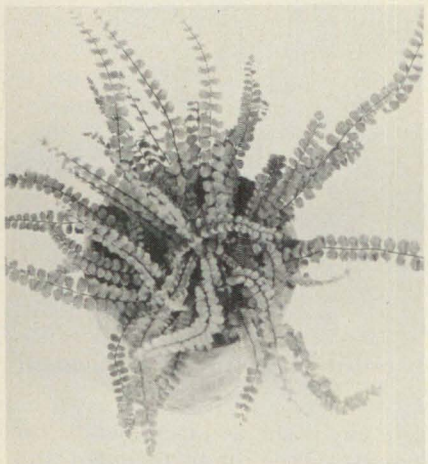
light airy place, and can tolerate low humidity. They can be mounted with moss to a piece of board or potted into a very porous, well draining mix. Let them dry out almost completely before watering.

8) HARTS' TONGUE *(Phyllitis scolopendrium)* — A small fern with simple strap-shaped fronds. It likes a little limestone in its soil mix. This one can tolerate low light.

9) MAIDENHAIR SPLEENWORT *(Asplenium trichomanes)* — A beautiful little fern with black stems forming a rosette of six inch long fronds. This



Harts' tongue fern (Phyllitis scolopendrium)



Maidenhair spleenwort (Asplenium trichomanes)

one also likes limestone in its potting mix and prefers low light.

10) BUTTON FERN *(Pellaea retundifolia)* — A handsome fern with short round leathery leaflets lining each side of the stems. It likes its soil to be more on the dry side and medium light.

Sources of Spores

1) Geo. W. Park Seed Co. Inc.
Greenwood, S.C. 29647

2) Major Howell's International Seed Collection
Major V. F. Howell,
Fire Thorn, Oxshott Way,
Cobham, Surrey, KT11 ZRT
England.

3) Thompson & Morgan Inc.
P.O. Box 24
401 Kennedy Boulevard
Somerdale, N.J. 08083

4) The American Fern Society
Annual dues — $5.00
Issues a quarterly scientific journal and the Fiddlehead Forum (bimonthly newsletter). This Society has a spore exchange program for members. For the list contact:
Mr. Neill D. Hall
1230 Northeast 88th St.
Seattle, Washington 98115
For membership in the society contact:
Dr. Terry W. Lucansky
Dept. of Botany
University of Florida
Gainsville, Florida 32601

Mr. George Kohut reports from Alder Flats, Alberta (68 miles west of Wetaskiwin), that he has two hardy pears and two hardy apples; good keepers, good quality and of commercial size. Scions of the pears have been sent to the universities at Edmonton and Saskatoon for testing.

He is interested in obtaining two-year-old seedlings of Ussurien pear.

In the production of apple seedlings he recommends sowing the seeds in the fall in the manner that seeds are "sown" in nature!

Lady's-slipper Orchids in the House and Greenhouse

SUSANNE OLVER
Supervisor U of M Greenhouse
HARVEY G. McCANN
Orchid Club, Winnipeg

Lady's-slipper Orchids in the House & Greenhouse

Did you know that in the inhospitable climate of our northern forests Lady's-slipper orchids grow and thrive? The orchid family is one of the largest plant families in the world, and orchids occur on all continents except Antarctica. Even as far north as Churchill, Manitoba and no doubt farther north, do some of these plants grow; of course not huge corsage flowers, but little dainty things like *Cypripedium passerinum,* one of the lady's-slippers, our Showy Lady's-slipper, *Cypripedium reginae,* and

the yellow Lady's-slipper, *Cypripedium calceolus* are certainly orchids which can compare well with many of the tropical ones.

While the Lady's-slippers of the northern hemisphere bear the scientific generic name *Cypripedium*, those from the southern hemisphere, once also *Cypripedium* are now properly called *Paphiopedilum*, although colloquially they are often still referred to as "Cyps". Both *Cypripediums* and *Paphiopedilums* can be easily recognized by the pouch-like or slipper-like lip.

Paphiopedilums are basically divided into two groups, the one with all-green leaves requiring cool temperatures with recommended night temperatures of about 45° to 50°F (although they seem to do quite well with a night temperature up to 55°F), and a warmer group with mottled leaves which do well where night temperatures go down to 55° to 65°F. A 10° to 15° temperature rise in the day time is about the best.

A very important condition for *Paphiopedilums* is high humidity, which is not too difficult to obtain in the greenhouse by keeping the walks and benches wet. The compost for these plants should be well-drained, but moist. A good mix consists of one-third turface, one-third fine fir bark, one-third fresh sphagnum with some dolomitic limestone. To ensure good drainage and aeration, the pots, plastic or clay, should have additional holes in their sides. The surface of the medium should be topped with some fresh sphagnum, if possible, to keep the medium moist without overwatering. Daily misting helps to increase the humidity. The plants should be fed about every two weeks with a very dilute fertilizer. Some special orchid fertilizers are available, some growers prefer to use dilute fish-emulsion fertilizer, others alternate with a complete fertilizer. Light intensity should not be too high; about the same as for African Violets, bright sun or closeness to artificial light yellows the leaves of these plants and inhibits growth. *Paphiopedilum*, or lady's-slippers, can also be grown in the house. Here are the following suggestion by Mr. McCann, who grows and flowers them in a basement growing room under Vita lights.

Lady's-slippers Grown in the House

Mr. McCann uses as potting mixture: Aquarium gravel, purified charcoal (obtain from any pet shop), some oak leaves, some tree fern fibre and medium to coarse bark chips. A good handful of coarse bark chips are placed into the bottom of the pot, followed by three or four heaping tablespoons of the thoroughly washed gravel and charcoal, then a layer of bark chips mixed with oak leaves and tree fern fibre. The remainder of the pot is filled with medium to coarse bark chips. To keep the plants firmly in place a couple of tablespoons of gravel and charcoal mixture are sprinkled over the bark chips.

Do not keep the "Paphs" too close to the light or in bright sunlight, or their leaves will bleach to almost white. Any plant food seems to work quite well but avoid over-fertilizing. It is best to use fertilizer only once a month at half strength. The plants should not be kept constantly wet. A good test is to lift the pot — if it feels heavy it is probably still too wet and should sit for another day or so before being watered.

Gardening Plots

ALEX F. HARP
Winnipeg, Man.

The statement was made many years ago that all non-native Canadians were farm grown, were connected with a farm, brought up on a farm, families of farmers, or had been farmers. Not so now, with the greater proportion of our population working in industry or dependent on it. However, many of our citizens like to grow things, even apartment dwellers with their house plants and balcony gardens, or have gardens to grow flowers and vegetables. The increasing number of allotments throughout our province, whether it be for economic reasons or because we like to grow our own produce, is evidence that people are still farmers or gardeners at heart.

City Allotments

Victory gardens were provided during time of stress, wars or scarcity, by using all available empty spaces, and allotments are generally provided in cities as most rural folks have their own home ground gardens. Many horticultural societies have garden plots available and there generally is a waiting list. One Society in Winnipeg has provided plots for about 50 years.

The plots may vary in size from 1,200 to 2,000 square feet and the cost to the holder is nominal, enough to cover the cost of cultivation, stakes and twine. Water may be provided in some blocks of gardens but, usually, the holders provide this themselves by whatever means is most suitable for them.

The Provincial Government of Manitoba has provided spaces in three areas in different parts of Winnipeg and have sheds in which the holders may keep tools etc., at a small extra charge. Scattered throughout cities wherever there are vacant lots, gardens are to be seen where many people enjoy working in the soil, enjoying the fresh air and reaping the benefits of their labours by having fresh vegetables on their table and pride in the growing of their own produce.

The Hydro companies and owners of vacant ground are to be commended in allowing plot holders the use of their property for the purpose of providing gardens. Usually there is the proviso that the land be kept in good order, weeds kept in check, and be cleaned off at the end of the season, this latter also so that the area be ready for cultivating. The gardens may be dug by hand, roto tilled and, in the case of large areas, hired help may be used.

The plot holders take great pride in their gardens, in the condition of their plants and in their choice of varieties grown. Where the holdings are under the auspices of a Horticultural Society, the gardens are judged for freedom from weeds, good tilth, varieties grown and the general appearance of each plot, and prizes are awarded in order of merit.

When all these gardens are viewed the beholder can surely be amazed to see the amount of vegetables grown, to see many stalks of corn growing where none grew before.

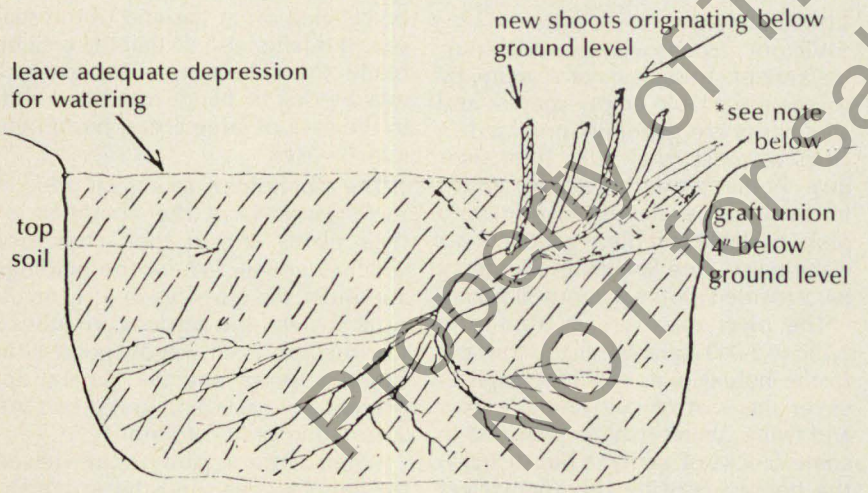
Hybrid Tea Roses Can Be Grown on the Prairies

G. W. SHEWCHUK
District Agriculturist
Alberta Department of Agriculture

Very few gardeners here can say that they have had much success wintering the hybrid tea, grandiflora, floribunda and miniature roses. Too often they are planted according to instructions given in books which were written for growers in England, United States, eastern, or the west coast of Canada. Our climate in the prairie provinces is much different than in the places mentioned above and our winter and spring conditions are extremely hard on tender roses. However, when we do get them safely through the winter and spring, we grow very good roses.

Winter Survival

The first step for the successful winter survival of these roses is the time and method of planting. I learned of this method nine years ago from Percy H. Wright, Saskatoon, an eminent grower and hybridizer of roses and other ornamentals in Saskatchewan. I consider this planting method the most important factor for the survival of rose plants. I have used



*It is desirable to have this area around the stems and where the new canes are expected to emerge covered with a coarse, loose aggregate consisting of a mixture of one-third soil, one-third coarse sand and one-third peat moss. It will prevent soil compaction and allow the sprouts to come through easily.

it for nine years. The best time for planting is between April 25 and May 15. Here is his method:

You can see that in the event of a complete top kill, your grafted portion is more likely to survive with the new shoots originating below the surface of the ground. Any soil that can grow a good vegetable garden is good for roses.

The second step is the protection of the newly planted bush. Most roses obtained through the mail or locally come with tender white sprouts. Without protection these sprouts would be lost if exposed to the hot sun and drying winds. I find that a piece of porous burlap over the newly planted bushes is a fine protector. I leave the cover on for a few days until the sprouts harden and green up well. I remove this on a calm, cloudy and rainy day. When hardened, the sprouts can stand up to the hot sun and wind. I have seen many rose bushes perish because of this initial neglect.

The third step is the winter protection. Around the end of October rose bushes are ready to be bedded down for the winter. The tops are frost killed and the ground is about to freeze up. Cut tops off, leaving a stubble ten to twelve inches. Remove the remaining foliage. Mound heavily with soil or peat moss the 10 or 12 inch portion of stubble. Do not use soil from around the rose bush for fear of exposing the roots. Use soil from another source rather than the rose bed. I have used soil and pulverized peat moss with equal success. I prefer the peat moss because it is easier to handle in the fall and again in the spring when it has to be removed. When peat moss is used, a cover of spruce bows, straw or hay is required to keep it from being blown away. In front of the house where these materials may be unsightly I cover the peat moss bedded roses with sheets of burlap. These are anchored down with 6 to 8 inch nails. The cover is removed in spring at the time the trees are beginning to leaf out. Should there be a threatening frost after the removal of the moss, cover the plants with burlap or paper which had been lightly dampened. A light wind is not likely to remove damp paper.

Growing Roses

The fourth step in growing roses is proper fertilization. I find that fertilizing mid-May, mid-June and mid-July with 20-30-20 and fish fertilizer is very beneficial. [1 tablespoon 20-30-20 and 1 tablespoon fish fertilizer per gallon of water]. Every plant gets one-half gallon of this solution for each dose. Cow manure is also very good and can be used in place of fish fertilizer.

The fifth step is the watering. Roses require lots of water — one inch per week during hot dry periods. This is equivalent to five gallons per plant per week.

Following these five simple steps, I have grown tender roses successfully for many years. In the spring of 1976 I lost three plants out of a total of 150; the following spring I lost only two out of 210. This encouraged me to increase the number to 250 roses in 1977.

I hope that those who have had failures, and others who would like to grow roses but are wary, would try the method outlined here. I am sure they'll be thrilled and will grow more roses every year. Why not? It is the world's most loved flower. There is great satisfaction in growing your own roses.

Trace Element Deficiencies in Horticultural Crops

L. J. LaCROIX
Department of Plant Science
University of Manitoba

There are thirteen mineral elements essential for plant growth, which are normally present in the soil. Of these thirteen, six are accumulated in the plant to concentrations of 0.1 to 1.5% of the dry weight. This group is sometimes referred to as major elements and consists of nitrogen, phosphorus, potassium, magnesium calcium and sulphur. The group of remaining elements (trace elements) occur in the plant in concentrations between 0.00001 to 0.01% and include molybdenum, copper, zinc, manganese, iron, boron, and chlorine.

Generally, Manitoba soils have an adequate supply of trace elements for plant growth, however, several environmental factors may affect the availability of these elements to plant roots. A further complicating factor is the variation from species to species and even between varieties within a species, in ability to utilize trace elements from soil sources.

Iron Deficiency

In Manitoba iron deficiency appears to be the most widespread trace element deficiency with horticultural crops. Visual symptoms of interveinal chlorosis (loss of green color) on terminal growth appear on ornamentals such as amur maple, birch, and roses; and on fruits such as apple, plum, raspberry and strawberry. The deficiency is less common with vegetable crops with the exception of beans and occasionally peas.

Iron deficiency problems are most common on high lime soils, on soils that are poorly drained, and soils low in organic matter. Symptoms commonly appear during periods of high temperature and rapid growth immediately following heavy rainfall.

Persistent deficiencies of iron can be alleviated by soil application of chelated iron sold under various trade names such as Sequestrene. The treatment rarely lasts more than one growing season. Another treatment which may be longer lasting, that is recommended on an experimental basis, is the incorporation of flowers of sulfur into the soil in the rooting zone at the rate of one pound per 20 square feet.

Manganese

Manganese deficiency, which is closely related to iron deficiency, is accentuated by the same environmental factors but is less common in occurrence. Symptoms are identical except they occur on older leaves first in contrast to the effect of a lack of iron.

Boron

The element boron can be deficient with crops that have a high requirement for normal growth. Severe symptoms appear as a distortion and death of leaves at the growing point. It is more common, however, to observe symptoms in specific tissues of certain plants eg. hollow stem and brown curd of cauliflower, brown heart of turnips, lesions on beets, carrots and radishes, black heart and pitting of celery, rough skin on tomatoes and corky core of applies. After diagnosis and on recommendation of a specialist, the problem can be corrected by the application of commercial borax.

Alkaline Soil Conditions

Copper and zinc are less available and molybdenum more available under alkaline soil conditions that are common in many parts of Manitoba (calcareous soils tend to be alkaline to varying degrees). There is growing evidence that soils in the north-west part of the province (north of highway No. 1 and west of Neepawa) are of such a nature that plants tend to be high in molybdenum and low in copper and zinc. There is no research at present to determine plant responses to zinc and copper, with the exception of a demonstrated response to zinc by beans with certain soil types (Soil Science Department).

Chlorine appears to be sufficient in Manitoba soils.

Cultural Practices

Good cultural practices are important to provide an adequate supply of trace elements for plant growth. These include provision of good drainage and aeration of the soil, proper use of fertilizers to provide adequate levels of major elements and incorporation of organic matter, especially with sandy soils.

The general rule of thumb in watering house plants is: — Water a plant really well; within an hour pour off any water still standing in the saucer. Do not water again until the surface soil feels nearly dry to your fingers.

Another rule of thumb covering watering is to avoid extremes. Few plants will flourish if the soil is constantly wet or really dry for any length of time. Plants certainly need moisture but, remember, they also need air in and around their root system.

A Wild Flower Garden

MARGARET SIMPSON
Sedgewick, Alberta

During the early seventies I became interested in the idea of trying to grow some of the provincial floral emblems in my garden. In the course of researching the habitats and sources of supply of these plants I became so intrigued by the names of North American wild flowers that I decided to experiment with others as well as the floral emblems. So began the love affair with a wild flower garden.

It has been largely a trial and error effort, with hours spent pouring over books and magazines on the subject of wild flower gardening. Then, more time was devoted to writing letters seeking information and sources of supply for some of the plants not available here. Lastly, many hours were spent on the special preparations several of the plants required. This was espeically true in the case of the woodland plants.

Flowers for the Garden

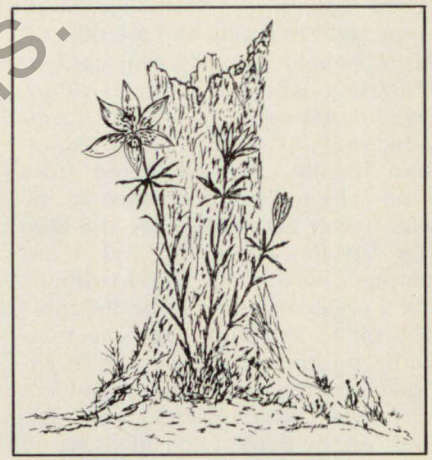
I found the essential element of success with wild flowers is to provide conditions in which they grow naturally. Most of the native plants which were obtainable in local fields and woods and roadsides were transplanted to my wild flower garden with comparative ease; but many of the plants purchased from nurseries in Eastern Canada and in the United States were not a success. However, those which survived were well worth the effort. The exquisite Queen Lady's-slipper *(Cypripedium reginae)*, Blue Flag Iris (*Versicolor*) and Iris setosa — Jack-in-the-pulpit, Canada Columbine (*Aquilegia canadensies*) and Wild Bleeding Hearts (*Dicentra eximia and formosa)* to name but a few. I will never forget the joy of watching a trillium emerge from the ground in early spring and later produce its enchanting bloom. To see leathery leaved bloodroots unfolding to reveal their lovely white flowers, and the winsome little hepaticas peeping out from their furry coats was a completely new and delightful experience for me.

Environment

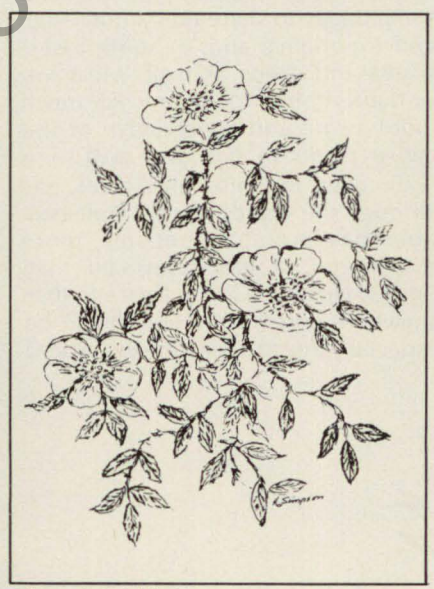
The decision to establish a wild flower garden entailed a great deal more time and effort than the addition of the twelve floral emblems would have done. For the sun loving plants, two small rock gardens were built as an extension of the existing perennial border. One section is devoted to desert plants and ther other contains a mixture of plants suitable for a sunny alpine garden. Behind the perennial border, in the shade of shrubs and trees, winds a woodland path containing shade loving wild flowers and ferns. This section is still very much in its infancy, but a source of interest and pleasure from spring until fall. One feature in favor of wild flowers is that many varieties bloom so early in the spring — a most welcome addition to any garden in this country of long winters and short blooming seasons.

Floral Emblems

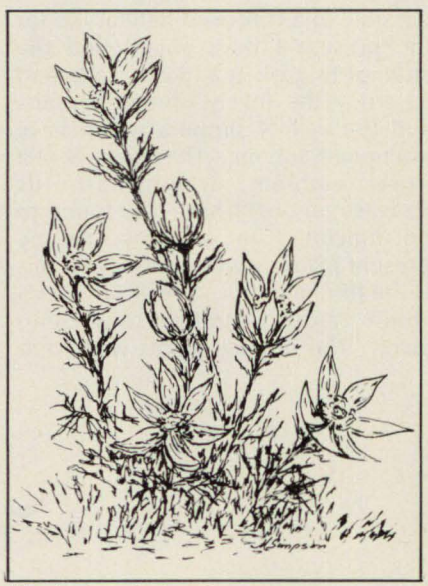
The provincial floral emblems experiment has proven fairly successful. As the British Columbia floral emblem, *Cornus nutalli*, cannot be grown here I attempted *Cornus canadensis* (Bunchberry) instead. It is a diminutive cousin of the floral emblem, which is found in abundance in local aspen groves. It is one of the more difficult plants to establish, however, requiring a moist and more acid woodsy soil than most of the shade plants. Alberta's wild rose (*Rosa acicularis*) is my favorite flower and of



Saskatchewan's Red Lily



Alberta's Prickly Rose



Manitoba's Prairie Crocus

course is exceptionally easy to grow here. I have also had excellent success with Saskatchewan's wood lily (*Lilium philadephicum var. andinum*), and with Manitoba's prairie crocus (*Anemone patens var. wolfgangiana*) which I grew from seed. The "crocuses" have always been such a welcome sight in spring and are delightful to behold in one's own garden. Ontario's white trillium (*Trillium grandiflorum*) grows well here if provided with its natural moist, woodland habitat, and protected from winds. To represent Quebec in my wild flower garden I chose the Blue Flag Iris (*Iris versicolor*) and it has adapted very well. The Maritimes floral emblems seem to be the most difficult to establish. Both my trials with the pink lady's-slipper (*Cypripedium acaule*), the floral emblem of Prince Edward Island, were failures. All the books I consulted stated that this is an extremely difficult plant to grow; some books said it was impossible in a contrived habitat. So for the present I have abandoned the attempt to grow it and am contented to enjoy the lovely Queen slippers and the yellow slippers which have multiplied for me. The Nova Scotia floral emblem, trailing arbutus (*Epigaea repens*) I have also found to be difficult. I am still not sure my present planting will survive, and this is the third attempt. New Brunswick's violet (*Viola cucullata*) has been lovely. The original plants were sent to me by the New Brunswick Department of Agriculture, a gift which I appreciated very much. Newfoundland's floral emblem is the pitcher plant (*Sarracenia purpurea*). Although my pitcher plants seem to be healthy looking plants, they have never bloomed for me as yet, and they were planted four years ago. The emblem of the Northwest Territories, *Dryas integrifolia*, is a lovely little creeping shrubby type plant that produced several blooms this past spring. It was obtained two years ago from Mr. A. Guppy, a botanist from Vancouver. Lastly, Yukon's Fireweed (*Epilobium angustifolium*) is an attractive flower but a rather invasive plant which has to be thinned ruthlessly to prevent it spreading through the garden like wildfire.

My adventure with a wild flower garden has been a joyful experience, opening up whole new horizons in gardening. It has also given contact with so many interesting people who seem happy to share their knowledge and experience and, in some cases, plants and seeds as well. Most important, it has made me so much more aware and appreciative of the native plants in our own area — a walk over the hills and dales and through the woods, always a pleasurable pastime, has become more meaningful. It has been said that, "one is closer to God in a garden than anywhere on earth". I feel this to be especially true in a wild flower garden.

Manitoba's Floral Emblem

DR. MARGARET DUDLEY
Author, Researcher, and Former Lecturer in Botany, University of Manitoba.

A Life History

Our floral emblem, Anemone patens, has several common names, one of which is the prairie crocus. I prefer to call it a pasque (Easter) flower, since the name "prairie crocus" is apt to give rise to misconceptions, as, for example, that of the American artist who submitted a beautiful painting of a **cultivated** or true crocus to a committee offering a prize of $100 for the best sketch of our floral emblem. She won, too! Needless to say, the members of the committee were not botanists.

The true crocus, not native in Manitoba, is not even distantly related to Anemone patens, and is hairless, with fibrous roots and parallel-veined leaves (similar to those of grasses, but possessing a keel). Each crocus also possesses an underground bulb-like stem called a corm.

Scottish settlers, noting only the shape and color of the flowers, named the plant "prairie crocus". True crocuses grow wild in Scotland, and the Scots probably thought that the hairy "overcoats" were an adaptation to our frigid temperatures! True crocuses, such as the Scots were familiar with, do not grow **wild** in Manitoba, but may be found in flower gardens and florists' shops.

Anemone patens, the pasque flower, and our floral emblem, is our earliest flower, the harbinger of spring, and may be found in abundance on grassy parkland, and on gravelly hillsides facing south as, for instance, the north bank of the Birdtail River at Birtle, Manitoba, where they once formed a flowery carpet during early spring.

Soon after the snow has melted, clumps of grayish-green hairy buds appear among the dead brown grass. No anemone leaves are visible at this time.

The flower stalks elongate rapidly, and we can soon identify a circle of leaf-like bracts below the flower bud. This is called an involucre, and serves to protect the flower buds when they first appear above the ground. Next the mauve sepals begin to open. The anemone has no petals. The sepals number from five to seven, six being the most common number (as determined by the writer, who counted the sepals of 500 flowers).

The flower stalk elongates rapidly both above and below the involucre,

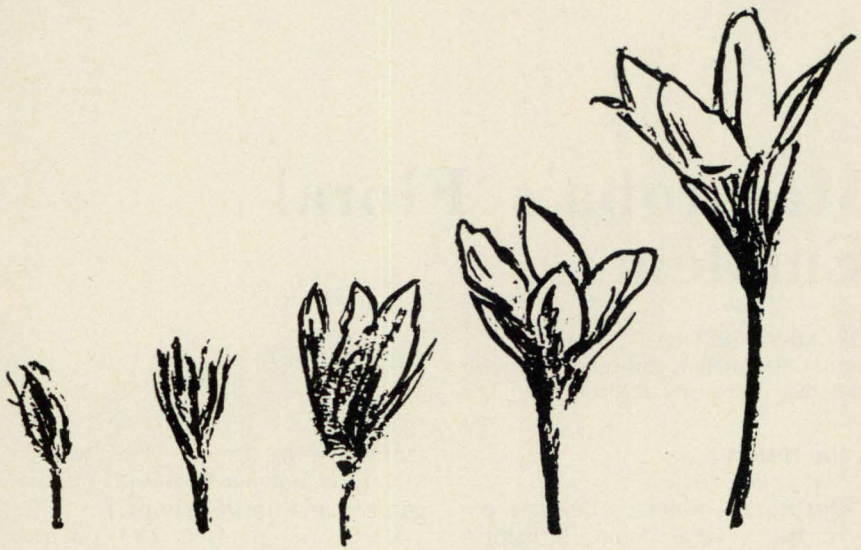


Fig. 1 Fig. 2 Fig. 3 Fig. 4 Fig. 5

Anemone patens

Sketches show progressive development at daily intervals.

and finally the fruiting head is developed, each seed having a long feathery "tail" which aids its dissemination by the wind. (See Fig. 6)

Then, and only then, do the ternately compound, net-veined leaves appear, attached to the very short stem (see Fig. 7, which is natural size, and was obtained from an actual leaf by projecting its image onto a piece of white paper tacked to the laboratory wall). The leaves continue to grow throughout the summer, providing food for the developing buds of the next year's flowers.

The seeds, with their long feathery styles are disseminated by the wind. They do not germinate until the next year for, like many other plants, they require a period of dormancy for the seed to mature. Anyone endeavoring to grow anemones from seed requires patience! However, the ripening of the seeds may be hastened by refrigerating them for about 90 days, thus simulating winter conditions. The writer has, in this manner, induced premature germination in several different species of seeds, e.g. Calla palustris, horse chesnut, etc.

The Anemone and Its Importance to Man

The prairie anemone possesses an acrid poisonous sap, which irritates the skin. This acridity is due (according to Pammel) to the presence of a crystalline substance called anemonine, the vapours from which inflame the eyes to a very great degree, even closing them temporarily. Sheep have been known to die from the effects of eating anemones, not, however, from poison, but by having their digestion impaired by the presence in their stomachs of felt-like balls of epidermal hairs. *A. Patens* was used by the Omaha Indians as a medicine in cases of rheumatism and neuralgia, when the fresh leaves were crushed and applied to the surface over the affected part. The juice from the bruised leaves acted as a counter-irritant, causing a blister if left on long enough.

Fig. 6

The same flower, ten days later, after the fruiting head has developed.

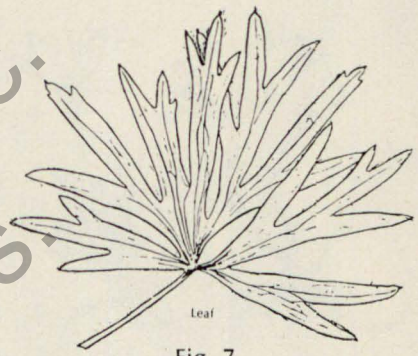


Fig. 7

(Projected onto a piece of paper on the wall for sketching.)

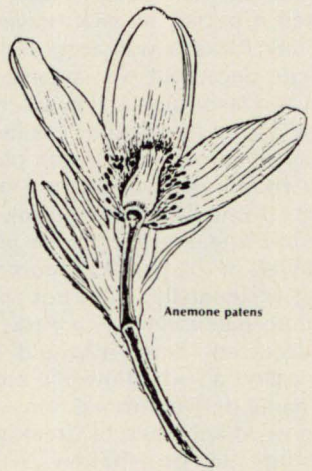


Fig. 8

Longitudinal section of flower. Note hollow stem, involucre, and epidermal hairs.

Preservation

The preservation of the anemone and other endangered species is a matter of supreme importance. In this respect we are behind our neighbors to the south. I am ashamed to say that when I was in Minnesota attending university (1932-1935) I was the only

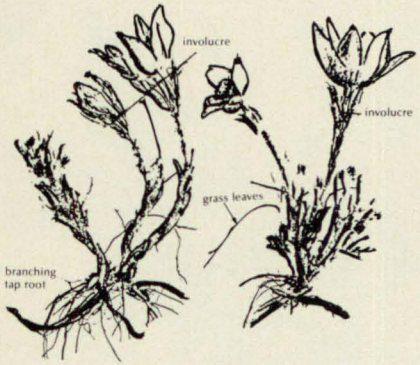


Fig. 9

member of the ecology class who boasted a permit to pick flowers in the State Parks. I was accorded this privilege because I was a Canadian, and was a taxonomy major, intent on adding to my herbarium. I collected one specimen of the larger plants, and a couple of each of the smaller ones. Anyone lacking a permit was liable to a fine, and there were plenty of officials in the park to enforce the ruling! Incidentally, I did not collect anemone patens in Itasca Park. If it *had* occurred there, it would have been called a "windflower", a common name derived from a translation of the word anemone (a Greek word meaning "to be shaken by the wind").

Conclusion

Those of my readers who are expecting helpful hints on the transplanting of anemones are doomed to disappointment for the following reasons:

a) I am, on principle, vigorously opposed to the practice of transplanting wild flowers into alien habitats*, and

b) such transplants, even when carefully carried out, result, sooner or later, in the death of the plant.

The so-called "march of civilization" has resulted in the near-extermination of many of our wild flowers, so it behooves us to cherish the few that remain so that they do not join the procession into oblivion.

Fig. 10
True Cultivated Crocus

Comparison between True Crocus and Anemone Patens, Manitoba's Floral Emblem

(Figure 9) **Anemone patens**	(Figure 10) **True Crocus**
Sub-class — Dicotyledon	Monocotyledon — allied to lilies
Family — Ranunculaceae — allied to buttercup	
Habit — flowers in clumps, plant densely hairy	Flowers solitary, smooth (no hairs)
Root — branching tap root with brownish rootlets (see Fig. 9)	Roots fibrous, numerous, of almost equal length below the corm
Leaves — ternately compound, net-veined, grayish-green, hairy, appearing after flower has been polinated (see Fig. 7)	Medium green, simple, parallel-veined, grass-like with keel, smooth (no hairs), appearing before the flower buds
Flowers — bluish-mauve, no petals, sepals 5-7 (usually 6), stamens and pistils numerous (see Fig. 8)	Flowers purplish or yellow, perianth 6 (3+3) alike (as tulip or lily), stamens 6, pistil 1, with 3 branched stigma
Fruit (ripened ovary) — each pistil develops into an achene with a long hairy "tail" (see Fig. 6), disseminated by the wind	Each flower produces a 3-lobed body containing seeds. Probably disseminated by birds.

*The plants photographed by the writer were, of necessity, transplanted to a flower pot for observation but, at the conclusion of the experiment, were returned to their original locality, which has since been covered by houses. Much of the river bank property in and around Winnipeg, once covered with trees, shrubs (including dogwoods, hazels, plums and cherries) and flowers (nodding trillums, asters and golden rod, etc.) is now bare of natural vegetation.

Reference
Dudley, Margaret G., **The Anemones of Manitoba**, 1930, Master's Thesis (unpublished).

If you are particularly interested in growing African violets you could well be interested in subscribing to "Chatter", an excellent magazine dedicated to African violets. It is published quarterly by the African Violet Society of Canada, 336 South Street, St. Catharines, Ontario L2S 2J5. The cost is $4.00 per year which also entitles you to membership in this Society.

Flowering Trees and Shrubs

JOHN WALKER
(In 1928, Superintendent Dominion Experimental Station, Indian Head, Sask.)
This article, written in 1928, is still very pertinent today).

The title above will no doubt bring to the mind of every reader a picture of some well-known, and perhaps oft-described, flowering tree or shrub. Most homes can boast either a caragana hedge, a honeysuckle bush, or a spirea clump, and their usefulness and beauty are too well known to need further description.

Why are these plants so popular, especially in the colder regions of Canada? The answer is, because they withstand the severe climatic conditions and produce pleasing colours in leaf, blossom, and fruit that the natural vegetation of the country does not provide.

While the list of flowering shrubs and trees that can be recommended for planting in the prairie provinces is not, relatively speaking, a large one, it permits of a selection of plants that will satisfy the most fastidious taste. At the Experimental Farm, Indian Head, Sask., specimens of the flowering shrubs given in the accompanying table have proven to be hardy and valuable. They are recommended, therefore, to those who contemplate extending their plans for home beautification.

A number of hardy and desirable trees and shrubs growing at Indian Head do not appear in the foregoing table because they produce inconspicuous blossoms, or none at all. Acer dasycarpum, Celtis occidentalis, Tilia americana, T. cordata, and such well-known trees as Acer negundo, Betula populifolia, B. papyrifera, Fraxinus pennsylvanica, Populus alba, Quercus macrocarpa, Q. dentata and Ulmus americana are of this type. All these, however, make attractive specimen trees and should find places in the home grounds.

Type of Growth — An explanation of the differences in height, and the seeming small amount of growth made by some shrubs, is suggested. With some, Caragana, Cornus, Lonicera, Syringa and Viburnum, the most vigorous growths are from buds towards the bases of the oldest branches or near the root, while annual growths from the upper branches become progressively less as the plants get older. Others stay dormant until relatively late in the season e.g. Celtis, Quercus, Tilia and Fraxinus. A determinate type of growth characterizes Acer, Amelanchier, Philadelphus, and Symphoricarpos species owing to the location and method of flower bud development. Cytisus, Ribes and Spireas remain low shrubs because the tips of the oldest branches die, new stems arising from buds near the ground.

Pruning — It will be readily apparent that, with a great number of shrubs, little or no pruning is required other than the removal of flower

HARDY FLOWERING TREES AND SHRUBS, INDIAN HEAD, SASK., 1928

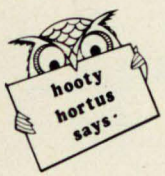
Name of tree or shrub	Year planted	Approx. height in feet	Season of blooming (1) From	To	Where blossoms produced	Habit of growth
Acer, tataricum	1902	10-12	Mid. June	mid. July	2nd or 3rd joint of new growth	Tree or bush.
Acer, ginnala	1896	10-12	Beg. June	beg. July	2nd or 3rd joint of new growth	Tree or bush.
Amelanchier alnifolia	1902	10-12	Mid. May	beg. June	2nd or 3rd joint of new growth	Bush.
Caragana arborescens	1895	14-16	End May	beg. July	Buds, 1 year wood	Bush.
Caragana frutescens	1895	8	End May	beg. July	Buds, 1 year wood	Bush.
Caragana grandiflora	1896	8	End May	end June	Buds, 1 year wood	Bush.
Caragana pygmaea	1896	4- 6	Beg. June	beg. July	Buds, 1 year wood	Spreading.
Caragana Redowsky	1895	8	End May	end June	Buds, 1 year wood	Bush.
Cornus alba sibirica	1896	8	Mid. May	mid. July	Terminal buds 1 year wood, and spurs from 1 year wood later.	Bush.
Cornus Baleyi	1898	10	End May	end July	Terminal buds 1 year wood, and spurs from 1 year wood later.	Bush.
Cornus stolonifera	1896	7- 8	End May	beg. Aug.	Spurs from 1 year wood	Bush.
Cotoneaster acutifolia	1899	7	Beg. June	end July	Buds, 1 year wood and spurs from older wood.	Spreading.
Cotoneaster integerrima	1896	5- 6	Beg. June	beg. July		Spreading.
Cotoneaster laxiflora	1899	4- 5	Beg. June	beg. July		Spreading.
Cotoneaster tomentosa	1898	12	End June	end July		Spreading.
Crataegus Arnoldiana	1907	14-16	End May	end June		Tree or bush.
Crataegus chlorosarea	1896	14-16	End May	end June		Tree or bush.
Crataegus coccinea	1897	14-16	End May	end June		Tree or bush.
Crataegus oxycantha sibirica	1897	14-16	End May	end June		Tree or bush.
Crataegus sanguinea	1897	14-16	End May	end June		Tree or bush.
Cytisus capitatus	1896	4- 5	Beg. June	beg. July	Buds, 1 year wood	Spreading.
Cytisus biflorus	1901	4	End May	end June	Buds, 1 year wood	Spreading.
(2) Lonicera tatarica	1898	9-12	End May	end June	Buds, 1 year wood	Bush.
(2) Lonicera Alberti	1907	3- 4	End June	end July	Buds, 1 year wood	Spreading.
Philadelphus coronarius	1907	4- 5	End June	end July	Spurs on 1 year wood	Bush.
Potentilla fruticosa	1899	3- 4	End June	end Aug.	Buds, 1 year wood	Spreading.
Prunus demissa	1895	12-14	End May	mid. June	Buds, 1 year wood	Tree or bush.
Prunus pennsylvanica	1907	14-16	End May	mid. June	Buds, 1 year wood	Tree or bush.
Pyrus Americana	1906	20	End May	mid. July	Buds, 1 year wood	Tree or bush.
Pyrus baccata	1896	18-20	End May	mid. June	Buds, 1 year wood, and spurs on older wood.	Tree or bush.
Rhus aromatica	1908	6- 8	Beg. June	end June	Terminal bud, 1 year wood	Bush.
Ribes alpinum pumilum	1899	2- 3	End May	mid. June	Buds, 1 year wood	Bush.
Ribes aureum	1913	5- 7	End May	end June	Buds, 1 year wood	Bush.
Ribes sibirica	1898	3- 4	End May	end June	Buds, 1 year wood	Bush.
Sambacus—No. 13	1898	6- 8	End May	mid. June	Spurs, 1 year wood	Bush, not hardy.
Spiraea arguta	1896	3- 4	End May	beg. July	Short spurs, 1 year wood	Spreading.
Spiraea chamaedrifolia	1896	4	Beg. June	beg. July	Long spurs, 1 year wood	Spreading.
Spiraea sorbifolia	1898	3- 4	End June	end July	Long spurs, 1 year wood	Spreading.
Spiraea Van Houttei	1895	4	Beg. June	beg. July	Med. long spurs, 1 year wood	Spreading. Not hardy.
Symphoricarpos racemosus	1895	4	Beg. June	end July	Spurs from 1 year wood and older wood.	Bush.
Syringa chinensis	1896	6- 7	End May	beg. July	Buds, 1 year wood	Bush.
Syringa Japonica	1905	18-20	End June	beg. Aug.	Buds, 1 year wood	Tree or bush.
Syringa Josikaea	1896	10-12	Mid. June	mid. July	Buds, 1 year wood	Bush.
Syringa pekinensis	1899	8-10	Beg. July	mid July	Buds, 1 year wood	Bush.
Syringa villosa	1899	12-14	Mid. June	mid. July	Buds, 1 year wood	Bush.
Syringa vulgaris	1895	10-14	End May	end June	Buds, 1 year wood	Bush.
Viburnum Lantana	1906	8	Beg. June	end June	Buds, 1 year wood	Bush.
Viburnum lentago	1907	10	Beg. June	end June	Buds, 1 year wood	Bush.
Viburnum opulus	1895	7- 8	Beg. June	beg. July	Buds, 1 year wood	Bush.
Viburnum prunifolium	1899	10-12	End May	end June	Buds, 1 year wood	Bush.

(1) Mid. means "middle of." Beg. means "beginning of," and End means "end of."
(2) Similar habits of growth, dates of blossoming, etc., characterize L. alpigena, L. bella atrorosea, L. Fewylii, L. gracilipes, L. Morrowi, L. mundeniensis and L. virginalis alba.
Ostaya verginica (Iron wood) similar elms, hardy, upright, slow growing.
Celtis occidentalis (Hackberry) hardy, upright, slow growing.

spikes and dead or old branches. Emphasis is also laid on the fact that by careless spring pruning the blossom buds, may be removed from Crataegus, Rhus, Syringa and Viburnum. Pruning in spring may be safely practised on some spireas and Symphoricarpos which produce their blossoms on spurs of current year's growth. With most trees and shrubs vigorous vegetative growth results from severe pruning. A number of the oldest Lonicera and Syringa bushes in the arboretum at the Experimental Farm, Indian Head, were cut back to a height of three to four feet. From the results obtained and the symmmetrical growth which followed this treatment, it is strongly recommended for straggling and unsightly bushes. The though of losing the wonderful showing of blossoms and berries should not defer its fulfilment, for the loss of these for one or two years will be well repaid by the resulting desirable type of bush.

Propagation — The propagation of most trees and shrubs can be accomplished by seeds, many of which require two or more years to germinate. Quite a number do not breed true to type by this method, and for these, cuttings, grafting, or budding must be the means employed. In work of this king, however, results are often disappointing and, unless one has the time, material and ground to give it the proper attention, it should be left to the specialist.

In conclusion do not imagine that, because a tree or shrub is hardy, it will require no care. A distance of at least six feet from the plant should be kept clear of weeds and grass, and plants themselves should be from twelve to twenty feet apart according to their size at maturity.



Cut garden flowers will last longer if you do the following:

- *Cut the flowers in the early morning or in the cool of the evening.*
- *Cut them with good shears or a sharp knife and on a slant to provide as much water absorption area as possible.*
- *Harden them off by placing them in a deep, wide-mouthed container of warm water and leave them there for several hours.*
- *Condition the stem ends that bleed when cut, such as Oriental poppies, by dipping them in boiling water, or with woody stem material, such as lilac, shattering the stem ends.*
- *Cut most flowers in their early bud stage just as their outer petals start to unfold.*
- *Keep containers and water clean. Special florist conditioners do prolong the life of cut flowers. Sugar is of some value but aspirin is not.*

The Role of Juvenile Tissue in Plant Propagation

DR. S. J. NELSON
Dept. of Horticulture
University of Saskatchewan

One hesitates to personify plants, yet plants like people have juvenile and adult or mature physiological growth stages. The juvenile stage is the period from the time a seed germinates until the first flowers are initiated and, then, the plant tissue passes into the adult or mature growth stage. The juvenile stage is incapable of initiating flowers while flower production in the mature stage continues, depending upon the environmental conditions surrounding the plant and the nutrients available to the plant.

Plant Changes

Although first flower production on a seedling is an obvious demarcation between the two growth stages, many other changes take place on the plant. Branching habits, thorniness, and growth rates change, as well as producing leaves of different sizes, shapes, thickness and hairiness.

There are also internal changes. There are changes in the internal structure of the wood, but more important to the plant propagator, are the changes in chemical constituents that generally completely change the rooting ability of these plants. The juvenile growth phase of plants is generally associated with ease of propagation characterized by high rooting percentages, quick rooting and numerous roots. The adult form may prove very difficult to root and when rooting does occur on some cuttings, it is slow to initiate and the root system is very weak with only a few straggly roots.

Rooting

The juvenile period in many plants is so short that it is never noticed, but in others it may last five to twenty years, or even much longer in rare cases. Fortunately for the plant propagators, many of our woody shrubs root sufficiently well in the adult form that propagation is not a problem. With many of our trees, particularly fruit trees, however, rooting of the adult form is very difficult and other methods of propagation rather than cuttings must be used. Since most plants do not come true-to-variety from seed, such practices as grafting onto rootstocks must be practised.

Normally most rootstocks can be produced by seed, but there are special clonal rootstocks that have spe-

cial attributes, such as dwarfing, that must be raised by methods other than seed. Mound layering has been most commonly practised, but this practice is laborious and costly and still depends upon the tissue being in the juvenile stage for best rooting. Of course, cuttings from the juvenile stage will also root readily and should be used more widely.

Retaining Juvenility

The site of juvenility in a seedling is very close to ground level. Unlike a juvenile child which loses its baby teeth to be replaced by new teeth, the plant does not lose its juvenile tissue, but merely buries it under succeeding layers of tissue. Juvenility can be maintained by severe pruning of plants in the juvenile stage back to ground level each year to force wood for propagation. Accordingly, if trees are to be propagated by asexual means such as cuttings, care must be exercised to maintain the juvenile characteristic. Unfortunately, in many instances, this juvenile tissue has been inadvertently lost because the original seedling which contained the juvenile tissue was not maintained through the many years of testing necessary to evaluate a particular selection of shade or fruit tree. This is of particular concern with special rootstocks where no other method of propagating them, such as grafting, is available.

The ability to retain juvenility is almost essential in special rootstocks and could be of tremendous value in the propagation of shade trees where the production of flower and fruit is not critical. With fruit trees, however, even though the retention of juvenility and the ability to use cuttings would help the nurseryman by circumventing the necessity of raising rootstock and subsequent grafting, the use of cuttings is of questionable value. Trees propagated in this manner would be much slower to bear fruit because they would have to complete their juvenile stage before they would be capable of flowering. The present practice of using an adult bud on a rootstock will bring the tree into fruiting much earlier and is far more acceptable to the purchaser. Incidentally, the non-fruitful years of a grafted fruit tree after it is first planted out should not be confused with juvenility. It is adult tissue which will fruit as soon as a balance of food reserves for the initiation of flower buds is re-established.

Plants growing in plastic pots do not dry out as fast as plants in porous clay pots. If you overlook watering a plant in a clay pot until it is really dry, you should water both of them. The best way to do this is immerse the pot and soil in a pail or sink of warm water for thirty minutes, remove, drain and return to its growing location. Frankly, I'm just that old fashioned that I like clay pots but one should know the difference, water wise, between clay and plastic pots in the proper handling of indoor plants.

Hanging and Trailing Plants for Beginners

JANET OSBORNE
Winnipeg, Man.

Fashion in houseplants, as in everything else, comes and goes and at the present time the big rage is for hanging plants. Houseplants have become a major part of interior design, and homeowners are selecting them as carefully as carpets and furniture. It is important, however, for the beginner to realize that success with houseplants depends largely on buying the plant to fit the conditions and kind of care it will recieve.

Hanging plants fill a real need in today's homes which are usually built without windowsills. I have my kitchen window "curtained" with hanging plants. There is one way in which hanging plants have a big advantage over those standing on a windowsill, and that is that they get much better air circulation and are less likely to suffer from sitting in chilled air. Unless your windows are very drafty, they will be safe a few inches from the glass.

Light

Every houseplant grower must understand the importance of light, either natural or artificial. No plant will grow without sufficient light, although many will survive for quite a long time in poor light. If it is important to you to have a plant in a very poorly lit spot, then it is better to buy two plants and keep one in a well-lit place so that you can rotate them month and month about. This way you will always have a lovely plant on display. This applies to foliage plants only — it will not work with flowering plants as they need light all the time. In December and January, when days are at their shortest, light conditions in the average home are particulary bad, and unless your plants are near a window, you should extend their "day" for them by having them fairly near a lamp in the evenings, though not close enough to burn the foliage. I have not found it necessary to provide special "grow" lights for the plants which I will be describing.

Watering

Never shock plants with cold water — always use lukewarm water. It is best to allow plants to become fairly dry between waterings, but if they are grown in a sunny window, check them frequently — every day in summer. Just feel the surface of the soil with your finger and if it is damp wait until tomorrow. Wet soil will produce soft growth and an unattractive plant. It will also lead to root rot and the

death of your plant. On the other hand, plants must not be allowed to dry out completely. Ferns in particular will die if they get too dry. Thus frequent checking is the rule.

To avoid water dripping on the floor from hanging plants you have to place the plant pot inside an enclosed container. This way you can give water until it runs out of the drainage hole, without getting it on the floor. I stand on a chair so that I can see between the two containers, or I put my fingers between them so that I can feel when the water begins to run out of the pot. Water slowly so that you can stop as soon as it runs out of the drainage hole, otherwsie you will have to take the pot down and empty out the surplus water from the container, since nothing kills a plant faster than sitting in water. Water sparingly if the room temperature is low, if the weather is dull, and when the plants are first potted.

Temperature

Now that we are being asked to lower our thermostats to conserve resources, it is good to know that most plants will be happier in slightly lower temperatures, say from 16°C to 20°C during the day and a couple of degrees lower at night. If you turn your thermostat down at night, remember not to have your plants too close to the glass. Experimentation with some of your hardier plants will show that most of them will thrive on night temperatures only a few degrees above freezing. This temperature might be reached near a window if you turn your thermostat down to 15°C. All of the plants which I will list have done well with this treatment.

Fertilization

Be cautious — a strong solution will burn the roots of the plant! Plants restricted to pots need plant food, but it is better to under-fertilize than to over-fertilize. Some people have never fed their plants and they still thrive, but I recommend the use of a houseplant fertilizer. I use either a powder or a fish emulsion, both of which have to be mixed with water; or tablets which are placed on the surface of the soil. The tablets are easier and I have not encountered any problems through using them. I like to use all three in rotation, and I buy a different formula of powder whenever I run out, so as to add a good variety of nutrients to the soil.

Plants purchased from a florist will not need food for several weeks, and neither will plants you have recently repotted. Although there is no single rule for feeding houseplants, it is important to remember that they use food only during periods of active growth. Most plants should not be fed during the winter months. I feed my plants from the beginning of March until early October, and use a very weak solution. Foliage plants need less food than flowering ones, and since most of my plants are foliage plants, I use the fertilizer at one-quarter the strength recommended on the container. For flowering plants I use it at half strength. Never give fertilizer to a dry plant — water lightly first, then go around with the fertilizer. Remember that fertilizer will not make up for poor growing conditions.

Troubles

If the lower leaves of plants yellow and fall off, you can suspect too much water. Too little water or lack of humidity will cause leaf edges to dry and curl under, or lower leaves will turn yellow with brown spots and drop off. When you are used to your plant, you will be able to detect a sad and wilted look when water is overdue. If leaves on one side of the plant turn yellow or brown and that side of the plant is near a window, you can suspect sun scorch — either move the plant further back or hang a net curtain over the window. Plants which do not get enough light will have weak growth, leaves will be small and stems elongated. In general, the plant will appear pale and weak. If the plant is getting good care and plenty of light and the right amount of water and still looks unhealthy, examine it carefully for insects.

Insects

Some insects, such as aphids and white fly, etc., are easy to get rid of with an all-purpose plant spray — just do not get the full blast of the spray on the foliage as it is too cold. In warm weather, take the plant outside, hold it upside down, and spray under the leaves. In winter, do it in the bathroom, so as not to damage furniture. For springtails (little creatures which jump around on the surface of the soil) I make up a solution of one teaspoon bleach to one cup of water, and add just enough of this to cover the surface of the soil. Bleach is not good for plants but so far I have not had any trouble and it gets rid of the insects fast. I would advise a beginner who has plants with mealy bugs or scale to throw the plant out as they are hard to get rid of and will infest other plants. Always keep a new plant away from your other plants for two or three weeks in case it is infested, and keep on inspecting it carefully for several more weeks as some insects, such as scale, can take a long time to hatch out.

Containers

Try to attain a pleasing relationship between the size of the plant and the size of the container. A tiny plant in a huge pot looks lost, and a large plant in a tiny container not only may tip over but will not have enough soil to support growth. Experiment with plants in groups until you have a pleasing effect. I prefer to keep my plants in separate pots so that I can vary the arrangements as the plants grow or come into bloom, or just to make a change.

For beginners, it is really not difficult to grow plants, start with the more common, hardier plants. There are so many and they are so attractive you may never want to try any of the fussier ones. Some of the old favourites (which I have had for years and years) which will survive and even thrive, in spite of amateur care are:

Trailing Plants

EASY TO GROW:

Philodendron:

There are lots of varieties of philodendron, and all are relatively hardy. But the most common one with the heart-shaped leaves is the hardiest. The philodendron family have quite a good tolerance for dim light and dry air. Some people let them grow up a bark stick, they also make a good hanging plant. Cut back the stems and root these pieces in water. They will also grow well for a long time in plain water. If you root pieces cut from long stems, you will always be able to replace any weak stems with better ones. In fact this is the best way to handle almost any trailing plant.

Pothos:

This plant is often mistaken for a philodendron. It has a good tolerance for dry air and grows quickly. If the plant does not do well, you are almost

certainly overwatering it. It needs moderate light. It can climb, but I like it best trailing. When it gets too long, just cut off the stems and root in water.

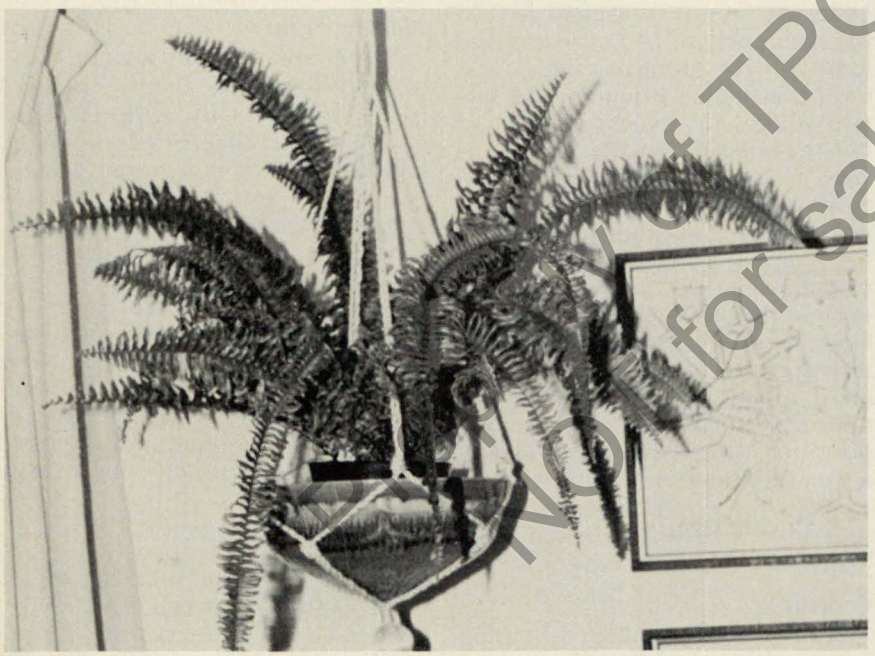
English Ivy:
Culture as for Pothos, but ivy needs more humidity.

Swedish Ivy:
Comes in plain green and mottled green. Culture as for Pothos.

Asparagus Fern:
Easy to grow from seed. Needs good light for best growth.

Fibrous-rooted begonia:
Not really a trailing plant, but I have one in a hanging container in my kitchen window, and the flowers all year round are a treat. It stands quite cold night temperatures as it is close to the glass and it gets direct sun in winter and summer, although in summer the sun is not on it for long as it is higher in the sky. Care is the same as for other hanging plants, and it too will root in water. You can easily keep a nice bushy plant, either by starting new ones or by replacing any weak growth. It will also do quite well in good light away from the window, but it will not flower in poor light.

Spider Plant:
This is the plant for you if you want a splashy display in a short time. There are several varieties of striped green and white, and a plain green. The plain green one will take the least light. It grows runners on stems and these can be removed from the mother plant and placed on a pot of soil in the shade and they will root quite fast. I secure them with a paper clip pushed into the soil. Do not overwater. I like the flowers which are small, white, star shaped.



Boston Fern

A LITTLE HARDER TO GROW:

Purple Passion Plant:
This plant needs some sun, and has furry purple leaves. Pinch back to get a bushy plant. The pieces will root in water. Needs humidity.

Tradescantia and Zebrina:
There are many varieties. They need some humidity and fairly good light. They tend to become "leggy" but easily root in water, so it is best to keep replenishing the plant with these pieces.

HARDER TO GROW:

Episcia:
A very attractive plant, related to the African Violet. It must not be overwatered, or allowed to dry out completely. It likes humidity, needs good light and winter sun, but no direct sun in summer. In subdued light the episcia will live, and will grow a little, but needs better light to grow well and to flower.

Boston Fern:
No summer sun, but good light and humidity. Will not thrive in a draft or a dark corner, and does not like being brushed against. Watering as for Episcia.

Silver Nettle
A pretty light green and silver plant. Likes winter sun, filtered sun in summer. Needs humidity. Let dry out between waterings. When it gets too straggly, pinch back and root cuttings in water.

Periwinkle:
Can be grown as a houseplant if you have plenty of sun. Will root in water. Pretty blue or white flowers.

Other:
Many other plants look good in hanging containers, including the Waffle Plant, which needs some sun. If you have a very sunny window, you might like to try some trailing annuals, such as trailing nasturtium, trailing lobelia, trailing petunia, etc.

Your Questions Answered on Manitoba Sphagnum Moss, Peat, and Peat Moss

by Three Horticultural Experts

Some Uses of Sphagnum Moss in Horticulture

SUSANNE OLVER
Botanist, University of Manitoba

Fresh sphagnum, the green, living parts of the moss including the yellow, but not yet decomposed plant parts, is much less known to most gardeners than sphagnum peat, peat, or peat moss, the material one buys in bales to use as a soil conditioner, either for the garden or for potting soil. Sphagnum can be found in great quantities in the eastern and northern parts of our province growing in bogs; either in open bogs or, in our forested areas, in spruce bogs, under stands of black spruce.

On a weekend trip it is easy to stop along the road at one of those bogs, armed with a plastic bag and rubber boots, to collect enough to last through the whole winter in a very short time. Unless you like mosquitos, go in spring, late fall, or on a cool windy day. But when you enter the bog, don't think only about your bag of moss. Stop and listen for a while, and look at the world around you. All sounds are muffled by the thick carpet of moss, only a few creatures are near you, but a special world of plants grows at your feet. But I am not writing about the beauty of the spruce bog — but what you want to know is what you can do with your moss when you have collected it in great handfuls, and got it home.

First of all, when you are home, find a dry spot where you can empty the bag to inspect your moss and dry it or pack it up for freezing, unless you want to use it within a short time. You might find a little frog or salamander in it, or some other surprise, so don't do this part of the operation in your livingroom. If you pack the moss into smaller bags and freeze them, they will stay fresh almost indefinitely, but air dried and stored in a cool place it also keeps very well. Just don't leave it for too long in the plastic bag — it will eventually break down. Sphagnum stored under high temperatures or for extended periods can lose its antibiotic properties, as well as when it is heat-sterilized.

Now you've got it — what should you use it for?

It makes an excellent lining for all sorts of hanging baskets. Just use slabs of moss to line the basket, then cut strips of plastic to line the inside, then fill potting soil into the hollow and plant your plant into that. Those plants which like very good drainage, however, would do better without the plastic strips.

Do you want an Epiphyte tree for orchids and bromeliads and other things which grow on tropical trees? Fresh sphagnum is a 'must' to wrap around the branches of the gnarled oak or apple or whatever you have obtained as a basis for your tree. Nylon fishing line, used to tie the moss and the plants to the tree, will not rot.

For some potting mixes, for some orchids and bromeliads for example, sphagnum must be used. And if you want to grow some of the strange insect-eating plants, like the Venus fly trap, the darlingtonia, Sundew and others, you will need it.

But for ordinary, everyday plants like the rubber tree and the African violet, sphagnum has its uses. If you want to root African violet leaves, try sliding them into a wad of damp moss, keeping each leaf separated, but several to a bag if you wish. I label them and tie the bag up. Keep it about 75°F, but out of the sun. If you do this during the growing season you can have little plantlets in four to six weeks. Only one warning — take care when you separate the leaves, since the new roots are well imbedded in the moss and break off if you are not careful. Leave a little moss on the new plant and plant it with that. It won't matter. We experimented a little in the Botany Greenhouse at the University of Manitoba, using various rooting methods for African violet leaves, but found that the sphagnum-plastic bag method worked best, with hardly any losses of leaves. The same method can be used for various other cuttings, hibiscus for instance, orchids and bromeliads and many others. I would not try plants which don't like acid soil, or want to be dry, like cactus and succulents, but perhaps one could experiment even with those.

Rubber trees and other large ornamentals can be air layered using fresh sphagnum moss (see pages 90-91, Prairie Garden, 1977). Sphagnum also makes an excellent packing material for transporting fresh plant material, keeping the plants or cuttings moist, but largely preventing rotting because of the antibiotic properties of sphagnum.

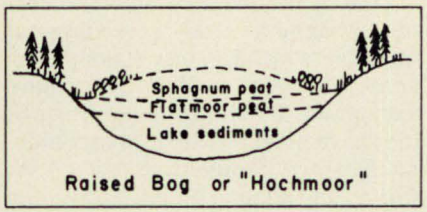
One of the main commercial uses for sphagnum is as a seeding-out medium, which can be obtained from some firms as milled or ground sphagnum. Its antidamping-off qualities have been proven by experimental evidence (Stoutemyer, V.T., A.W. Close, and Claude Hope. Sphagnum Moss for Seed Germination. USDA Leaflet 243. 1944). To use sphagnum for this purpose, the dry moss can be rubbed through a quarter inch screen and moistened before use. The seed flats or pots are then filled with sterilized soil mix or other seeding-out medium, and covered with about one and a half inches of milled sphagnum, which is pressed down and the seeds are then broadcast over the surface. Proceed as usual (see Prairie Garden, 1977, page 88). To hasten development of the germinated seedlings syringe with a mild complete fertilizer solution made up from one of the soluble fertilizers.

The next time you are out in the forest, bring some sphagnum back with you and try it. It is 'great stuff'! A much neglected natural resource of our forests.

Peat Moss

DR. JOHN M. STEWART
Department of Botany
University of Manitoba

What possible interest can a gardener or greenhouse operator have in the soggy inhospitable bogs or muskegs that occupy much of Manitoba's land surface area? The answer lies in the ubiquitous moss — *Sphagnum*, or as it is known locally — bog or peat moss. It is a frequent component in most bog communities where its presence is easily detected by its small upright stems forming compact cushions of various hues of



colours ranging from pale green to browns, oranges and reds. Words such as 'lawns', 'carpets', 'hummocks', 'hollows', 'cushions' describe the real extent of the various habitats occupied by sphagnum.

Closer examination of these sphagnum populations reveal such different rates of growth that often the slow growing members of the bog communities are 'overgrown' or 'swamped' by the faster growing sphagnum. A good example can be seen in black spruce 'layering' where the lower branches of the tree are engulfed by the faster growing sphagnum, thus forming rooted extension of the original tree, a practise 'copied' by many gardeners when they propagate cuttings. This faster rate of growth is often reflected historically in the fairly thick strata of preserved sphagnum moss in the underlying peat. It is these upper layers of relatively pure sphagnum peat which are actively sought after as a soil-conditioner and growth media in horticulture.

What is Sphagnum Moss?

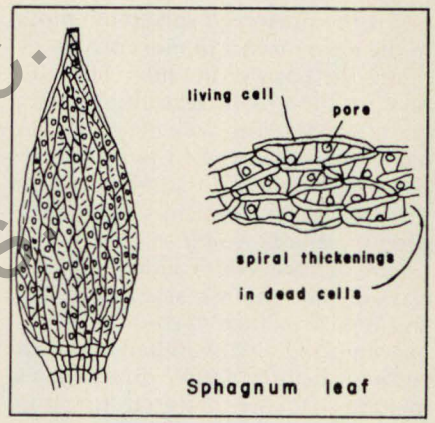
Like the more evolutionary advanced vascular plants, the mosses are small plants capable of photosynthesis, but they differ in being devoid of a vascular conduction system. Examination of the many species of sphagnum will reveal upright green shoots anywhere from one to several centimeters in height closely associated with other individuals so as to form a continuous cover. Each green stem has from three to seven spreading branches emerging from the stem at intervals with these whorls becoming dense and compacted at the apex.

Propagation

The sphagnum plant, unlike the more familiar garden flowering plant, does not develop from a seed, but from a spore. This spore, when it lands on a wet, acidic site, absorbs water, bursts and grows into a branched, threadlike structure called 'protonema', which looks similar to a filamentous algae. In time, the upright stems of the sphagnum plant appear. When these plants mature and also when conditions are right, they will produce male and female germ cells. Upon fertilization of the germ cells a spore capsule is formed. In suitable weather, ripe spores are released from here ready to begin a new life cycle.

In addition there is vegetative reproduction where the sphagnum


Sphagnum plant



plants can branch extensively as they grow. The older parts, usually a few centimeters beneath the apex, die and partly decay. The upper terminal parts keep growing from year to year and thereby give rise, with the partly decayed remains of vascular plants, to the often thick strata of organic debris known as peat.

Sphagnum Leaf

The reason for the commercial interest in sphagnum lies in its ability to take up and hold large volumes of water. This can be easily demonstrated by squeezing a handful of living sphagnum moss. Both stem and branch leaves are minute and crowded (Fig. 2). They lack a midrib and are only one cell thick. Each leaf has two types of cells, small green chlorophyll cells alternating with large empty cells whose pores allow for the entry and storage of water and nutrients.

Where Does Sphagnum Grow?

Sphagnum is world-wide in its distribution, but it is most abundant in the colder temperate zones, where the wet organic soils, together with their high humidity and relatively low temperatures, form an ideal habitat for sphagnum growth.

Uses of Sphagnum

Sphagnum is one of the few mosses harvested in large quantities both in the living and preserved states. The living sphagnum is used commercially for packing nursery stock, promoting root cuttings, air layering, media in the transport of cut flowers and other operations with plants. The water-holding capacity of the moss keeps living material in a moist and slightly sterile environment. It was the latter property, believed to be caused by the release of phenolic compounds, which lead to vast quantities being collected during the two world wars for use between cheesecloth as bandages and bedding.

It is the preserved sphagnum moss in the upper layers of most peat bogs that is the basis of the huge horticultural and intensive agricultural practices of today. The bulk of sphagnum moss peat is harvested by the 'mill' process, air dried to something less than 45 percent moisture and packaged in variable volumes, depending on the market. When added to heavy clays or sandy soils it acts as a mulch and improves their texture. It is frequently used as a seed-bed and root cutting medium. Other diverse uses include packing material for fine china, base in animal factory farms, and fuel (Eire and U.S.S.R.).

Future

In some European countries, e.g. Netherlands, the demand now exceeds the supply of this non-renewable resource. In all countries the high quality sphagnum moss and peat deposits have been exhausted near the large urban centres, with the result that companies are having to go further afield for supplies. Also in Europe the change in climate induced by industrial pollutants is believed to be responsible for the overall decline of many sphagnum species in the surface vegetation of peatlands. A conservation policy is urgently needed in all countries to manage wisely this rapidly diminishing non-renewable resource.

Manitoba Peat As a Starting Medium

DR. JOSEPH D. CAMPBELL
Department of Food Science
University of Manitoba

For successful horticultural production, starting many of our favorite vegetable and annual flowers indoors is an absolute necessity on the prairies. The bedding plant industry, which is flourishing, can provide most of our requirements, however, if it can be done without too much trouble, this is something we should do ourselves. For most gardeners it is fun to watch the development of young plants, also, one can be more certain to have the varieties one wishes.

Many articles have been written on the use of artificial lights for indoor gardening, and in recent years great strides have been made in plastic and peat containers for starting plants. The use of peat in growing media has also become available and well accepted. In this article another do-it-yourself idea will be discussed.

A useful development from Cornell University was a starting medium called Peat-lite Mix.* This was a mixture of finely ground peat moss with an equal part of horticultural grade Vermiculite. To this was added the necessary "goodies" for seedling growth. Experience with this product at the University of Manitoba has been both good and not-so-good.

For germinating plants the medium was too light in weight for best results with crops such as tomatoes. To overcome this problem it was found that if the seed is covered with a ⅛ inch layer of sharp sand, better results were obtained. It is for practical purposes, sterile, it is light in weight and

Left to right: Peat Moss with "Manitoba Mix", Peat-lite; Garden Loam (unsterilized); 2:1:1 (soil, peat, sand plus slow release fertilizer 5-10-5).

will produce excellent plants. When plants are pricked out into individual cells or containers, the amount of medium required may increase considerably, and using it this way could become expensive. To enable growers to use locally produced peat moss and reduce costs, "Manitoba Mix"** was developed at the University.

The following nutrients are required to make one bag (approximately nine pounds in weight) of "Manitoba Mix". When this is thoroughly incorporated in one large tightly packed six cubic foot bale of peat moss, it will produce about nine cubic feet of complete growing medium.

Major and Secondary Nutrients	**g.**
Ground Limestone	1,503
Dolomitic Limestone	1,618
Triple Superphosphate (0-45-0)	173
Potassium Sulfate (0-0-50)	347
Calcium Nitrate (15-0-0)	173
Ammonium Nitrate (33.5-0-0)	231
Total	4,045

Micronutrients	
Borate 46 (14.3% B)	2
Copper Sulfate (25% Cu)	5
Iron Sulfate (20% Fe)	11
Iron Chelate (Fe 330 10% Fe)	4
Manganese Sulfate (25% Mn)	4
Zinc Sulfate (23% Zn)	4
Sodium Molybdate (40% Mo)	1
Total	31

Total weight per bag 4,076 g or 9 lb. For smaller amounts use 1 lb. per 1 cubic foot of peat moss. This is equal to approximately ¾ of a bushel or two and a half pails.

When the seedlings have become established they should be fed each week with a solution of a soluble fertilizer such as 20-20-20 or 15-30-15 at the rate of half a tablespoon per gallon.

Following in Table 1 are the results of a comparative test using different growing media. The weights in grams are of eight plants which were grown for three weeks in a well controlled growing room.

TABLE 1

Wet and Dry Weight Production of Tomato Seedlings.

Rank	Treatment	Fresh Weight (g)	Dry Weight (g)
1	Peat Moss with "Manitoba Mix"	17.9	1.5
2	Peat-lite	13.2	1.1
3	2:1:1 (soil, peat, sand + Slow Rel. 5-10-5)	9.8	1.4
4	2:1:1 + Earth Worm Castings	9.3	1.1
5	Loam (sterilized)	9.0	1.0
6	2:1:1	7.4	1.0
7	2:1:1 + fertilized peat	7.1	0.8
8	Loam (unsterilized)	6.5	0.6

*Sold by W. R. Grace & Co. as "Redi-Earth".

**Available from Mid West Soil Products Co. Ltd., 110 McDermot Avenue, Winnipeg, Manitoba R3B 0R8.

Midsummer Planting of Container Stock

W. B. HUTCHISON, P. Ag.
President,
Hutchison Environmental Associates Ltd.

—Should we plant trees during the heat of July and August?
—When is the period of rapid plant growth?
—Is root damage from spring digging a probably cause of summer death of plants?
—Should container-grown material be put right into the ground with no special care or handling?

These are some of the questions pertaining to summer landscape site improvement often asked.

Should we plant trees during the heat of July and August?

The answer can be yes, when container-grown or container held stock is purchased for the job. With container material, when you locate the tree on site and plant it, there is no condition known as "transplant shock" experienced by the plant. The confusion on this topic arises from the delicate nature of the plant in the spring. Plants received in the spring have lost perhaps 60 to 70 percent of their roots when dug, have been bare rooted and have just started to leaf, thus it is under stress and extra care is needed. This is not the case with container-grown or held material which arrives with 100 percent of the life support roots.

July and August are periods of rapid plant growth.

This statement is not correct. The fact is that dormant winter buds have probably been developed and the plant is already developing its systems for winterization. To interrupt this system by lack of watering or weakening of the root system by digging will cause wilting and die back, if not death. Containerized material will not be interrupted in its hardening off process. A tree will not leaf out fully if its roots are severely injured, dried or cut off at the time of digging. Should you receive a plant showing poor leaf growth or partially leafed branches, it may be a sign of a weak plant due to poor handling before potting. Even held in its container longer will not likely help in this situation. Most plants grown in a container have not suffered to any extent from this condition, all that is left to be done is proper removal from the pot.

It is thought that this tight root growth must be loosened to allow new roots to branch out into the soil. This is best done by taking a sharp penknife and making three or more vertical cuts from top to bottom, then spreading the bottom two to three inches outwards from the centre.

Newly potted stock must be handled more carefully, so that the earth does not crumble away from the new root growth. (No spreading should be done.) After showing reasonable care when removing the pot, normal good planting practice is recommended.

If these recommendations are observed, plants can be used to improve our communities, homes and recreation areas throughout the season by careful planting of container stock.

Have a good green summer. Green Survival — it depends on you.

Professor John Walker Recipient of Stevenson Commemorative Award

The Stevenson Commemorative Award is presented for "Conspicuous Achievement in the Field of Horticulture", and there have been fourteen recipients to date. On February 3, 1978, Professor John Walker will join this honored group when the award will be presented to him at the M.H.A. convention in Winnipeg. The first award was made to the late Dr. F. L. Skinner in 1932. Other prairie recipients still living are Dr. W. R. Leslie, Robert Simonet, A. J. Porter, Dr. C. Walkof, W. L. Kerr and Dr. W. A. Cumming.

Professor Walker is most worthy of this honor. A native of Scotland, he received apprenticeship training in all phases of horticulture at an early age, and put this training to good use while employed at the Lethbridge and Lacombe Experimental Farms before he enlisted for overseas war service in 1915. He received his B.Sc. (Agr.) degree from the University of Alberta after the war in 1924, and attained his M.Sc. degree from the University of Minnesota in 1926.

Space does not permit us to list all the positions Professor Walker has held over the years. He taught horticulture at the University of Minnesota, and was Head of the Division of Horticulture of the University of Manitoba from 1937 to 1942. Prior to that he was Extension Horticulturist for the Manitoba Department of Agriculture for eight years. He was a good administrator and was Superintendent of the Forest Nursery Station at Indian Head from 1942 to 1958. Later, Professor Walker returned to the University of Manitoba and served as Research Associate from 1958 to 1968. Since then he has been active in extending horticultural knowledge by working with all Canadian horticultural organizations. Prairie Garden readers have benefitted greatly from the numerous articles he has written, as well as the many he has obtained from other writers over the years.

Professor Walker is also well known for plant breeding and selection. *Potentilla* — "Coronation Triumph" and *Caragana* — "Walker" won W.C.S.H. Merit Awards. The P.F.R.A. Tree Nursery had a hybrid poplar named "Walker". "Density" spirea, "Korman" spirea, "Radiance" Amur maple, "Jubilee" willow, "Prairie Princess' phlox and "Garry Pink" Viburnum are other plants bred and selected by him.

Numerous research publications and popular bulletins and articles flow from his pen.

His contributions to horticulture have been recognized by a long list of well deserved awards. Professor Walker was elected a Fellow of the A.I.C., an Emeritus Member of the American Society of Horticultural Science, and Honorary Life Memberships were bestowed on him by:

Winnipeg Horticultural Society
Saskatchewan Horticultural Society
Manitoba Horticultural Association
Western Canadian Society for Horticulture
Canadian Society for Horticultural Science
Manitoba Institute of Agrologists

There is no doubt that this quiet, efficient horticulturist who shares his life with a wonderful wife, is well deserving of this highest of all honors, the "Stevenson Commemorative Award". Professor Walker can truly be cited for "Conspicuous Achievement in the Field of Horticulture".

The Prairie Garden proudly congratulates their own "John Walker".

Some ways of raising the humidity level in the home, at least around plants, is to cluster the plants relatively close together, as they respire they help raise the humidity level in the immediate area or you can stand the potted plants in trays of pebbles and water. The depth of the pebbles — or bricks, sand, gravel or whatever you use — should be sufficient so that the bottom of the pots are sitting above the water line.

Mist spraying of your house plants is also an excellent habit. Get yourself a small hand sprayer and mist your plants every day during the winter months. This practice will do much to keep your house plants healthy.

So You Want To Plant A Tree?

JOHN DIETZ
Manitoba Department of Agriculture

Planning to shop at a nursery this spring to buy a tree or shrub for your yard? Here are a few pointers gathered from the Manitoba Department of Agriculture horticulturists.

Spring is the best time to plant — until trees are in full leaf. Your new plant needs a summer of growing to heal the damage done to its root system during the transplanting process and to develop new roots that branch out into the soil.

Be sure to cut off the top one-third of all branches immediately after transplanting, if the nursery has not already done this job. It's a 'must' because the root system has been damaged and it can't support the same amount of foliage it did at the nursery. The only exceptions to this planting rule are evergreens and container-grown nursery stock, which can be planted at any time of year.

Plan first, before shopping, but be flexible within your plan. Choose according to a landscaping plan you have developed. The wrong choice, discovered perhaps a year or two later, can have heartbreaking consequences.

Unless you've studied horticulture, you may be in for a 'mindboggler' when you visit the nursery. More than 200 varieties of trees, shrubs, climbers, ground covers and hedges are recommended for Manitoba.

A Manitoba Department of Agriculture publication that can help is the "Recommended List of Ornamental Trees, Shrubs, Climbers and Ground Covers." It sorts out the varieties available according to height, style and purpose, and provides general information about care of nursery stock.

Deciduous trees, the kind that lose their leaves every fall, are listed according to height, over or under 10 m (about 33 feet). Some unusual varieties include walnut, buckeye, hophornbeam and linden, as well as more commonly grown plants such as birch, crabapple, lilac or cotoneaster.

Deciduous shrubs are listed in three sizes, and come in an almost limitless variety of shapes and colors. Then there are climbers, ground covers and evergreens.

The pamphlet also lists plants for special interest or special locations and suggests many plants which can be used for hedges. For instance, if you want red or purple foliage throughout the season, try Cistena

plum, Shubert chokecherry or Thunderchild crabapple.

For shady areas, consider cedar, Aurora falsepirea, currants, dogwoods, dwarf euonymus, honeysuckles, saskatoons or others.

Many other horticultural publications are available from the provincial and federal departments of agriculture, the University of Manitoba, libraries, and nurseries. Many are available without charge and will serve for years to come.

Some plants, commonly advertised nationally, are not recommended for Manitoba the Department of Agriculture warns. The horticulturists caution against buying Austrian pine, flowering dogwood, honeylocust, Japanese maple, Lombardy poplar, Rose of Sharon and Tree of Heaven for Manitoba planting.

House plants can be a problem if you are away from home for any length of time and have no one there to care for them. During the summer months some of the more rugged ones can be moved into a protected shady part of the garden. Set these plants into the ground, pot and all, and don't put the pot in too deeply. The bright light of a sunny window is often equivalent to open shade outside.

Other smaller and more tender plants may be sustained for several weeks by watering them well and enclosing them in transparent bags. The moisture within these miniature greenhouses will collect and drop back to re-water the plants while you are away.

For larger plants you can put inverted pots or bricks on the bottom of the bathtub. Place the plants on these and fill the tub so that the water does not quite touch the bottom of the pots. Finally, cover the whole tub with a piece of transparent polyethylene and tape to the tub and wall.

As it is a good idea to leave a light or two on in the house while you are absent, why not make one of these lights, the bathroom light. It will help your plants survive your absence and they should be in pretty good shape when you return home.

Environmental Conditioning of Interior Landscape Plants

by SUSANNE OLVER
Supervisor,
University of Manitoba Greenhouse

Many plant lovers have had the experience, after having bought a Ficus benjamina, Schefflera, Aphelandra, or some other tropical plant, that in spite of all the tender loving care given it, its leaves dropped off one by one for no apparent reason. In his paper "Environmental Conditioning of Interior Landscape Plants," Dr. Charles A. Conover of the University of Florida, Agricultural Research Center, Apopka, Florida, discusses the necessity of acclimatization of these plants prior to shipment.

Light Acclimatization

Plants grown in the sun adapt themselves to high light intensities by developing smaller, thicker light-green foliage, and a change in the arrangement of chloroplasts (photosynthethising bodies) in the leaf cells. Unfortunately, these leaves adapted to high light intensities cannot change back to functioning well under low light intensity but will be dropped as in the case of Ficus benjamina, and replaced by a new crop of darker leaves of a softer texture. To minimize this leaf crop which, of course, influences saleability of these plants, methods have been devised which will acclimatize them before they are put on the market.

Research at the Agricultural Research Center, Apopka, has shown that with Ficus benjamina, placing it under 80 percent shade for five weeks reduced leaf drop by 50 percent when plants were placed subsequently in indoor conditions. Additional acclimatization of ten to fifteen weeks was also beneficial — but not of the magnitude of the first five weeks. Similar results have been obtained with Brassaia actinophylla (Schefflera), but here leaf drop was not as severe.

Whether plants are acclimatized or not, sufficient light intensity, duration, and light quality will go a long way toward maintaining plant quality. It also helps to know whether a plant has been sun or shade grown, since a sun grown plant requires at least a light intensity of 150 foot-candles for a minimum of ten to twelve hours duration, seven days a week. A shade grown plant can make do with 75 to 100 foot-candles ten to twelve hours a day seven days a week.

Since a comparison is usually difficult to make for the customer, it

might be better to err on the side of more light than less. A sun grown Ficus benjamina, which has been acclimatized, will have both light and dark green leaves. The light green leaves will gradually drop off over a period of a few months, while the dark leaves will remain. A non-acclimatized plant might shed all its leaves! A Schefflera might have short and long petioles (leaf stems) if it has been acclimatized, or only short ones if it has been entirely sun grown.

Light quality is important for plant growth, i.e. both the blue and red wave lengths should be supplied as in a mixture of incandescent and fluorescent light or with special grow-lights. However, excellent quality tropical plants can be maintained under fluorescent light alone.

Soil Acclimatization

Besides light acclimatization, soil medium acclimatization is important. A plant growing indoors needs only about one-tenth or less of the amount a sun grown plant receives and utilizes. If a plant growing in such a nutrient rich medium is moved to a low light intensity environment, problems of fertilizer damage might occur, such as loss of colour, burned foliage, leaf drop or, in severe cases, death of the plant.

If such symptoms occur and fertilizer damage is suspected, it is suggested to leach the soil heavily by pouring water through it two to three times in quick succession, then draining the plant and not feeding it, of course.

Other Factors

Some so-called 'confusion factors' are mentioned in Dr. Conover's Paper also. For instance, leaf drop due to light exclusion during extended periods of shipping, application of shine compounds (which should be kept to a minimum), damage through pesticides) and tip-burn due to fluoride in the water which can cause damage in Chlorophytum (spider plant), Cordyline, Dracaena, Maranta and Yucca. Cold damage, air pollution and over-watering can also cause leaf drop or damage.

My Pop Bottle Tulips

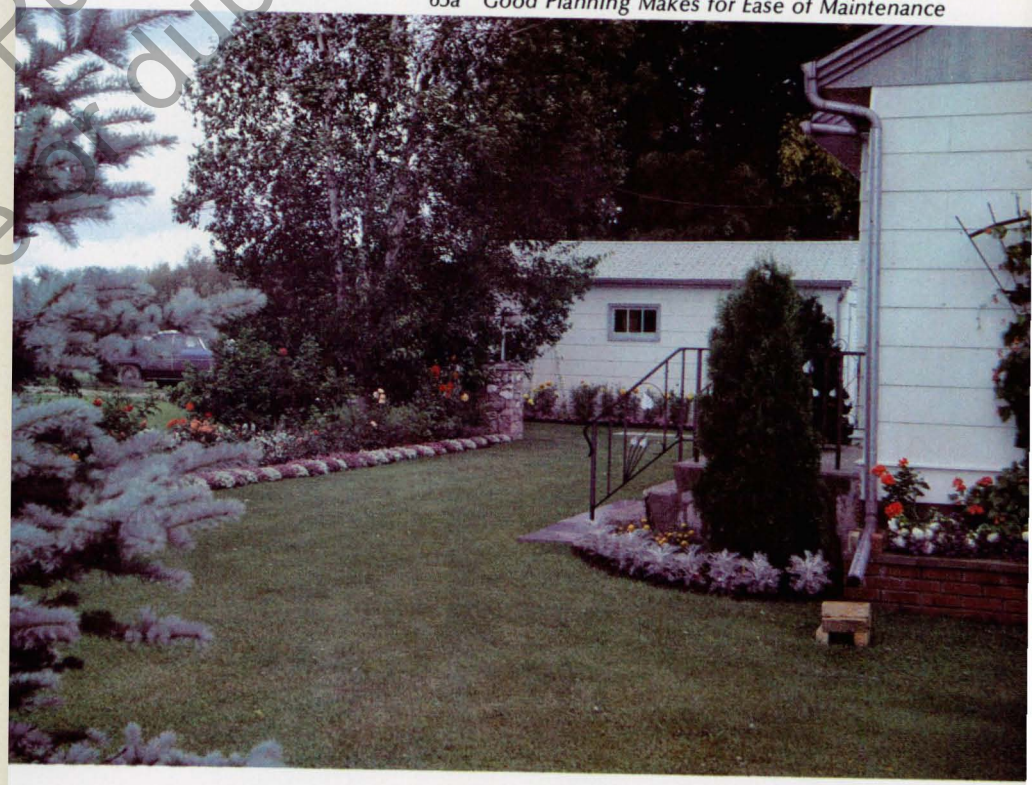
This morning when exercising the dog I picked up three pop bottles — bottles which in all probability would have been thrown on the sidewalk and broken to bits before I walked that route again. It has been my practice for some time to pick up such bottles, put the proceeds from them in a special container and in the fall buy tulip and hyacinth bulbs for the garden.

Last fall the front flower bed was replanted and it was rewarding in the spring to see a lovely show of tulips. Neighbours, friends and passers-by were also able to enjoy them, and they made a bright spot after the long winter. The hyacinths didn't make a very good showing, no doubt due to adverse growing conditions, but the container has some small change in it to buy a few more again in the fall.

I like to think this was a small effort towards keeping the city clean, perhaps preventing some child or animal from getting a nasty cut from broken glass, adding a bit to the beauty of the landscape, and giving a little pleasure to people who passed by and who hadn't a spot to grow a few bulbs.

Gardening Hints for Everyone

65a *Good Planning Makes for Ease of Maintenance*

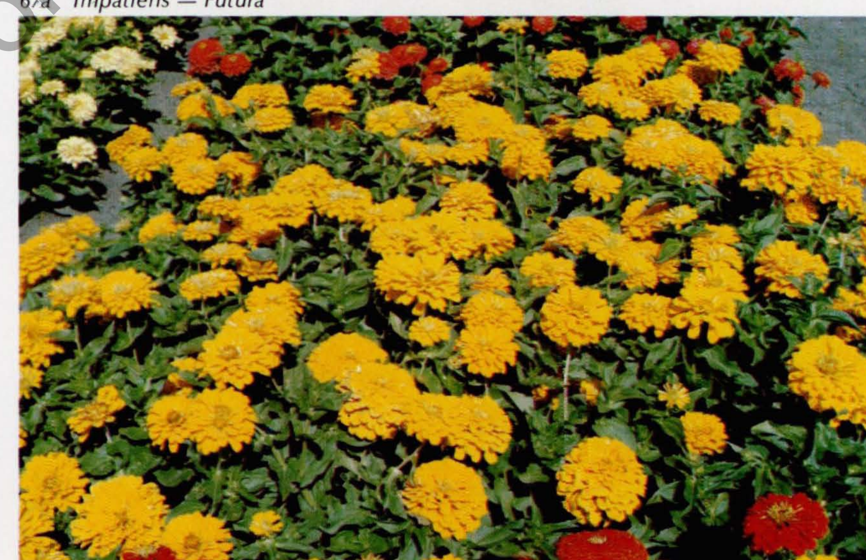


66a *Dianthus — Snowfire*

66b *Celosia — Golden Torch*

66c *Celosia — Brer Fox*

67a *Impatiens — Futura*



67b *Zinnia — Gold Sun*

68a Tuberous Begonia — Picotee

68b Epiphyllum Hybrid (Celeste)

68c Selected Large Flowering Cypripedium (Span 11 cm)

69a New Hardy Rose Cultivar — Morden Ruby

69b Hardy Garden Mum — Morden Cameo

69c Hardy Garden Mum — Morden Delight

70a *Lythrum — Morden Gleam*

71a *A good crop of Dolgo Crabapple*

71b *Insect Control Companion Planting*

72a Well Designed Farm Flower Border

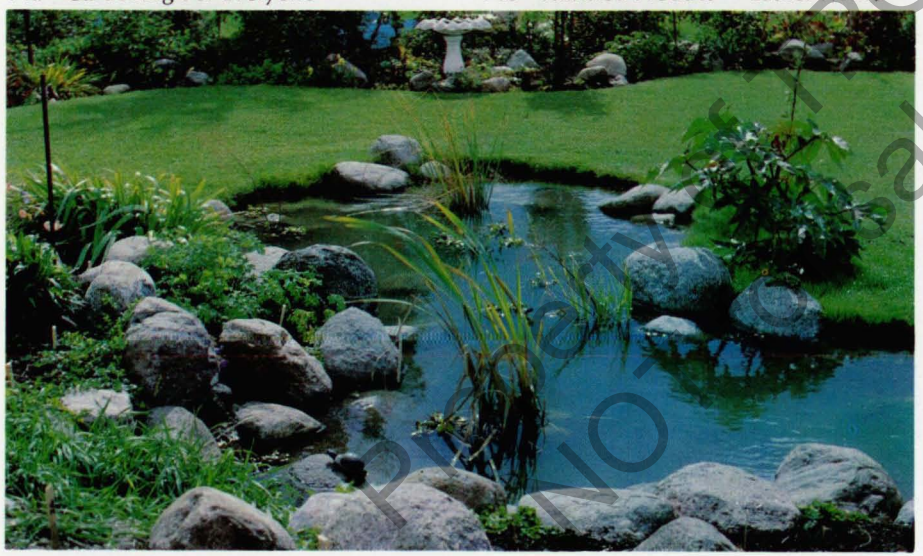
72b Attractive Flower Border with Bird Bath as Feature

73a Harmonious Combination of Simplicity and Beauty

73b Annual Flowers Used to Extend Foundation Planting

74a Gardening For Everyone

74b Finished Product — Luther Home



74c Natural Setting in an Urban Landscape

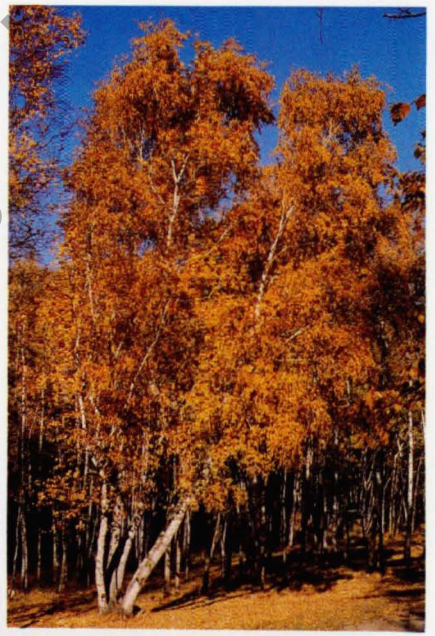
75a A Gracious Welcome to Apartment Block Living

75b That Quiet Corner

75c A Raised Patio with a Vista

76a *Clematis — Jackmanii*

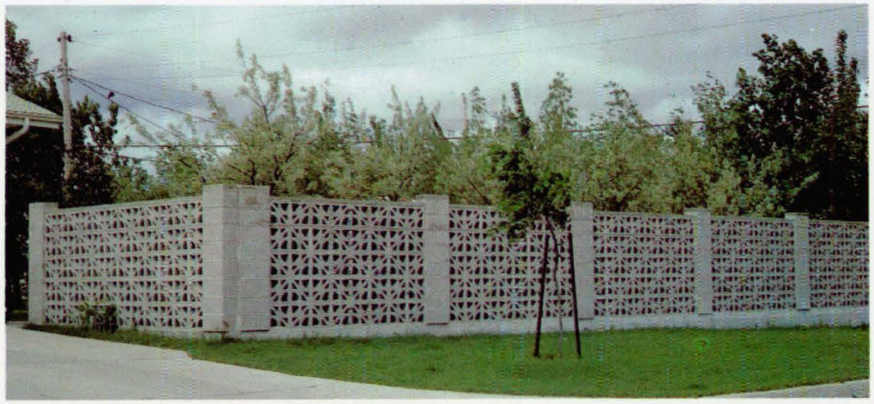
76b *An Effective Combination of Flowers and Shrubs at the Entrance*

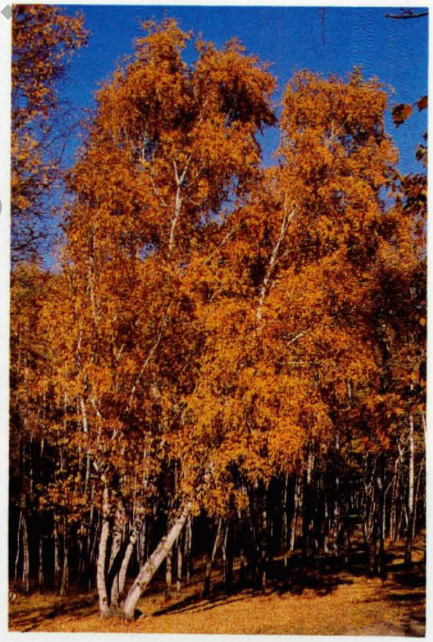


77a *Paper Birch — fall colour*

77b *SUMAC FALL COLOUR*

78a top, 78b middle and 78c bottom Various Materials Used for Fence Construction



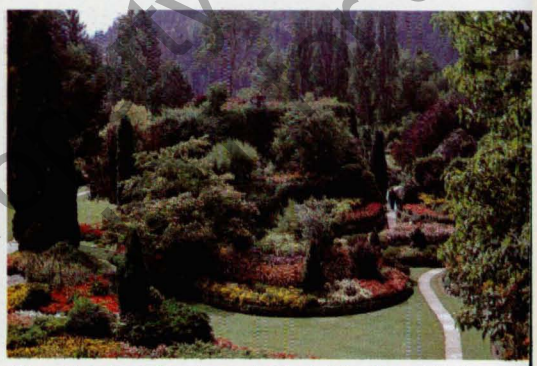


77a Paper Birch — fall colour

77b SUMAC FALL COLOUR

80a *Assiniboine Park English Garden — A View from Above*

80b *Grouping colours for Best Effect*



80c *Butchart Gardens. A Model for Floral Colour and also Tree and Shrub Shapes and Combinations*

Plant Disease Control Identification and Timing

DR. GARY PLATFORD
Plant Pathologist,
Manitoba Department of Agriculture

Plant diseases are a constant problem in the home garden. From early spring to late fall there is a progression of different disease problems. **The most important aspect of disease control is the ability to recognize a disease problem and apply preventative or corrective measure at the proper time.**

The first step in disease control is to recognize the problem. The provincial Agriculture Departments in Manitoba, Saskatchewan and Alberta have plant disease specialists on staff who can assist in the identification of disease problems. Quite often a visit to the local agricultural office is all that is necessary to get your problem identified. If the local agricultural representative is unable to identify the problem, samples can be submitted to the Provincial Plant Pathology Laboratories in Winnipeg, Manitoba; Regina, Saskatchewan; Edmonton and Brooks, Alberta.

Timing of control measures is essential for disease control as, usually, there is a critical time in the life cycle of the disease when control measures will be of greatest benefit. Specific plant disease control recommendations are available from the provincial Agriculture Departments.

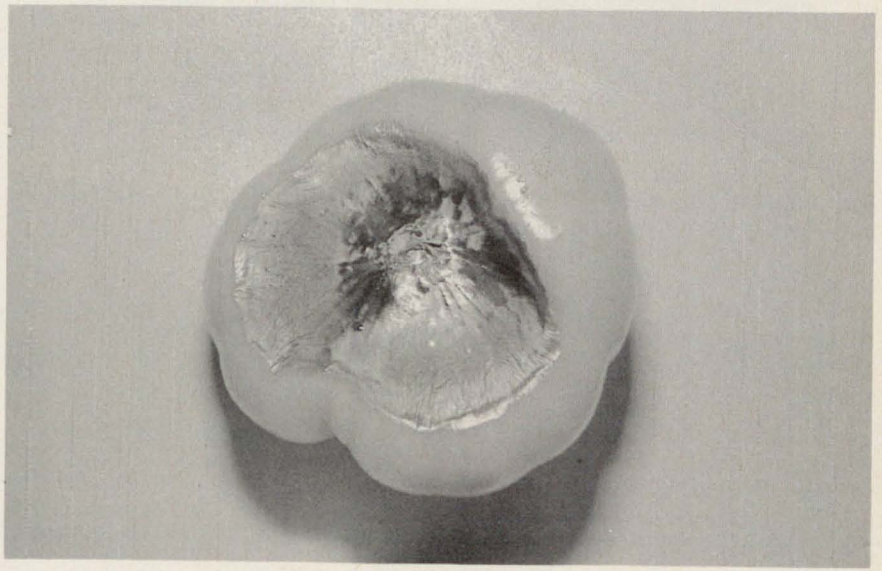
Plant diseases can be caused by living organisms such as fungi, bacteria or virus or they can be caused by non-living physiological or environmental conditions. Pesticides can help control some specific disease problems but are of no benefit when the disease is caused by such things as a nutrient deficiency or browning of evergreen needles as a result of winter dessication. Find out what your problem is, and the proper time to apply control measures, before attempting to control your disease problem.

Common Diseases in the Home Garden

Snow Mould — Snow mould appears in the early spring while the snow is melting. This disease is caused by several different fungi. Fungicide control is usually not necessary for home grounds. Prevent development of disease by cutting the grass in the fall to about 1½ inch height. In the spring it is important to break up the snow drifts on the north and east sides of the yard or other areas where snow melts slowly thus speeding up the melting of the snow and drying of the lawn surface. Lightly rake off the lawn surface any cobweb like mould growth. If dead areas appear evident by mid May spread some topsoil over these areas and reseed.

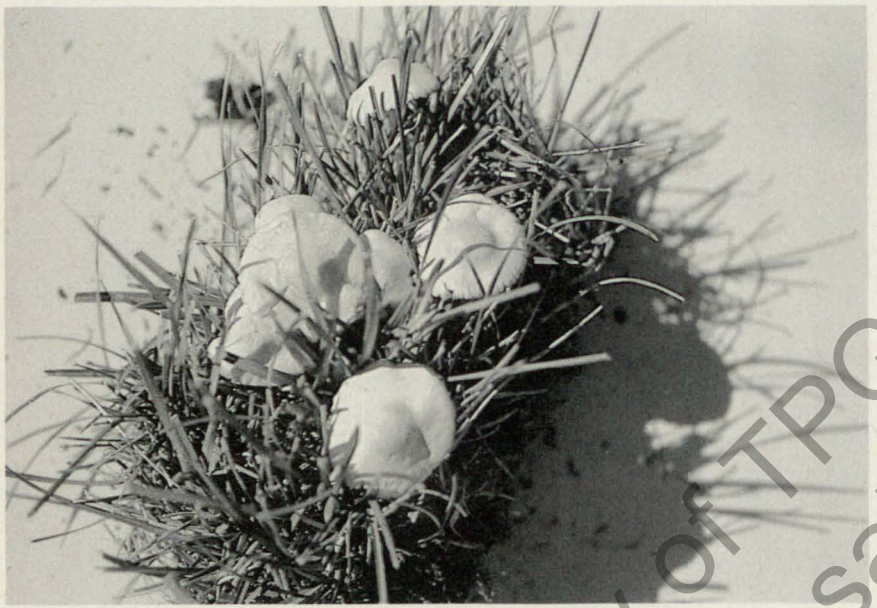
Needle Browning — Evergreens such as cedar, mugho pine, Scots pine and juniper are prone to winter dessication. This results in unsightly brown needles in the spring. The damage is confined to the south and west exposures. The browning can be prevented by watering the evergreens late in the fall before the ground freezes. This will ensure an adequate supply of moisture in the needles to prevent needle dessication which occurs in the very early spring. Further protection can be achieved by wrapping foundation planting with burlap in the fall to provide shade protection. Don't prune off the brown needles of cedar until after the appearance of new growth. The cedar will initiate new growth along the branches. Spruce and pine will only initiate new tip growth. Needle browning can also occur in the fall and is a natural phenomenon. All evergreens lose needles over a period of time. The needles farthest removed from the tips will fall first. (top right).

Blossom End Rot of Tomatoes — This disease is a physiological problem related to wide and frequent fluctuations in soil moisture. Maintain uniform soil moisture throughout the growing season by incorporating peat moss into the soil and mulching around the plants with straw or long grass clippings.

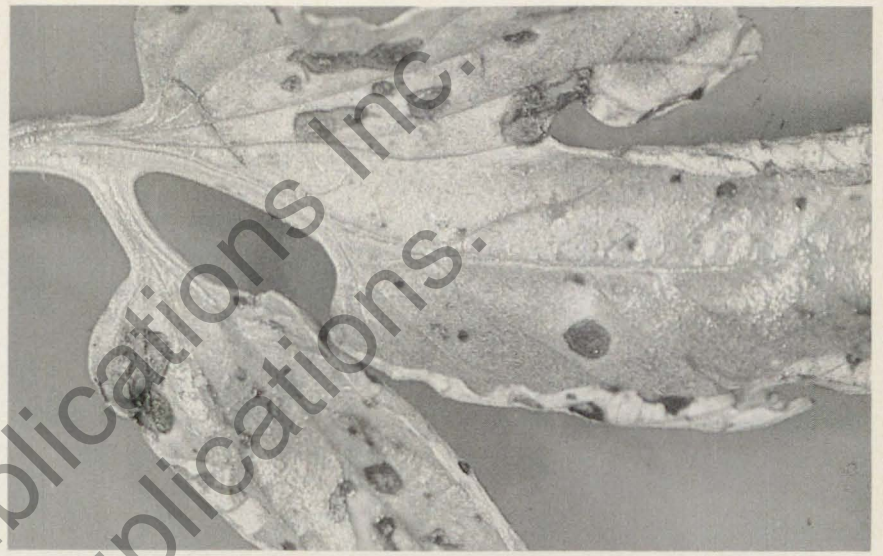


Fairy Ring — Mushroom growth in lawns often occurs during a wet summer or early fall. The mushrooms are usually light brown or white and often appear in the form of doughnut like rings called fairy rings. At first the grass appears to grow more vigorously in the vicinity of the rings but it eventually dies out.

Collect and destroy the mushrooms when they appear. Perforate the ground in the vicinity of the ring and water thoroughly keeping it soaked for several weeks. Keep the lawn growing vigorously by adequate watering and fertilization. These control measures will mask the appearance of the rings. Complete eradication is not usually practical as this involves removal of affected sod, fumigation of the soil and replacement with new sod.

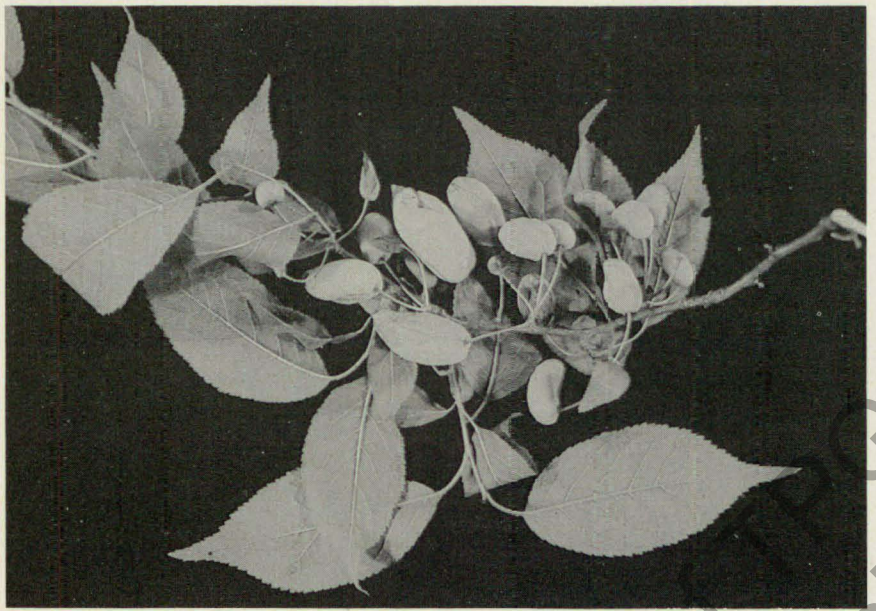


Early Blight of Tomatoes — Tomatoes are affected by a leaf disease during July and August which can cause considerable leaf defoliation and result in a lowered plant productivity. The disease is caused by a fungus and is favoured by humid or rainy weather. There are a number of fungicides available in the garden centres that are suitable for early blight control. These products are sold under the trade names of vegetable or potato and tomato dusts or sprays. The fungicide must be re-applied every seven to ten days for maximum control. Consult the label for specific directions. (top right)

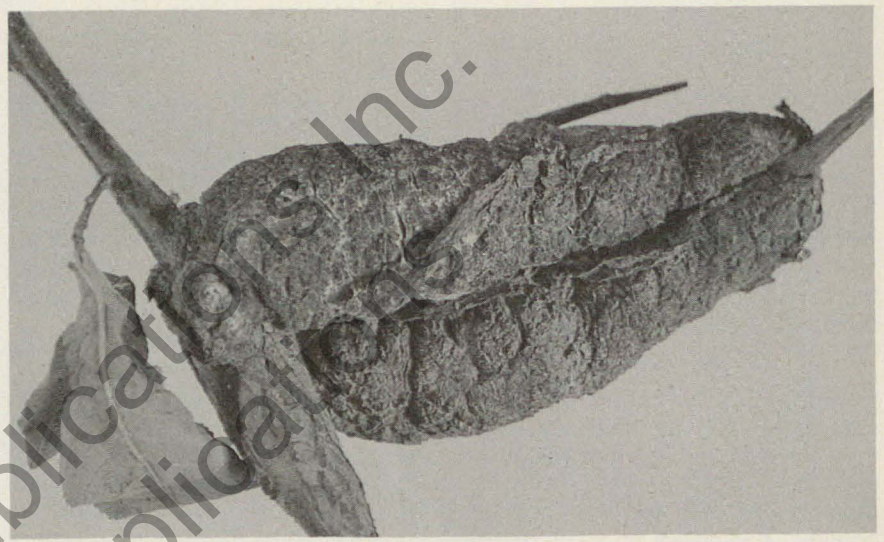


Dutch Elm Disease — Native American elms are very susceptible to Dutch elm disease. The disease is caused by a fungus and is spread by native elm bark beetles. The first symptom of the disease is a wilting of the leaves. The leaves turn brown and remain firmly attached to the branch. For further information on Dutch elm disease, consult the article in the 1976 edition of The Prairie Garden.

Plum Pocket — Plum pocket is a commonly encountered disease on native plums and cultivated plums derived from native North American species. The disease is caused by a fungus and attacks the immature plum fruit causing them to greatly expand. The affected fruit is hollow and without the normal pit. Collect all infected fruit and **destroy** to prevent overwintering of the disease organism. In the early spring spray trees with a copper fungicide such as bordeaux as a dormant spray, before blossoms open.



Black Knot — Black knot of chokecherry and plum is caused by a fungus. The knots or swellings can expand to eventually kill the affected branch. The diseased branches should be pruned off at least 7-10 cm (3-4 in.) below the knots. Sterilize pruning shears with methyl hydrate or a disinfectant such as chlorine bleach diluted one part bleach to three parts water. Eradicate infected wild prunus species in the vicinity of orchards or ornamental planting if possible (top right).



Powdery Mildew — Powdery mildew attacks a wide range of ornamental plants and some vegetables. The disease does not usually become a problem until August. The disease can be prevented on crops like garden peas by early planting to allow for ripening of the peas in July. On ornamentals like zinnias, begonias and lilacs the disease can be controlled by applying benomyl fungicide (sold under the trade name Benlate), or powdered sulphur.

Epiphyllums under Lights

DR. P. K. ISAAC
Department of Botany
University of Manitoba

Epiphyllums, Phyllocacti or Orchid Cacti as they are often called, are cacti that grow naturally under the most uncactus-like conditions. They are found growing epiphytically on the boughs and trunks of trees in the mountainous coastal regions of Central America. This habitat may occasionally dry out and the thick, fleshy, green flattened stems are well adapted to resist drought like their cousins the desert cacti, but the orchid cacti are more often subjected to cool mists and tropical rains and it is during the moist periods that growth and flowering take place.

Although a well grown specimen has a certain appeal in the vegetative stage, few would be grown if it were not for the possibility of flowering; it is then that the rather uninteresting plant is transformed by the production of some of the most spectacular flowers known. Unfortunately, in many parts of the world, flowering is not to be taken for granted and although a number of "do's and don'ts" have been established it is still not certain what it is that triggers the formation of a flower from a dormant bud. Herein lies the challenge when growing Epiphyllums under artificial lights where the conditions are less variable and, theoretically, more controllable than the changing conditions found on a window sill or out of doors in the summer. If it was known what was required to stimulate flower production it should be possible to bring the plants into bloom to order. We are not yet at that stage and so the following cultural directions are aimed at producing mature ripened stems on which the flowers are found.

Light

Epiphyllums like diffused light rather than direct sun or deep shade. Commercial growers keep them under trees or in a lath house, and I have found for growing in the basement that four or five cool white or wide spectrum fluorescent tubes, three to six inches apart and a foot or so above the plants, provides enough light for good growth. I have added about 30 percent tungsten light in addition to balance the spectrum closer to that of sunlight, but I am not sure that it is essential.

The day length does not seem to be critical, and although in temperate latitudes they usually flower in the early summer when the day is lengthening, the buds are set in early spring and a 12-hour day appears to be adequate; there is no point in burning lights longer than necessary.

Epiphyllum hybrid 'Janet'

Water

The growing compost should not be allowed to become completely dry but, on the other hand, neither should it be waterlogged or rotting can easily set in. It is not that drought will kill the plant — they are very difficult to kill — but drying sets them back and the ensuing growth is often weak and immature. Spraying or misting is very beneficial and if carried out regularly, say every morning, then direct watering of the pots is largely unnecessary.

Soil

Many different potting mixtures have been proposed but the one thing they have in common is a very high porosity and low soil content. It is essential that water should drain through freely. A typical mixture is equal parts well rotted leaf mold and coarse sand to which some bark chips and charcoal may be added. It should be an acid mixture and chalk, lime or alkaline soil avoided. Traditional clay pots are difficult to maintain above the minimum moisture level as they dry out too quickly and better results are obtained with plastic pots or tin cans. One advantage of the latter is that it is possible to solder a loop of stiff galvanized wire to the can to act as a stake, thus preventing root damage due to staking, and providing a convenient handle. It is important not to use too large a pot, as Epiphyllums will not flower until they are root bound and a 3½ to 4 inch pot will be found large enough.

Feeding

It is generally accepted that phosphate is required for flowering and this can be provided as bone meal when potting and by occasional watering with a weak fertilizer solution, say one teaspoon of ammonium phosphate to a gallon of water. High nitrogen should be avoided as it tends to produce too much vegetative growth.

Temperature

Epiphyllums can tolerate a wide range of temperatures above freezing and house temperatures are ideal for growth, however, there is considerable evidence to suggest that the formation of flower buds is stimulated by relatively cool temperatures and flowering is certainly improved if the winter night temperatures can be in the 50-55°F range.

Propagation

Propagation is normally by means of stem cuttings. After taking a cutting from a mature stem, that is, one that has stopped growing, it is important to let it dry out on a bench for a week or two before planting. The cut surface must heal and cork over completely otherwise a stem rot will almost certainly set in. This requirement makes Epiphyllums very easy to send by mail as all that is necessary is to wrap them in newspaper and a roll

of corrugated cardboard to prevent crushing. Cuttings should be planted about an inch deep in the sandy mixture mentioned and not watered for a week.

Seeds are readily available and are sometimes offered for sale, but are rarely worth bothering with. My first hybrid "Janet", illustrated, took 21 years from seed to the first flower and although I feel I know more about flowering now, it still involves a wait of six or more years.

Pests and Diseases

Epiphyllums are not difficult to keep healthy but a few pests have to be watched. If the plants are put outside in the summer it is important to protect them from slugs which love them. Never stand the pots on the soil, but raise them on boards or, better still, suspend them. Root aphids and mealybugs can cause problems, but watering with a malathion solution is very effective. If one has strong feelings against using malathion indoors, a nicotine extract made by steeping a cigarette or two or three butts in a cupful of boiling water is just as effective.

Sources of Supply and Information

The simplest way to start growing Epiphyllums is to obtain cuttings from a friend; few nurseries stock them in Canada, but one is Harborcrest Nurseries.

A membership in the Epiphyllum Society of America* puts one in touch with the growers in California. The Society has also reprinted the standard work on orchid cacti, the "Epiphyllum Handbood" by Scott E. Haselton, first published by Abbey Garden Press, Pasadena in 1946, which should be consulted by anyone interested in this group of plants.

*Address: Epiphyllum Society of America
23500 The Old Road
Space 59
Newhall, Cal. 91321, USA

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

Supplementary fluorescent lighting, either as a growing unit in the basement or under bookshelves and other fixtures in the living area of your home, may be the answer to many of your indoor growing problems. That is, if you have a year round interest in plants and find your windowsills, particularly in winter, overcrowded and your plants during this period not looking too happy.

I suggest that you spend about $1.50 for a copy of Elven McDonald's book "The Complete Book of Gardening Under Lights". This book can open up a new world of gardening to you. It is available in the garden section of most book stores.

Hints in the Care of a Cut Rose

MARK B. ELLIOT
Student, University of Manitoba

The fragrance of a rose in exquisite, so the longer the life of a rose, the greater the pleasure. A healthy plant will produce a healthy bud, and the bud stage is the preferred stage of the rose for keeping.

- To insure a longer life, a sharp, clean flower knife should be used in cutting the rosebud from the rest of the plant. This helps prevent the occurrence of infectious diseases.
- If the vase and water is carried to the garden and cut flower placed in immediately, the stem is not exposed to the air to dry out.
- Each bud stem must be cut on a slant, without squeezing the stem. The more surface of the stem exposed to the water, the more water intake for the bud to survive. A flower must not be limited on the supply of water.
- The end of the stem should be crushed, this increases the area for water entering its system. It is also believed that the green layer from the stem should be removed by scraping with a knife.
- Thorns and lower leaves should be removed from the rose stem as foliage becomes soft and slimy in the water. The decayed leaves effect the stem, forming bacteria in the water. The water becomes "old" and will destroy the flower in a short time.
- The stem can be placed in cool water for about half to one hour. This type of bath brings color and vigor to the bud. A longer period in the bath could be beneficial.
- If rosebuds are arranged the following day, storage problem occurs but there is a quick solution if a refrigerator is handy. The rosebud is covered and tied with wax paper around the bud and base of the stem. Then this package is put in the refrigerator. Another way to store buds, is by placing the bud and stem in a plastic bag containing enough moisture so that the flower does not wilt. A wet paper towel is good enough to be wrapped around the stem.

The following day, the bud or buds must be placed in water immediately. If some leaves are still below the water level, they should be removed. The leaves remaining on the stem for the foliage part, should be cleaned with a sponge. Water is the best substance to use as it does not plug the pores by which the flowers breathe.

- A teaspoon of sugar is sometimes put into the water in order to keep the roses healthy. Another method is crushing ice and placing the ice in the water, producing a cooling effect. To keep the buds from opening quickly the temperature should be controlled at near 40°F. A bud will open quite fast in a bright room with a little draft. Generally, the heat of the room will open the bud.

There are quite a few methods used in preserving roses. The best procedure is to try as many as possible to find the best method that works for you.

PFRA Tree Nursery Birthday

Courtesy: **Indian Head News**

. . . More than a thousand visitors, including several farmers who flew their own planes to Indian Head, Saskatchewan, enjoyed displays, conducted-tours and equipment demonstrations during the 75th anniversary celebrations at the PFRA Tree Nursery, July 12, 1977. The occasion featured the dedication of an historic cairn with a bronze plaque, by Ed Lumley, MP., Parliamentary Secretary to DREE Minister, Marcel Lessard.

Mr. Lumley, a former mayor of Cornwall, Ontario and Chairman of the Ontario Liberal Caucus, said that the Nursery is one of the oldest continuous government operations. Speaking briefly about new PFRA water development policy, he said that requests for aid this year have increased considerably. "I wish that all government endeavours had the same respect and admiration that has been earned by the Prairie Farm Rehabilitation Administration" he said.

Expressing his amazement at the fact that most of the trees in the region were hand planted, Mr. Lumley spoke of the beauty of shelterbelts. "It is almost impossible to conjure up a picture of what the prairies would be like without trees" he concluded.

Senator Dave Steuart spoke briefly, saying: "We need PFRA. Wherever it operates, hope grows and prospers" adding that whenever non-prairie provinces learn of PFRA activities, they want similar organizations. Congratulating Nursery staff on their work, Senator Steuart stated: "Parts of southern Saskatchewan would look like a moonscape without your effects."

John Walker, Superintendent of the Nursery from 1942 to 1958, and now a resident of Winnipeg, presented a momento to Bill and Eleanor Lane, recipients earlier this year of the 400 millionth tree produced at Indian Head. Mr. Walker told them: "People who are here don't need advice on the benefits of tree planting, it's the people who aren't here who need educating."

Later, Senator Steuart and Indian Head Mayor, John Maddia, planted a Thomson Elm, selected at the Nursery and named for former PFRA Director Walter Thomson, in the Town's Cenotaph Park. Dr. Cram stated that it is hoped that the new variety will take the place of elms currently susceptible to Dutch Elm disease, and it will prove resistant to this blight.

Garden Stock-Taking

MARGARET FOSTER
Barrhead, Alta.

"All experience is an arch to build upon."
Henry Brooks Adams

Some of the best reading in the world (provided you are interested in the subject) is contained in garden books. From the standpoint of pleasure alone, a January night is perhaps the best time for such reading.

Taking Stock

In Many garden books, a very useful chapter deals with taking stock. Winter is a very good time to read that chapter, and an excellent time to take stock of your own garden. Now in late summer, at a time of maximum growth, errors in grouping, in spacing, in situation, are at once apparent. Are there colors which clash? Are there small delicate flowers partly hidden and perhaps all but swamped by the rampant growth of coarser plants? Are there sun-lovers in the shade and shade-lovers in an exposed spot? A garden is a long-range affair; spacing which was just right at planting time ten years ago will be much too crowded now.

Whatever you may decide to do in the way of re-planting in the fall or spring, don't trust to memory! Fall is a busy time with a thousand things to do; and at spring rake-up time no need of any kind of alteration is in evidence. Jot it all down, what you mean to move, when to move it, where to move it to, and any special notes as to soil preparation.

Moving Plants

Lilies are best moved in early fall, though an early spring move is fairly satisfactory. Bearded iris are not at all touchy — fall or spring, they take up residence in the new location with no set-back. I moved Astolat delphinium seedlings one year on the first day of October (a wet year.) Seven seedlings moved; seven blooming plants the following summer.

Delphiniums

My Pacific Giant delphiniums had for several years been a source of delight when those magnificent spikes went towering up to burst into bloom, the blues, the pinky blues, the whites — Sir Galahad, pure white, and Sir Percival, white with black bee, very striking, and the exquisite Astolats — one deep raspberry rose and some delicious pale pinks.

But all this glory lasted only until the first howling wind-and-rain storm swooped down from the north-west. Then those huge spikes with the three-inch blossoms went down flat. If staked, they broke over at the stake; flower spikes which were tied broke over at the tie.

Then I read (in a garden book!) that one man had coped with this problem by setting the plants much closer together than ordinarily recommended, so that each plant is a support to its fellows. "Thus set, in the most sheltered spot you can find, the difficulty is largely overcome."

The most sheltered spot I could find was in the lee of a willow hedge; and there, as soon as the frost was out of the ground in spring, I transported them. I made a double staggered row, nineteen plants in all. I set them as close as I could comfortably dig the hole for the next plant. I took as large an earth-ball as I could manage with each one; I set them a fraction deeper than they had been, and raked in loose soil to cover the well-tramped planting. They never looked back; so far as they knew, they had never been disturbed. Some of the flower spikes are eight feet tall; and all have bloomed extravagantly. And since there has already been one storm with furious gusts of wind and torrents of rain, and only slight damage was done, they would seem to be secure against all except catastrophic disturbances.

One bonus of delight is worth passing on. In planting these delphiniums I took them as they came, and did not know until they bloomed, which color was where. A border of columbines, also of mixed colors, is directly in front of the delphiniums. And from the living-room window a vista seen through shrubbery showed, for the whole of a perfect week, a lemon-yellow columbine with vivid gentian-blue spires rising above it. Not all planning is human planning.

Peonies

A plant which does not like to be moved, and takes years to recover, is the peony. A new plantation gives only token bloom, and shows small indication of what it will become in about four years. Sometimes a plant seems unhappy, notwithstanding careful planting and attention. So if you have a peony that is doing well, leave it where it is! If other things are crowding it, move them and leave the peony in undisputed possession. This summer I cut back a lilac bush and moved a golden glow to give a Kelway's Glorious tax-free rights to that bit of territory; and later I shall dig up a clump of Brenda Watts lilies that have grown out of bounds and are crowding a Jules Elie.

So when the snow piles up in the winter months, take your favorite garden book to find the answer to many of your problems, and help you plan next year's garden.

In making your choice of snapdragons for your next summer's garden, don't overlook the new snap-less snapdragon annuals. Their blooms are more like phlox or even pansies than the traditional snapdragon flowers with their definite lip petals. Little Darling, Madame Butterfly and Bright Butterflies are three good selections.

Decorating with Flowers

KEVIN WALPOLE
Horticulture Student,
University of Manitoba

It is always a pleasure to bring some natural beauty into your home with a flower arrangement. Whether you use flowers from your garden or the florist, the supplies needed are few. All you need is a desire for beauty, and a few additives.

Holders

The 20th Century needle point holder, or oasis, makes flower arranging easy. Before these conveniences, one had to be more ingenious. Examples are the Delft bricks with pierced tops and the Leed's creamware quintac flower horn designed in the 1700's. Wet sand or interwoven branches, which the Japanese arrangers still use, are other possibilities.

Size

Almost everyone has an understanding of the size and scale of objects needed to give a room an attractive setting, and also favorite color combinations. An awareness of color and scale can be developed to use with flowers, too.

Try a mass bouquet with extravagant use of color. It is easily done in any size of container. You need not limit yourself to prescribed ideas about color combinations, as long as the colors blend and do not clash. Nor does the home arranger need to be concerned with a flower show theme. After all, flowers are in a room to be enjoyed and to enhance its furnishings.

The plant material can even be a simple combination of garden flowers and foliage. A mass of apple blossoms, a mass of gladiolus alone, or greens alone, such as cedar, are good examples.

When to Pick Flowers

An arrangement will always last longer if a few precautions are taken when picking the flowers. In hot weather, it is best to pick when the plants contain the most moisture. Although morning is best for an abundance of moisture, early evening is perhaps as good for cutting because the transpiration rate of the plants should have slowed down by that time.

Use a sharp knife or pruning shears. Woody stems can be split about an inch vertically at the base to allow more water absorption. The flowers should be placed immediately in water, preferably at room temperature.

Arranging

Try using an opaque container of a plain color that does not draw atten-

tion away from the flowers. In the bottom, place the largest holder, such as oasis, which will fit the vase and which is sturdy enough to hold the stems of flowers to be arranged. Next, fill the base with warm water.

Foliage, with its large stems, is the easiest material to place in the vase first. Foliage and flowers are more easily handled without numerous side branches. Straight stems that are not too bushy go directly into place. For ease in handling, strip the stems that will be in water. This practice also eliminates leaves which will decay in water.

Spiky flowers are ideal for outlining the shape of an arrangement. The rounded forms of zinnia or tulips could give weight and substance. A filler material is last, but very necessary. Tucking small flowers or finely leaved foliage among the more prominent blossoms will give the design a little more softness.

Try to avoid a flat arrangement. The various positions and sizes of flowers, as well as the colors, provide a feeling of depth and dimension. Look at flowers growing naturally for hints about how to create depth for they usually grow at different heights and angles.

Dark colors deep in an arrangement make it look more stable and dense. Also, try to keep the larger flowers down low; smaller flowers out to the edges of the arrangement. To help the viewer's eye move out and over the entire mass, it is a good idea to try to weave the colors and shapes of flowers throughout the arrangement. More of the stronger colors and bulkier flowers toward the center give a focal point.

Care

Once the arrangement is completed, it needs a little care. This means adding water as needed and removing old flowers. Foliage will often last longer than the flowers. If this happens, discard the flowers; recut the stems of the foliage, and add fresh water and flowers.

Whether you decide to do a large or small composition, with any mixture of materials and colors, a mass of real flowers will enliven your home by adding extra touches of your own personality and character.

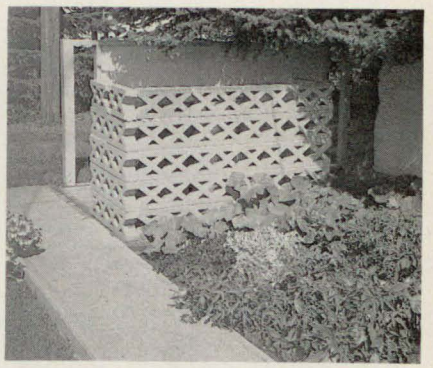
Many books are available giving instructions to those who doubt their natural instincts. There is a new book available that will become a useful tool for Junior gardeners. This book is called: **Floral Artistry for Beginners**, published by the Prairie Garden. It will help you to understand and love the art of flower arranging.

When it comes to choosing bedding plants for flower borders, the old reliables — petunias, marigolds, zinnias, snapdragons, pansies and salvia — are still the most popular. They will most certainly give the best show of continuous bloom all through the summer.

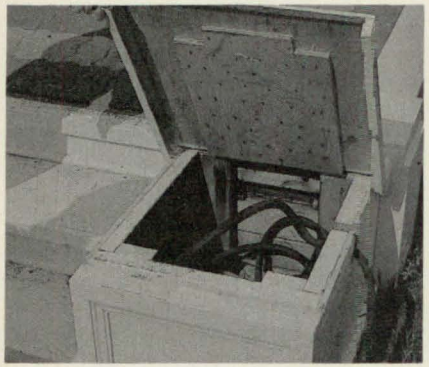
Hints on Landscaping Your Home Grounds

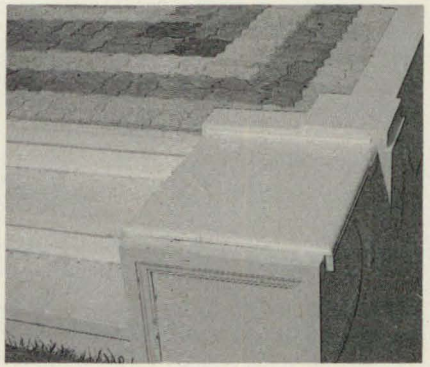
REG CURLE
Manitoba Department of Agriculture

Mowing Edge — A simple and useful time saver regarding lawn maintenance is the installation of a mowing edge. Concrete, lumber or brick can be used. With one wheel of the mower riding the edge, trimming is minimized. This practice can prevent encroachment of grass into shrub beds, flower beds or the driveway and also prevent scalping of the turf edge.



Garbage Storage — In the ulitity area, garbage cans can be screened off from the rest of the yard effectively and in an attractive fashion by using a variety of construction materials. Masonry blocks provide this decorative and functional purpose.





Hidden Garden Hose — Finding an inconspicuous yet reachable location for the garden hose can be a problem. A unique solution is shown here. The covered box doubles as the storage area for the hose and also an ornamental footing for the garden house and patio.

Fences — More thought and effort should be given to this element of landscape design.

Very briefly, fences can be used efficiently to provide enclosure for the private area, to provide a background for flowers and shrubs, to screen out unsightly views, to protect the patio from wind, and to restrict and regulate traffic across property.

Location of the fence along the lot line helps delineate the property and conserve space. The storage area and other items in the service yard should be screened by fences located inside the property line. Fences or baffles used as part of, or close to, the patio should be refined or in harmony with the patio design.

Selection of Fence

In selecting the type of fence for your property, consider its function and the cost, and maintenance required.

A few do's and don'ts:

1) Do not change fence style at a corner — This tends to draw attention to the corner.
2) The fence at the end of the property should be the same height as along the sides.
3) The gate as part of the fence should not be too ornate. It should be of the same material and basic design as the fence.

Editor's Note:
Refer to Color Section p. 78a, b, c.

Foundation Planting — a few simple guidelines:

1) foundation plants must complement the design of the house
2) study the architectural strengths and weaknesses of the home before selecting specific plants and their arrangement
3) allow enough space between plants and between the foundation and shrubs to accommodate plant growth
4) vary the height of plant materials
5) provide the best possible soil to allow for plant growth.

Editor's Note:
Refer to Color Section p. 65a, p. 73a and b, p. 76b.

Slope and Bank Stabilization — The landscape situation with any degree of slope has special problems that require special solutions or treatments.

The initial establishment of sod on a steep slope is difficult because even a light shower can wash away soil and seed. As well, if sod is established, maintenance can be a problem as water flows over the surface too quickly to allow penetration into the root zone. Therefore, more frequent watering and fertilization is generally required. Mowing either across or along the slope can be difficult.

With steep slope landscaping and stabilization there are basically two options:

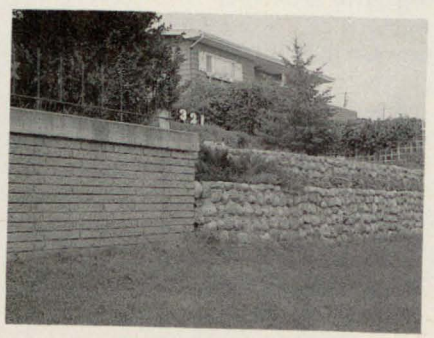
1) Use of low growing shrubs and ground covers
2) Construction of some type of retaining wall using various materials e.g. timbers, concrete, stone, etc.

Construction of different kinds of retaining walls depends on availability of materials, personal preference, degree of slope and other factors.

Editor's Note:
Refer to Color Section p. 79 a and b.

Ground Covers — These specialty plants should be more commonly used as a landscape tool. Vines, low growing evergreens, annual and perennial flowers can be used effectively to cover bare spots in the yard, to prevent soil erosion, and regulate pedestrian traffic. In addition, ground covers can be the common denominator or binding agent that give a cohesive, smooth flowing appearance to any landscape design.

Gout Weed



Success in establishing a good ground cover requires proper planning, good soil or planting zone, weed control and maintaining a well defined planting area. Initial planting or spacing should be such that the area is covered as quickly as possible.

Staking evergreens — Loss of the terminal bud or leader on a spruce can result in an open centered misshapen tree. This damage can be caused by a heavy ice and snow load, high winds,

Before staking

After staking

or even encroachment by surrounding trees. To re-establish a central leader, tie or fasten a wooden support to the main trunk of the damaged tree so that it extends about 18 inches past the damaged area. Then select the most vigorous branch of the top whorl or grouping and gently bend this branch to a vertical position and tie it to the support. In a few years this redirected growth will be virtually unnoticed.

Nolana

PHYLLIS ADAMS
Langenburg, Sask.

Although I have bought The Prairie Garden for about fifteen years, I have yet to see in this publication any mention of one of my favorite dwarf plants, nolana. Neither have I seen it listed in any seed catalogue.

Nolana growing next to double petunia.

I was first introduced to nolana when we stopped at a small greenhouse at Saltcoats in our search for bedding plants back in the 1960s. The picture on the seed packet intrigued me, and my neighbor and I bought some plants, which grew very well. I have planted them every year since. They will seed themselves, but I prefer to plant them myself, as they get too crowded otherwise.

The leaves are pale green, fleshy; and the plant creeps so that a few plants soon cover a small area. The flowers are a soft lavender blue with white throat — showy in a subdued way. They are sun-loving blooms which close their eyes every evening. Once the plant commences blooming it is continuously full of flowers.

Special Gardening Hints on Soil

Soil Improvement

Use waste coffee grounds and tea leaves as mulch around plants. Soil acidity is increased by such continuous application.

Mulch

Cabbage, cauliflower, Brussel sprouts, lettuce, spinach, all benefit from a damp mulch of peat moss, chaff, sawdust to which a little fertilizer has been added. — *Bill Emerson.*

Soil

When mixing small amounts of soil for houseplants, place one-third sand, one-third soil, one-third manure and peat (that you have sterilized) and drained, into sturdy plastic bag. Tie at the very end, hold between hands and roll back and forth. Nice fluffy soil, well mixed is the result good for average plants. — Yvonne MacAlister.

Lime Induced Iron Chlorosis — is a problem, especially on the calcareous soils of the prairie provinces. When the pH of the soil is above 7 (neutral), the iron in the soil is tied up in an unavailable form. Trees such as mountainash, apple, amur maples, hawthorne, willow and birch, will gradually die from lack of iron. The inter-veinal portion of the leaf is unable to produce chlorophyll, and becomes progressively more yellow. Most of these trees, plus strawberries and raspberries, are indigenous to acid soil areas where the soil releases more of its iron year by year.

Putting powdered sulfur under the tree or plant, and raking it in each year, will slowly lower the soil pH.

The Midwest Soil Products Co. Ltd., in co-operation with Dr. J. D. Campbell, University of Manitoba, has developed a Chelated Iron which is fast acting when foliage fed. This new Chelated Iron is not expensive and may be obtained at the Midwest warehouse at 63 Higgins Ave. Winnipeg, or by writing the compnay at 1251 Redwood Avenue, Winnipeg.

The benefits of a compost

The dictionary has described compost as a collection of organic material — leaves, grass cuttings, etc., built up in a heap, allowed to rot and used as a fertilizer. If you have a small spot in your garden where you can make a compost you will find many uses for it. Instead of putting garden wastes, fruit and vegetable peelings, etc., in the garbage, add them to the compost. Collect your neighbour's leaves when he bags them up for the garbage collection in the fall and add them to the compost. When it has rotted down put it around the plants to hold in the moisture, dig it in the soil to help lighten it. You will also find many more worms to help with the digging where there is a goodly amount of compost.

Special Gardening Hints on Flowers

Hints on Flower Arranging

YVONNE MacALISTER
Grande Prairie, Alta.

Hints

Never use chicken wire in antique or old containers as they are softer material and the wire will scratch them. Pin-frogs are risky also as they can be difficult to remove and you may break the container.

Arrangement Anyone can Make

Tea cup and saucer — preferably white or white with silver or gold edges. Shape a piece of oasis (dry) to fit into cup, then wet and it will swell tight. Place five small geranium leaves around the edge of the cup with one inch stems, so they fit snugly all the way around the geranium, after hardening them add one flower head. Place full bloom in middle of cup and it makes a lovely coffee table center, as lovely to look down onto as well as from all sides. Nice as a gift.

Nylons

Old nylons work very well to hold your different varieties, and colors, of tulip bulbs (or glads, iris, etc.). Also they can be dipped easily into insecticide solutions, and then hung to dry. Put name tag in.

For dried arrangements pick cattails while still greenish. They will ripen in semi-dark areas. Leave seed head on as this makes them appear more finished. Spray with hair spray before putting into arrangements. They will keep indefinitely.

Question:

How Can I Produce Lily Bulbs from Seeds?

JOHN WALKER
Retired Professor, Horticulture
University of Manitoba

Answer:

First, it should be understood that a named lily, e.g. Maxwill, must be increased by the use of scales or daughter bulbs from a Maxwill bulb, if bulbs of this variety are wished.

However, production of bulbs from seeds is the procedure to follow where:

a) two varieties have been cross-pollinated,

b) seeds have formed from open-pollination and a completely new variety is sought.

Briefly, the usual time when cross-pollination may be carried out, preferably by bud pollination, is in late June up to mid-July. Date of harvesting seed capsules is from late August to mid-September.

Obtaining Seeds

Place the seed capsule in a small coin envelope, *with tag if cross-pollination*, at the garage or similar window to ripen, and when the capsule splits open seeds can be extracted from it.

Keep seeds dry in the envelope without attempting to separate viable from non-viable ones until time to sow the seeds after mid-October.

Planting

Put drainage material in the bottom of a plastic pot (survives freezing and cracking better than a clay pot), and fill it to within an inch of the top with a friable soil mix. Scatter the seeds over the soil surface and cover them with soil to a depth of approximately three-eighths of an inch and press surface lightly.

The pot is then well watered by placing it in a container holding enough water to soak the soil from the bottom. The next step is to plunge the pot in a shady border outdoors (not exposed to direct winter sun) so that the top edge of the pot is about one inch above the surface of the border soil.

A handful of leaves may then be applied on top of the soil, and with a good snow cover that is not likely to disappear too early in the spring, evidence of seed germination may be expected around mid-April, depending on how early weather becomes very mild.

After growing in a favorable environment, the new bulbs may bloom in three or four years.

Growing Paphs, Cypripediums

HARVEY G.McCANN

On growing Paphs, Cypripediums, more commonly known as the lady's-slipper orchid, I find the following mixture works quite well. Aquarium gravel and purified charcoal, which can be obtained from any tropical fish or pet shop. I put a good handful of medium to coarse bark chips in bottom of pot first of all, followed by three or four heaping tablespoons of the gravel and charcoal mixture, which has been thoroughly washed beforehand. Following this, I add a few more bark chips along with some oak leaves, as well as some tree fern fibre. The top part of the pot is then filled with more medium to coarse bark chips. Last of all, I sprinkle a couple of tablespoons of gravel and charcoal mixture on top of the wood chips, so as to keep the lady's-slipper orchid firmly in the pot.

Do not keep your paphs too close to lights or bright sunshine, as some of the leaves will become bleached to almost a white colour, and do not over-fertilize! Any plant food seems to work quite well, but only use it about once a month, and only about one-half of the strength recommended on the container or bottle. Never keep your paphs in a constant wet state. If a pot feels heavy when you lift it up, let it sit for another couple of days or so before you water.

The above system works quite well for me. I have a basement growing room with vita-lites.

Special Hints on Diseases, Insects, etc.

Mildew on African Violets

To treat mildew of African Violet blossoms, spray Lysol lightly in the air above the plants, letting the mist settle gently. Should the problem persist, repeat in several days. — *Donna Sanford, University of Manitoba.*

Hint on Removal of Mealybugs

Alcohol can be used for the removal of mealybugs — dip a fine brush into alcohol and brush insect infestations only, with it. Do Not wash plant leaves with alcohol to remove mites and insects. Alcohol will kill these pests but in many cases will also kill the plants. — *Susanne Olver*

Slugs

Slug bait has dangers to children and pets if scattered around, so instead use a weak solution of Dettol or Lysol at 2 teaspoons in a gallon of water to drench the ground around the plants and any nearby hiding place. The smell repels the slugs — probably does not kill them.

Remove Pests Without Chemical Poisons

1. Aphids on trees can be killed out with a weak solution of Fels Naptha soap and water.
2. Aphids on roses can often be syringed and controlled by a sudsy water from laundry wash.

*If the carrot fly is a problem in your vegetable garden, a few plants of sage among the rows, or near by, will control these pesky insects.

*Hyssap, the ancient perennial herb of the old world, lives in complete harmony close to cabbage and all members of the Brassica family, assisting the cabbage in evading club root and repelling the cabbage white butterfly.

*If you sow peppermint in your garden, it will keep most aphids away.

Beneficial Insects

To reduce killing of 'good' insects, spray low residual insecticide in the evening or before blooming time. So insect predators and pollinators are not harmed.

Cutworms

In August the cutworm moth is attracted to jars of vinegar sweetened with molasses set in the garden. Encourage birds to feed in the garden. Owls, toads, bats also like cutworms.

Nematodes

The marigold can be useful to rid the soil of nematodes because their roots resist them and starve them out.

Crop Rotation

1. Rotate crops so that disease is not carried over to the next same crop. Some old timers believe that toxins built up by 'exudates' from the roots are bad for the crop, where a rose has died is not the place to plant another. However, other gardeners consider that if the crop is disease-free no toxins have accumulated.
2. Potatoes planted in a plot will eradicate the weeds. If peas or beans are planted, a build-up of nitrates takes place which a next cropping of cabbage or lettuce can utilize. Any lime added at this stage can be used by carrots, turnips, onions. Finally, potatoes can be planted (they then start the same cycle as before).

— *Bill Emerson, Winnipeg.*

What to do about mildew

When tomatoes are starting to set fruit, if you have been bothered with blossom end rot in past seasons, this would be a good time to water your plants with some calcium chloride. It can be purchased at hardware stores, or you can check local tire dealers who supply tractor tires. Two tablespoons per gallon of water will do the job.

Besides tent caterpillars which, I might add, are making a mess of our country side, other problems seem to be creeping in. Be on the lookout for mildew. It seems to appear in cloudy, humid weather and on plants that are grown in the shade. Check your begonias for white or gray spots. It can be held in check by dusting your plants with fine sulphur. This is an old remedy, but you can control it also by spraying your plants with captan. Add one tablespoon to a gallon of water and give it some time to dissolve, then spray the affected plants.

One thing that makes gardening such an interesting hobby is that there is something different taking place all the time.

After the good rains you should be on the lookout for aphids. These beggars are not choosey and will attack almost anything in your garden.

Look for them on the maple trees and if you find them there, you can rest assured they could be on such plants as roses near the tips of the new growth. Delphiniums and peppers that seem to have stopped growing could be infested with aphids. Malathion spraying should clean them up.— *Reprint Courtesy — Gus Hendzel*

To cure African Violets of lice — put the plant in a pail with a tight cover. Light a cigarette and put it inside the pail. — *Frances Walbridge, St. Ignace de Stanbridge, Quebec.*

How can Slugs be Controlled?
Answer:

A well-tried method is to place inverted halves of grapefruit skins on the ground in areas where slugs are present. Halves of scooped out potatoes may also be used; let us call these slug traps! Because slugs do their damage at night, the traps should be put in place in the evening.

Slugs will take shelter in these traps when daylight returns and the gardener can devise his own method of destroying them.

A modern effective way to control slugs is by the use of pellets containing *metaldehyde*. Rather than scatter solid pellets in the areas where slugs are active, my recommendation is to pulverize the pellets before use. Place enough pellets for your immediate need on a piece of strong paper laid on concrete floor or other hard surface and carefully pulverize them with a hammer or mallet.

Early evening, *before dark*, is the best time to put the bait out, but before doing so, the open or vacant strips between lawn and borders should be made slightly moist. When

that is done, use a trowel to "spot" small quantities of the bait at eight to ten inch intervals. It is here that you will find the slugs next morning, *more or less inactive,* when they can be removed and destroyed. — *John Walker, Winnipeg, Man.*

1.

Question: What is the best way to control *Forest Tent Caterpillars* on my trees?

Answer: When the leaves have dropped in autumn, or before new leaves appear in spring, remove and dispose of the brown colored egg bands which are wrapped around branches near the terminal ends. If the tree is not too large and if all egg bands can be removed, nothing more is required.

Watch trees soon after the leaves are out for presence of tiny black caterpillars. Spray with either malathion, diazinon, carbaryl, methoxchlor or an organic spray containing the pathogen Bacillus, at label rates before the caterpillars reach three-quarter inch in length. This will control the caterpillars when they are most susceptible to sprays and before serious defoliation occurs.

Egg Band of forest tent caterpillar

Forest tent caterpillar larva

Spray fruit trees prior to blossoming to prevent killing of beneficial pollinators. If malathion is used, spray only if daytime temperatures are 68°F or higher.

2.

Question: My radishes are being eaten by something as the leaves disappear soon after they are up. What is it and what can be done to prevent this?

Answer: The insect causing this is the *flea beetle.* Because flea beetles are so tiny and fast moving, they are sometimes difficult to see, however the chewing on the radish leaves is evidence of their being present. Early detection and control is the answer. Watch seedling radish closely and spray with diazinon at label rates if flea beetles or their damage is present.

3.

Question: How can *slugs* be controlled in the home garden?

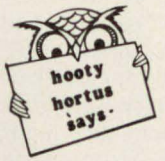
Answer: Slugs thrive in shady, moist locations. Crowding of plants too closely, therefore, may result in an ideal environment for slugs. Early detection and persevering control measures will reduce the slug problem. Slug baits containing metaldehyde should be set out in early summer and repeated as necessary. Follow label directions when using slug baits to achieve the maximum benefit. — *A. J. Kolach, Entomologist Manitoba Dept. of Agriculture*

Aphids on Delphinium (Chinense) Grandiflorum Can Be Eliminated!!

In late afternoon of June 11, 1977, I noticed clusters of small reddish aphids on and near the growing tips of *D. grandiflorum* (Siberian Larkspur) plants. Having used the systemic insecticide, *Cygon 2E,* for a number of years to control aphids on roses I decided to try it on the delphinium plants.

That evening, holes about six inches deep were made with a rod, diameter about one-half inch, a couple of inches from each plant crown, and into each hole *one teaspoonful* of Cygon 2E was poured. Immediately afterwards more than two quarts of water were slowly poured into each hole to distribute and dilute the Cygon 2E liquid.

June 12, 1977, no aphids in evidence! — *John Walker, Winnipeg, Man.*



Let's talk about the forcing of tulip bulbs for the winter home where you live in an apartment or a house without a cold area.

If you are able to allocate some space in the refrigerator you can grow at least a few pots of bulbs for winter bloom. Put the potted bulbs in the fridge for about 10 weeks. Keep the soil moist but not wet. Check for good root development before bringing them out into the home.

Another refrigerator cold treatment method, normally recommended for tulips only, will allow the forcing of more bulbs for winter bloom in much less refrigerator space. Here it is. . .

Place tulip bulbs in plastic bags containing moist peat moss and seal the bags. The water content of the moss should be just visible on the fingers after you have squeezed it gently.

Treat the bulbs with a fungicide before placing them in the fridge. In about ten to twelve weeks these bulbs should produce a good root system. Now take the rooted bulbs out of their plastic bags and pot them in the normal way being very careful when laying out the newly formed roots on the bottom of the pots.

Special Hints on Vegetable Gardening

'Tricks of the Trade' On Growing Vegetables

MR. BILL EMERSON,
Winnipeg

*Mixing garden pea varieties that do not mature at the same time solves the problem of a whole row maturing all at once.

*Radish thinly sown with carrots or parsnips saves space and thinning.

Carrots

1. Plant groups of carrot seeds in non-vegetable parts of the garden — the foliage makes an interesting ground cover (the same applies to lettuce and chives).

2. Finger size carrots are tender, tasty, pleasing, but are pale, have less food value than mature roots because vitamin content increases as colour deepens.

3. Cover shoulders of carrots with soil to prevent greening. Check to see that the soil is still covering them after heavy rain or increased growth has pushed the root upwards.

Tomatoes

1. When purchasing plants select only smaller younger plants. These should be stocky in stem with no wide spaces between lateral leaves. Stem should be pinkish, leaves dark green with a velvety fuzz. Avoid spindly plants, pale leaves, blossoms already showing, or crowded flats.

2. According to Swedish experiments where the ripening season is very short, tomato plants can be induced to blossom earlier if, after germination at 65°F for eight days, they are cooled at 54°F for four nights running, and returned each day to a 65°F sunny greenhouse.

3. Tomato foliage should not be cut or trained away from the fruit to expose it to the sun because the shading of the foliage ripens the tomatoes evenly and produces a better taste.

4. Blossom end rot is generally due to subsoil dryness, so dig a hole 18 inches deep at planting time. In the bottom of this hole put a large wad of sodden newspaper, fill up the hole to the plant level so that the plant roots are just above the wad. On surface, mulch thickly with grass clippings, sawdust, or peat moss. This conserves soil moisture and buffers the plant against fluctuations of moisture.

5. For earlier bloom on tomatoes germinate seeds at 75°F to 80°F and then move them to a propagation case in a greenhouse with a temperature of 60°F. Eight days after the seedlings have emerged move them each night to a cool basement with a temperature of 54°F, and each day to the greenhouse for four nights and days. This results in much earlier and larger blossoms — the chilling effect initiates flowering.

Asparagus

1. The height of the fern at the end of the summer should give an indication of how many weeks the shoots can be cut the following spring. For example, a four foot high fern will give four weeks of cutting or one week to every foot of height.

2. Weeds infesting the bed are a problem and some shallow cultivation, no deeper than 4 inches, before and after harvest of the spears is possible. A rotary mower can also be run over the bed to chop down all weeds.

Beans

1. Beans are best picked in the early morning or evening when the air is cool. Process them not more than an hour after picking to retain their freshness and flavor.

2. Pick beans continually to promote more growth on immature beans and do not permit beans to ripen to seed as this can initiate the end of production. See that all hidden beans are picked for the above reasons.

3. To prevent bud drop in hot weather mist spray the vines each evening. This also reduces mite infestation.

4. For greater success in growing English broad beans try the following: If and when the bean aphid starts to infest the tender tops of the vines pinch them out and place in pail with the aphids and destroy. Remove all suckers at base. Fertilize with a high phosphate fertilizer to swell pods. Mulch with grass clippings, sawdust, or straw to conserve moisture.

Zucchini Squash

1. These take up less space in small garden plots compared with other squash and marrows.

2. Zucchini squash can be picked before maturity as they taste better when young. Winter squash, however, must be mature for storage, so check whether the stem is dried up and skin hard, particularly so in such varieties as Butternut and Hubbard.

Beets

1. Harvest beets by easing gently from out of heavy clay ground to prevent the top root being pulled off which will result in bleeding.

2. When harvesting beets twist off the foliage tops to reduce bleeding rather than cutting them.

Peas

1. In hot weather prevent bud drop by mist spraying the vines each evening. This also reduces spider mite damage.

2. Pick regularly, using one hand to hold vine (to prevent it being pulled out of the ground), the other hand for picking the pod.

Watermelon

A ripe melon will emit a slight creaking sound when pressured. If rapped with the knuckles and the sound is dull and hollow, it is ripe. If the sound is high and sharp it is unripe. Again if the tendil is green and alive the squash is unripe, if dead close to picking.

Onions

1. If the leaves are not turning yellow, dormancy can be induced by bending them down towards the north so that the sun's rays are on the bulb. The soil can also be removed on the south side to fully expose the bulb.

2. Plant onion sets in loose soil but firmed on surface to prevent the onions from pushing themselves out of the ground. They must be trowelled in to just cover the tops. Do not push them in!

3. When the roots and tops of onions are brittle and can be easily broken off the vegetable is ripe and can be stored.

Garlic

Bulb may be purchased from a supermarket, separate it into segments and plant 2 inches deep 6 inches apart in early May in light sandy soil into which some rotted manure has been dug.

Restricted Vegetable Garden

If the plot is restricted, use lot fences for growing scarlet-runner beans, or cucumbers or tomatoes against a wall trellis.

Potatoes

1. One method of producing better and more abundant potatoes is to select seed only from plants which produced tubers of best size, largest numbers, disease free. This practice improves the strain each year. It is not a good idea to select only the best looking tubers from all the plants, for there may have been only one of such size and quality in one or more of the plants.

2. A heavy mulch around potato plants causes the tubers to grow close to the soil surface. If new potatoes are required, the mulch is removed, the soil lightly scraped off to expose the small potatoes, and these are removed, leaving the larger ones to grower larger for harvesting much later. The mulch and soil are replaced.

3. Stored potatoes must have good air circulation to prevent sweating and mustiness. They should not be stored with strong smelling material because they can pick up unpleasant odors.

4. Do not use lawn fertilizer on potatoes as this may result in heavy leaves but few potatoes. Use only recommended feed.

5. Mulch with black plastic over the levelled potato bed, plant the seed potatoes through slits in the plastic by pushing lightly into the prepared bed below. This mulch prevents weed growth, no cultivation is required, no mounding, and moisture content is not lost. To harvest, remove the plastic and pick up the potatoes which will be usually very close to the surface. Clear plastic cannot be used as the potatoes will turn green and toxic. Weed growth will also occur.

Vegetable Culture

Cauliflowers, cabbage, sprouts should have yellowing leaves removed in growth as they have a rotten odor which can taint them.

Planting Times

According to the Indians, corn is planted when the wild plum blossoms. More tender quicker germination vegetables such as beans and squash are planted when the hawthorn flowers or the peony blooms, or the common lilac flowers.

Slant Planting

Plant spindly seedlings of vegetables on a slant with the roots well up in sun warmed surface soil. Extra roots are then initiated along the stem.

Rhubarb

1. Divide and replant the plants every third year in the fall. This is best done by moving and dividing one-third of the plants each year leaving the other two-thirds undisturbed. Fertilize with manure each year.

2. Spindly 'sticks' of rhubarb may be due to the rhizones having been planted too deep, so remove some of the soil to just expose the eyes.

Interplanting

1. Corn and cucumber can be grown together in interspaced rows. The root zone of the corn is shaded by the cucumber vines which also benefit from the light shade from the corn. They do not get leathery skins from too much sun, and taste better.

2. To test when corn is ready for picking, pull back tip of husk to expose top kernels, crush one with finger and thumb nails. If the kernel is watery it is too green, if floury too old, if milky just right for picking. Cook at once to get best flavor.

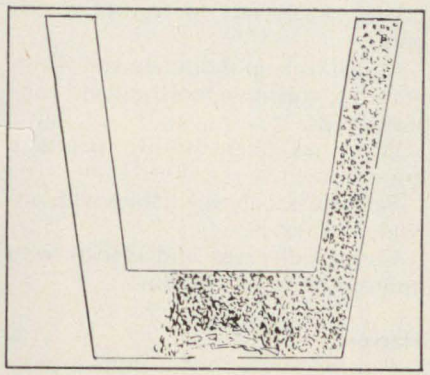
Leeks for Exhibition

To get good blanched specimens slip a drain pipe or cardboard tube over the plant late in growth. At first sink this in the ground so as not to cover the plant completely but leave some of the foliage exposed. As the plant grows, lift the sleeve upwards to cover the stem.

Re-Potting into Larger Flower Pots

J. R. ALMEY, Winnipeg, Manitoba
Retired former Manitoba Prov. Horticulturist.

Difficulties are often encountered when re-potting plants such as African Violets and Gloxinias, or plants with leafy bases, in endeavoring to avoid breaking off the lower leaves. This can be overcome easily by using an empty flower pot, the same size as the one in which the plant is growing, as a mold. (As an example a 3 inch pot-grown plant into a 4 inch flower pot.) Never overpot.



To do this, place the usual drainage material into the 4 inch flower pot and soil to a depth, so as to bring the rim of the 3 inch empty flower pot to the level of the rim of the 4 inch pot. Then, using your potting soil somewhat dry, pack and ram the soil between the sides of the two flower pots. Lift out empty flower pot and place the plant from the 3 inch pot into the prepared 4 inch flower pot. A slight pressure with the finger tip will firm the soil, and a good watering will complete the operation.

Sometimes it is difficult to remove a plant from the present-day plastic flower pot without breaking the leaves, due to the absence of one large centre-drainage hole. It would help to use an electric drill to open a half inch hole in the centre, before using these pots. Pressure with a lead pencil against the proper drainage material through the hole will solve the problem.

Special Hints on General Gardening

General Vegetable Gardening Hints

DR. A. C. FERGUSON
University of Manitoba

Spring to Fall

Select a site with good drainage, at least six hours of direct sunlight, a level surface, beyond the range of tree roots, and the best soil possible (loam or sandy loam is ideal).

Soil Preparation

Prepare the soil in the fall, turning under organic matter (manure, peatmoss or compost) and a high phosphate fertilizer.

Don't work soil when wet.

Selection of Seed

Decide what you want to grow, well in advance, and order seed from a reputable seed firm.

Grow what your family likes best.

Draw a Plan

Locate perennials along the side or end of the garden.

Interplant early and late types within the same row to conserve space.

Locate the tallest kinds to the north so not to shade shorter species.

Don't overplant. Use short rows in successive seedings to lengthen production period of quick growing vegetables.

Be prepared to can or freeze surpluses.

Grow vines on trellises to conserve space (tomatoes, cucumbers, bean and peas).

Transplanting

Use transplants to produce earlier crops and frost-tender kinds. Some vegetables do not transplant easily so must be grown in individual containers to minimize root disturbance when set in field (e.g. vine crops).

Most vegetables take at least six weeks from seeding to adequate plant size for transplanting into the field. Celery takes nine to ten weeks, peppers and eggplants, nine weeks, and onions, twelve to fourteen weeks.

Summer Care

Hoe or cultivate to control weeds only.

Mulch to help moderate soil temperatures, conserve moisture and control weeds.

Water as necessary to produce good growth.

Side dress leafy vegetables with nitrogen fertilizer.

Control diseases and insects with appropriate sprays or dust.

Harvest

Pick when produce is in its prime.

Cool quickly in ice water and store in poly bags in refrigerator.

Remember the shortest time from garden to table is best.

Don't refrigerate tomatoes or eggplant.

Rutabagas, kale and parsnips are best in fall when weather is cool. Seed so they will mature in mid to late September.

Broccoli is cut when the terminal bud is at its maximum size but before yellow flower appear. Side shoot develop later and can be harvested over at least two weeks.

Peas and beans must be picked regularly. Dont' leave over-mature pods on the vines to ripen or plants will stop producing.

Harvest **kohlrabi** when the stem is a maximum of two to three inches in diameter.

Onions for storage are pulled when outer scales are dry and left to cure in window, however, don't let them get wet.

Summer squash are harvested when very immature, before seeds are fully formed. Remove and discard oversized fruit at each picking to prolong production.

Don't harvest **winter squash** and **pumpkin** until the rind is hard or they will soon break down in storage.

Although vine-ripened **tomatoes** are best, fully formed, green fruit picked in September just before frost will provide ripe fruit of good quality until after Thanksgiving. Ripen at 60 to 65°F.

Sweet corn is ready for harvest 21 days after silking. Silks will be brown. Plant early, mid-season and late varieties at the same date to expand production period.

Cantaloupe are ready when the stem will "slip" from the fruit under slight pressure.

Finally — home grown vegetables are an excellent source of minerals and vitamins. However, don't overcook them.

Remember — start small and expand as you gain experience. Overplanting can result in frustration.

Hints on Timing

H. H. MARSHALL,
Agriculture Canada, Research Station, Morden, Manitoba, Canada.

Timing is essential for success in gardening. With correct timing you work with nature; without it you work against nature. Each plant is designed to grow very well under a certain set of conditions in a certain part of the season. Success will be more easily attained if you learn what conditions are required, and follow them. Performing each garden operation in an effective manner at the **right** time will contribute greatly to gardening success and enjoyment.

Timing for Tilling

Timing is important for *deep digging or tilling a garden*. In the fall, trash, manure, leaves, or compost may be incorporated into the soil to improve its texture and capacity to produce. The same operation in the spring can give a loose seed bed that will dry quickly in the hot sun. Deep tillage among growing plants or trees will destroy their most important feeding roots. Most of the soil's fertility is in the top six inches. Broken roots cannot feed healthy plants. That big tiller with its oversize slashers is of use only for a few hours each fall. Rent one.

Timing for Weed Control

Timing is important in *weed control*. You have seen someone break a

piece of grass sod in May. He spends all afternoon and evening tilling back and forth, and the next week with a pulled muscle. Yet when he plants, the soil is still full of weeds. The same effort started in July and applied every two weeks would have produced a garden and happy muscles. Perennial grass and weeds would be dead and giving their substance to the garden crops.

Control of Seedling Weeds

Timing is important for *control of seedling weeds*. Young weeds grow rapidly, absorbing all moisture and nutrient within reach, leaving nothing for any late starter or garden plant. Even if they are tilled into the ground, the moisture is gone and the nutrients are tied up for a while. An aid to early weed control is to sow seeds in marked straight rows or evenly spaced hills. If you know where the seeds are sown, you can cultivate the rest of the area when few or no plants can be seen.

Timing in Seeding

Timing is important in *seeding grass, flowers, or vegetables*. Wild plants usually do not germinate except at the best season for their species. Cultivated plants may have lost this ability, but some retain it. The best results can be obtained by sowing at the correct season. Grass germinates well in early fall, grows well under cool fall and spring conditions and will develop into an acceptable lawn by May. This can often be done with little or no watering, as compared with daily watering for a spring sown lawn. Lettuce, carrots, spinach and top onions may be sown in November or very early spring. Also many hardy flowers such as calendula, larkspur and hollyhocks enjoy a cool spring. Other species such as beans, cucumbers, marigolds, or zinnias require warm soil and weather and should be sown later.

Transplanting Trees & Shrubs

Timing is important for *transplanting trees and shrubs*. Transplanting is not a natural process. It is a major shock to the plant because the root system is always damaged in some degree. Soft new growth and leaves demand — yes, demand! — large amounts of water. The damaged root system may not be able to meet this demand, resulting in shock or death to the plant. Trees and shrubs transplant best when they are dormant and have no new leaves. Container-grown trees can be planted at other times, but best results can still be obtained in spring or fall.

Transplanting flowers

Timing is important in *transplanting perennial and annual flowers*. As in trees and shrubs the root system is always damaged. Flowering is a major stress for these plants so they should be moved at a time far from their season of blooms. Spring and early summer flowering species move best in the fall and late flowering types in the spring. Annual flowers with few or no blooms transplant better than more advanced plants. A cloudy afternoon or evening is a better time for planting than a windy sunny morning. Use that windy day for weeding or other chores.

General Garden Hints and Suggestions for the Prairies Month to Month

MR. B. W. BURNINGHAM

Planning

Early in the year it is time to start thinking about a new adventure in gardening and to begin planning your operations. First visualize your garden as it was last summer, then eliminate any plants that were not suitable or pleasing. In place of these, adventure a bit and try some new varieties. The seed catalogues will give you enough information to enable you to judge if they will fit in with your plan.

Order your seeds early if you are growing your own plants, if not — check with your nursery-man and let him know you will be needing these plants.

Geraniums that have been cut back should be producing good healthy cuttings, these can be taken now for good, sturdy, well rooted plants to bed out in the spring. Put cuttings in vermiculite, clean sharp sand, and peat moss (any sterile medium that will stay open and not pack is suitable).

Planting seed in February

Seed orders should be made up and dispatched to assure early delivery. Seeds such as pansies, double petunias, spanish onions, celery, leeks etc., can be planted at mid month. They can be transplanted twice for well rooted plants to place in the garden.

Make sure your containers are clean and in good repair. A good mixture to use for seeding is — two parts good garden soil or loam, one part peat moss or leaf mold, and one-half part clean sharp sand. Fill containers within one inch of top after firming soil. Place in basin or deep dish allowing the water to rise to one-third the depth of the container, leave until the top of the soil shows dampness, then remove and allow to drain for a couple of hours. Plant seeds thinly, cover as per directions on packet, firm lightly, cover with plastic or glass, and place a piece of brown paper over glass or plastic, and place container in warm location. Check frequently and remove condensation from glass, water lightly when top soil is dry.

Check dahlia roots and begonia tubers. If the dahlia tubers appear shrivelled at all, just sprinkle with water. Do not force into growth at this time. Hold tubers in temperature of 40 to 45 degrees to delay growth. Check begonia tubers to ensure they are firm and no signs of mold, don't bring into growth at this time.

March

This is a good time to give the garden tools a check, do any sharpening, cleaning, adjusting necessary. The lawn mower will also need checking and if it needs overhauling, now is a good time before the mechanics get too busy with the spring rush.

Toward the end of the month, put in seeds of asters, stocks, snaps, annual pinks, petunias etc. Start begonias toward the end of the month. Place tubers in dampened peat moss or leaf mold, make sure the tubers are the right way up (hollow or dished side up) bury to top of tuber, keep medium moist, not wet. When shoots appear, a light misting is helpful.

Annual seedings should be transplanted when large enough to be handled.

Pruning or trimming can be done when weather permits, but in any event should be done before growth is evident.

April

Plant seed of staking tomatoes, brussels sprouts and savoy cabbage.

Pot up begonias when growth and root system are plainly evident (about four leaves opening is okay). Use a light soil rich in leaf mold or peat moss and slightly acid. The soil must be kept moist, not soggy.

Outdoors in the garden, when the ground is dry enough, loosen up but do not remove trash cover on perennials and tulips. This allows the air to circulate and prevent dampening off of growth which may be showing.

Watch the lawn for signs of snow mold. If present, treat with fungicide. The garden supply store will handle this item.

Dahlia tubers can be started into growth toward the end of the month if early flowers are required. Place tubers in shallow box, cover with leaf mold or peat moss. Keep medium just moist. A temperature of 50 degrees is about right for sturdy growth.

Transplanting of seedlings should be completed early to ensure well rooted stocky plants. Pinch back any geraniums that are growing leggy.

May

If the weather is mild and sunny, put bedding plants outside to harden off (a short period to start with, increasing as the weather warms up).

Weather permitting, remove and dispose of trash covering. When the ground is dry enough, use dutch hoe to loosen soil around perennials, don't work soil too deeply. Toward the end of month hardy annuals may be planted out if soil condition warrants. Tender annuals should be held until end of first week in June.

Onions, parsnips, carrots, parsley and lettuce seed can be planted in the garden as soon as soil is fit to be worked.

Pull up soil to form rings around shrubs and trees, especially any planted last fall. Water well inside ring and if no rainfall, repeat at three day intervals. A good mulch around trees and bushes will help to retain moisture, and keep root system cool. Perennials will also benefit from a good watering once a week in dry weather.

Watch for dandelions in lawn and eradicate before buds appear.

N.B. Plant out dahlia tubers at end of month taking care not to damage shoots. A location which gets early morning sun and late afternoon sun is ideal. If this is not possible, protect from midday sun (10 a.m. to 3 p.m.).

Hardy annuals can be seeded out in the garden toward the end of the month and will produce good flowers in six to eight weeks.

N.B. Place supporting stakes with dahlia tubers at time of planting.

June

Finish planting of annuals and bedding plants. Be sure to soak flats containing annuals and bedding plants overnight so that soil will adhere to root system.

Begonias should be set out around the 10th to 14th if the weather is warm. Plant them in a porous, slightly acid soil and do not bury the tubers too deeply as moisture laying in the crown can cause rot to set in. A mulch of peat moss or leaf mold will help to keep soil moist and cool. If stems of begonias become tall, they must be supported. Begonias do not require total shade but should have protection from hot sun — 10 a.m. to 3 p.m.

Cut off dead blossoms of perennials, this will assist in having more flowers and healthier foliage. Annuals also benefit from this practice.

Stake and tie any tall specimens to save damage from wind.

Check rose bushes and shrubs for aphids etc. Spray if necessary using the appropriate spray. As the flowers on lilacs and spireas fade, cut them off, just below the flower head. This assists the growth of the plant or bush and will help the blooms for next year.

Thin out seedlings where growth is too thick. Plant out staking tomatoes if protection is available. Set stakes at same time and keep side shoots trimmed out. A watering with manure water every ten days after blossoms set will give quite a boost.

Keep lawn watered. A good watering twice a week is good practice. *Don't* just sprinkle.

July

Keep the hoe moving to keep dry mulch and less weeds. The dry mulch keeps soil from drying out and from cracking, but do not disturb soil unless it is fit to work.

If required for show purposes, disbud dahlias, carnations etc., leaving only the crown bud. Water frequently and sufficiently, application of manure (liquid) weekly after buds appear and until color shows is good practice.

Be sure dahlia is tied to support as required. If you intend to exhibit at the flower show, pick out several good specimens and give extra attention, it will pay dividends.

Don't forget to give fruit trees a good soaking once in awhile. Keep them mulched if possible. Water the garden well, don't just sprinkle. Make sure the water gets down to the roots. Prune back where necessary, and trim shrubs and bushes that have finished flowering in June. Be sure and remove dead flower heads.

Carry out lawn maintenance.

August — 'Flower Show Month'

Keep the hoe shined up.

Keep dead foliage and flowers cut and deposited on compost heap. A good soaking is a 'must' if it is dry, to keep bacteria acting.

Protect show specimens from wind and sun damage and keep well watered.

Get all accessories for show rounded up. *Make sure you are conversant with rules and regulations governing exhibits and the deadline for receiving entries.* If you are interested in flower arrangement classes, a few practice runs are a help when materials are plentiful.

Be sure entries are true to type, perfect shape, size, color and quantity.

As soon as vines and plants are through producing, remove them and place on compost heap. Keep lawn grass cut, water lawn as required. Onion tops should be tramped to encourage ripening. Lay the tops away from prevailing winds. Tramp lightly so as not to break tops, if necessary, tramp again in a week's time. Lift before frosts or protect. A few days before lifting, loosen bulbs with garden fork. Onions should be placed in shallow trays and allowed to ripen in sun. Keep under cover during wet and damp weather.

September

Dig up and store geraniums, fuchsias and begonias. Hang up geraniums in paper bags or cut back and plant in flats. Water sparingly, keep in cool part of basement in light.

Lightly fork over perennial beds and around individual plants.

After first killing frost, cut off dahlia foliage four inches above the ground leave tubers in ground as long as possible at least until there is danger of heavy frost. Then dig up and store.

Get all available ground dug up and left rough.

Dig up and store glads.

Cut lawn if necessary (it shouldn't be left with a long heavy growth).

Start list of changes in the garden for the coming year. Look for any additional information you may need.

October

Clean and store garden accessories. Make note of repairs if any. Clean, sharpen and repair garden tools after garden activities are finished for the season.

Protect exposed perennials, bushes, roses (climbing roses by laying on ground and covering with soil and a good layer of leaves on top).

Rake leaves off lawn and paths, either store same for mulching or place in compost heap. *Do not* remove leaves in shrubberies and under trees, they are valuable to retain moisture and keep roots cool next year.

Note:

Commonsense must be used with these general garden hints, since weather is not predictable. Only work in the garden when conditions permit good work. Don't try to grow too many annuals indoors, unless you have the time and it is convenient. It might pay to purchase the bulk of your plants and just grow a few special ones.

Do you know the humidity level in your winter home?

We, of course, all know that we must water our house plants, not necessarily regularly, but more particularly in accordance with their needs. However, do you ever give much thought about the water or humidity level in the air around them?

When winter arrives and the furnace is the basic source of heat, have you any idea just how low the moisture content in the air in your home can become? It could be almost zero, or as low as 10% to 15% or less. The only indication you may get of this condition is a dry nasal passage or some sinus trouble, but your plants, many of which are natives of the tropics where the humidity level is usually around 50%, will try to tell you by tip kill-back of leaves and such unhealthy signs.

I suggest a hydrometer or humidity thermometer as a solid investment, both for the health of your plants and your own well-being. They are available at hardware and department stores at little more than $6.00. The humidity level in your winter home should be not lower than 30%.

Miscellaneous Special Hints

Foliar Feeding

Coal soot and manure diluted in water can be used to spray the leaves to foliar feed the plant, while the odor of soot repels pests.

Starting Seeds

Use eggshells filled with sandy loam for starting seeds. Use two seeds for each shell (use the stronger seedling). Lightly tap the shell to crack it at bottom when ready to plant out. The shell decays and gives additional soil minerals. — *Bill Emerson.*

Get Dutch hoe

You can water for days on end, but nothing can take the place of God's rain. Lawns and pastures that were turning brown seem to have greened over night. With warm sunshine things should start to grow — and that will include the weeds.

The first order of business in both the flower and vegetable garden is to keep ahead of the weeds. One of the best pieces of garden equipment is the Dutch hoe. This is a D-shaped hoe that can be used for cutting down the weeds; what I like about it is that it can just be pressed under the soil to cut down the weeds or, with a bit of pressure applied, it can loosen the soil to a depth of two inches with little effort.

It may be just a bit too wet to get into the garden for the next day or so, but as the surface dries, get rid of the portulaca which is starting to appear.

Go through the garden with the Dutch hoe and after you have cleaned up the weeds, loosen up the soil with a three-prong cultivator and this will help conserve the moisture.

If you have used fertilizer on your lawn during the dry spell, you should be busy cutting the grass about twice a week. I hope you are not gift-wrapping those lush grass clippings for the city dump. You can use them to mulch your tomatoes, cabbages and raspberries.

It seems a waste of time and money to apply the fertilizer and really force-feed the lawn and end up with more garbage. Manures are becoming scarce. Why not start a compost pile with all that organic matter.

Speaking of mowing the lawn, it is time to adjust the lawn mower and it should cut the grass to at least two inches in height. When you cut below the two inches, it leaves it open to drying and scorching in the hot weather.

The important reason for cutting at the two-inch level is that, grass starts to branch or stool out at this height. Cutting below that height actually thins out your lawn to just one blade.

I would not apply any fertilizer unless I have a few pet goats. Let nature do the work. — *Reprint, Courtesy Gus Hendzel.*

Consider building a cold frame

As you wait for spring to arrive you could ponder over some plans for a cold frame to grow your own plants. A couple of storm windows and a few pieces of plywood and you have a cold

frame that will serve you for a number of years.

In the past we suggested the use of an interior car heater which can be used on cold nights. Also available are soil heating cables in different sizes with or without thermostat control. I would suggest you choose one with controls. Shop around for these at the different hardware stores and lumber yards.

Your cold frame should be located in a protected area and one location used by some gardeners is over a basement window. By removing the window you can get an earlier start over a frame built in another part of your garden.

You can place a heating cable in the soil within the cold frame and there should be some basement heat which would help maintain a good growing temperature. The great thing about such a lean-to cold frame is you can check your plants through the basement window during rough weather.

With a bit of planning on your part and, with no increase in seed prices, you could end up ahead of all those increased costs in food this coming summer.

If you are going to try the jar method of starting seeds, place in a good light but not in direct sunlight. If you left your jar with the lid on in bright sunlight, you would just about cook your seeds.

As you thumb your way through the seed catalogues, check out flowering cabbage or kale. This is something new for the past couple of years and should become popular in a couple of seasons. Here is a plant you can use in your flower bed and at the end of the season use the cabbage as you would an ordinary cabbage. It is a two-way plant, it will add color to your home during the summer and can be used as a salad in the fall. They come in color combinations of green and white, red and white and pink. It would make an ideal background plant or centre of a flower bed. They take about 20 inches of growing space, and would make ideal plants to border a long driveway. It grows similar to other green cabbages in size of head, height and spread. Seeds are available locally and they are easy to grow. — *Reprint, Courtesy Gus Hendzel.*

Water Gardening by an Amateur

MRS. W. C. TAYLOR

I must make it clear that I do not consider myself an authority on water gardening. Any knowledge I have was learned the hard way — by trial and error. If you enjoy the sound of running water, however, — the sight of gleaming goldfish, and freedom from weeding and watering — why not try a lily pool?

Lily pools should be located in the sunniest part of your garden, if you want your lilies to bloom. Pools may be made from a washtub, half a barrel, a hole lined with plastic or concrete. It should be about two feet deep so that the lilies are about six inches below the surface of the water.

The lilies should be planted in boxes about sixteen inches square and twelve inches deep. The containers should be of pine, weathered wood or plas *by* The soil should be a rich mixture of compost, loam or manure or fertilizer, bone meal, with a 1½ to 2 inches layer of sand on top for cleanliness in the pool. Lilies should be placed in the pool about June 1st and removed about October 15th. They should be stored in a frost-free place and watered sparingly during the winter. I plant four to six pots of anacharis oxygenating plants in the bottom of the pool.

A waterfall may be constructed and a circulating pump, preferably with a filter, installed. The filter helps to control algae and the pump oxygenates the water for the fish. Absolutely *no copper* should be present in a pool containing fish. Books on water gardening are available at Public Libraries.

Shrub Roses which are Hardy in Northeastern Alberta

K. I. TAYLOR
Wainwright, Alta.

The Rose, called the Queen of Flowers, is loved by all. Shrub Roses are especially valuable in this part of the world because most of them are hardy, and look best when allowed to grow naturally . . . only being pruned to improve the shape or to remove old or diseased wood. They do not need to be covered during winter. Shrub Roses should be considered a permanent fixture . . . the ground being well prepared in a sunny location and the bushes well watered.

Hansa: A Rugosa Hybrid originating in Holland, the bush grows six to eight feet high, has dark red blooms which are in flower continuously from June to September.

Altai: A Scotch Rose, grows to six feet in height . . . large, single, creamy white blooms which completely cover the bush in June, with some blooms again in August. Blooms are followed by large showy black fruit which hangs on during the winter.

Will Alderman: Rugosa Hybrid . . . Flowers profusely from June to middle of September. Flowers are fully double, clear rose pink and fragrant. The foliage is particularly attractive.

Dr. Merkley: Two feet high, deep pink flowers in June and early July, . . . some flowers again in August.

Scotch Yellow: Height three feet . . . double yellow flowers in June.

Betty Bland: Tall and slender, smooth canes (red) five feet high, lovely pink blooms in June.

Therese Bugnet: Hybrid of Betty Bland, five to six feet high, blooms in July and intermittently during the summer.

Ruth: A gleaming shade of deep, clear pink, bordering on red, semi-double, grows seven to eight feet high . . . flowers in June.

Prairie Dawn: Six feet high, flowers in June and intermittently during the summer, very fragrant, fully double, very deep pink.

Cuthbert Grant: About two feet high, compact bush, bright red flowers, like "PEACE" foliage . . . very hardy, double blooms.

Marie Bugnet: White double, June to September . . . about five feet high.

Isabelle Skinner: Cream, rose tipped . . . about four feet high.

Persian Yellow: May not be too hardy in this area.

Preparing and Laying of Sod for a Lawn

ROGER BROWN
Supervising Gardener,
Gov't Greenhouses, Winnipeg

To produce a good lawn means a lot of hard work, but if done properly the end result will show it was well worthwhile.

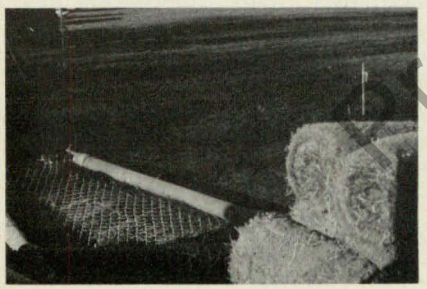
When levelling in preparation for the sod, make certain that any excess water will drain away from the house. If the base for your new lawn is mostly clay, a good layer of black earth should be used and some well rotted manure, if you can get it. About two inches of black earth and three quarters to one inch of manure. This will make the initial cost higher but will help to retain moisture during the hot summer months, which is important to a good lawn.

Only good quality nursery sod should be used as prairie sod is usually full of weeds and it will take several years to get rid of them. Sod should be laid so that it looks like a brick wall when completed. Try not to finish with a half strip against a sidewalk or driveway as this will tend to dry out, always finish with a full width and have the half strip about three feet into the lawn. Water the sod well, checking here and there to make sure the water is getting through the sod. Leave for a day or two before rolling to avoid soil from sticking to the roller or your feet.

If a top dressing is needed to help fill the joins, spread with a shovel and then rake it in, using the back of the rake.

Watering and Mowing Your Lawn

A really good soaking once or twice a week is much better than a little water each day or two. Watering too often causes the roots to develop close to the surface and in dry hot weather these roots will soon be damaged and dry out. When watering is done thoroughly every three or four days, a good root system will develop as the roots have to grow deep to look for moisture.



Most lawn grass should be left about one and one half inches long after mowing. It is not necessary to mow on a regular basis, only when the grass needs cutting. The most important thing to remember in cutting grass is to have your mower sharp. If it is dull it will leave the blades of grass rough at the tops causing your lawn to look dry and brown.

How Flower Arranging Came to the Peace River Country

YVONNE MacALISTER
Grande Prairie, Alberta

John Wallace of the Beaverlodge Nursery (winner of the Alberta Horticulture Association Centennial Medal) was the first to encourage me and make me aware that tulips grew beautifully in this Peace River country. I was to prove him so right, from my first dozen in 1963 to my final count of over 3,000 bulbs in 1973.

I read anything and everything I could find on growing and arranging flowers, entered flower shows, learning by trial and plenty of errors. My biggest thrill, I think, was in 1970 when a picture of my winning buffet arrangement from our South Peace Horticultural Society Spring Show was sent to the National Tulip Society Inc. in New York, U.S.A. and won first in the Tulip Specimen Shows! This arrangement was made of Red Emperor tulips and our own local slough grass and tansey foliage.

Yvonne MacAlister and Winning Arrangement of Tulips.

Award winning "Merry Widow" tulip.

By this time I was totally addicted to flowers, mainly tulips. In 1971 I received the 'Most Outstanding' Award of our Flower Show for a single tulip, "Merry Widow", judged by David Enns from the Fairview College. Mr. Enns gave us continual encouragement and support to continue with our Horticultural Society — which has been growing slowly and steadily since it was begun in the spring of 1969. This year we sponsored the second year of a Judging Course. A course that was needed badly in this northern end of the province and it was also a help to the northern B.C. area.

Unfortunately, a back injury, sustained during the winter of 1966, finally caught up with me, and I had to give up gardening. It was a tragedy to me to watch 3,000 bulbs die out from lack of division and neglect.

R.C.M.P. Centennial display — Mountie Boot and Poppies.

So my interests had to change. Realizing how difficult it is to get gardening information in this area, in the winter of 1970/71, I took a correspondence course from the U.S. on flower arranging and flower shop management. I am now a Canadian representative as I believe their course is an excellent one.

After eighteen months of running my little flower shop on our farm in my spare bedroom, which I called Yvonne's "Country" Flower Shop, gaining experience, I now give a General Garden Course to those interested and it has been received very well by the people who have taken it. I supply the students with all materials needed.

The outline of the General Garden Course — three hours per day once a week is as follows:

1. Houseplants and Their Care; Benefits of Birds in the Garden; Conserving Our Wild Flowers.

2. Arranging Garden Flowers and Materials Used; the Correspondence Course; Benefits from our Horticultural Society and Garden Clubs.

3. Basic Landscaping and Vegetables; Planting Bulbs; Small Greenhouses; Simple Corsages and Boutonnieres.

4. Container Hunting for Arranging, and Houseplants; Flowers and Vegetables for Exhibiting; Picking and Drying Flowers and Grasses.

I also supply silk flowers with registration on which the students can continue to practice at home.

This course is sponsored by our Horticultural Society, and since its inception 137 people have taken it. There is a great interest here in learning how to care for, love, and use garden flowers.

Rock Garden Construction in the Prairies

P. MATHEWS, O.D.H.

Before construction of a rock garden is attempted, there are a few considerations:

1. Can it be located in the lot so that its important slope faces southeast? Many alpine or rock garden plants are sunloving and do not like too much shade. Also they do better if the snow cover is retained late in the spring. A southwest facing rock garden is too warm and snow cover gets melted off too early.

2. Can the rock garden be so sited that it is not in a windswept place which can prevent snow cover from building up, and excessive drying of the soil in spring?

Damp, 'closed in' sites conversely can also cause plant injury.

3. Can the rock garden be located away from the house foundations? Such sites often detract from the appearance of the house, and can be inconvenient for its maintenance (painting, window cleaning).

4. Can the root zones of large trees be avoided so that they do not invade the rock garden and cause dehydration of the soil? Besides this, the built up rock garden must not blanket the root zones of the trees and cause injury.

5. Will the garden fit in with adjacent lots, or surroundings where natural outcrops will be lacking, or traditional landscaping methods have been more commonly used? In consequence of this, rock gardens are best located in the rear of the house (which is often fenced in), and any landscaping in it will not affect adjacent yards.

If these basic questions have been answered satisfactorily, the rock garden may now be planned.

Size of Rock Garden

The lot size will limit the ultimate size of the rock garden quite apart from cost considerations. Many new households, such as townhouses and older city homes, have small yards. There is also a trend to smaller lots due to high land development costs and the lifestyle of younger home makers today.

Despite this, however, a small rock garden in a small yard can be a source of great pleasure because many miniature and interesting plants can be grown in a small area. The tremendous interest in the use of house plants by homemakers could well be matched by a similar interest in rock gardening in the prairies. It should not be forgotten that the dry sunny prairie climate is preferred by many alpine plants, if the other factors such as soil and drainage are favorable.

Rock Material

Ideally, this should be stratified limestone or sandstone, which produces slabs or rectangular blocks from 50 to 200 pounds (or more) in weight. However, manhandling 200 lb blocks can be a problem. In the prairies and foothills, limestone and sandstone quarries occur, while on the edge of the Precambrian shield

rock areas (particularly in Manitoba) granite, greenstone, volcanic rocks, can be collected, or supplied by occasional quarries. These Precambrian rocks are not generally blocky or slabby but if nothing else can be located nearby they can be used quite well.

Over very wide areas of the prairies glacial boulders are found in moraine deposits, gravel pits, and river beds and are often the only source of material. Many farmers situated on morainic ground have had to clear boulders from their land and they make dumps of them at the sides of their fields. These boulders do not make the best rock garden material but, if employed in the manner of Japanese gardening, can make an interesting rock garden.

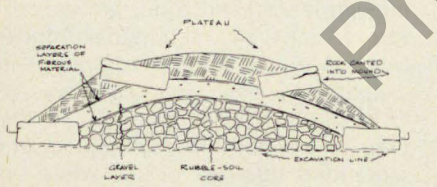
Landscape architects use such boulders frequently in landscaping of office blocks, factory grounds, institutions, etc.

Cost of Rock Material

Handling and trucking costs can be high but if the design is phased, a small area can be constructed at first to which further phases can be added as and when the budget permits.

Some homeowners collect rock in a trailer from spoil heaps, borrow pits, rock cuts, old quarries but, in many instances, this is illegal so it is safer to contact the owner (probably a local farmer) and purchase a load.

Carrying heavy rock in the trunk of a car is bad practice from a safety point of view and because of the damage it can do to the car.



SECTION THROUGH RAISED ROCK GARDEN

Drainage

This is not a problem if the lot is sloping, as is the case in foot-hill regions, the rolling prairie, or near gullies close to rivers or creeks, but in Winnipeg and Regina where many homes are on very flat subdivisions, a rock garden will have to be elevated to obtain the good drainage which is especially necessary in the time of thaw and run-off. Many alpine plants like well drained soil. The soil, moreover, in the prairies is often heavy clay so the soil itself must be improved for drainage.

Construction

'Island' rock gardens are handy to maintain as all sides are accessible.

The 'Island' does not have to be in the centre of the rear yard of course, but in one or the other corners, dependant on the orientation of the lot. It should be sited in front of a background of evergreens whose pyramidal form remind one of mountains. Generally such evergreens are the smaller forms of spruce, pine, cedar or juniper. Large evergreens will eventually overwhelm not only the rock garden but the lot (if it is very small). The roots will also invade the rock garden.

Height of the Rock Garden

The height of the small rock garden should be about 3 feet and this means it will not be less than 12 feet in width. A rule of thumb is 4 to 5 feet of width to every one foot in elevation. A very large rock garden can be, of course, much higher.

Procedure

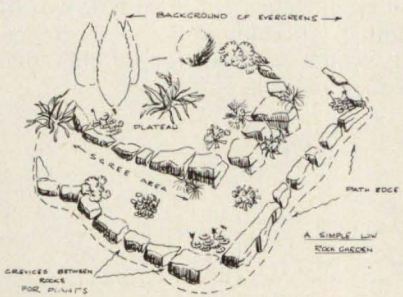
1. Dig out the topsoil and turf to at least six inches over the entire rock garden site. Transfer this material to the rear of the site where it will be used to increase the soil layer for the planting of the background evergreens.

At this time any quack grass must be picked out from this excavated material. Quack grass cannot be included in any of the rock garden structure for it is a most serious weed to eradicate from the rock and screened material. It usually means upsetting the stonework to remove it.

2. Place and shape the core for the rock garden. This material could be concrete rubble, broken bricks, very coarse gravel.

3. On top of this is spread a six inch layer of gravel. It is tapered off to the edge to allow for a 12 inch layer of soil to be spread over it. Gravel can be purchased from garden supply contractors by the truck load, or only several yards at a time.

4. On top of this, a three inch layer of coarse fibrous material comprised of coarse peat, straw, hedge trimmings, will form a separation between soil and gravel. The soil is then added to a depth of 12 inches and tapered off at the edges. It need not be fertile topsoil, but a gritty, humus, garden soil without any fertilizer addition.



Such material can be made by mixing three parts lean soil with sand, two parts peat or leaf mold, and one part of gritty gravel (screened gravel).

It will be seen that if a load of coarse to very coarse unwashed, unscreened gravel is ordered it can be screened by the home owner to various sizes required for the core, the gravel layer, the grit and sand for the soil. A piece of expanded reinforcement mesh can be used as a screen.

The first application of soil is then tramped down hard to receive the rocks of the rock garden.

Placement of the Rocks

The quantity of exposed rock to be seen on the surface of the rock garden mound will be no more than one-third of the area, otherwise it will look overcrowded. An occasional stepstone in the soil areas is useful for maintenance. These will be placed to the convenience of the householder.

The placement of the main stonework is very important and the objective must be to simulate closely a natural outcropping. Observations of natural outcrops will show that some have horizontal strata, others slightly dipping or inclined beds. The layers are not always continuously exposed and this fact should be initiated in the simulation.

A plan and elevation, (or section), are drawn up before bedding the rocks on to the rock garden mound.

The load of stratified limestone should contain a selection of different size blocks, some cubic, and others slab and rectangular, and of different thicknesses. It may or may not be possible to get weathered rock material. The edging stones can be the same thickness.

Each stone must be sunk into the soil base to two-thirds of its length

and canted slightly into the mound so that the rain water (or sprinkling) will run into the mound and not flow off down the outer slopes.

Stability must be achieved so that the rocks can be stepped on and will not slip, so the soil around each stone is rammed firmly.

The best face of each stone is towards the observer and if it is naturally weathered all the better.

Edging

The edging stones are ideally all the same thickness with other dimensions variable. They are set with their outer edges parallel to the grass or path edge. They are also bedded so that their top surface is roughly level with its neighbor. They need not be continuous all around the rock garden.

The rocks throughout the garden should be so placed that there is some space between them for soil to be tamped in (even special pockets of soil required for certain plants). These crevices are ideal for many rock plants.

When the stones have been placed, the remainder of the soil is spread and shaped, tramped down in and around (and over) the rocks to complete the garden. The whole is thoroughly watered in before planting and any slumping rectified at that stage.

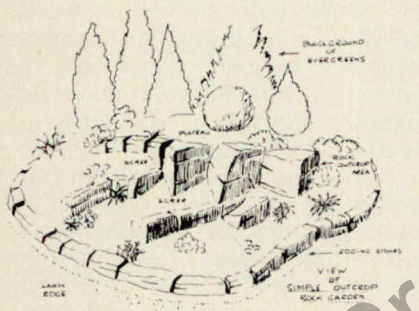
At first the new rock work will look somewhat artificial but as it weathers, and rock plants grow around it, a natural look is achieved.

Screes and Pavements

Small areas of the soil slopes can be used as screes made of a 12 inch layer of shale suitable for special plants. Pavements of flat stones on the plateau area of the rock mound are for planting other alpines that prefer that type of environment. Such specialities can evolve when the garden is well established.

We have not discussed rock garden plants here. Information is available from various sources on these. It is sufficient to say that there are many suitable miniature and dwarf plants available from nurseries in Canada. Some actually specialize in alpines and there are many public gardens which have excellent rock gardens in which many fine rock garden plants can be observed.

Three sketches are included, two of simple outcrops, and one diagramatic sketch of a section of the rock garden mound.



Your New House Plant

SHIRLEY GORE-SMITH
Tree and Leaf Shop,
Winnipeg, Man.

A "green thumb" is mainly a matter of believing or "positive thinking". If you think you can grow any plant, then chances are that all plants will flourish for you, and the best way to feel confident with your plants is to master a few basics in plant care.

Before you actually buy your plant, you should first check for new leaves sprouting, healthy colouring, and stiff, firm stems. Also, be sure to check the undersides of the leaves and stems of the plant for bugs. If your plant passes the test, then you are ensured of adding a healthy, happy plant to your collection. After you have chosen the plant, find out the name and the care requirements for it.

Light

Light is a major factor in determining how well your plants will grow. When you are choosing plants, be certain you can provide the correct amount of light your plants will need to be lush and healthy. There are three basic exposures of natural light, direct sun, diffused light, and shade. **Direct Sun** — Plants such as ivies, hibiscus, jade and cacti are direct sun-loving plants. **Diffused light** is any exposure with bright light without having the sun's rays shining directly on to the plant. Asparagus fern, weeping fig, rubber tree and Boston fern will do extremely well with this type of light. **Medium light** — in a situation of medium light to shade, one can expect to see their plant grow at a much slower pace. Plants that will tolerate and survive the weaker light conditions are the Chinese evergreen, palms, philodendrons and the ol' faithful cast-iron plant. Try a plant in that dim corner, it will surely brighten up that space! When you bring a newcomer home, always expose the plant to light gradually. Allow about a week's time before giving it the maximum exposure they require.

Cineraria

Artificial Light

There are so many improvements today that one can grow any type of foliage by means of artificial light. Any kind of artificial light, as a supplement to daylight, will help plants grow. Among the most widely used are the cool-white fluorescent tubes combined with warm-white types for plant growing. The reason for the mixture is that plants need a certain amount of light in the warm or red end of the spectrum for balanced growth. Whereas, the cool-white fluorescent tubes provide rays primarily in the yellow-green-blue portion of the spectrum. If you wish to use incandescant bulbs, use the ratio of three watts of fluorescent to one watt of the regular bulb. For example, you can use two 40 watt tubes and one 30 watt bulb. You can grow foliage successfully, with fluorescent lighting as close as four inches to the greenery. But, with incandescent bulbs, keep the light 12 to 18 inches above the plants because the plants may be burned by the high intensity of the heat. If plants are to be grown strictly by artificial lights, then, the lights should be on for at least 12 to 16 hours a day.

Watering

The favourite question asked concerning the care of houseplants is "How often should I water my plants?" There is no simple answer to that question. When to water a plant depends on the size of the plant, location, light, temperature and the type of container it is in. Many of the novice gardeners tend to give too much tender-loving care and water to their plants causing the leaves to wilt, turn yellow and die. In severe cases of overwatering, the leaves of the plant will drop without even changing colour. If you keep your plant waterlogged, the hair-roots of the plant will not be able to breathe because the water fills up all the air spaces and keeps out the life-giving oxygen which is essential for healthy growth.

On the other hand, if your plant seems wilted and totally lifeless, chances are that you could be underwatering. Underwatering will cause the edges or tips of the leaves to turn brown and crisp. If you catch the plant at the browning stages, there is still time to save your plant. Water! The brown edges or tips may be cut with a sharp pair of scissors, otherwise, it will drain energy from the green growing parts of the plant. Please don't just tear or pull off the brown parts — plants have feelings too!

A good rule of thumb for watering is to stick your finger ½-1 inch deep into the soil, if it feels moist or muddy, do not water. If the soil feels dry and crumbles, then your plant is thirsty and wants watering. When you are watering your plants, be sure to use tepid water or let the water stand overnight so that the impurities will settle to the bottom. Also, one can purify the water by placing purified charcoal on top of the soil (do not use barbeque charcoal) and then watering your plants. Remember, no two plants are alike, even plants from the same family, will require different watering schedules.

Humidity

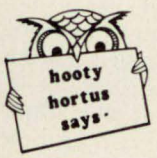
Another factor in growing healthy plants is humidity. When plants arrive from the greenhouses, they are accustomed to humidity of 60-80%, whereas, our homes provide only 10-40%. There are several ways to retrieve this loss. A cool vapor humidifier is an excellent method of

increasing the humidity. It is a very good investment because it will definitely aid your plants. Another way of increasing humidity is grouping or placing your plants close together. The leaves of all plants give off moisture constantly and this moisture hangs in the air causing the humidity to rise.

Another procedure is setting up a "dry well". It is extremely simple to do. Find either a tray or container constructed of waterproof materials, such as metal, plastic or non-absorbent rubber, or glazed ceramic, and fill with small rocks or pebbles. Add enough water to the tray so the water level remains just below the top of the rocks. Set a plant or grouping of plants on the rocks, and you don't need to worry about root-rot because the roots do not sit in the water.

Misting is also an easy, inexpensive method of creating a humid atmosphere for your plants. Misting creates a fine spray of moisture that surrounds your plant, and should be done daily. Like watering, misting should be done in the morning so the moisture will have time to evaporate. Remember some hairy-leaved plants, such as African Violets, do not like to be sprayed.

If you follow the basic rules for growing plants, you will become a "green thumb" in no time. Happy growing!



If you are growing African violets and wish to mix your own soil, here is a formula used by most members of the Winnipeg African Violet Society. It is a recipe of one of Canada's leading hybridizers, Ernest Fisher. Here it is:

Two quarts of sterilized loam, two quarts perlite, two quarts coarse perlite, two quarts fine chip charcoal, eight quarts fine peat moss. Mix separately the following: one cup of bonemeal, one cup of calcium carbonate (ground limestone), and one tablespoon fermate. Combine all these ingredients and add a half-gallon of water, to which you may add a half-teaspoon of Cygon 2E. Store in clean bin or plastic bag. Makes a half-bushel.

Sterilized loam is good soil that has been heated in a 250 degrees oven for 1½ hours. If you have a meat thermometer, use it and bake the soil until this thermometer reads 180°F, for one half-hour.

An Inexpensive Natural Garden Pond

BRUCE RICHARDS,
Parks and Recreation
City of Winnipeg

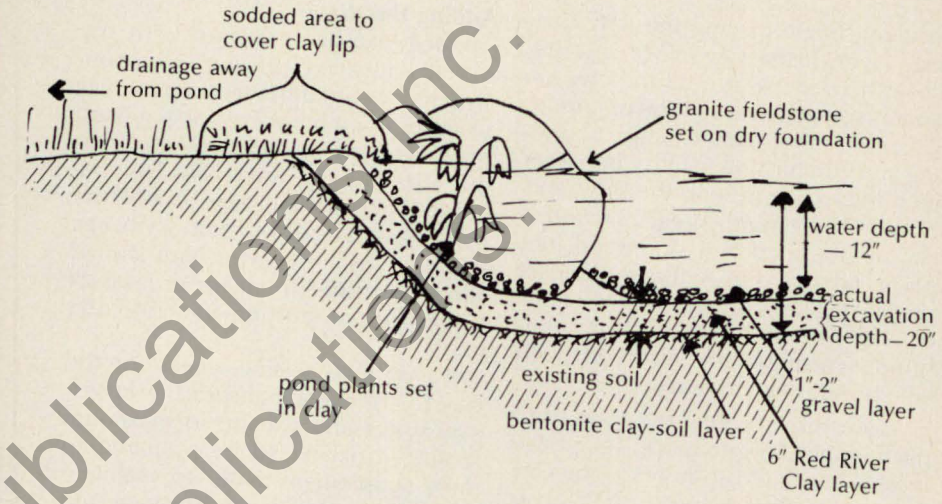
In south-central Manitoba the occurrence of natural ponds is very rare. As a result most people, like myself, when contemplating the construction of a garden pool want to capture the essence of a natural occurring body of water and not merely a man-made convenience in which fish and water plants are kept. Attitudes and preferances vary of course, and in many situations a more formal water feature may be in complete harmony with the adjacent landscape. The traditional materials utilized for pond construction, concrete, fiberglass, and polyethylene liners, have characteristic properties which do not fully lend themselves to the creation of a 'natural pond!'. Study a real pond situation and you will realize that the shape is often very irregular with a shoreline that is neither sharply defined or comprised of a consistent material such as a single row of stones lined up in an orderly manner. In looking for an impervious material that was sufficiently flexible to create a natural effect, it was suggested that 'good ol' Red River clay might provide the solution.

Material

Red River clay, I soon discovered, was an excellent material with which to construct a naturalized garden pond. The characteristic properties of clay are such that it can be relatively easily moulded and shaped to any configuration and possesses a natural water holding ability. The major disadvantage to clay was that it is quite a sticky, messy material to work with, and that it has to be placed quickly in order to minimize the drying, cracking, and shrinkage effects when exposed to the drying effects of air. Provided a person is not adverse to literally 'wallowing in mud' and prepared to complete the pond in one day, Red River clay will give satisfactory results. Once the clay is in place and the water added, the clay will remain perpetually wet and not subject to further drying, shrinkage and cracking.

Obtaining Clay

Where do you obtain the clay? It is virtually everywhere in the Winnipeg area, however, usually it is found four to five feet below the ground surface. To best obtain a clay source, watch for any construction site where extensive excavation is occurring and you are almost guaranteed to find piles of pure clay. Another great benefit to using clay for constructing a pond is that it is free. Most contractors are very obliging and will allow you to take all the clay you require. About two to three yards of clay will suffice for constructing a pond approximately 20 feet by 15 feet in area with a 6 to 12 inch depth. It must here be stressed that what you have identified as clay is in part pure clay! Don't be misled and haul home a 'clay' which in reality has a high silt content. If you are not confident in identifying the quality and consistency of the clay, check with someone who



is knowledgeable. While pure clay is impervious to water, the numerous clay-silt mixtures are not.

Fieldstone

Once you have found a source of clay, begin gathering various sizes and shapes of granite fieldstone. A source of free fieldstone is readily obtained from most rural areas where farmers are all too willing to dispose of piles of fieldstone accumulated while cultivating their fields. Fieldstone grouping located randomly at intervals along the edge of your pond will help create a very natural effect.

Preparation for Pond

While digging the hole for your pond, make sure you dig it approximately six inches deeper and wider than the size of pond you want. This extra six inch excavation will be the thickness of the clay liner to be added to the pond. Although the shape of the pond can be any configuration, be careful not to make the side slopes of the pond steeper than 45°. Steep side slopes will be very unstable since wet clay is structurally weak and incapable of supporting the weight of a person standing at the pond's edge.

If you are the least bit suspicious as to the consistency or purity of the clay, take the added precaution of constructing a secondary impervious layer before applying the clay. This is easily achieved by heavily watering down the surface soil of the pond and dusting the wet surface with a bentonite clay powder. This clay powder is readily obtained locally in 50 lb. bags for a few dollars. After dusting the wet surface with bentonite, work the powder into the surface soil with your hands. Bentonite has an extremely high water absorbency. As it absorbs water it swells considerably, filling or 'plugging' any fractures in the Red River clay liner through which water is escaping. This is a precautionary measure only, but one well worth the additional effort.

Clay Layer

Once the pond area has been prepared with a bentonite-soil mixture,

you can begin placing the Red River clay layer. If the clay 'clogs' are dry, soak them in water until the clay becomes soft and easy to form or mould. Using a rubber mallet, begin pounding and compacting the clay into a six inch thick layer around the sides and bottom of the pond. As each section of clay is pounded and smoothed into place, take care to seal and compact the joining lines between the sections of clay. The clay liner must be continuous without any seams through which water can escape.

As you move around the pond compacting the clay into place, set groupings of your fieldstone on to the clay liner at random intervals. Observations of natural ponds will give you some direction for placing the stone. Additional clay is pounded around the base of the stones to hold them firmly in place.

Once the clay liner is completed and the fieldstone set to your satisfaction, add a one to two inch layer of clean gravel (*not* limestone) over the exposed surface of clay. This will not only enhance the natural appearance and create a feeling of depth to the pond but will also protect the clay liner from disturbance and resulting murkiness of the water.

Finishing Touches

To add the finishing touches to the pond, plant clumps of native reeds, marsh marigold, and arrowhead directly into the clay along the shoreline, being careful not to completely penetrate the six inch liner. You may want to extend your lawn area right to the water's edge by placing sod over the lip of the clay liner. This will eliminate the visibility of the sharply defined and artificial clay rim around the pond.

Adding the Water

Once you are satisfied with the overall appearance of your newly constructed pond, fill the pond slowly using a garden hose. Try not to disturb the gravel and clay liner while adding the water or the water will become murky and you will have to wait for the murkiness to settle out before you can add your fish. However, you should allow the water to sit for at least 24 hours before putting fish into the pond.

It may take several weeks for the clay to completely absorb the necessary water and expand to maximum sealing capacity, so be prepared to daily supplement water to maintain the desired water level. However, the daily drop in water level (1 or 2 inches) will gradually diminish as the water-holding capacity of clay reaches its maximum level. Thereafter, a further drop in water level can be attributed primarily to the natural rate of evaporation into the air.

Except for the occasional drainage of the pond in order to add clean, fresh water (usually in the spring) your pond should never be without water, even during the winter months. It is essential to keep the clay liner wet at all times in order to maintain effective sealing. The natural, perpetual softness of the clay liner will enable you to reduce or increase the size or shape of your pond as you desire, an option not readily available with the rigid form of concrete, fiberglass or polyethylene liner.

Although you may expend considerable time and energy, although not money, in creating your natural garden pond, the final results, I am sure, will be rewarding and pleasurable for many years to come.

Editor's Note:

Refer to Color Section p. 74C.

Horticulture of Townsendia Excapa

LAWRENCE STUCKEY
Photographer, Brandon, Manitoba

This plant is accredited a fairly wide range in botanical catalogues, however, during all my wanderings as a botanical photographer, I have found it in only three locations in southern Manitoba, and growing very sparsely in those.

It is a very small plant, grows in open sandy areas, so inconspicuous that only a sharp-eyed botanist will spot it when not in bloom. The flowers are very showy, with petals that are white on top and pink beneath, about two inches in diameter, and growing without stems, apparently right out of the ground, backed by a rosette of grey leaves, so that it is often called the "ground daisy".

I had wanted to try this exquisite plant in my rock garden for some time, but would not transplant one because of their rarity, when I chanced to find it in seed. I gathered a small quantity of seed which I scratched into the sand on the upper tier of my rock garden (cactus country). That was summer of 1973. Next spring I had a number of two leaved seedlings, which I weeded with tweezers all summer as I knew the plant wouldn't tolerate competition. The third year my seedlings had a few more leaves and one formed a true rosette! In early May of 1976 I was elated to have a flower on that most advanced plant, and during the summer several more plants formed rosettes. This spring there were ten blooms and several more plants developed to where I expect them to bloom next year.

I have had good success with a variety of native plants horticulturally and believe wider use should be made of some of them. I am opposed to indiscriminately transplanting any but the more common species. Areas about to be destroyed for construction of roads or buildings I consider proper hunting grounds for plants of horticultural use. More time and patience are required to grow them from seed but it is the least destructive method.

The Criddles of Aweme

G. MALAHER
Winnipeg, Manitoba

The Criddle home "St. Albans" at Aweme, Manitoba.

In Alloway Hall of the Manitoba Museum of Man and Nature there is an exhibit honouring the pioneer settlers of the Canadian prairies. That hardy group of pioneers who came from many lands and broke the prairie sod on what was later to become the bread basket of the nation.

Many individuals, many families from all walks of life contributed to the opening up of the vast prairie landscape, each in their own way.

All contributed something to the development, culture and economy of the new land; and some made outstanding contributions. Among the latter group was the Criddle family who emigrated from England in July 1882 and homesteaded some twenty miles south east of Brandon, Manitoba.

Percy and Alice Criddle had no knowledge of farming and little conception of what they were coming to, but they had the courage and tenacity to wrest a living from the land. Blessed with intellectual skills and ingenuity they imposed their civilizing influence on a harsh wilderness. They brought a young family of four children with them and they, in their turn, developed interests and skills in a variety of fields which contributed to knowledge in meteorology, botany, mammalogy, ornithology and entomology.

Both Alice and Percy Criddle were well educated. Percy had studied music, the law and medicine at Heidelberg. Alice had graduated from Cambridge and specialized in natural history including botany. Love of plants and the gift of observation were passed on to their children. Percy's first sighting of our Manitoba floral emblem was recounted in his diary for April 26, 1883. "The Prairie full of a beautiful little purplish flower with yellow stamens and pistils — resembling a crocus, only the outside of the cup of the flower is a hairy green — 'tis a species of anemone."

Though a school was established close to the homestead not long after the Criddles arrived and though Percy Criddle was elected to the Aweme School Board for thirty-one consecutive years, he preferred to have his children educated at home. It was mainly from their mother that the growing family learned to appreciate their natural surroundings and to make scientific studies in many directions in later life.

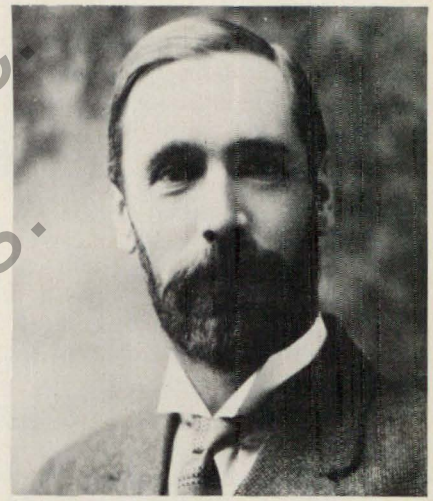
It would be impossible to do full credit to each member of the family in a short article; their interests and activities were so diversified. Each in his or her own way added knowledge to the subject of their study and investigation; knowledge of benefit to man, particularly in the field of agriculture.

It is typical of pioneer life that the individual and the family must create their own avocations, be they recreation, sport, hobbies of various kinds, or study. The Criddle family engaged in a particularly well rounded program which not only led to Aweme becoming the social and cultural centre of the community but to research in the natural sciences of benefit to their community and to Canada. It is to such activities that this article must necessarily be confined.

Percy Criddle's main interests appear to have been in astronomy and meteorology. He kept the first official weather records in Manitoba, outside of Winnipeg. He was interested in all the natural sciences, and knowledgeable in many. Both he and Mrs. Criddle encouraged the interests of their children in the natural sciences and were proud of their achievements.

Norman

Norman Criddle, the eldest son, was destined to become the most prominent member of the family. Very early in life he evidenced a keen interest in natural history. As a very young man he showed interest and considerable skill in drawing. He won first prize for his drawings and paintings at a Brandon Fair. His paintings of wildflowers sent to Ottawa for identification gained him the recognition of the federal government. He was commissioned by the government to illustrate "Farm Weeds;; published in 1907, followed a few years later by "Fodder and Pasture Plants", which he illustrated as well. Between 1906 and 1910 he collected seeds for the government, (aided by members of his family). From 1910 to 1913 he worked as a seed analyst, after which time he was appointed as "Entomological Field Officer for Manitoba". In 1919 Norman was appointed "Entomologist", a post he held until his death.



Norman Criddle, 1905

A number of insects collected by Norman Criddle were named for him, although the names of some have since been revised.

Although his chief interest was in grasshoppers and their control, he did not restrict his interest entirely to entomology. Between 1907 and 1933 he had published 125 articles in the following areas: Entomology 68; Ornithology 31; Botany 7; Mammalogy and Wildlife 12; Miscellaneous 7. He held memberships in a number of organizations. such as the Game Protec-

tion Society; Entomological Society of Ontario; Ottawa Field-Naturalists Club (Past President); National Association of Audubon Societies (sustaining member); Manitoba Natural History Society (Honorary President) and many others.

After his death on May 4, 1933, Dr. Ralph Bird, a friend and colleague, wrote: "He lived up to his creed and left a host of friends, no enemies, and a better world than when he entered. Can more be said of any man?"

Stuart

Stuart Criddle's main interest was in mammalogy, particularly the small mammals, their place in the scheme of things and their effects on agriculture in the area. This work led him also into the field of taxidermy. He was also a keen horticulturist and plant breeder, his favourite occupation being the development of new lily hybrids, one of which (Lilium Criddlei) was named after him. His work also included development of a good fodder sunflower and the hybridization of corn.

As an amateur archeologist and zoologist he contributed many specimens to the national museum and other institutions. The most outstanding of these were the remains of two distinct prehistoric buffalo found near Douglas, Manitoba.

Stuart Criddle's specialty — Beautiful lilies.

Between 1913 and 1971 Stuart Criddle published nineteen articles, most of which appeared in the "Canadian Field Naturalist". His brothers, Norman and Evelyn collaborated in several of these publications.

In later life his contributions to the Manitoba community were widely and deservedly recognized. He was an Honorary Life Member of the Natural History Society of Manitoba, a Founding Member of the Manitoba Museum Association and a respected member of a number of international scientific societies.

In 1968, at the age of ninety years he received his Doctor of Science degree at the first Convocation of the University of Brandon.

Stuart Criddle received his Doctorate at the University of Brandon's first Convocation.

Evelyn and Talbot

The brothers Evelyn and Talbot complemented the work of Norman by making entomological cases and similar items, to house his collections; they also built a laboratory for Norman's use after his appointment to the staff of the Dominion Department of Agriculture.

Both were skilled craftsmen in wood and produced many articles of inlaid woodwork. The mother of pearl used to ornament the inlay work was taken

from fresh water clams out of the Assiniboine River. All tools used were hand made, each for a particular function. Thus did the pioneers use materials at hand and both design and manufacture the tools they needed.

Talbot was interested in horticulture. He crossed the pumpkin and marrow, producing what he named the "marrowkin". He also worked with the lilacs, producing a variety of shades all the way from pure white, single and double, to pink, mauve and deep purple.

Maida

Maida, born just two years after the arrival of the family at Aweme is, at the age of ninety-three, the only survivor of the original family. Her interest has always been in birds and she established a relationship of complete trust with the many varieties she fed and looked after. She was also most interested in the garden, particulary the raising of flowers.

Maida Criddle experiments with cross bred chickens, 1957.

After the death of Norman in 1933 she took over the weather recording previously conducted, first by her father and then Norman. Maida carried on this service until 1960. A Centennial Plaque was later presented to her in recognition of this work. Following the death of her mother in 1918 Maida became the "Chatelaine of St. Alban's".

In 1960, after seventy-eight years, the family left the homestead and retired to Sidney, B.C., where they had purchased almost a quarter section of wooded land some years previously. With them went the second Percy Criddle, grandson of the pioneer and son of Stuart Criddle.

This was not to be the end of pioneer activity however. The whole family as it then existed turned in to transform their wild, wooded holding into what is now the beautiful Glen Meadows Golf and Country Club. Neighbours looked askance at the Criddle ladies picking stones off the fairways to be, but to them it was just another family project undertaken in the pioneer tradition. The Club is now owned and operated by the second Percy Criddle, his wife Rae and their stalwart sons.

Of such families was Manitoba made and by them the prairies of Canada brought into production.

Ordering Seeds

ISABELLE R. YOUNG
Garden Columnist
Calgary, Alta.

Before you start ordering seeds there are a number of things one should think about before doing so. The beautifully colored pictures in the seed catalogues are all very lovely and we sometimes get carried away by them. The look of a flower may attract your attention, but have in mind where you are going to plant it and for what purpose it is to be used.

If you have taken the time to do your planning carefully, usually on paper, you will know what you are going to plant in each part of your garden and the approximate number of plants that you will require. To help you determine this, place plants as far apart as the height they grow. If a particular variety grows 12 inches high, then space them 12 inches apart in a bed or border. If they only grow 6 inches high then space them 6 inches apart, etc. For the taller ones, space according to your own judgment, leaving enough room to prevent crowding. If you are fairly new at landscaping your yard, at the end of the growing season, towards the end of August when the flowers have reached their approximate size, count the number of flowers in each bed and keep a permanent record of this. Make a note of the height, because they do vary from one part of the country to another, depending on growing conditions in each particular area. Do this each year and you will have a fairly good idea of what and how many flowers to put in your beds and borders.

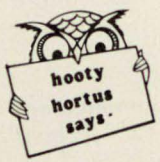
For small quantities, an ordinary packet of seeds will suffice, but if you are going to use a great many of any one particular variety it may be wise to buy more than one packet or the TRADE PACKET, which usually gives you considerably more seeds for your money.

It is much easier to plant the layout of beds and achieve proper harmony if separate colors are used. The occasional mixed bed is fine, but gets monotonous if used everywhere. It is a good idea to have a fair selection of seed catalogues, and then you not only can compare prices but, also, each firm has a little different selection and information about a particular plant you might be thinking about. Different firms specialize in certain plants. For instance, Unwins and Boltons in England specialize in Sweet Peas, and Burpees in the States specialize in Marigolds. That doesn't mean that good Sweet Peas or Marigolds may not be obtained elsewhere but these firms are most likely to have the largest selection. Nor does it mean that these firms do not have very good varieties of other plants.

There is a great selection of catalogues. Some have fine illustrations, others give information about the plants and seeds offered. Catalogues vary greatly in make-up. There are those of Thompson and Morgan which give lists of plants, plus beautifully colored illustrations. These people have been in business since 1855 and advertise "The World's Largest And Most Famous Seed Catalogue", Ipswich, England. There are many excellent and informative catalogues in Canada, England, the States, and other countries that are most helpful. Do not forget, however, the seed catalogues of your local suppliers. If these people are to stay in business and improve their offerings they must have your support. Often they will not have everything that you would like to grow, so do not hesitate to get seeds from outside sources, and if you find a plant that is especially suitable and out-of-the-ordinary, tell your local dealer about this and he might possibly be willing to stock some.

Obtain your seeds in plenty of time so that you will have them when it comes time to sow them, and make certain that you know of any special conditions that are required by the various seeds.

There is very little in the way of new plants that will not be in one or more of the various catalogues that come out each spring. While on the whole you should stick to plants that you know, do try one or two new ones each year. In this way your knowledge of plant material will increase so that you will have a greater choice when planning. When you have gained experience with a wide variety of plants, you will be in a much better position to make wise choices when determining your needs. At the same time, keep notes of the results that you get with your plants under various conditions. It is these notes that will be of the greatest help to you in years to come. I have kept notes and diagrams and layouts of my garden for a good many years. These are supplemented by colored photographs, which make planning a garden and ordering seeds very much simpler.



One way of getting an early garden is autumn planting of some vegetable and flower seeds. After all isn't it nature's way of reproducing many plants? Then too, even if this fall seeding isn't an entire success, you still have time to repeat the seedings in the spring.

In choosing vegetables for fall seeding one must eliminate such seeds as corn, beans, peas and all so-called warm soil plants. Your choice should be from such cool soil plants as carrots, beets, onions, lettuce and radishes.

The choice of annual flower seeds for autumn planting, should be largely restricted to such plants as bachelors' buttons, poppies, strawflowers, larkspur, calendula, clarkia and cosmos.

The Plant Quarantine Problem

DENNIS LIDGETT, BSA
Technical Advisor
Plant Quarantine Division
Agriculture Canada

The high standard of living that we presently enjoy is very much dependent on our agricultural and forestry industries. However, much of the production from these resources is lost to the devastating effects of a wide array of plant pests and diseases. Millions of dollars are spent annually on efforts to protect these resources from the ravaging effects of other plant pests and diseases.

Immigrant Pests

The destruction caused is very familiar to all of us who grow plants. Very few of us, however, are aware that most of these organisms are actually immigrants to our land. In fact, a review of the situation, present and past, brings out a very startling fact– **that well over half of our domestic plant damaging pests have been introduced from other parts of the world.** Because of the especially devastating effects that these alien pests can impose on a new plant host in a new home, the load these pests impose on our economy is tremendous.

Seldom is a native pest seriously damaging on its native host plant. In fact the records are full of cases where an organism of insignificant consequence in its natural environment has been carried away and become established in another environment with disasterous effects. The story of the chestnut blight in America is typical of the altered behaviour of a pest. Scarcely known as a chestnut pest on its oriental host, the blight fungus went wild on the unresistant American species, resulting in the near elimination of the American chestnut from the North American Continent. In France the grape phylloxera and the grape downy mildew were introduced from America where they are minor pests on native wild grapes. These organisms almost destroyed the European grape industry before they were controlled. These examples taken from the long list that could be presented serve to emphasize the important role played by introduced pests in the agriculture scheme.

Before Commerce

Before man and his commerce entered the picture natural barriers held all life forms within their own restricted range. Large bodies of water, mountain ranges, deserts, and adverse climate discouraged their wanderings. As a consequence, each species sought to adjust its life more comfortably to local conditions by slow evolutionary change. In the long

course of time, these adaptations produced forms quite different from those beyond the impassible barriers where different conditions induced different adaptations. In this utopian environment no one species was superior to another. Each species was dependant on the others for its survival and host-parasite relations usually arrived at a sort of equilibrium, the host managing to survive the pest depredations without undue debilitations, and the parasite being controlled by its own parasites or predators. This mutual tolerance arrangement was only a local relationship, however. Remove the barriers and a "Pandora's Box" is opened.

Movement of Pests

So long as pests are dependent on their own natural means of dispersion, oceans and seas present almost impassable obstacles. Man himself has given the necessary assistance needed to overcome these obstacles. In fact the most effective and almost the only channel for the dispersion of plant pests around the globe is in the voluminous stream of man-made commerce. The endless list of materials and products shipped from continent to continent, country to country, and area to area are apt to be accompanied by unseen or unheeded pests, wide in their variety, countless in their numbers, secure in their minuteness, but fully alive and ready to continue their predator or parasitic existence on whatever they can find in a world new to them and their kind.

The movement of plants and plant products and their accompanied pests began early in man's existence. This unwholesome movement of plant pests increased through the years with the growth of shipping, the expansion of trade and the rise in living standards. More recently improved refrigeration and the inauguration of airplane service have given further impetus to the hazard of the unwanted importation of plant pests.

Plant materials intended for propagation purposes are most to be feared as pest carriers. Nursery stock, plants, cuttings, bulbs, corms, tubers, roots and seeds considered together as propagating material can serve as very effective carriers of pests. In fact propagating material has been the source of about 90% of the plant disease and pest introductions into this country. What more effective way of establishing a pest in a new area is there than to transport and plant it with its living host? Among the various types of propagating materials, nursery stock is by far the most dangerous medium of pest distribution. Items in this category are entire plants, with roots and stems, frequently soil and, in the case of evergreens, leaves too. Typically, such plants represent several years growth so that they have had time to acquire and effectively multiply the various pests occurring in their original surroundings, both above and below ground. Soil is also a very dangerous medium for pest dispersal because soil is a natural catch-all and respository for all the plant pests in its neighborhood.

Control of Immigration

Throughout history various attempts have been made to control the unwanted entry of foreign pests. Some have been effective, others have not. From the biological point of view a complete prohibition on the importation of all plants and plant materials would effectively control all possibilities of importing crop pests.

However, neither national nor public sentiment would allow trade interference to reach the isolationist's extreme. It is also clear that the free and unhindered movement of plant pests could not be an acceptable practice either. Nevertheless, not until the 20th century has the plant quarantine problem been attacked positively. Through international cooperation and national legislation the introduction and spread of plant pests is minimized by a system of inspections, disinfestation or disinfection treatments and by the issuance of certificates relating to the phytosanitary condition of the exported commodity.

The Plant Quarantine Division of Agriculture Canada is the national agency in Canada which has been given the responsibility of protecting Canadian agriculture and forestry from the introduction of destructive pests from foreign countries. It also has a responsibility to foreign countries, our export markets, in ensuring that the agricultural commodities being exported are free of destructive pests.

Plant Quarantine Act

The Plant Quarantine Division gains its working authority from the Plant Quarantine Act and Regulations. These regulations permit the importation of certain plants from certain countries, provided the required import procedures are followed. The required import procedures vary according to the commodity being imported and the country of origin. Plants being imported from all countries, except the United States, require a pre-entry import permit which is obtainable from the Divisional headquarters in Ottawa. Plants originating from the United States, on the most part, do not require pre-entry import permits. Each importation of plants, whatever the origin must, however, be accompanied by a phytosanitary certificate issued, dated and signed by an authorized official of the country of origin, indicating that the plants included in the shipment were examined at or about the time of packing and were found to conform with the Canadian import requirements.

All plant importations are subject to inspection upon arrival. Shipments not properly certified or not conforming to Canadian import requirements may be returned to the shipper or destroyed.

Classes of Foliage Plants

There are essentially two principal classes of foliage plant imports permitted entry under permit. These include:

(a) Plants grown originally in soil, washed completely free of soil, packed in peat or sphagnum and certified free of plant pests.

(b) Plants rooted in sterile growing media.

Plants rooted in sterile growing media must originate from a propagation program which has been approved by the state or federal agency of the country of origin, in accordance with the import requirements of the "Canadian sterile growing media regulations".

Plant Quarantine Inspection

By far the biggest threat to Canadian agricultural production is through the smuggling of nursery stock. Through ignorance, many people returning from vacation bring plant material into Canada that is obtained from uncertified sources. This type of plant material is almost certain

to contain many plant pests prevalent in the area from which it came. To discourage this type of importation of plant pests the Plant Quarantine Division maintains a staff at most international airports whose primary responsibility is to examine, with the cooperation of Canada Customs, passengers' baggage for plants, plant products and soil which may harbor plant pests. This material is generally confiscated and destroyed by incineration. In addition, with the help and cooperation of Canada Customs, trucking firms, railway companies, air lines and shipping companies, Plant Quarantine is informed of all plants and plant material entering Canada through the various ports of entry. Most of these imports will be inspected by Plant Quarantine before being released to the importer.

Domestic Quarantines are also of considerable concern to the Plant Quarantine Division. The spread of such plant pests as the Cereal Leaf Beetle, European Corn Borer and Dutch Elm Disease, to mention just a few, are constantly exerting pressures on non-infected areas. The Dutch Elm Disease Quarantine, for example, attempts to control the spread of the disease westward by controlling the movement of elm trees and lumber from infested areas to non-infested areas within Canada.

Plant Quarantine functions as a service in the public interest in preventing the entry and spread of injurious crop pests. **To do its job effectively it requires public support.** Foreign pests already introduced are costing the Canadian economy millions of dollars annually, and many more pests from all corners of the world are still capable of introduction. In fact, it has been reported that there are 93 pests of the potato not yet introduced to North America. In addition a vast number of behaviour strains of all pest species are constantly in danger of introduction. For example, there are over 200 recognized races of one species of wheat rust, many of which have not been recognized as occurring in North America.

To facilitate the orderly importation of disease free plants the various plant quarantine offices across Canada will be more than willing to advise you on the plant quarantine import regulations. Plant Quarantine Offices within the prairie provinces are located at the following addresses:

Plant Quarantine Div.
Agriculture Canada
722 Federal Building
269 Main Street
Winnipeg, Manitoba R3C 1B2
(Phone 985-2210)

Plant Quarantine Div.
Agriculture Canada
820 Federal Building
9820-107th Street
Edmonton, Alberta T5K 1E7
(Phone 425-6306)

Plant Quarantine Div.
Agriculture Canada
404 Derrick Building
1825 McIntyre Street
Regina, Sask. S4P 2R2
(Phone 569-5617)

Plant Quarantine Div.
Agriculture Canada
1415 First Street S.E.
Calgary, Alberta T2G 2J3
(Phone 231-5635)

Plant Quarantine Div.
Agriculture Canada
Rm. L249 Research Stn.
P.O. Box 3015
Lethbridge, Alberta T1J 4B1
(Phone 327-4561)

Growing African Violets

MRS. O. IVERSON
Compiled from "Growing African Violets"

African Violets do not like too much sunshine, or any direct sun but like to be near a window. They like small pots and flower better when a little crowded. The real secret in growing African Violets successfully is simply regular attention.

They can be grown under fluorescent lights in a basement area lined with builder's aluminum foil, with 14 hours of light per day. African violets do best at a temperature of 65 to 70 degrees F., do not expose them to anything below 65 degrees.

On cold nights, place a folded newspaper between plants and frosty window. A north window is fine, but they can grow in east, west or south windows if there is a sheer curtain between plants and window. If leaf stems grow too long and spindly and flowers are few, the plant needs more light. If leaves turn yellow, you will find they will green up again when you move them from the window to table near by. To keep window plants symmetrical, turn each pot a quarter turn every three or four days.

Humidity is especially important for good growth. Pots can be arranged on a flat pan that will hold an inch or so of pebbles, keep the water under the pebbles. The pots must never stand in water. In winter you may have to replenish the water in the pebbles every day as the furnace dries the air. When watering the plants, don't be too generous. You may kill them. Aim at making the soil moist, never wet. The temperatures of the room and the moisture content of the air governs how often a plant needs water.

Feeding

A newly potted plant does not need fertilizer for four or five months. Established plants benefit if you feed them every three weeks or so with a water soluble plant food. Choose one that supplies nitrogen, phosphorus and potash in a 1-2-1 ratio. Add water soluble fertilizer to pots when soil is damp.

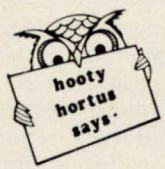
Repotting

Plants need repotting only when roots are crowded. Tap the pot upside down on the table edge to loosen the ball. If all the soil is interlaced, repot in a slightly larger container. Use a porous mixture that contains plenty of peat moss, vermiculite, or compost. It's a good idea to scrub and boil pots before you transplant into them, especially if they have been used before.

Some African violet growers do not recommend letting water touch the leaves at any time, but another grower says his thrive when he puts them in the kitchen sink every ten days and sprays them with room temperature water, and keeps them away from direct sunlight until perfectly dry.

I care for my violets in the following way: I keep them in a north window or on a table some distance from a south window. Pick off all dried flowers and dead leaves. Water twice a week with rain or snow water which I heat to lukewarm, using two drops of Dixon-Reid plant food to each quart of water. I usually water from the top, placing spout between leaves. I set them in the sink and sprinkle with a little clothes sprinkler, and let dry before putting them back in place. New plants can be started from a healthy leaf cut from a plant close to the root. I like to take a new crown that has started alongside the old root, as you have a nice plant in a shorter time.

I stir or cultivate the top soil on all plants once in awhile, with an old table fork, if the pot is not too full of stems.



Plant a Cuthbert Grant rose in your garden next spring and it will become a long time friend for years after you have had to replace all or most of the tender roses you now have in your rose garden. It is completely hardy in prairie gardens.

Dr. Henry Marshall, Morden Research Station , Morden, Man. is the originator. He crossed the native rose of our prairies with a floribunda hybrid, Donald Prior, and finally with a hybrid tea, Crimson Glory, to produce a hardy vigorous rose that resembles the tender hybrid roses in many ways. Its large red blooms, made up of twenty or more firm petals are borne in clusters of from three to six on new growth. Don't overlook this hardy new rose next spring! It is available from most prairie nurseries and should be a 'must' in a prairie rose garden.

A Frost Tolerant Flower Garden

PROF. L. M. LENZ
Plant Science Department,
University of Manitoba

The short growing season of the prairie climate necessitates that plants must grow and mature in a relatively short period of time. To gain advantage, we start plants early and transplant outdoors for earlier and continuous flowering over a longer period of time. Also, we often protect plants by planting in locations such as near house foundations, or cover them to prolong the blooming period, especially in the fall months. Many of us utilize such techniques to lengthen the life of the flower garden. However, we have probably overlooked one important factor, that is, the plants themselves, and their inherent tolerance to low temperatures and frost. Through the selection of frost-tolerant types, it is possible to extend significantly the blooming period in the flower garden, especially in the latter part of the growing season.

Frost Tolerant Annuals

During the last several years, we have been monitoring the frost tolerance of the many kinds of annual flowers in the Annual Flower Cultivar Trials at the University of Manitoba. In these trials, the various kinds of flowers are all managed similarly, are equally exposed to freezing temperatures when they occur, and are given no protection.

According to our records, the annual flowers may be grouped into three categories based on frost tolerance. In general, the cultivars of the same kind of flower show little difference in tolerance to frost. The three categories are as follows:

1. Little or no frost tolerance — all parts of the plant damaged by light frosts: ageratum, amaranthus, aster (china), balsam, begonia (wax), cleome, cockscomb, coleus, cosmos (klondyke), dahlia, datura, four o'clock, gomphrena, heliotrope, impatiens, lobelia, marigolds (all types), morning glory, nasturtium, perilla, portulaca, salvia (scarlet sage), sanvitalia, sunflower, tithonia, vinca, zinnia.

2. Partial frost tolerance — flowers damaged but foliage not, by a few degrees of frost, possibly will continue to bloom under favorable conditions: bartonia, bells of Ireland, blue laceflower, candytuft, coreopsis, cosmos, gazania, geranium, echium, evening scented stock, helichrysum, lavatera, linaria, malope, matricaria, mignonette, nemesia, nicotiana, nigella, petunia, red flax, rudbeckia, salpiglossis, sweet pea, sweet sultan, verbena.

3. Tolerant to several degrees of frost, flowers and foliage not damaged continue to flower in late autumn: alyssum, acroclinum, arctotis, bachelor button, calendula, califoria poppy, dianthus, dimorphothexa, dusty miller (grown for foliage only), foxglove, kale (ornamental), larkspur, pansy, penstemon, phlox, salvia (farinacea), scabious, snapdragon, statice, stocks, viola.

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

The night before — or at least a few hours before — you put bedding plants into the garden, it is a good idea to water the planting area and the boxes or flats of plants. The soil will then be moist but not too wet when you do get down on your knees and go to work.

Flowering annuals are a blessing to prairie homeowners. They cover unsightly spots inexpensively and quickly. They are ideal for providing masses of color in front of foundation plantings, filling in spaces between and in front of perennials and where spring-flowering bulbs have finished blooming.

To reduce transplanting shock and get bedding plants off to a quick and healthy start, you should water in the newly set-out plants with a water solution made up of about two level tablespoons of water soluble plant food to a gallon of water — but read the package label and find out for sure.

In the fall you will find that certain flowering annuals are much more tolerant of early light frosts than others. In my experience I have found that marigolds, zinnias and salvia, have been nipped on a frosty night, while petunias, snapdragons, pansies, carnations and phlox have sustained no frost damage.

Featured Topics of Past Issues

Identification

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

Perennials

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

Landscaping

The 1975 books are filled with articles on landscaping home grounds for beauty and practicability, and the colored section features the many happy results of good landscaping.

World of Bulbs

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

Fruits and Vegetables

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

Indoor Gardening and Flower Arranging

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

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

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International Flower Show

The Winnipeg Horticultural and Gladiolus Societies have announced that the Twenty-Third Winnipeg International Flower Show will be held on August 24th and 25th, 1978 at the Polo Park Shopping Mall.

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

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

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