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

Winnipeg, Manitoba

25th Annual Edition

February, 1968

The Prairie Garden Marches On to Its Silver Anniversary



See Special Rates on above issues on back page insert

The Prairie Garden, 1968

Our Silver Anniversary—25 years of service to our fellow gardeners in the Northern Great Plains. Our one purpose is to supply you, year after year, practical information on the genera, species and cultivars of plants recommended for the western plains, and how to grow them along with other interesting information on what is going on in the world of horticulture.

From sales of THE PRAIRIE GARDEN and your many, many letters of praise, we know that we are filling a need—successfully. This is indeed reward enough, not only to us, but also to the western Canadian professional and amateur gardeners who supply us the pertinent information that makes this publication possible.

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COVER PICTURE—Tulip "Maytime"—Cultivar lily-flowering. Photo by Malak, Ottawa.

PRAIRIE GARDEN INDEX

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Photo by Malak, Ottawa

Greigii "Marianne"



Photo by Malak, Ottawa

Greigii "Marlen"

A Whole New World of Early Tulips—Greigii Hybrids

From MALAK, Ottawa, Ontario

Written for the Netherlands Flower Bulb Institute.

Brilliant, big flowers visible a long way off and fascinating close up, appearing just after the snow melts with the earliest of spring flowers, are the new race of garden tulips called Greigii hybrids.

The Dutch breeders have crossed the original wild Greigii tulip (with its 9-inch height, huge, vivid flowers of orange scarlet, and its red-mottled green leaves) with the little, early-flowering Kaufmanniana or water lily tulips, and with the huge, brilliant red, early-flowering Red Emperor. The hybrids are a bonanza for the home gardener. In addition to the well known hybrid vigor, this new race of bulbs offers heights varying from six to 20 inches; flowers in colors predominantly red but with stunning red and yellow combinations that stand out well in the dull gray, early spring landscape; large flower size; and beautifully marked foliage that is attractive before the buds open and after the flowers fade. The stems are sturdy, and the heavy flower petals stand up to blustery spring weather.

Greigii hybrids offer the gardener a wide choice in places to plant. Three bulbs alone of a named variety will provide a bright spot of color among evergreens; larger groups of five, seven or nine look absolutely smashing. And a bed planted exclusively to one variety will fluoresce in the spring sun and can be seen for blocks.

Try a few in pockets between shrubs in the border — they'll complete their growth cycle almost before the shrubs come into leaf. Groups set among rose bushes keep the rose bed from looking quite so dead in April. And for

extra early bloom, in March in the warmer parts of Canada, plant six to eight inches from a foundation wall on the south or west side of the house.

Although Greigii hybrids are a new race, heavy production in the bulb fields of Holland has kept the price down so that you can get some excellent varieties for about 15 cents a bulb. Red Ridinghood, for example, one of the finest brightest reds, with a black base and attractively mottled leaves, can often be found in inexpensive packages in food chains. Oriental Beauty, another stand-out, somewhat taller, also is modestly priced. Somewhat more expensive but worth every penny is the 20-inch tall Royal Splendor. This magnificent tulip has bulbs as big as hyacinths, and the largest scarlet flowers you can find in early spring. Also more expensive but a stand-out is Oriental Splendor, with huge flowers on 20-inch stems. The inside of the petals is yellow, the outside red, and the base yellow, red and black. Even the leaves are colorful, being mottled with brown stripes.

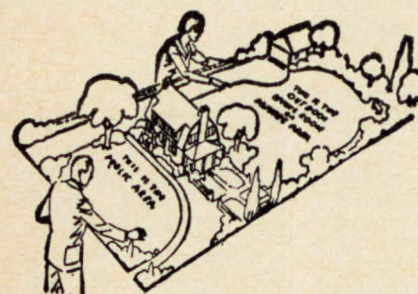
There are many, many more named varieties, and a group of mixed seedlings of Greigii and Kaufmanniana tulips, is called Peacock. The latter, in mixture, are inexpensive, low-growing, very early flowering plants with reds, yellows and white predominating.

Since Greigii tulips generally flower before the commoner garden varieties, they should be planted earlier this fall. Anytime after September 15 will do fine, and all planting should be completed before the ground freezes. This new race is as hardy as commoner kinds, but like them will flourish best in a soil that has been prepared. Plant about four inches apart and five to ten inches deep.

All Dutch bulbs like a good supply of potash and phosphorus and the home gardener can provide this easily by mixing a little bone meal and wood ashes into the soil under the bulbs where the roots can reach it easily. An ideal soil would be a mixture of humus and sand, so if you can mix these materials into the soil under the bulb as well as over it, you'll improve its performance. And don't forget to water after planting if the soil is dry. Bulbs, like all other plants we grow in our gardens, need moisture.

For further information on tulips, we refer you to *The World of Tulips*, by W. H. Gray, THE PRAIRIE GARDEN, 1965, page 37.

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View of part of bridge, garden and bell tower

The Nikka Yuko Centennial Garden

By C. W. CHICHESTER
 Manager, Nikka Yuko Centennial Garden
 Lethbridge and District Japanese
 Garden Society
 Lethbridge, Alberta

The Japanese Garden in Lethbridge, or to give it its proper name, The Nikka Yuko Centennial Garden, almost invariably invokes the variously phrased question from thousands of visitors, "Why did a small city of approximately 35,000 population, in the southwestern edge of Canada's vast prairie lands, build and plan to maintain the largest inland Japanese garden in the world? And how did Lethbridge conceive the basic idea of keeping the authenticity of design and the character of the gardens paramount?"

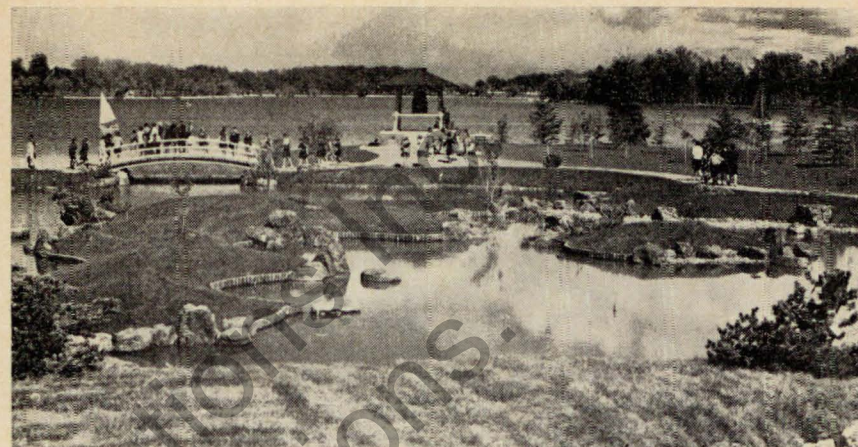
One answer lies in the fact that, excepting Vancouver and its environs and also Toronto and its satellite areas, Lethbridge and district have the largest concentration of Japanese Canadians in one area of Canada. Next, it is almost unbelievable, especially to the stranger, how fully those of Japanese ancestry have integrated into our community and, in the truest sense, have become Canadians and, in our eyes, first class citizens of the highest degree.

The Lethbridge and District Japanese Garden was conceived in 1963. The next step was approval by the Lethbridge Centennial Council and the Lethbridge City Council which appointed a committee to undertake the task. As an approved Centennial project it qualified for certain federal and provincial grants. But a great deal of the cost was raised directly by donations from civic-minded business firms.

The City of Lethbridge donated the land, nearly four acres, within an approximate 200-acre civic recreational centre, combining one of this country's finest outdoor swimming pools, a beautiful 18-hole golf course, and an artificial lake of about 70 acres well stocked with Rainbow trout for public fishing and also used for yachting. On two sides of the lake are ample picnic conveniences and parkland with a forested area. Also within this complex are a bowling green, a formal rose garden and broad lawns. The Japanese Garden is at the west edge of the lake.

Nikka is a contraction meaning Japan-Canada and Yuko is Japanese for friendship, so Nikka Yuko stands for Japan-Canada Friendship. The Nikko Yuko Centennial Garden was designed by Dr. Tadashi Kubo of the Osaka Prefecture University. Mas Sugimoto, a graduate student of Dr. Kubo's, was the resident architect during the Garden's construction. Starting with a flat, weedy, boggy piece of wasteland, Dr. Kubo and Mr. Sugimoto created a work of art. Using thousands of tons of earth fill, rocks, stone, and water, they designed a miniature mountain and islands, and a mountain stream, ponds and waterfalls.

Some visitors are surprised by the lack of flowers blooming, but the Japanese, while admiring and loving flowers, say that their colors distract and excite. Thus their inclusion within the Nikko Yuko Garden would impair its harmony and contemplative peacefulness.



—Lethbridge Herald Photo

Upper pond from east side of mountain—small island at right is symbolic turtle—large island at left is purely decorative. Also bridge crossing lagoon of the lower pool, and bell tower with Henderson Lake (man-made 70 acres) in background.

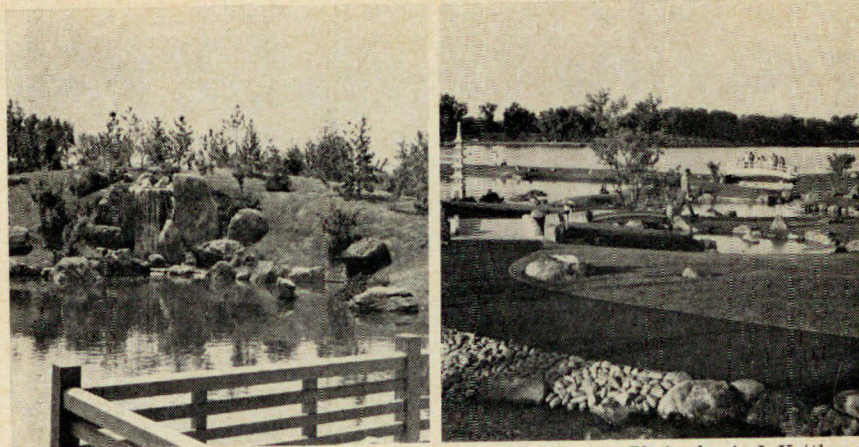
The Garden was designed to incorporate the best features of the five basic types of Japanese gardens: mountain and waterfalls, stream and ponds, islands, prairie or flat garden, and a dry garden, the latter so-called because of its lack of vegetation. Included are many of the traditional elements of a Japanese garden, a bell tower, bridges crossing the stream and ponds, an *azumaya* (shelter), "arizo" beaches of flat stones hand-picked for shape, size and color, a five-tiered granite pagoda, traditional stone lanterns, the main pavilion, and a water well designed and shipped from Japan.

Rocks were collected from the Crow's Nest area of the Rocky Mountains, approximately 100 miles from Lethbridge, and were selected, many by Dr. Kubo personally, with an eye to duplicating as near as possible the geological formation of Japan, as well as in some instances grouping within the Garden to have special symbolic meanings. The Garden is partially enclosed by a traditional wall which has a peaked roof of copper shingles designed to harmonize with all the buildings and structures.

All of the structures, except part of the Garden wall, were built in Japan, shipped to Lethbridge, and re-erected on the site. Five artisans from Japan were engaged to help the local workmen. The largest building, one of the focal points of the Garden, is the pavilion, combining a ceremonial tea room, with traditional artifacts such as *Tatami* (rice straw mats) on the floor, and an *obachi* (water-heating pot). On special occasions the Tea Ceremony, a ritualistic performance with strict attendance to rule and procedure required, is performed.

The visitor will see frequently changed Japanese flower arrangements, chiefly of the Ikebana school of flower arranging. The pavilion and other minor structures are built mostly of cypress imported from Taiwan. The main beams are dovetailed, requiring no nails, and wooden pegs are used where necessary. The wood is planed to a very smooth and almost silky finish. No preservatives, polishes or waxes are used; the wood is intended to mellow over the years.

It is from the pavilion that visitors view the "dry garden." Its beauty lies in its starkness. Outlined by a border of black dolomite chips is an



—Photos by A. J. Kettleson

View from deck of pavilion showing man-made mountain with waterfall. Large rock at right weighs 17 tons.

Path winding along side of mountain stream with pebble beach ("ariso"). Pagoda is at left with Henderson Lake in background.

area of white dolomite chips in which are set three groups of large rocks selected for shape, contour, and relationship one to the other. The whole, to many people, is seen as the ocean with islands. Ancient Japanese legend says the numbers 3, 5, and 7 are lucky and the groups in our dry garden conform in this manner.

From the viewing deck of the pavilion the kimono-clad Canadian (of Japanese heritage) tells visitors of the outstanding features to be seen while strolling the garden paths. They are shown the largest rock in the Garden, weighing 17 tons, the island shaped like a turtle as a symbolic wish of longevity, and the bell tower, which is not anchored at the four corner posts and would topple over were it not for the Friendship Bell, specially cast for the Nikka Yuko Garden, and is so placed that it weights the roof onto the corner posts so keeping them rigid.

It is not necessary for a Japanese garden to use plants and trees native to Japan and our prairie weather excludes this possibility. Consequently, the shrubs, trees and other plantings of an indigenous nature were chosen to add grace and charm and, most important, to harmonize with the large stones, the various bodies of water, and the overall architecture of the Garden. Evergreens such as Mugo pine, Scotch pine, Ponderosa pine, Lodgepole, Timber pine, White and other spruce have been widely used, with individual specimens selected for suitability in each specific location. Deciduous plantings include maple, dogwood, apple, plum, barberry, Russian-olive, and others. Where possible, material larger than normal nursery stock was used initially.

From June 3 to October 20, 1967, well over 100,000 persons visited the Garden. Prince and Princess Takamatsu, of the Imperial Family of Japan, on July 14, 1967, officially opened and dedicated the Garden.

This novel (for Canada) and most beautiful Garden has had world-wide publicity. It has drawn visitors from all parts of the world; many were critical judges of Japanese gardens, having visited the most famous ones, as well as having Japanese gardens in miniature near their homes. All were high in praise of the Nikka Yuko Centennial Garden and amazed that such a project could be so successfully accomplished on the Canadian prairie.

Trees for Prairie Shelterbelts

By W. H. CRAM, Ph.D., and C. H. LINDQUIST

Tree Nursery, Prairie Farm Rehabilitation Administration
Canada Department of Agriculture, Indian Head, Saskatchewan

The absence of trees on the prairie was deterrent to the early settlers and though some trees were shipped in from Eastern Canada, all too often those failed to survive our rigorous climate and calcareous soils.

In 1901, the Tree Planting Division was organized by the Forestry Branch of the Canada Department of the Interior, to produce tree material for farm shelters throughout the prairie region. In 1903 and 1913 tree nurseries were established at Indian Head and at Sutherland in Saskatchewan. To date, these nurseries have produced and distributed some 347,000,000 trees which if planted in one row would circle the earth about five times. Almost 100,000 farm homes have been supplied with trees to protect the home and livestock. It was soon found that within the shelter of the trees, the farm home could be landscaped, gardens would grow, and even fruit orchards flourished. During the drought of the 1930's field shelterbelts consisting mainly of caragana were found to reduce soil erosion and ensure crop yields. Since then over 60,000,000 trees have been distributed for this purpose.

Not only did the nurseries supply trees, they also advised the farmers on the planting and care of shelterbelts from tests on the nursery. A test planting was started in 1908; eventually it expanded to 20 deciduous and 31 coniferous species grown under dryland conditions. The severe drought of the 1930's and 1961 necessitated removal of all trees in 1964. Fifty-three years after planting, survival was 59%, 48%, 29% and 22% for green ash, American elm, Manitoba maple and Siberian elm respectively.

Colorado spruce proved vastly superior to white, Norway and black spruce for survival, and Siberian fir superior to balsam fir for both survival and growth. Siberian, American and European larch demonstrated exceptional growth (65 feet in 56 years) and had reasonable survival. Pines generally had higher survival than most other conifer genera. Scots pine as a group was exceeded only by Swiss stone pine for survival but lacking the growth of Scots pine. The Russian race of Scots pine was superior to all other races for survival. Lodgepole, limber and white pine displayed 25% survival with good growth, whereas Austrian, red, jack and Ponderosa pine generally were inferior. However, the average height of jack and red pine was superior to all other species, approaching 60 feet in 50 years. Douglas fir and cedars proved less adapted to the prairies, but demonstrated some ability to survive on being established.

Spacing of trees in a shelterbelt has been and still is a contentious issue. A spacing test for a 3-row shelterbelt was planted on the nursery by J. Walker in 1943. The first row was caragana, the second row American elm, cottonwood, elm and Manitoba maple alternated, and the third row green ash. Caragana was planted at one foot apart while the remaining species were planted at four feet apart in the row. Three separate belts were planted at row spacings of four, eight, and 16 feet.

Survival and growth records in 1960 demonstrated that survival of caragana, maple and ash was not influenced by spacing, whereas that for elm increased from 91% to 100% and cottonwood from 0% to 25% as spacings increased from four to 16 feet. Survival of caragana was 100% for

all row spacings. The average heights of the belts were 17 feet, 19 feet, and 21 feet for the four-, eight-, and 16-foot spacings respectively. The increased survival and height obtained at the eight- and 16-foot spacings were economically insignificant when compared with the efficient shelter obtained with the four-foot spacing which required only one-quarter to one-half the maintenance. Thus the Tree Nursery still recommends close spacings of four to six feet between the rows for prairie farm shelterbelts.

A woody ornamentals planting of 109 species was established at the Tree Nursery in 1959 as a co-operative test with W. A. Cumming of the Canada Department of Agriculture Morden Experimental Farm, Manitoba. Records were compiled in 1964 on hardiness, disease resistance, growth and survival. The results indicated that 33 species were good, 27 medium, 34 poor, and 15 were recommended for retesting. Details for these results are available from Mr. Cumming. Since 1959 a total of 418 species or varieties have been planted in this co-operative test for the purpose of evaluating new species for prairie plantings.

Sixteen regional shelterbelt tests with up to 25 species of trees and shrubs have been planted in Saskatchewan since 1959 by the Tree Nursery. Planting sites have been chosen with the assistance of the Agricultural Representatives Service, Saskatchewan Department of Agriculture, to test adaptability under as many diverse soil and climatic conditions as possible. Interim results suggest that four shrub species with high survivals are promising species for future shelterbelts; these are Villosa lilac, Hansen hedge rose, sandthorn and the native chokecherry.

A 1965 test planting on the Tree Nursery of 21 poplar and nine willow clones indicates that two poplar clones (P.B.L. No. 3 and P. 44-52) are now significantly more vigorous than the standard Northwest poplar; and the Basford willow is superior to acute willow.

Poplars provide the earliest shelterbelts but most clones are susceptible to various canker and gall diseases. To overcome this problem and to find superior male clones a breeding program was commenced in 1959. Some selections have demonstrated good rooting ability and growth. Disease inoculation studies were initiated in 1966 with the co-operation of Dr. H. Zalasky, Canada Department of Forestry, to determine the susceptibility of available poplar clones to Septoria canker and black poplar gall diseases. Interim results to date suggest 15 clones are susceptible and six clones may be resistant.

These and other studies will be continued in the future at the Tree Nursery in an attempt to produce satisfactory tree material for farm shelterbelt plantings.

CHEMICAL WEED CONTROLS FOR SHELTERBELTS

By W. H. CRAM, Ph.D., and G. A. MORGAN

Tree Nursery, Prairie Farm Rehabilitation Administration
Canada Department of Agriculture, Indian Head, Saskatchewan

Control of weeds is most important for the establishment, survival and growth of shelterbelts. Shallow and clean cultivation of all rows in shelterbelt plantings is essential for at least three years, after which the foliage canopy and outside summer fallow strips will control weeds. Modern farmers have

forsaken the hoe and with mechanized equipment require herbicidal controls for shelterbelt weeds comparable to those now available for field crops.

Herbicidal research for nursery production and shelterbelt plantings of trees was initiated at the Tree Nursery in 1960, and conducted by Dr. R. Grover to 1963. Research during the 1960-63 period revealed that Simazine* herbicide (50W) at four to six pounds (active ingredient) per acre in 30 gallons of water gave good control of annual weeds for one or more years. Fall applications were recommended for new plantings, which must be free of trash and debris so that the chemical is applied uniformly to the soil surface. The higher rates were recommended only for heavy soils and the lower rates for sandy soils low in organic matter. Spring applications of two to four pounds to newly planted trees gave good weed control, but caused some injury and losses.

Applications of water after Simazine treatments will ensure better weed control. On the other hand the soil surface should not be cultivated or disturbed following Simazine treatments, except to remove manually perennial weeds. Subsequently, Simazine applications have proven phytotoxic to nursery plantings of Siberian elm, Boxelder maple, conifers and poplars. It would appear this chemical, when leached into the root zones by soil cracking and spring run-off, is lethal to some shallow-rooted species of trees. The persistence of the residual effect of Simazine varies for soil types from two to four years but may be neutralized by activated charcoal.

Since 1963 G. A. Morgan conducted herbicidal investigations under the direction of Dr. W. H. Cram primarily for nursery production operations with some of the following results.

Linuron* (50W) herbicide, when applied at two to four pounds per acre (active ingredient) gives good control of most annual weeds for a period of almost two years if applied in the spring. It may be applied as an overall spray (in 50 gallons of water per acre) to dormant plants of all shelterbelt species, preferably after irrigation or watering of newly planted trees. If the buds have broken care must be taken to avoid contact with all new foliage and to direct the spray onto the soil surface only. Linuron will control small weeds if applied immediately after emergence, but not if more than four inches tall.

Chloroxuron* (Tenoran) at six to eight pounds in 40 gallons of water per acre provides good weed control for six to ten weeks when applied in the spring. It must be applied as a directed spray immediately after irrigation or watering of new plantings, with care not to contact foliage. Some control of emerging weeds is obtained with chloroxuron.

Paraquat* at one to two pounds in 50 to 100 gallons of water per acre may be applied to kill tall annual weeds and top growth of grasses or perennials. However, *great care must be taken to avoid applications to any foliage*, especially the needles of conifers. Repeated applications as a directed spray are required during the growing season, because this chemical only kills the tops and has no residual.

Granular forms of Simazine (4G) are available, but must be applied to clean ground and must be followed by an overall application of water to activate same.

* (5) See Service Card

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Prairie Regional Trials for Woody Ornamentals

By W. A. CUMMING

Head, Ornamentals and Fruit Crops Section, Canada Department of Agriculture
Research Branch, Morden, Manitoba

A SUMMARY OF FIVE YEARS RESULTS COVERING PLANTS SENT OUT FROM MORDEN IN 1960

Co-operating Stations

Provincial Horticultural Station, Brooks, Alberta.
University of Alberta, Edmonton, Alberta.
Tree Nursery, Prairie Farm Rehabilitation Administration, C.D.A.,
Indian Head, Saskatchewan.
University of Manitoba, Winnipeg, Manitoba.
Research Station, C.D.A., Morden, Manitoba.

Key to abbreviations used in the table

R—Recommended
T—Recommended for Trial
MI—More information required
U—Unsatisfactory
NC—No comment
D—Died during the first summer

Taxa	Brooks	Edmon- ton	Indian Head	Winni- peg	Morden
<i>Acer Ginnala</i>	R	R	R	R	R
<i>Acer platanoides</i>.....	.....	.....	MI	T	R
<i>Acer tataricum</i>.....	.....	.....	R	R	R
<i>Acer truncatum</i>.....	.....	.....	MI	MI	T
<i>Aesculus arguta</i>	T	U	T	T	T
<i>Amorpha fruticosa</i>	R	R	T	R	R
<i>Amorpha fruticosa tennesseensis</i>.....	.....	.....	MI	NC	R
<i>Aronia arbutifolia</i>	T	T	U	T	T
<i>Berberis chinensis</i>	U	.....	.....	NC	U
<i>Berberis circumserrata</i>.....	.....	MI	U	T	R
<i>Catalpa bignonioides</i>	R	U	T	T	T
<i>Celastrus hypoleuca</i>	T	U	U	NC	T
<i>Cotinus coggygria</i>	MI	.....	.....	T	T
<i>Cotoneaster acutifolia</i>.....	.....	.....	R	R	MI
<i>Cotoneaster integerrima</i>	R	R	R	R	R
<i>Cotoneaster tomentosus</i>.....	.....	R	T	T	T
<i>Crataegus mordenensis—Toba</i>	R	.....	.....	T	R
<i>Crataegus rivularis</i>	T	R	.....	R	R
<i>Euonymus atropurpurea</i>	T	T	T	T	R
<i>Euonymus europaea—Aldenhamensis</i>	T	T	R	R	R
<i>Euonymus Maackii</i>	R	R	R	R	R
<i>Euonymus phellomana</i>.....	.....	R	.....	U	U
<i>Euonymus verrucosa</i>.....	.....	.....	MI	T	T
<i>Juglans mandshurica</i>	U	U	MI	T	R
<i>Lonicera canadensis</i>	MI	.....	.....	MI	T
<i>Lonicera suprefolia</i>	MI	.....	T	NC	T
<i>Lonicera tatarica</i>.....	.....	.....	R	R	R
<i>Lonicera tatarica—Sheridans Red</i>.....	.....	.....	R	NC	R
<i>Lonicera xylosteum—Claveys Dwarf</i>	NC	R	R	R	R
<i>Mahonia repens</i>.....	.....	R	NC	T	R
<i>Malus—Almey</i>.....	.....	R	R	R	R

Taxa	Brooks	Edmon- ton	Indian Head	Winni- peg	Morden
<i>Malus baccata—Columnaris</i>.....	.....	R	.....	R	R
<i>Malus baccata Jackii</i>.....	.....	R	.....	NC	R
<i>Malus—Jubilee</i>	R	R	.....	T	R
<i>Malus—Leslie</i>.....	.....	R	.....	T	R
<i>Malus—Makamik</i>.....	.....	.....	R	T	R
<i>Malus—No. 6113</i>.....	.....	.....	R	T	T
<i>Malus—Sundog</i>.....	.....	R	.....	R	R
<i>Philadelphus Lemoinei</i>.....	.....	.....	T	T	U
<i>Philadelphus Lemoinei—</i> <i>Boule de Argent</i>	NC	.....	T	T	T
<i>Philadelphus Lemoinei—</i> <i>Girandole</i>	NC	.....	T	T	R
<i>Philadelphus Lewisii</i>.....	.....	.....	T	R	R
<i>Philadelphus virginialis—</i> <i>Bouquet Blanc</i>.....	.....	.....	MI	MI	T
<i>Philadelphus virginialis—</i> <i>Virginal</i>	NC	.....	T	R	T
<i>Physocarpus amurensis</i>	T	R	R	NC	R
<i>Potentilla fruticosa—</i> <i>Farreri</i>.....	.....	.....	R	R	R
<i>Potentilla salesoviana</i>.....	.....	.....	T	T	T
<i>Prunus fruticosa</i>.....	.....	.....	R	R	R
<i>Prunus japonica</i>	R	R	MI	T	R
<i>Prunus Maackii</i>	R	R	R	R	R
<i>Prunus tomentosa</i>.....	.....	.....	R	R	R
<i>Quercus mongolica</i>	NC	T	MI	T	T
<i>Rhamnus crenata</i>.....	.....	.....	R	R	R
<i>Rhamnus pallasii</i>.....	.....	R	R	R	R
<i>Rosa rugosa—</i> <i>Kamtchatica</i>.....	.....	.....	R	R	R
<i>Securinaga suffruticosa</i>	U	U	T	T	R
<i>Sorbaria—</i> <i>Aurora</i>	MI	.....	.....	R	R
<i>Spirea geminata</i>	MI	R	U	MI	T
<i>Spirea japonica</i>	R	R	U	MI	R
<i>Spirea nipponica</i>	R	R	MI	R	R
<i>Spirea nipponica rotundifolia</i>	U	NC	NC	T	T
<i>Spirea vanhouttei</i>	T	U	R	T	T
<i>Syringa amurensis japonica</i>.....	.....	.....	R	R	R
<i>Syringa josiflexa—</i> <i>Redwine</i>	MI	R	R	R	T
<i>Syringa Josikaea</i>.....	.....	R	R	R	R
<i>Syringa laciniata</i>	T	R	R	R	R
<i>Syringa microphylla—</i> <i>Superba</i>.....	.....	.....	T	NC	U
<i>Syringa Prestoniae—</i> <i>Isabella</i>.....	.....	.....	R	R	R
<i>Syringa vulgaris—</i> <i>Ami Schott</i>	NC	.....	MI	NC	T
<i>Syringa vulgaris—</i> <i>Brands Special</i>	R	R	R	MI	R
<i>Syringa vulgaris—</i> <i>Congo</i>	R	R	R	R	R
<i>Syringa vulgaris—</i> <i>Crepuscule</i>.....	.....	R	T	NC	R
<i>Syringa vulgaris—</i> <i>Ellen Willmott</i>	NC	R	R	R	R
<i>Syringa vulgaris—</i> <i>Monge</i>.....	.....	.....	R	NC	R
<i>Syringa vulgaris—</i> <i>Monique Lemoine</i>.....	.....	.....	R	NC	R
<i>Syringa vulgaris—</i> <i>Planchon</i>	MI	NC	T	NC	T
<i>Syringa vulgaris—</i> <i>President Poincare</i>	MI	.....	R	NC	R
<i>Syringa vulgaris—</i> <i>Primrose</i>	NC	R	.....	NC	T
<i>Syringa vulgaris—</i> <i>Vestale</i>	NC	R	R	R	R
<i>Viburnum burejaeticum</i>	MI	.....	R	T	R
<i>Viburnum Opulus—</i> <i>Compactum</i>	R	NC	MI	T	R
<i>Viburnum Opulus—</i> <i>Nanum</i>	R	R	MI	R	R
<i>Viburnum Opulus—</i> <i>Roseum</i>	R	NC	R	T	R
<i>Viburnum Opulus—</i> <i>Xanthocarpum</i>	U	NC	.....	T	R
<i>Weigela—</i> <i>Profusion</i>	U	NC	.....	NC	U

The Horticultural Section, Research Station, Canada Department of Agriculture, Lethbridge, Alberta, and the Horticulture Department, University of Saskatchewan, Saskatoon, Saskatchewan, both received their first plants in this project in the spring of 1966. The 1,543 plants of 222 species and cultivars representing 45 genera were shipped from the Morden Research Station to co-operators in the trials in 1966. Total of plants sent out from Morden for this test in the period 1959-66 inclusive was 5,934 plants of 598 species and cultivars representing 82 genera.

4-H Garden Clubs—Churchill River Area

By H. R. CLARK

Senior Extension Specialist and Associate Professor
Extension Division, University of Saskatchewan, Saskatoon, Saskatchewan

The Churchill River area in Saskatchewan begins approximately 400 miles north of the International Boundary. The furthest point north where there is a 4-H Garden Club is LaLoche, about 560 miles north of the International Boundary. If one were to drive 500 miles due north from Winnipeg to a point near Boyd, Manitoba, or the same distance north from Swift Current, Saskatchewan, one would be in the same latitude ($53^{\circ} 30'$) as LaLoche.

In 1951, 4-H Garden Clubs were first organized in the Churchill River area. The first club was at Ile-a-la-Crosse. Since their inception, garden clubs and, of course, many other types of 4-H Clubs, have been in operation at Dillon, Beauval, Buffalo Narrows, Green Lake, Pine House Lake, Montreal Lake, Molanosa, Cumberland House, Pemmican Portage, Sandy Narrows, Pelican Narrows and Lac la Ronge. In 1967 there were 398 4-H members in the far north. These clubs are under the direction of Don Neilson, the Agricultural Representative at Prince Albert. Leadership is provided by teachers, Sisters and local men and women. This past fall (1967) I judged the 4-H Garden Clubs at LaLoche, Dillon, Buffalo Narrows and Green Lake.

Vegetables grow abundantly in the far north. Varieties which we grow on the prairies can be grown in the Churchill River area with much success, as illustrated by the picture below.

There are some varieties of vegetables which grow better than others in the far north. Root vegetables and potatoes do exceptionally well. Carrots, turnips, parsnips and beets grow very well in light sandy soils. Heavy yields are in evidence from observations of the mission and private garden plots in the area. Potatoes, especially the early varieties, give good yields. The Netted Gem in many years has outyielded all other varieties and this year, 4-H members reported good yields of Netted Gem from their plots. Corn, pumpkin, marrow, tomatoes, onion, cucumber, celery, and cabbage give excellent results.



4-H Garden Club vegetable exhibits at Green Lake, Saskatchewan. Mr. H. R. Clark is pictured at right.

I judged several good exhibits of cauliflower this year and have seen other fine exhibits of cauliflower on previous visits to the Churchill River area.

Varieties grown by the 4-H members were as follows: Carrots, Chantenay Red Cored. Cabbage, Copenhagen Market. Turnips, Laurentian. Corn, Hybrid Golden Beauty. Peas, Homesteader. Wax Beans, Round Pod Kidney Wax. Green Beans, Tender Green. Beets, Detroit Dark Red. Parsnips, Short Thick. Pumpkins, Connecticut Field. Pumpkins, Sugar. Radish, Champion. Lettuce, New York No. 12. Cucumbers, Straight Eight. Onions, Hybrid Epoch. Tomatoes, Meteor.

Indian, Métis and white children in the clubs in the far north enjoy their 4-H work and try to do their best, in many cases against heavy odds. These young people are wonderful to work with; one cannot help but give them highest praise. Weather elements, insects, diseases and thievery are the main difficulties in the harvesting of good yields of vegetables from their gardens.

In the far north the spring season is relatively late and the first killing frost in the fall usually is around the end of August; thus the frost-free period is less than 105 days. This year the first killing frost was much later. I visited the LaLoche area during the week of September 11 and everything was beautiful and green.

Usually moisture is not a limiting factor in vegetable production in the Churchill River area, but it becomes a factor when weeds are a problem. Like the prairie boys and girls, the 4-H Club members in the far northern clubs do not like to pull weeds. It would seem that all young people are allergic to weeds!

Light, sandy loam soils, with a slope to the south and good drainage, appear to be the best producers. Undoubtedly, an application of commercial fertilizers to these soils plus good cultural practices would give fantastic yields. Research is necessary on the best fertilizers to use in this area for vegetable production. In some years it may be necessary to water gardens but drought is the exception.

The other major problem, weeds being the first, is damage caused by insects. Wireworms, cutworms, cabbage worms, and turnip and onion maggots do heavy damage to vegetables. In the main this damage can be prevented, but someone must be available and willing to give advice to the members and to assist in prevention and control of these insects. Demonstrations probably are the answer.

Wireworm damage was very heavy in the potato and carrot exhibits which I judged last fall. Many potatoes had six or seven holes in them. The cutworm does its damage early and only by inspecting the gardens in May and June would the extent of infestation be evident.

Part of the answer to wireworm damage is one of two years summer fallowing of the garden plot after breaking the virgin soil, keeping a good width of summer fallow between the garden and the adjacent grassy area, and the use of a chemical at seeding time.

Turnip and onion maggots and the cabbage worm, likewise, can be controlled by good cultural practices, but, as previously mentioned, the members must have this demonstrated to them before it can become a reality. It is too late to talk to them about insect control at Achievement Day.

Flowers do extremely well on a south and west exposure in the Churchill River area. Some of the finest flowers one would wish to see were exhibited at the Achievement Day at Buffalo Narrows. Snapdragons, dahlias, marigolds

and daisies, just to mention a few, were exhibited along with the members' vegetables.

Since their beginning in 1951, the 4-H Garden Clubs in the far north have, without a doubt, clearly demonstrated that vegetables of excellent quality can be grown successfully. The 4-H members have done their best; they have worked hard; they have learned much about the 4-H program and the world around them. Many have attended Farm Boys' and Girls' Camps at Prince Albert and also Provincial 4-H Leadership Camps. They have been active in public speaking, debating, curling and other types of recreation.

Boys and girls in the far north enjoy many benefits from 4-H training. Their lives are different in many ways from the boy or girl on the prairie. Wherever one goes, in the 4-H program the objective is the same, "Learn to do by Doing."

The boys and girls of the Churchill River area are endeavoring to show us that top-quality vegetables can be grown successfully in their area. Probably, in the near future, top-quality potatoes from Green Lake or Buffalo Narrows will be sold in the Churchill River area. Incidentally, when I was in the far north during early September, potatoes of very poor quality were being sold for 8 cents per pound as compared to the good quality vegetables I judged at the 4-H Achievement Days. The potatoes in the stores were not grown locally.

In my opinion, there is a good opportunity for the commercial production of vegetables in the Churchill River area.

Application of Sulphur in Lowering the pH of the Soil

By R. J. SOPER Ph.D.

Department of Soil Science, University of Manitoba, Winnipeg, Manitoba

The application of elemental sulphur is one of the cheapest, easiest and safest means of lowering the pH of a soil. The trick is in how to do it.

pH is a measure of soil reaction. A soil with a pH of 7 is neutral in reaction; above pH 7.0 it is alkaline, and below this figure it is acid. It has been shown in water culture experiments that a large number of plants can grow normally in a pH range of 4 to 8; in soils, secondary effects of soil reaction limit considerably the pH range for satisfactory plant growth. Plants show considerable variability in their pH preference. They may be grouped according to soil reaction preferences as follows:

Group 1: Preferring very strongly acid soils, pH 4 to 5: cranberry and blueberry.

Group 2: Preferring strongly acid to moderately acid soils, pH 5 to 6: strawberry, raspberry, turnip, potato and celery.

Group 3: Preferring moderate acidity to slight alkalinity, pH 6 to 7.5: apple, pear, plum, currant, asparagus, bean, cabbage, cantaloupe, carrot, corn, cucumber, onion, pea, pumpkin, squash and tomato.

Prairie soils range in pH from 4 to 9, the most common range being from 6.5 to 7.5. Thus prairie soils usually are suitable for plant growth without any soil amendments. There are several types of soils which have an alkaline pH which may be too high for optimum growth of some plants:

Calcareous Soil. This soil contains sufficient calcium carbonate or lime (often with magnesium carbonate) to effervesce visibly when treated with

cold dilute hydrochloric acid. The pH varies from slightly above 7 to well over 8.

Alkali Soil. (a) A soil with a high degree of alkalinity (pH of 8.5 or higher), or with a high available sodium content (15 per cent or more of the available bases, calcium, magnesium and potassium), or both. (b) A soil that contains sufficient alkali (sodium) to interfere with the growth of most plants.

Alkaline Soil. Any soil that has a pH greater than 7.0. The pH of alkaline soils may be reduced by the addition of elemental sulphur which is oxidized by soil bacteria to form sulphuric acid. The amounts of sulphur required will depend upon such factors as the texture of the soil (clay, loam, sand, etc.), degree of alkalinity, pH required, organic matter content, and the soil type. Therefore it is obvious that it is very difficult or next to impossible to recommend how much sulphur should be added. The best method perhaps is to spread and incorporate some sulphur, then wait a few weeks and test the soil to see what has happened. If insufficient sulphur has been added, add some more; if too much has been added, some of the original soil could be incorporated or lime could be added.

Alkali soils and alkaline soils in general are easier to treat than calcareous soils. It has been recommended that to reduce the pH of the former types of soils one pH unit requires the addition of 10 to 15 pounds of elemental sulphur (flowers of sulphur) per 1,000 square feet for sands, and 20 to 25 pounds for clay soils. These are tentative recommendations only.

Calcareous soils are much harder to treat since the calcium and magnesium carbonates which they contain must be destroyed before the pH can be lowered below 7.0. Some prairie soils (Red River Lowlands, Manitoba) contain as much as 30 per cent calcium carbonate and would require a prohibitive 2.5 tons of sulphur per 1,000 square feet to neutralize the calcium carbonate. Calcareous soils commonly contain 5 per cent calcium carbonate and even with this smaller calcium carbonate content, 800 pounds of sulphur would be required to neutralize the soil.

Various plants (Amur maple, spirea, mountainash, raspberry, plum, etc.) are iron-deficient when grown on calcareous soils. Although it is perhaps not practical to add enough sulphur to completely neutralize the calcium carbonate, pockets of soil may be acidified by small additions (25 to 30 pounds per 1,000 square feet) of pelleted sulphur. If pelleted sulphur cannot be obtained, holes may be drilled into the soil and powdered sulphur added. The soil in the vicinity of the sulphur will be neutralized and available iron released. Iron may be released in sufficient quantity that the plant's requirement for iron will be met. The effects from adding sulphur to calcareous soils will not be as permanent as those obtained on non-calcareous soils. The addition of iron chelates usually is a more effective cure for iron deficiencies.

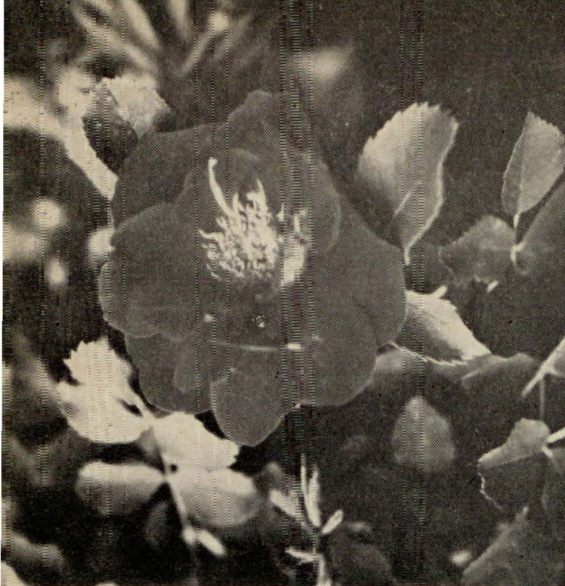
The measurement of soil pH by the gardener presents a problem. Prairie Soil Testing Laboratories will make this test but the cost may be prohibitive. Home pH test kits are available and usually are accurate enough for most purposes.

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(7) See Service Card



"*Rosa Assiniboine*"



Potentilla fruticosa
"Coronation Triumph"

The Merit Trials for Ornamental Plant Introductions on the Prairies

By W. A. CUMMING

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Canada Department of Agriculture, Morden, Manitoba

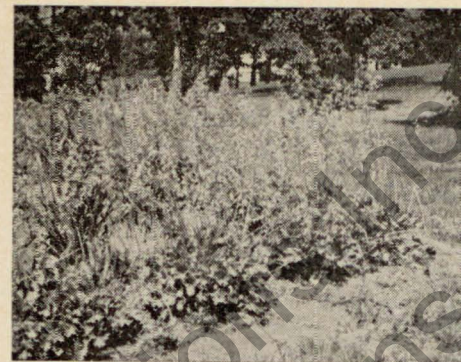
The Morden Research Station conducts Merit Trials for ornamental plant introductions for the prairie provinces in cooperation with the Western Canadian Society for Horticulture. These trials are in conjunction with the Society's Plant Registry which records new introductions and accessions on a punch card system and publishes a list in the proceedings of its annual meetings. At the time of registering new plant introductions with the Society, registrants are requested to send three plants to the Research Station at Morden for inclusion in the Merit Trials.

The concept for these trials was adopted from the Royal Horticultural Society of Great Britain and their Merit Trials at Wisley Gardens in England. An Award of Merit has been set up with an appropriate committee to recommend awards from among the plants which have been submitted for inclusion in the trials at Morden. To date four ornamental plant introductions have received awards and a fifth will be presented in February 1968.

Plants of the first candidates for these trials were received at Morden in 1959 and by the autumn of 1967 a total of 73 varieties and selections had been sent in by 16 plant breeders on the Canadian prairies and adjacent North Central States.

The first two Awards of Merit were presented at the 1965 annual meeting of the Western Canadian Society for Horticulture at Falcon Lake, Manitoba. Both were presented to Henry H. Marshall of the Brandon Research Station, Canada Department of Agriculture, for his introductions Brandon Pink coralbells and Assiniboine rose.

Heuchera 'Brandon Pink' is a hybrid between a red-flowered but tender cultivar of *H. sanguineum* and the native greenish flowered species *H. Richardsonii*. From overwintering rosettes of attractive, roundish, green leaves it sends up many spikes of pink flowers. This new hybrid has already proven



Heuchera "Brandon Pink"



Juniper horizontalis
"Dunvegan Blue"

a valuable parent in the breeding of new, hardy coralbells cultivars for the prairies.

Rosa 'Assiniboine' is a hybrid between the native prairie rose *R. arkansana* and the hybrid floribunda cultivar 'Donald Prior.' It has bright red, semi-double flowers and blooms throughout the summer and autumn.

At the Society's 1967 annual meeting at Banff, Alberta, two more awards were presented. One went to John A. Wallace, Beaverlodge Nursery, Beaverlodge, Alberta, for his Dunvegan Blue creeping juniper. The other went to Professor John Walker for his Coronation Triumph shrubby cinquefoil (*Potentilla*) introduced from Indian Head, Saskatchewan, during the period that he was superintendent of the Forest Nursery Station, Prairie Farm Rehabilitation Administration, Canada Department of Agriculture.

Juniperus horizontalis 'Dunvegan Blue' was discovered by Mr. Wallace in the wild in the Peace River district of north Alberta. It holds its distinctive silvery blue color better than other blue-colored cultivars of this species. This juniper has the added attraction of retaining its juvenile form for many years. The juvenile form has needle-like, feathery foliage as compared to the scale-like foliage of the adult form.

Potentilla fruticosa 'Coronation Triumph' is one of the showiest of the 35 shrubby cinquefoil cultivars in the Arboretum at Morden. It has bright yellow flowers with distinctive narrow petals and blooms freely from mid-June until severe autumn frosts. Probably because it is almost sterile, the seed pods remain green for most of the season. Browning seed pods on many *Potentilla* cultivars give them a rather unkempt appearance in late summer.

At the Society's 1968 meetings which will be held in Winnipeg in February, W. L. Kerr,* formerly superintendent of the Prairie Farm Rehabilitation Administration, Canada Department of Agriculture, Tree Nursery at Sutherland, Saskatchewan, will receive an award for his Royalty rosybloom crabapple.

Malus 'Royalty' is an open-pollinated seedling of *M.* 'Sutherland.' The male parent is suspected to be *M.* 'Rudolph.' It is particularly valued for its very glossy, dark reddish purple foliage, which color it retains throughout the growing season. It is a hardy, strong growing, well shaped small tree. The flowers are dark purplish red but are masked by the bright reddish hue of the unfolding leaves.

*See article on Kosybloom Crabapples, by W. L. Kerr, in THE PRAIRIE GARDEN for 1965.—Editor.

Lawn Preparation for Special Growth

By H. R. CLARK

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Say! Farmer, why don't you bring in your sheep? This is what greeted me when neighbors or interested citizens passed my home. I didn't mind being called a farmer because I have been a farmer all my life; and I really wouldn't mind having a flock of sheep because, according to the economists and animal husbandry specialists, sheep are money in the bank.

In the spring of 1964, we moved into a new home — moving was easy compared with preparing the front and back yards for seeding the lawn. This is where all the curiosity and questioning began.

The soil in the area is heavy clay loam. The sub-surface soil has solonchic properties, it is poorly drained and has soluble salts present. Native grass covered the area prior to the start of the recent housing development. At the time of excavation, the contractor carefully piled the surface soil from all of the lot. The soil from the basement, as well as approximately two feet of sub-soil from the entire lot was trucked away.

Following the completion of the house in the spring of 1964, the surface soil was spread over the entire lot. The back lot was terraced with a 2-foot drop about 25 feet from the house. Black field soil was then brought in and about eight inches was spread over the entire lot. During May and June, 1964, the lot was worked over with a tiller at least four or five times in order to incorporate the two types of soil; also to level the soil and kill any weeds or grass growth. Around the end of June, three bushels of wheat were broadcast, raked in and watered.

Within a week there was a green cover over the lot. In two weeks the wheat was four inches tall. Neighbors were curious as to the type of grass I used. I told them it was a new variety just released. They were amazed at its thickness, the beautiful rich, green color, and the speed with which it grew. Towards the end of July people going past would say: "Hi! Farmer, why don't you bring in your sheep?"

The neighbors couldn't be fooled much longer especially, in August, when the wheat started to head out. The mystery was over. The wheat was allowed to grow until the kernel started to harden. At this stage it was cut down with a lawn mower. The lawn mower cut up the wheat very well and thus gave a wonderful straw mulch of about two inches over the lot; actually the growth was mowed twice. This straw mulch was worked into the soil several times with a tiller.

In September, 1964, fall rye was sown thickly and before freeze-up there was another excellent green cover over the lot. One passer-by, who had seen the first performance, asked me what the variety was this time. I told him antelope, and he said "Sure, and how big!"

The rye was green very early in the spring of 1965 and, to the dismay of the neighbors, it was necessary to cut it about the second week in May. The rye grew about eight inches before each cutting during the months of May, June and July. The idea here was not to let the rye reach the shot-blade stage. The last 8-inch cutting was mid-July. The rye was then allowed to grow until the end of August; it was over 2½ feet high and all headed out. This was cut with the lawn mower and worked into the soil with a tiller. An application of rotted manure (approximately three tons to the 5,000

square feet) was added. The lot was then tilled several times, and by September 1, 1965, the lawn was ready for seeding the grass. The lot was raked level with a hand rake and then packed with a roller.

The grass seed, a mixture of 20% Kentucky Blue (Park), 30% Kentucky Blue and 50% Creeping Red Fescue, was sown with a standard lawn seeder in three different directions to get good uniform coverage. The rate was one pound per 200 square feet. The lawn was not packed after seeding; the grass seed was covered by using a garden rake. Moist, warm weather, with the aid of watering, brought the grass on quickly and before freeze-up it was about two to 2½ inches in height.

The grass survived the winter of 1965 exceptionally well. The good snow cover and the excellent fall growth were contributing factors. By early June, 1966, the lawn was cut for the first time. The grass has been cut regularly to about 2½ inches in height and the clippings have been left on the lawn. Annual weeds were quite thick the first year and in the summer of 1966. Some pulling by hand was done but in the main the weeds were either smothered out by the grass or killed by repeated mowing.

The lawn did not receive any special treatment or dressing during the 1966 growing season, was not mowed after September 15, 1966, and went into the winter with a good growth. The winter of 1966 saw the lawn well covered with 2½ to three feet of snow. The snow is ridged each winter to catch more snow when drifting occurs. The lawn has not been treated for snow mold and so far none has been in evidence. An even growth has been maintained and no bare or thin patches have occurred.

The lawn has done very well this past summer (1967). It has been mowed regularly, and at no time were the clippings more than 1½ inches long. A dressing of ammonium-nitrate-phosphate 27-14-0, at the rate of five pounds per 1,000 square feet, was applied around the middle of May, 1967. The lawn was not watered until after the fertilizer was applied and then only watered twice during the month of June. July and August were dry months; watering was done once every ten days. I believe that repeated watering is not necessary for a lawn and it does little to develop a good root system. The lawn was treated twice this past summer with 2,4-D to control dandelions.

In my judgment the lawn has done very well when one considers this is only the second full season of growth. It has remained healthy; has thickened exceptionally well; and has withstood the dry, hot summer we had in Saskatoon this year.

The cultural practices in the preparation of the lawn prior to seeding, in my opinion, were in the most part responsible for the type of lawn I now have. The practice of seeding a new lawn too quickly before the soil is properly prepared is much too common. Do not be in a hurry to seed a new lawn!

Incorporation of the crop growth in the soil and the final preparation of the seed bed gave the soil more body and thus allowed for better penetration by the root systems and therefore more drought resistance. I feel that a new-home owner should not be in a hurry to plant his lawn. I would recommend the use of annual cereal crops to improve the soil texture rather than growing potatoes. You get more humus; the lot is well covered; no mud is tracked into the house; and the grass is more attractive.

The preparation of one seed bed, following the method used for this lawn, is not sufficient evidence to recommend it to all prospective new-home owners. But, if you wish to arouse the curiosity of your neighbors and have a good lawn in two years' time, I strongly recommend that you give it a try. Then, too, you can raise sheep to help pay your taxes.

In Praise of Annuals

By DONALD E. FIDDLER, O.D.H.

Florist, City of Winnipeg Parks and Recreation Department, Manitoba

If flower beds are to be gay and interesting throughout the summer and on into the first frosts, the home gardener will have to rely to a great extent upon annuals. Unlike plantings of a more permanent nature, annuals, once they come into bloom, will give continuing color until the end of the season, and it is toward this end that we employ these plants in summer bedding.

The factor which is not present in permanent plantings is hot, strong color, and this lack can be made up with the use of certain annuals. It may involve the free mixing of many varieties of plants, or the careful use of a limited number of varieties, but in either case the key word is color.

Most people, I do not doubt, will get greater pleasure from the creation of their own arrangements, and the basis of all good bedding is experiment. The reluctance of many to make a mistake leads to sterility of ideas and inevitably to monotony. The principal difficulty in creating new bedding plans is to produce an original idea.

It is open to doubt whether we all see color alike, and so it is unlikely whether we all will agree on any one mixture, but, if it pleases the owner in his own garden, it has served its prime purpose. Keep new ideas coming along and your garden is likely to be a fertile source of pleasure to you and your friends. For those who prefer their effects ready-made an observant eye will reveal a wealth of material all around. Your neighbor's garden, and the public parks, are the most informative.

In the following paragraphs, I will outline the main factors governing the culture of annuals, with particular attention to color blending by species and varieties.

Management of Flower Beds

Usually we have to garden in anything but an ideal medium which, in my opinion, is a clayey loam sufficiently sandy not to be sticky. Lacking the ideal, a light soil is to be preferred to a heavy one as it is warmer earlier and more easily cultivated. If a heavy soil is to be dealt with, then it must be cultivated in suitable weather, working in material which will make it more porous, namely, compost, decayed leaves, sand, turface, or peat moss.

Deep cultivation pays in the flower bed, as in every other part of the garden, in ensuring a depth of good soil, easy for root penetration. Having laid the foundation for good plant growth, you will reduce the bad effects of drought and will cut down the need for frequent watering.

Purchase of Plants

Though many people having the aid of a sunroom, or a small cold frame, will grow their own plants, many, without facilities, have to purchase their bedding plants. Attention to the following simple rules will prevent many disappointments:

Do not buy too early. To be safe from late frosts delay purchase with the object of planting after June 1. The number of plants in most flats varies from 48 to 96, therefore choose plants from flats with the lower number, as obviously they have had more room in which to develop and are less likely to receive a check when planted.

The plants themselves should be young, healthy, dark green and short-jointed; usually they should have been topped to encourage strong basal

growth. Avoid plants which are thin, spindly, and already in flower. When buying plants use a reliable supplier who has a reputation to maintain.

Planting of Beds

Having prepared the beds properly and grown, or bought, good plants, it remains to plant them to the best advantage. If accent plants are to be used they should be set out first. In small beds, they should be placed singly; in larger beds, they should be grouped in threes or fives, for "weight."

Mathematical distribution should be avoided as a rule to give an appearance of informality. Once the feature or accent plants are placed, the main planting goes in. If it is to be a two-color mixture, such as 20 per cent blue and 80 per cent yellow, the lesser number should always be planted first. If an edging is to be used, space should be allotted on the plan before the main carpet is completed. Water all plants thoroughly as soon as the bed is filled.

Maintenance After Planting

Day to day maintenance consists of: Attention to staking and tying. Removal of seed heads; the formation of seed tends to stop flowering. Adequate supplies of water; drought stops flowering if prolonged. Keep the hoe working.

Color: In the final analysis the proper blending of colors will be the principal factor in your bedding success, and it is important that the true color of the plant material is known. Combinations which spring from the description in a seedsman's catalogue may have unwanted results, not from wish or intent to deceive, but from the impossibility of describing color accurately in words.

Two methods of using color are: as complementary colors; as contrasting colors. I will give a few examples so that you may note what is meant.

Contrasting Color. A bed planted with an edging of Blue Ageratum, with dot plants of tall White Rocket Snaps, and a carpet of Red Petunia Dwarf Bedding. **Complementary Color.** An edging of White Alyssum, around a bed of 60 per cent Yellow Rocket Snaps, and 40 per cent of Verbena Venosa (reddish violet), interplanted. **Contrasting Color.** An edging of Petite Gold Marigold, with dot plants of Salvia Farinacia (blue) and a carpet of Verbena Crimson Bedding. **Complementary Color.** An edging of Lobelia Cambridge Blue with a carpet of Marigold Yellow Pygmy.

The foregoing has been a brief outline of the use of annuals for summer bedding. Plant them carefully and with an eye for color and form, and they will give you enjoyment every day of the summer months.

A Few Notes on Hardy Annuals

By C. W. CARLBERG

Head Gardener, Research Station, Canada Department of Agriculture
Swift Current, Saskatchewan

Hardy annuals are those which can be grown successfully from seed sown outdoors where the plants are to bloom. Included among them are many fine flowering plants; yet they are often ignored by the home gardener. They are economical to grow. A few 20-cent packages of seeds will provide thousands of plants in a wide range of type and color, with an average of 75 cents

per dozen for half-hardy annuals which must be started indoors and transplanted.

The growing of hardy annuals can provide a natural and graceful flower garden. They may not be so well adapted to formal beds and borders, but on the other hand need not be grown in a series of straight rows. When thinning the young plants, some kinds may be transplanted to form interesting plant arrangements in the garden. Hardy annuals also provide many of our best cut flowers for inside the home, and appear in great numbers at horticultural shows.

Most hardy annuals can be relied on to grow and bloom effectively if a few simple rules are followed. Mine often suffer the same fate that my carrots do; they are not thinned and are too crowded to develop into strong, vigorous plants. Date of seeding will vary with kind. For example, sweet peas and larkspur should be seeded as soon as the soil can be worked in the spring; nasturtiums and zinnias may not be seeded until after the last spring frost. Shallow is the general rule for depth of seeding, but sweet peas must be sown much deeper.

Thinning should be done when the plants are small. A good supply of water is desirable but after plants are established the soil surface should be allowed to become dry between waterings. Cultivation for control of weeds should be shallow. Fading blooms should be picked promptly as seed production saps plant energy and promotes early maturity.

The University of Saskatchewan publication *List of Flowers, Shrubs, Vines and Trees for Saskatchewan* lists 37 different kinds of hardy annuals which may be grown successfully on the Canadian prairies. A few of the more common kinds are mentioned here. The *Calendula* or *Pot Marigold* comes in shades of orange and yellow, and will perform best if seeded later than most so that full bloom comes after the peak of summer heat. *Cornflower* and *Sweet Sultan* provide variety of color and are excellent for small arrangements.

A partially shaded border of *Clarkia* in pink, red and white is most delightful; the tiny seeds will germinate readily if covered only lightly with soil. The tall *Cosmos* which became one of our Centennial plants, comes in various colors, and is useful at the back of the flower bed or to fill in where a shrub may later be planted. *California Poppies* bloom quickly, are low-growing, and make a colorful bed of orange, yellow and pink. The azalea-like flowers of *Godetia* in shades of pink are most attractive.

Strawflower is most useful as an everlasting and when cut as a loose bud or half-open bloom dries beautifully and lasts indefinitely. *Sweet Peas* are in a class by themselves and require no comment here. *Linaria*, often called baby snapdragon, is low-growing, upright and dainty. *Evening Scented Stock* is grown mainly for its fragrance. *Shirley Poppies*, single or double, are delightfully graceful with showy bloom. For edging a hot, dry location *Common Portulaca* is suggested. *Nasturtiums* do well in poor soil and the blooms are excellent for tea table decorations. The *Common Zinnia* has been much improved by plant breeders; blooms though somewhat stiff, come in a wide range of color on plants varying in height from 6 inches to 2½ feet.

It is true that many of these hardy annuals are the same kinds that our grandparents grew many years ago but it is suggested that experimenting with some of the new as well as the old varieties will bring additional pleasure to you and your neighbor.

For further information on annuals we refer you to THE PRAIRIE GARDEN: 1964 (6); 1965 (5); 1966 (2); 1967 (4).—Editor

Home Landscape Design

By M. GARRY HILDERMAN, B.L.A.

Winnipeg, Manitoba

The purpose of this article is to trace briefly the steps involved in creating a master plan for the home landscape. It is the writer's intention to show an approach for a solution to the problem rather than a specific solution. There is no single solution that will meet the needs of every family.

A master plan is a graphic description of the intended physical development of an area of land. It should permit any part to be developed alone at a separate time without the goal of a unified end product being destroyed. Relating this to the home landscape, it would enable the home owner to space the development of his landscape over a period of years, as time and funds become available, while still following a single unified theme.

The development of the master plan requires three phases: program, analysis, synthesis. Basically the program is a verbal statement of wants and needs. Relating it to the home landscape, the program may include such items as cut flower garden, outdoor dining area, children's play yard, clothes drying area, gardening tool storage, swimming pool.

As the design evolves it may be necessary to modify the program because it was either too ambitious for the space or the money available, or because site analysis suggested potentials previously not considered. The program can easily be established at a family brainstorming session where all members of the family may contribute.

Analysis. A thorough analysis must be made of both existing conditions and the proposed program, and in both cases the analysis must be quantitative and qualitative. Analysis of existing conditions should begin by drawing the outline of the property to scale and indicating on the plan at their scaled size and location all existing elements such as the house, sidewalks, trees, fences, telephone poles, etc. The plan outline of the house should include all windows and doors. Then on tracing paper overlays (to avoid cluttering the plan) the following analysis should be made:

(a) Topographical analysis showing drainage patterns of the yard, low areas, gullies, knolls, etc. (b) Neighboring properties analysis showing all elements that might have visual or physical effects on your property such as trees, adjacent fences, garbage; future developments such as roads, buildings, pleasant views and so on. (c) Climatic conditions such as predominant wind directions, areas of sun, areas of shade, areas that drift with snow and those that blow clear, areas that are protected from the wind, and so on.

Upon completion of the quantitative analysis of existing conditions a qualitative analysis of these conditions should be made, to include such observations as which trees are in good physical shape and which are not; which views are best and which one worst; and is the noise from the street a problem.

A similar qualitative and quantitative analysis should now be made of the proposed program elements. Questions to ask and answer are: What size should the proposed flower garden be? Does it need protection from the neighbor's cat? What are the best conditions for the kinds of flowers you wish to grow? How much parking area do you need? Should the parking area be accessible from the kitchen door? When the program elements have been given dimensions they should be blocked out at the same scale as the plan.

Synthesis. Now that the facts and desires have been gathered and stated, a synthesis of all the elements involved may begin. The first phase in the synthesis is to make a relation study of these elements of the plan. Use a

reciprocal process for this phase by first placing a tracing over the plan and on it locate all the elements where you believe them to work best; then refer back to the qualitative and quantitative requirements previously set down and criticize the plan keeping these aims in mind. Next, rearrange those elements that do not comply, then criticize again, repeating the process over and over. Gradually the plan will begin to take shape and the problems will diminish. The trick here is to be able to visualize in reality what you put on paper, and it is at this point that imagination and creativity play their roles.

It is during this synthesis that you will begin to realize that designing is a series of decisions and compromises, and that it is necessary to place a hierarchy of importance on the goals previously established. The master plan should be refined to a stage in which all parts of the plan can be visualized as to size, shape, material, etc. It need not show detail such as how the fence will be constructed, but only need specify that it is six feet high and is a visual barrier.

After the master plan is completed and before any part of it can be built, each part must be detailed, fences designed, and plants selected, etc. Everything must be dimensioned and located on the plan by dimensions, and all the technical problems must be solved. There are many people to answer technical questions, but few to do master planning.

What makes one design better than another? This question always concerned critics and designers. Since Roman times good design has been said to embody the characteristics of commodity, firmness and delight. Commodity is the workability of a solution. How well does it serve its purpose? Does the circulation system work? Is the patio really private?

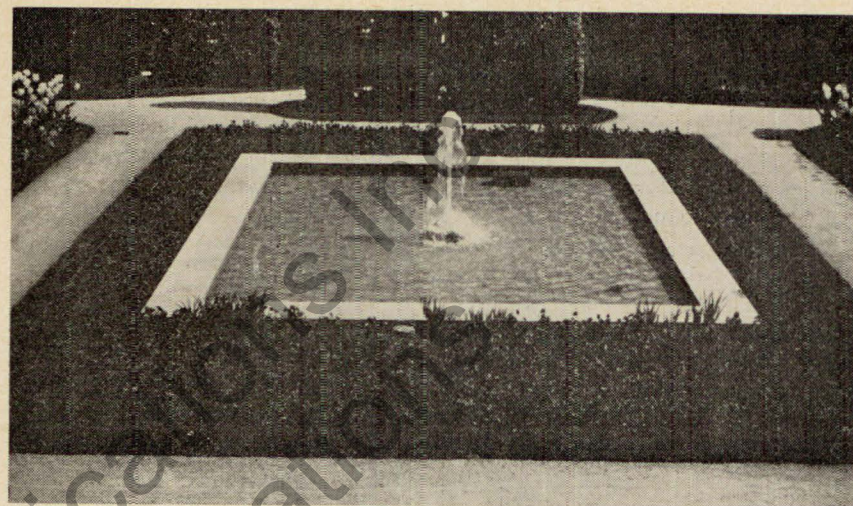
Firmness is the quality of stability of construction. Does the dry stone wall fall apart every spring? Does water stand on the walk? Does the fence lean? Delight is that mysterious "something" in good design that causes a thrill of pleasure, the feeling that something is exactly right in every way. Delight is the most difficult of the three to describe and by far the most difficult to achieve, yet without delight the design is nothing.

The home and the home landscape are areas of architecture and landscape architecture in which much freedom is left to explore the realm of delight because the functional and technical problems usually are easily solved. If that is so, then why do we continue to accept blindly the unimaginative, inappropriate and trite home and landscape layouts that are being constructed today. As the "package deal" of house and landscape becomes more popular with developers we are losing even the freedom to landscape our yards in our own unimaginative, inappropriate and trite ways.

Why must a single cut-leaf weeping birch always be centred in the front lawn? Why does all the existing native plant material have to be bulldozed down when a new house is being built? Why does more yard automatically have to mean more maintenance? Why can't some areas of grass be left unmoved? Why foundation planting? Why must subdivisions be grey?

If "why" was asked more often, perhaps our homes would be a little less bland and a little more delightful. The proverbial "why" should be asked when planning the landscape, not when mowing an acre of lawn. The home landscape need not be a burden to the home owner. If effort is made imaginatively and intelligently to solve the needs and wants of the family concerned and not merely repeat the cliché answers, the home landscape can become a welcome asset.

For further ideas on Home Landscape Planning see THE PRAIRIE GARDEN'S (still available) Do's and Don'ts in Landscaping, 1965; Planning Next Year's Garden, 1965; The Art of Shrub Arrangement, 1964; Texture in the Garden, 1964.—Editor



Design the Home Garden for Beauty and Comfort

By E. J. WALKER, M.L.A.

Director of Maintenance and Development, Wascana Center Authority
Regina, Saskatchewan

Although historical influences on present day home garden design may seem vague and disconnected, a brief statement of past garden development will indicate the source of most gardening ideas.

The original motivation in modifying the environment was to provide shelter from the elements, primitively reflected in the cave and cliff dwellings of early man. The next need was for protection from other tribes and marauding animals, achieved by using masonry and adobe walls as in the medieval castles and the African compounds. (We are still trying to prevent marauding animals in the form of neighbors' pets and children over-running our private domains. Today we use wood and wire fences, prickly plants, plus a dash of Scoot for added effect!) The final motivation effecting the environment has been to achieve beauty and comfort in our gardens.

In the development of all lands and communities, exploration had to come; then the initial surge of resource exploitation had to pass; and finally with a semblance of settlement and stability, with less time and physical effort needed to provide basic necessities, we can take time to look for and surround ourselves with things of beauty.

When and where did the different features of beauty in today's gardens originate? In the Western civilization we can look first to the Egyptians who revered trees, loved flowers and introduced the large treed park. They showed appreciation for fine trees because of a lack of them in their land, a situation not too far removed from many parts of the prairies.

From the Romans we inherited the culture of vegetables, annuals and roses; and gardens within courtyards each separated by clipped hedges. Architecturally, this Roman court-type of city house gave shelter, protection and beauty. The garden was in the middle, offering views from all rooms of the house. Sculpture and topiary highlighted these indoor spaces.

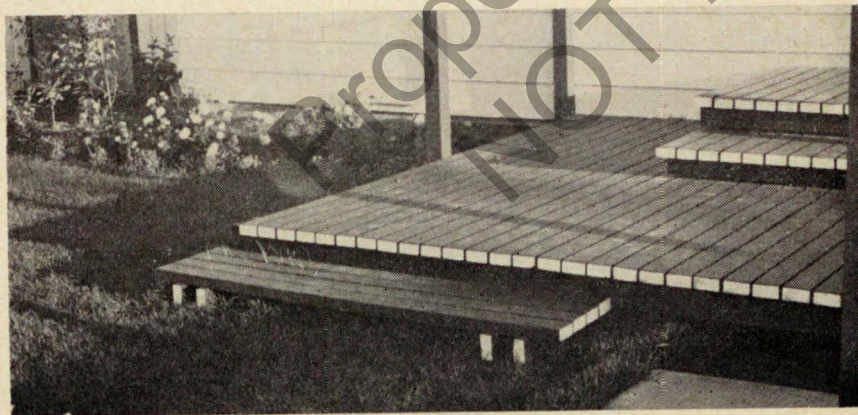
Our cold winters should promote the introduction of more controlled environment gardens within the house walls. The court-type house of the Mediterranean Sea and mild climate areas has not passed the "sun room" stage in most Western Canadian houses. The contemporary *atrium* house, periodically resurrected by the architectural profession, with minor adjustments, could show great promise by expressing the sun room or greenhouse function in a location and prominence that should warm the heart of the horticulturally inclined.

In other parts of North Africa and in Spain, the climate of hot sun and blowing sand led to masterful use of screens for both function and decoration. Water was used for cooling, sound and movement. Because of the climate, cool colors were added. Trees and shrubs were skillfully positioned to be silhouetted against grill works where the beauty of their structure, shadow pattern and shade could be appreciated. Plants were introduced for fragrance. There is much to learn and adapt from the gardens of the Moorish people.

From France came new concepts in uses of water in fountains, reflecting pools and water staircases. Excessive control appeared in the parterres and rigid geometric forms of French garden design. In its original use it was a style to impress grandly and to me it is not adaptable scalewise, for contemporary urban properties. The English country gardens reversed the trend, with informal grouping of trees in large areas of turf, and little harshness. Climate and the existing topography supported this approach. Adoptable contributions were the development and use of more kinds of shrubs, perennials and other plant material.

That briefly will give an indication of the origin of the garden elements most common to us. Today, the reasons for landscaping the residential property vary. Hopefully there are real personal expression and satisfaction from it. In some cases an unconscious and often begrudged sense of neighborhood obligation promotes the activity. If the latter is the case plan initially for a low maintenance.

A word of advice if you have recently purchased a new house or are renovating an older property. Before digging holes and pouring concrete patios all over your property, I suggest that the home owner sit down and determine his garden needs. Analyze the family outdoor space requirement before relating it to the shape of the site or the possible cost of the project. Space should be provided for outdoor adult entertaining, children's play, work and storage areas, and horticultural pursuits. The cost can be adjusted later by the choice of materials and the rate of proceeding with the installation.



There should be more allowance for flexibility in the use of spaces as the make-up and the activities of the family are continually changing. With more holidays, higher incomes and greater ease of travel, there is a growing trend to spend less time around the home, especially during the summer months. In our colder climates, the long winters of slow plant growth, coupled with a somewhat limited list of hardy plants, would support the introduction of constructed features as an aid in providing interest in the garden. The introduction of more permanent materials is a logical step. These materials can expand the usefulness and pleasure derived from the property, and at the same time reduce the work involved to obtain a striking garden picture.

Properly selected forms of wood, masonry and metal can achieve a variety of effects. For example, for an outdoor area, concrete and asphalt will give a surface able to withstand the wear and tear of active family life, is quickly usable after rain, and will help to define different use areas. Similarly, wood for screen, bench, and shade and deck structures, can be combined with plant material in developing the grounds as a year-round attraction. The initial purchase and installation costs may seem high, but to buy plant material of sufficient size to perform the same function, with subsequent maintenance and replacement, will be more expensive in the long run.

In spite of the previous statements on the use of constructed elements, the role of plants has not lessened. The application may be reduced, but the importance has grown. Let the structures aid in providing the framework and some of the physical comfort! Plant material can return to a function of being decorative. In a properly created setting, plants will soften an area yet command attention. The beauty of their individual characteristics will become more apparent. The home owner should use fewer kinds and more strategic locations that terminate views, aid in directing movement, and complement the mass and lines of the house.

Here will arise one of the points of conflict between the landscape architect and the horticulturist-plant enthusiast. The plantsman commonly wants space to enjoy and study as many different species as he can cultivate. The landscape architect more often is interested in the overall picture and tends to find horticultural collections busy and disturbing. I might add here that a lack of familiarity with many plants and their specific cultural needs, may be a fault with landscape architects. This may be reflected in an overly cautious and restricted use of many plant kinds.

Special plants of limited seasonal interest can be moved into the garden by using containers or tubs. After their contribution of flower, foliage or fragrance has been enjoyed, they can be moved to a holding area. Such plants as the native plum for spring blossom and the Amur maple for fall color could be handled in this manner. A word of caution in the use of animal statues, period urns, bird baths and other garden ornaments — they often compete with plant material and do not complement the architecture of today's homes.

There are senses, other than the visual, that our landscaping should satisfy. Greater use should be made of sound in the garden, both from a wind and a water source. Lighting can do much to raise the dramatic effect and appeal of properties as well as being an aid to circulation and in reducing vandalism.

Some points to consider in the development of the city property are: the various materials used to give a ground surface most suited to different activities; how we can frame the property; provide shelter from wind, sun and rain; and how to relate the house to the garden by using materials similar architecturally to that of the house. There are many examples where the house is red brick; handrails are wrought iron; garage is white wood; the patio floor is flagstone; the patio wall is perforated concrete block; metal

pipe roof supports and finally the patio roof covering are bright colored plastic or canvas. Too many things, shaped in too many ways! Try to pick out things of beauty in your house, some pleasing proportion of window or wall, some attractive color and textural relationships, some construction detail of interest such as steps, shutters and doors. Then carry certain of those forms and materials into the garden.

In my opinion this principle of continuity and restraint should hold in the use of plant materials in landscaping the city lot. The basic structure of the garden must be there all through the year, either created by plants or, often easier, by interesting backgrounds of fence or wall. The framework is dominant and provides the tone and setting for specialty or hobby plants.

Some Plants for the Modern Home

By ELIZABETH PARKIN

Greenhouse Supervisor, Wascana Center Authority, Regina, Saskatchewan

As architectural materials and designs have changed over the years, the porch and the wide windowsills which our mothers and grandmothers used for growing a wide variety of plants are disappearing. Now we have to find other places in the house where plants will grow successfully. Patios have become popular and it is possible to extend the outdoor landscaping into the home with large house plants such as split leaf philodendrons, oleanders or rubber plants indoors, often set in the same containers as small conifers or annual flowers.

Many present-day homes do not have large living areas, but do have large picture windows which make part of the room very bright and sunny and the other part dark and hot. So I would like to introduce two groups of plants suitable for growing in these extremes of temperature and light.

*Cacti and succulents are a large group of plants of infinite variety, which do well in sunny areas and will not suffer from the cooling effect of windows during the winter months. They must not be allowed to get so cold that they freeze but cooling in winter is beneficial. I suggest that you examine the shape and texture of these plants, consider using them in miniature gardens, as specimen pots, or to form a varied collection. There are many thousands of varieties and species in cultivation and relatively easy to obtain.

Don't feel that the prickliness of the cacti should prevent you from growing them. The large ones can be handled between two pieces of wood and the small ones by wearing rubber finger pads; just remember that all cacti have some spines even if very minute, and should be handled with care. Relatively few pests and diseases attack cacti and succulents. Mealy bug can be controlled with a small paint brush dipped in a solution of two parts water to one part methyl hydrate or by spraying with Malathion, but the latter may damage some species. Brown scale can be scraped off and the surface washed with soapy water. A corky substance sometimes forms on the leaves of some succulents, for example, the jade tree, caused by over watering and a resultant poor root system.

The second group of plants suitable for our houses are the Bromeliads. They will grow satisfactorily in the darker, dry areas of our homes. The pineapple belongs to this family but there are many varied colored and patterned leaves in this family. The leaves are thick and usually form a rosette in the centre of the plant. This holds water and the plant may be able to live on this supply for many months if none other is available.

Many of these plants are epiphytes (air-plant) and live naturally on rocks or trees, though some are terrestrials (soil-plant). The root system of the epiphytes is mainly for attaching the plant to a support; they will grow when fastened onto rock, driftwood, bark or wood, plus some sphagnum moss, and also will grow satisfactorily in pots if a suitable medium is used. Osmunda fibre used to be the standard material, but as it is difficult to obtain, a mixture of one part sphagnum moss, one part peat moss, one half part of broken clay pots and a sprinkling of broken charcoal would be suitable. This will give good drainage and should be allowed to dry a little between waterings. The cup in the centre of the plant should be kept full of water, soft water if possible but not "softened" water.

These plants may be fed monthly with a diluted solution of fertilizer recommended for house plants (at half strength). Bromeliads may be propagated by separating young plants from the base of the mature plant and potting, usually when they are six months old, but make certain there are plenty of roots before separating from the mother plant. Brown scale should be scraped and washed off as soon as seen.

Some of the varieties which grow successfully in the house are Queen's Tears (*Bilbergia Nutans*), Painted Feather (*Vriesea magnifica*) and Zebra plant (*Cryptanthus zonatus zebrinus*) but these are only a few of the many beautiful species. The flowers of many are very attractive, often red tipped with blue, and they can be encouraged to flower by bringing into the sunshine for a few months or by pouring a solution of calcium carbide into the cup about eight weeks before flowering is required (approximately ¼ oz. of calcium carbide in one quart of water but check with your supplier for the correct method of handling and mixing this chemical).

These two groups of plants suit the changing environments we live in and are well worth growing for their interest value.

*Refer Cacti and other Succulents, THE PRAIRIE GARDEN, 1967.—Editor

* * *

Consider the hammer. A good one doesn't lose its head and fly off the handle. It finds the point and drives it home. It looks at the other side and clinches the matter. Occasionally it makes a mistake, but rectifies it. It keeps pounding away until the job is done. It is the only knocker in the world that does constructive work.

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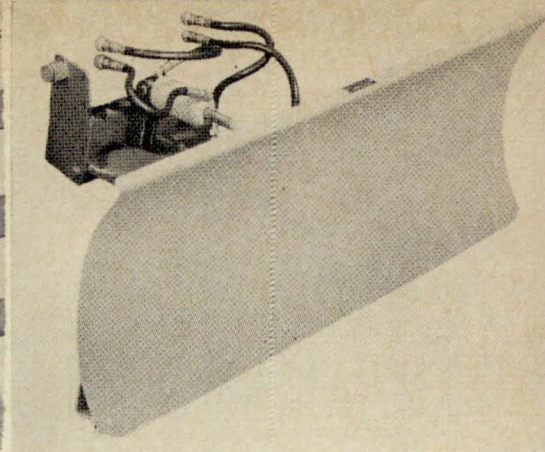
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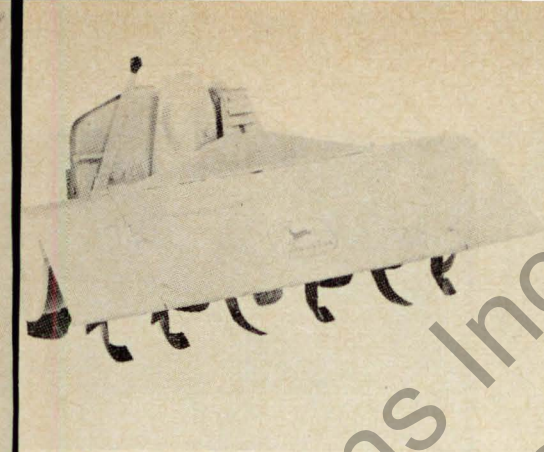
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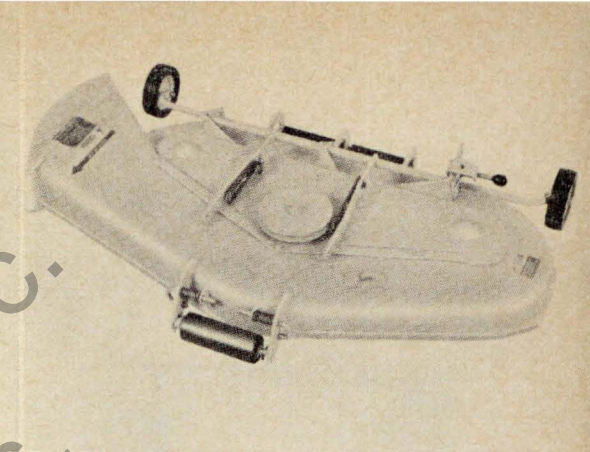
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(11) See Service Card



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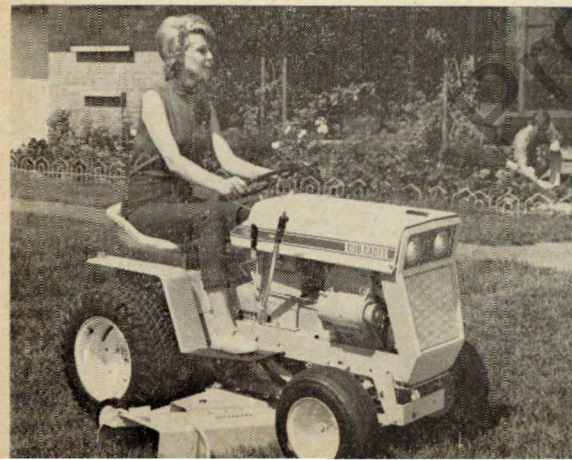
For the man with half an acre of ground or more, the Lawn and Garden Tractor, with its multitude of attachments (some fifty or more) has changed the ever recurring maintenance jobs around the larger holding from chores to fun. One man I talked to, said that not only did his tractor allow him to do all the necessary jobs around his home, to branch out into new projects, and keep his place in top shape during the summer, but that keeping his walks and driveway clear of snow during the winter was a cinch. He further stated that he actually found that driving his tractor was a form of recreation.

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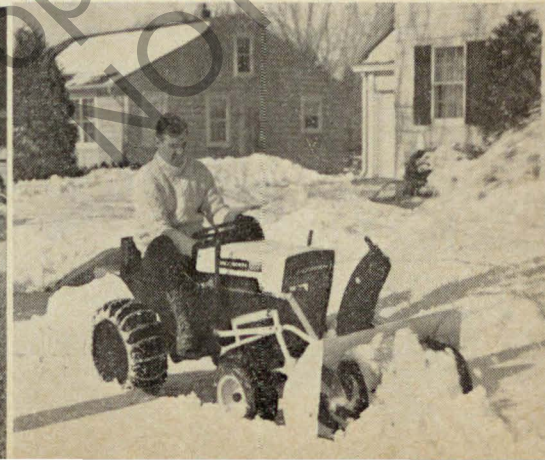
And then, when it comes to attachments, it is endless. These quick-attach implements include not only lawn mowers and snow blowers but tillers, scrapers, loaders, trailers, lawn seeders and fertilizers, lawn aerators, sweepers, foggers and sprayers to name a few.

The Lawn and Garden Tractor of today is the new Modern Genie not only for commercial maintenance but for the man with the larger holding.

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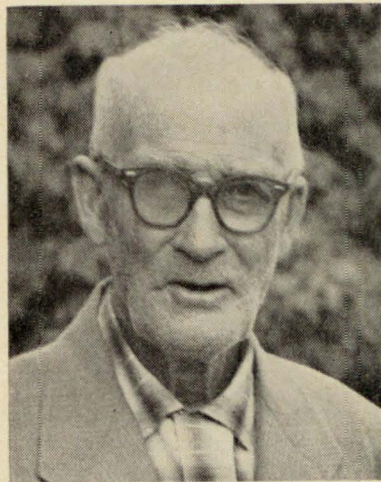
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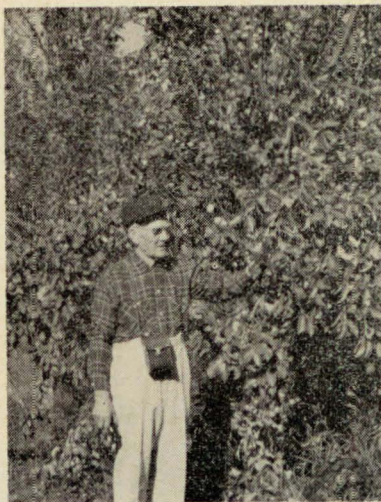


These Men Enriched Prairie Life



R. E. Marshall

W. Oakes

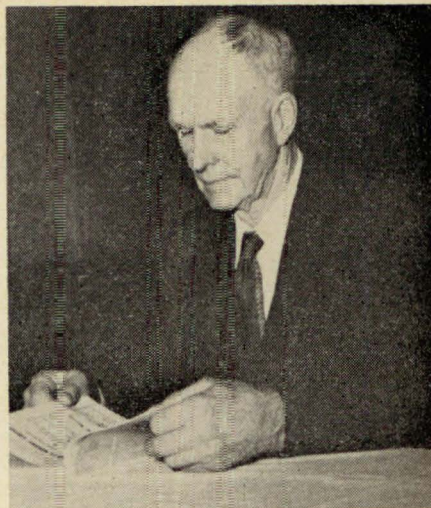


W. W. Ashley

(EDITOR'S NOTE: We were unable to obtain photograph of Mr. Ashley.)

Saskatchewan lost one of its senior horticultural workers with the death of W. W. Ashley of Saskatoon on July 21, 1967. Mr. Ashley was born at Warton, Ontario, in 1882. He came west, to Winnipeg, at the turn of the century, and then to Saskatoon in 1904. At first he was employed by the Union Bank; later he became active in the real estate and insurance field.

A pioneer in the horticultural field, Mr. Ashley planted butternuts and



F. L. Skinner

The prairie scene is deeply impoverished by the recent departures of four outstanding plantsmen and illustrious citizens. But there is no real sadness at their final leave-taking from their gardens and their throngs of friends as they had run their course, each having arrived at a ripe, mellow age. W. W. Ashley of Saskatoon was 85 years of age; William Oakes of Miami was well into his 83rd year; Robert E. Marshall of Roseisle and Miami was 87; Dr. Frank L. Skinner of Dropmore had enjoyed 85 birthdays.

Each of our treasured and enriching friends had set high standards for himself. Even as the years piled up and strength waned they settled for nothing less than continued life in the sunny, fertile prairies. While some companions of lesser fibre softened and faded off into mild countries, our four recent men were steadfast in their love for the Great Plains with the whole quota of four seasons, and indescribably glorious sunsets that closed the days which started as gentle rosy dawn sunrises, often orchestrated with liquid music piped forth by the early songbirds.

eastern maples (probably the Silver maple) on his home grounds about 1916. Perhaps because of the location near the Saskatchewan river, these trees thrived and fruited for many years. He distributed widely seedlings from these relatively uncommon species. He recognized the value, to farmers and others, of the American elm and packaged and mailed out, to interested prairie residents, more than 15,000 packages of elm seeds during the late 1920's and early 1930's. His horticultural interests covered a wide field and his enthusiasm was contagious. We note that he exhibited locally grown butternuts at the first Saskatchewan fruit show in 1944 and again at the fruit show in 1956. He served for 45 years as a member of the Saskatoon Parks Board and exerted a strong influence on park planning and tree planting in that city.

Mr. Ashley was a loyal supporter of the Saskatoon Horticultural Society and was its president in 1929. Early records indicate that he was in attendance at the first convention of the Saskatchewan horticultural societies at Saskatoon in February, 1929, and was elected first vice-president of the Saskatchewan Horticultural Societies' Association at this meeting. Later, he served as president of the association, first in 1931-1933, and again in 1947-1948. Honorary life membership in the Saskatchewan Horticultural Societies' Association was conferred on him in 1950. Mr. Ashley did much to encourage amateur and professional gardeners on the prairies for more than half a century. He will long be remembered by his many friends for his service to Saskatchewan horticulture.

William Oakes

Mr. Oakes, born near Rosebank, Manitoba, May 24, 1883, was a son of Scottish parents. His life ended on December 28, 1965. Even as a toddler he had keen interest in plants, and as a growing boy he was busy transplanting flowering plants and strawberries from the garden of nature into that of his mother.

The family doctor prescribed a sea voyage when he was 19 and during two years in Scotland he operated a fruit store. Returning home, he opened a photography studio in Morden, but soon reverted to his main interest, farming. Fancy poultry captivated him. For many years he raised and showed a number of different breeds and was an authority at exhibitions. In 1952 he offered his land and help for the introduction and preservation of Wild Gobblers.

In the late twenties he moved to his farm at the foot of the Pembina Hills, a few miles south of Miami, where he built the Glen Elm nursery, skilfully cross-bred strawberries, grew tree and berry fruits, and supported horticultural societies and garden shows. His Glenheart strawberry won wide recognition as a significant advance in hardiness combined with fine quality, and he won awards for some of his apple seedlings. He held an honorary life membership in the Manitoba Horticultural Association. A daughter, Mrs. Jeanne Penner, Sperling, writes: "Our dad was a man of many talents and a good neighbor; and had a very big green thumb as things just seemed to grow especially for him."

Robert E. Marshall

Mr. Marshall, a son of Hamilton, Ontario, was born in 1880; came to Manitoba on a harvest excursion in 1904; and after working around Miami for five years bought his farm. The land was on the lower bench of the Pembina Hills and was chosen largely because of the many fruit species growing wild on it. In clearing off the woods he carefully saved the wild plums, pincherries and Saskatoon bushes.

In 1915 he married Maud Moorhouse, thus forming a team that gained wide renown as growers of orchard fruits. At annual provincial fruit shows

they won the T. Eaton Trophy for the highest number of points received by exhibitors 13 times. He was an honorary life member of the Manitoba Horticultural Association. His service as a trustee of Eldorado School extended to 25 years. His energetic interest in growing things in the garden finds continued expression in the eldest of five sons, Henry H. Marshall, horticulturist and gardener at Brandon Research Station, Canada Department of Agriculture.

In 1967 Mr. Marshall wrote of his work: "My conscious desire to grow fruit began with a large-sized orange brought home by my father when I was about four years old. I planted the seeds in the late winter and they grew for about seven years with glossy, scented leaves but no fruit. Shortly later I planted peach stones and they did produce good fruit by the time I was 12 years old. During my teens I planted on my father's farm hundreds of fruit trees grown by the late E. D. Smith, a farmer turned nurseryman, and made a senator.

"Coming to the Miami district I felt quite at home because of the many and varied fruits growing wild here. The struggle for survival kept me from planting cultivated fruit for about 20 years. Later Mrs. Marshall and I planted a number of kinds and varieties of fruit. We got active help from other growers. The late John Wiener and Harold Orchard were unselfishly helpful. Mr. Billy Oakes was helpful in other ways. As experiment and as a hobby, I have been growing fruits really too tender for here but it is a challenge. A younger generation will be tackling fruit growing in a different and more successful way."

To quote his son Henry: "Challenge seems to have been the key word throughout his fruit growing hobby. He tested all apple introductions and many plums and other fruit varieties. He also put much time and thought into devising a method of protecting non-hardy species from winter injury. He had a considerable degree of success with grapes, climbing roses and, finally in his last three years, produced a few hundred peaches."

Frank Leith Skinner, M.B.E., LL.D., F.R.H.S.

Dr. Skinner was born at Rosehearty, Scotland, May 5, 1882. Prominent landmarks in his career were:

1895, Came to the Dropmore-Castleavery districts, Manitoba.

1900, Homesteaded and farmed with his brother William as partner.

1911, Made first collection of plants in his garden.

1918, Began introducing plants from abroad. Visited Arnold Arboretum, Boston, Mass., and acquired seeds of rare plants.

1925, Commercialized his plant work, Skinner's Nursery Limited.

1932, Awarded the first Stevenson Memorial Gold Medal at the A. P. Stevenson fruit farm, near Morden, for Conspicuous Achievement in Horticulture.

1933, Recipient of the Cory Cup from the Royal Horticultural Society for breeding his Maxwell Lily.

1937, Bronze Medal and Life Membership from the Minnesota Horticultural Society.

1943, Made a Member of the British Empire in King George VI's birthday honors.

1947, Received Honorary Doctor of Laws degree from the University of Manitoba. Made first foreign plant hunting expedition to Europe and Great Britain. Married Helen Cumming, R.N., December 1947.

1951, Life Membership from the Saskatchewan Horticultural Societies Association.

1955, Life Membership from Agricultural Institute of Canada.

1956, Life Membership and Award from the Plant Propagators Society, Department of Horticulture, Ohio State University, Columbus, Ohio.

1959, Life Membership award from the Western Canadian Society for Horticulture. Life Membership from Russell Horticultural Society.

1960, Special Citation from Roblin Chamber of Commerce.

1963, Silver Medal from International Horticultural Exhibition, Hamburg, Germany, for display of lilies.

1964, Life Membership Canadian Nursery Trades Association. Life Membership in Canadian Society for Horticultural Science. Awarded the E. H. Wilson Award by the North American Lily Society for his work in lilies and in the society (charter member and former vice-president).

Citation from the American Horticultural Society "For his lifetime of collecting, growing, studying and distributing ornamental plants adapted to the cold Prairie areas of Canada. His introductions are now at home in many gardens and his efforts to increase our knowledge of cold-resistant plants have been acclaimed on both sides of the Atlantic Ocean." Golden Boy Award from Manitoba Tourist and Convention Association "For exemplifying a way of life that helps make Manitoba a better place for all in which to live."

1967, Order of the Buffalo in February from Hon. Dufferin Roblin, Premier of Manitoba, as emblem of highest esteem by Manitobans.

1967, Sunday, August 27, Dr. Frank Skinner, at home, concluded his very fruitful career. His name will shine brightly for generations and will be a permanent part of all records of improvement in garden plants by the planning and skill of men. His book, Horticultural Horizons, Plant Breeding and Introduction at Dropmore, Manitoba, published by the Manitoba Department of Agriculture, 1966, is an inspiring as well as an informative legacy for his scores of intimate friends and a treasure for his wife, three sons and two daughters. He may well be remembered as Mr. Prairie Canada—or, more fairly, Mr. Northern Great Plains, for truly he was as admired and beloved in the nearby States as he was in the provinces.

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Electricity in the Small Greenhouse

By E. W. TOOP, Ph.D.

Division of Horticulture, University of Alberta, Edmonton, Alberta

When a person considers building a small backyard greenhouse, be it a fancy prefab unit or a home-made lean-to on the back of the house or garage, he is not likely to consider installing electricity at all, or possibly power only for the convenience of an overhead light to permit working in the greenhouse at night or showing off one's green thumb accomplishments to evening visitors. But electricity can play an extremely important role in the hobbyist's greenhouse both for utility and for convenience. Electricity can provide heat (both for the greenhouse atmosphere and for the soil in the benches, pots or flats); to sterilize soil; to operate small fans for good air circulation and ventilation; to add supplementary light for improved plant growth; and to operate automatic controls for these and other greenhouse operations.

Electricity for heating is clean, efficient, and readily adapted to automatic thermostat control. It can be relatively expensive for installation and operation, but for the small greenhouse it is definitely worth considering, particularly if power rates are in the range of 1½ to 2 cents per kilowatt. It might be noted that regardless of the heating system used a greenhouse can be expensive to operate. For every degree the greenhouse must be heated over the temperature outside, heating costs mount rapidly. Usually it costs about twice as much to heat a greenhouse to 60°F. at night as to heat it to 50°F. For this reason few amateurs keep a greenhouse in operation through the severely cold months of the prairie winter, no matter what type of heating is installed. If only cool season crops, i.e., cyclamens, carnations, spring-flowering bulbs, lettuce, radishes, etc., are grown in the greenhouse during the late fall and early spring months, and only warm-season crops such as tomatoes, green peppers, eggplants, etc., during the late spring, summer and early fall, heating costs can be reduced.

Several types of electrical heating are usable in greenhouses. Many types of portable home heaters, with or without fans, some with thermostat control, are procurable in department or hardware stores, at varying prices. Insulated heating cables similar to those for heating hotbeds can be installed in small greenhouses in much the same manner as tubular heaters. These cables consist of a heating wire surrounded by an inert mineral insulant and protected by a metal sheath. They are readily controlled by thermostats.

Other types of electric heaters may prove useful and economical in a given greenhouse. Convector unit heaters can be effective for heat distribution but must be in the open, not under benches. A hot water system of heating can be installed using a water tank with an electric immersion heater as the source of heat rather than a boiler.

Electric fan heaters also are used for greenhouse heating; some have thermostats for automatic control. They operate by blowing air over a bank of heating elements and care must be taken to ensure even distribution of heat and to prevent hot air being blown directly on the plants. Perforated plastic ducts make it possible to distribute warm air evenly throughout the greenhouse. They can be mounted overhead supported by structural cross ties or by thin wires; or at ground level around the sides of the greenhouse. The fan heater is mounted at one end of this tubing and the other end is sealed. When the fan is turned on a sufficient volume of heated air is blown

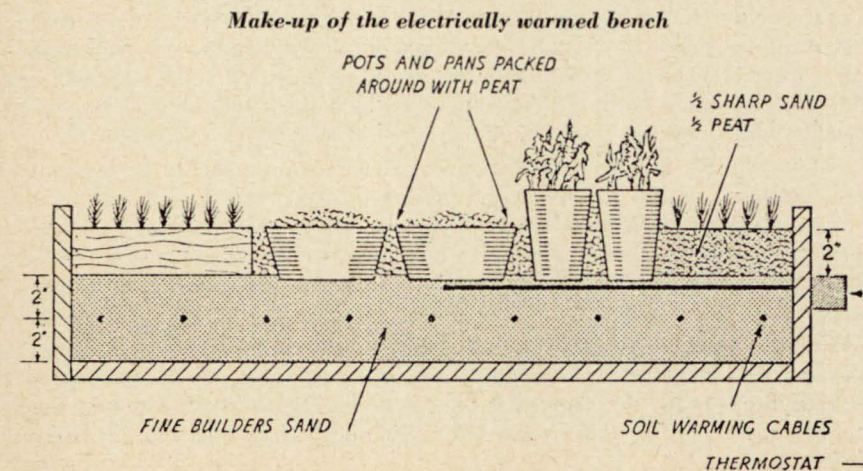
into the duct or tubing to inflate it. Judiciously placed perforations in the tubing allow this warm air to spill out throughout the greenhouse, giving an even distribution of heat. In order to have the tubing remain inflated while the heater fan is in operation it is essential that the total area of the holes or perforations not exceed the area of the fan. An advantage of this system is that in warm weather the heating element can be switched off and air drawn in from outside the greenhouse to provide cool, fresh air around the plants.

Regardless of the heating system used, it should have close automatic control, provided by thermostats. Since the thermostat is sensitive to the temperature of the air immediately surrounding, it must be set in a spot in the greenhouse where conditions are similar to those of the crop, away from heaters of any kind and screened from direct sunshine. Only a thermostat designed for greenhouse conditions should be considered, one that will stand high humidity and work within narrow limits.

Summer temperatures usually are checked with a whitewash or a shading compound on the roof, and by opening the doors and ventilators. Electric fans will keep a flow of air through the greenhouse. If passed through moist mats or pads of excelsior (aspen fiber usually) air can be cooled several degrees. The advantage is that it reduces the need for heavy shading of the glass, permitting more sunlight to enter the greenhouse without the usual rise in temperature.

The control of soil temperature usually is considered only in hotbeds or in propagating frames. For the amateur greenhouse operator it is worth considering for all his beds and benches. Most plants cultivated by the amateur gardener will tolerate air temperatures as low as 45°F. if the soil temperature is kept at 60°F. Therefore soil heating could greatly reduce the costs of heating the greenhouse itself. Moreover, this could effect an overall reduction in heating costs since it is much more efficient to heat soil with its high insulative properties than to heat the atmosphere of the greenhouse where heat is lost rapidly to the outdoors.

Electricity offers a simple way of heating soil with reliable temperature control. Heating cables of nichrome resistance wire suitably insulated and enclosed in a flexible sheath (either lead sheath or vinyl jacket) are used, and are obtainable in 60-foot lengths for use in 110-volt circuits and in 120-foot lengths for 220-volt circuits. In installing such cable in beds or benches, cinders, sand or vermiculite to a depth of two inches is laid in the bottom,



and the cable is looped back and forth at approximately seven inches between loops and four inches from the outside edges of the bench. This is covered with one inch of soil or sand, followed by a wire or hardware cloth mesh divider to prevent damage to the cable by sharp tools. An additional four or preferably six inches of soil are added if plants are to be grown directly in the bed or bench.

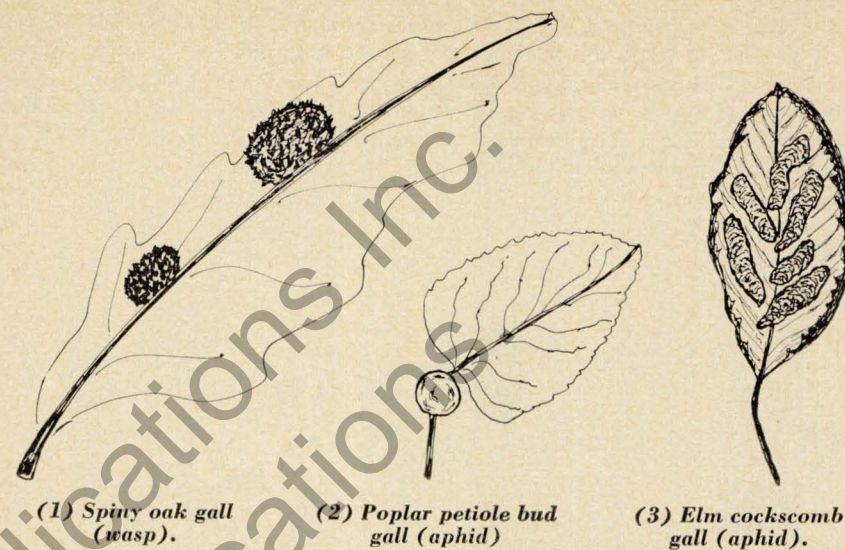
Soil sterilization or pasteurization is essential in greenhouse management, and heat treatment at 180°F. for 20 or 30 minutes is the most effective method. Units ranging in capacity from less than a bushel of soil to several bushels are available, with the smaller ones priced at less than \$100.00. These permit the rapid treatment of soil which can be used immediately afterwards, a distinct advantage over chemical treatments. These units can be used also to sterilize pots, flats and tools.

The most obvious use for electricity in a small greenhouse is to provide light, merely for convenience, to permit one to work in the greenhouse at night, or to supplement natural daylight. For those who maintain a small greenhouse during the dead of winter overhead lighting to supplement natural sunlight may be desirable; but to be of any benefit light of high intensity is required. This requires rather extensive installations which in themselves block out most of the natural light available. On the other hand, there are many plants (i.e., African violet, gloxinias, episcia, etc.) which can be raised very satisfactorily entirely under artificial light. If lights are to supplement or substitute for the low natural light of winter it would be wise to have them installed in such a way that they can be easily removed, partially removed, or shifted to permit full natural light to reach the plants when the lights are not in use.

The growth and development of many plants is affected by day length or the length of the night in relation to the day. For example, poinsettias will not produce flowers unless subjected to less than 12 hours of daylight every 24 for an uninterrupted period of several weeks. The intensity of light required to trigger such daylength responses in plants is relatively low. The amount of light from one or two 60-watt incandescent light bulbs in a small greenhouse would be sufficient. The enthusiast who works in his greenhouse for an hour or two a few nights a week could very well prevent, or at least delay, the flowering of some of his prize plants, such as the poinsettia, without realizing it. On the other hand, since these daylength or photoperiod responses are low intensity reactions, it is possible to manage in the greenhouse quite easily without having to install extensive or elaborate lighting systems. In addition to starting flowering in certain plants, many plants respond to daylength with respect of habit of growth (e.g., compact vs. open or spindly growth); formation of storage tissue (filling out of bulbs, corms, tuberous roots, etc., in plants which develop such structures); and other growth phenomena.

In conclusion, I might add that no small greenhouse should be without a few electrical outlets to enable the gardener to enjoy a favorite radio or television program on a portable set while working in the greenhouse. These outlets will prove invaluable also for power tools in the greenhouse as well. Regardless of the size or quality of the back-yard greenhouse, electricity certainly has a place in it.

Editor's Note: For more specific information relating to greenhouse structures, sources of electrical equipment, etc., we refer you to your provincial Hydro. Locally we know that the Manitoba Hydro in Winnipeg or the American Electrical Co., 925 Logan Ave., Winnipeg, Manitoba, will be happy to help you.



Have You Got a Lot of Gall?

By A. J. KOLACH, M.Sc.

Extension Entomologist, Manitoba Department of Agriculture
Winnipeg, Manitoba

Gall insects and mites are very numerous during the summer in Manitoba. They attack many species of deciduous trees and in particular oak, elm, maple, poplar and others, causing an unusual and most often a rather unsightly appearance.

Galls are caused by four major species: gall aphids, gall flies, gall wasps and gall mites. It is the act of egg laying or piercing the leaf that causes the tree to react and produce a gall. Each type of tree reacts differently to each insect and this is why so many different shapes, sizes and colors of galls are seen. Each gall can be identified readily by these characteristics. Some of the more common ones in Manitoba are:

Maple bladder-gall (mite)— These appear as granular bladderlike patches, green to rose in color on the underside of maple leaves.

Elm cockscomb gall (aphid)— These appear as raised elongated malformations on upper-leaf surfaces of elm leaves and resemble a cock's comb. Aphids feed inside the galls.

Spiny oak gall (wasp)— These appear as round projections from the mid-vein on underside of oak leaves and have short spine-like projections covering their surface.

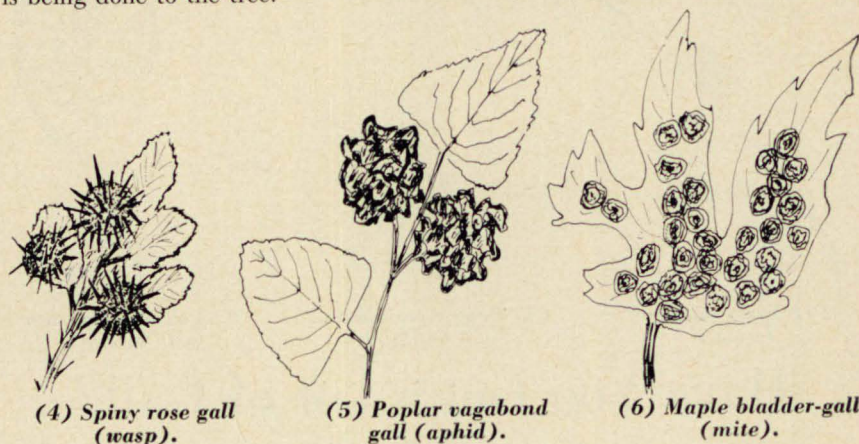
Poplar petiole bud gall (aphid)— These round, smooth or marble-shaped galls are produced on the leaf stems near the base of poplar leaves.

Poplar vagabond gall (aphid)— These insects cause poplar leaves to change into ugly, distorted, dark brown or black masses which are readily noticeable from a distance in an affected tree.

Spiny rose gall (wasp)— These appear on stems and leaves of rose plants as round projections having long, sharp spines.

In a sense, gall insects and mites "sting" the tree and thereby make the tree produce a home in which the young have both shelter and food. But the actual mechanism and reason for trees to produce galls are still somewhat of a mystery to science.

Fortunately, the gall insects and mites of Manitoba do very little actual harm to trees, but still are of concern to the average home landscaper. Some insecticides such as Malathion will control galls, but because timing of application is so critical it becomes almost impossible to apply the insecticide at the right time. Basically, it is best just to prune and burn infested leaves where possible and put up with the unsightliness, having the assurance that no harm is being done to the tree.



(4) *Spiny rose gall*
(wasp).

(5) *Poplar vagabond*
gall (aphid).

(6) *Maple bladder-gall*
(mite).

Mites and Insect Pests of Evergreens

By R. H. PATMORE, B.A.
Patmore Nurseries Ltd., Brandon, Manitoba

Mites probably are the most widely spread and the most troublesome of evergreen pests; every species of evergreen will harbor them. The rusty red mite, about the size of ground pepper, is so small that it is hard to see, but its presence can be detected by a dull, dirty brown discoloration of affected foliage and by the webbing it spins on foliage. In some plants, cedar and raspberry for example, the foliage is mottled and gray or pale green.

Mites thrive in a hot, dry atmosphere and frequent force spraying of the foliage with water helps control them. Among miticides which give very effective control, the most widely used are Aramite, Kelthane and Tedion. The last two are the most effective, Kelthane for quick results and Tedion for lasting control. Malathion is often used for control, but we have not found it effective. In fact it may even stimulate infestation by killing off insects that destroy the mites.

Mites are dormant during cool weather, but are active from late May until early September when weather conditions are favorable. In a wet summer they may almost disappear, but in a dry year such as in 1967, infestation can be severe. They suck the plant juices from the foliage and make the tree unthrifty. Spraying is done from late May to early September, following directions on the container.

Mites attack other plants as well as evergreens. Many house plants including chrysanthemums are susceptible. Raspberry plants are often affected. The same miticides can be used on these, but care must be taken when spraying raspberries to avoid making the fruit inedible.

Pine Needle Scale. Usually attacks spruce but also can affect pine and fir. It weakens the tree and makes it susceptible to other more damaging insects and to weather. Scale appears as small white spots on the needles,

often so thickly covering them that the whole affected branch may have a whitish appearance.

The scale covers and protects the active insects underneath and spraying is effective only during hatching in early June and the young move out from their protective covering; and the second week in August before the female begins egg-laying. Since hatching varies with the season the June spraying should be timed right. Keep in touch with your nearest entomological laboratory or experimental farm, or if this is not possible spray around June 1 in an early season, June 6 in a normal season, and June 15 if the season is late. If in doubt and only a small number of trees are involved, spray on all three dates. Repeat during the second week of August. Malathion is the most effective spray for this pest.

White Pine Weevil. Occasionally comes into cultivated plantings, possibly carried on trees brought in from the bush. We have seen it on spruce but have never, despite its name, seen a pine affected. It shows up as a dying back of the top of the affected tree, usually involving only the leader and the top tier of small branches. The tip of the leader will curl back like a shepherd's crook.

This insect is easily eliminated by spraying around May 1 with a solution of 25 per cent DDT emulsible concentrate in four parts of water. Wet the whole of the upper part of the tree thoroughly with it and apply also to nearby spruce that may be affected but not yet show signs. This insect usually attacks only spruce under 15 feet in height. Some varieties seem resistant. For example, we have seen Koster's blue spruce completely unaffected while Colorado spruce beside them have carried the insect for several years. If a leader is destroyed the damage can be repaired by tying a conveniently situated side branch vertically upward in its place.

Yellow-Headed Spruce Sawfly. Does its damage only in the larva stage, appearing as an inch long, yellowish-green worm with a reddish-brown head in early June and usually makes its presence known by eating off the young new needles. In severe infestations they will also eat the older needles, threatening the tree with defoliation, and in severe cases may even kill the tree. The usual result is to give the tree a ragged appearance. This pest is easily controlled by spraying thoroughly with 50 per cent wettable DDT, or with lead arsenate. Spraying must be prompt and thorough.

Leaflets on control of mites and other insect pests can be obtained by writing to the Prairie Farm Rehabilitation Administration Tree Nursery at Indian Head, Saskatchewan, or to the entomological laboratory at your province's university.

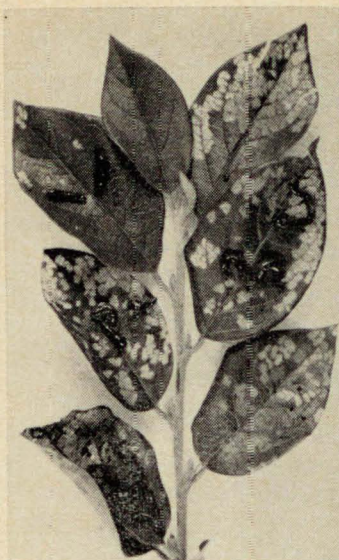
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A Pest of Cotoneaster

By M. E. TAYLOR, B.S.A.

Canada Department of Agriculture Research Station, Saskatoon, Saskatchewan

Cotoneaster with its shiny, dark green leaves in summer turning red in autumn makes an attractive hedge and is popular in prairie gardens. In recent years, however, the pleasing appearance of many hedges and specimen shrubs has been ruined by damage caused by the pear slug.

The pear slug is the larval stage of a sawfly. Besides attacking cotoneaster it will infest also pear, apple, plum, cherry, hawthorn and mountainash. In prairie gardens cotoneaster appears to be the most popular host but in West Coast orchards fruit trees have been severely defoliated.

Adult sawflies, black and about the size of houseflies, emerge from pupae that have passed the winter in the soil. They mate and lay their small, flattened eggs under the epidermis of the upper side of the leaves. The eggs hatch within two weeks and the tiny larvae begin feeding on the upper surface of the leaf. They are dark green, covered with slime, and shaped somewhat like a tadpole, giving them the appearance of slugs. When full grown, about one-half inch long, they enter the soil and change to pupae from which a second generation will arise.

The larvae or slugs feed on the epidermis of the leaves and may remove all excepting a fine network of veins (Figure). Heavily infested plants and hedges take on a brown, dead appearance. There are two generations per year on the prairies. The first brood of larvae, in June and July, fortunately is very light. The second brood, hatched from mid-August to early September, is the most abundant and destructive, and may spoil the attractive fall appearance of cotoneaster hedges.

The reason for the more abundant second generation can be explained, at least partially, by an interesting phenomenon in the life cycle of the pear slug. As noted above, the spring generation of adult sawflies must mate before laying eggs. The mid-summer generation of adults on the other hand do not have to mate. The females lay viable eggs without mating or fertilization, an occurrence called parthenogenesis.

The initial stages of infestation and injury are not too evident except on close examination. It is wise, therefore, to begin looking carefully for small larvae from mid-August onward. Light infestation often can be controlled by washing infested shrubs thoroughly with water. A spray of DDT or Malathion will give good control if required for heavier infestations.

* * *

Don't put a \$3.50 tree or shrub in a two-bit hole; especially prepare the ground well so that the transplanted stock will prosper.

Systemic Insecticides in the Home Garden

By D. L. SMITH, M.Sc.

Senior Entomologist, Extension Service, Manitoba Department of Agriculture
Winnipeg, Manitoba

During the past 20 years there have been tremendous advances in insect control. The home gardener has at his disposal a large number of excellent all-purpose insecticides which can be used safely and effectively to prevent insect damage on almost every type of plant he grows. The main key to success is the right insecticide at the right time and at the correct rate. The successful gardener makes sure that he reads the container label and is thoroughly familiar with its recommendations and restrictions.

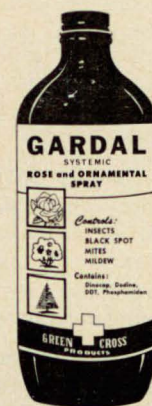
In spite of the variety of effective insecticides available, research workers continue to look for even better materials. One objective of this search has been to find effective systemic-type insecticides.

A systemic insecticide is a chemical which is absorbed and distributed throughout a plant's system in sufficient quantity to be poisonous to insects feeding on that plant. Such chemicals can enter the plant's system through the roots, bark or leaves, depending on whether the insecticide is applied to the soil, painted on, or injected into the stem or trunk, or sprayed over the entire plant.

Systemic insecticides, because they are absorbed into a plant's system, have certain advantages over the more common contact insecticides. Only insects feeding on a treated plant are affected by systemic insecticides. Pollinating insects such as honeybees, bumblebees and wasps, and predacious insects which feed on aphids, mites and other pests, are not harmed. Birds and other wild life coming in contact with plants treated with systemic insecticides also are not affected. Systemic insecticides are most effective in the control of sucking insects such as aphids and leafhoppers. Because sucking insects feed on relatively large volumes of plant sap systemic insecticides can be used at much lower rates of application than would normally be required with contact insecticides.

Weathering has little effect on systemic-type insecticides. Once they are absorbed into the plant's system, heavy rains or other weather conditions have no effect on them while on the other hand, because contact insecticides

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remain on the leaf surface they may be washed off by heavy rains or be broken down rapidly by bad weather.

At the present time there are less than a dozen systemic insecticides registered in Canada for the control of insect pests. Only two, dimethoate and phosphamidon, are readily available to the home gardener.

Dimethoate probably has been the most successful and widely used of the systemic-type insecticides. It has a large number of agricultural uses and can be used successfully in the home garden for controlling sucking insects on vegetables, fruits, ornamentals and trees. One of the most interesting uses which dimethoate has is the band-type application on certain species of trees and shrubs to control aphids, leaf hoppers, mites and leaf miners. This band can be painted on the bark and is particularly useful for very large trees which are difficult to cover completely by spraying.

The other systemic insecticide commonly available to the home gardener is phosphamidon. It has limited uses and is used mainly for the control of sucking insects on ornamentals.

The most important thing to remember about systemic insecticides is that they must be used with great care by the home gardener. Some systemic insecticides are highly toxic to some species of plants. Dimethoate, for example, is very toxic to American elm under certain conditions and can cause severe damage to these trees. Systemic insecticides should be used only on plants listed on the container label.

Storage Performance of Winter Cabbage

By D. H. DABBS, M.Sc.

University of Saskatchewan, Saskatoon, Saskatchewan

Cabbage is one of our vegetables that can be stored for at least part of the winter if suitable storage facilities are available. Conditions for relatively long-term storage are more exacting for this vegetable than they are for such others as potatoes and turnips, and few home owners can consistently provide the high humidity and near-freezing temperatures that are desirable.

Some of the newer varieties of winter cabbage can be kept in prime condition in storage for considerably longer periods than the older standard sorts and are well worth trying. Two of these are Evergreen Ballhead and Houston Evergreen. Both were tested at the University of Saskatchewan in 1966 and Houston Evergreen also in 1965. Storage has been in perforated polyethylene bags at a temperature of 34°F. to 36°F. On December 9, 1966, both varieties were exhibiting an outstandingly fresh, green color and an almost complete lack of senescent and decaying outer leaves.

This was in sharp contrast to four other varieties (Badger Ballhead, Danish Ballhead, Penn State Ballhead, Wisconsin Hollander) which showed at best a pale green color and for the most part were merely a creamy yellow. The trim wastage also was much higher in these varieties. On January 6, 1967, the varieties Evergreen Ballhead and Houston Evergreen were still fresh and green, though many of the other heads were completely unusable.

The next few years likely will see an improvement in plant uniformity within these valuable new cabbage varieties, as well as the introduction of additional varieties.

Potatoes in the Home

By G. E. STONE, M.Sc.

Potato Specialist, Manitoba Department of Agriculture, Winnipeg, Manitoba

Potatoes have been an important source of food for many years. The tubers which form under the plant are a good and inexpensive source of several nutrients required for the daily diet, and although many people believe otherwise, potatoes in themselves are not high in caloric content when compared to numerous other foods usually found on the table.

Consumption of potatoes per capita in North America was much higher 25 years ago than today, but in recent years total consumption in the fresh and processed forms has been on the rise from an all-time low of a few years ago. Perhaps potato products today can be likened to cars; they also come in many sizes, models, forms and prices. You can make your own if you have the inclination and interest, or you can purchase the product in one or more of several forms.

Fresh potatoes are available in large lots from growers or roadside stands, in smaller lots, washed or unwashed, from retail stores in bulk displays and packed in boxes or bags or wrapped in foil. Processed potatoes are available as chips, french fries, flakes, flour, au gratin, etc. Generally speaking, the greater the amount of service provided with the product, the higher the cost to the consumer. Of course, going along with this higher cost is a greater degree of convenience.

Canada's food rules say "For good health serve potatoes daily." They are an excellent source of food energy, B vitamins, riboflavin and thiamin, vitamin C and iron. In addition to being an economical and beneficial food, they can be served in a wide variety of ways. Fresh potatoes can be boiled, with jackets on or off, and served whole, mashed or riced, fried, baked with or without foil, and served plain or stuffed, barbecued, cooked with a roast of meat, escalloped, used as salads and toppings, in soups and stews. Similarly, the various processed products can be served in many ways. When reconstituting dehydrated potato products, care should be taken to follow the directions of the manufacturer carefully. This will help to bring out all the natural flavor of the product.

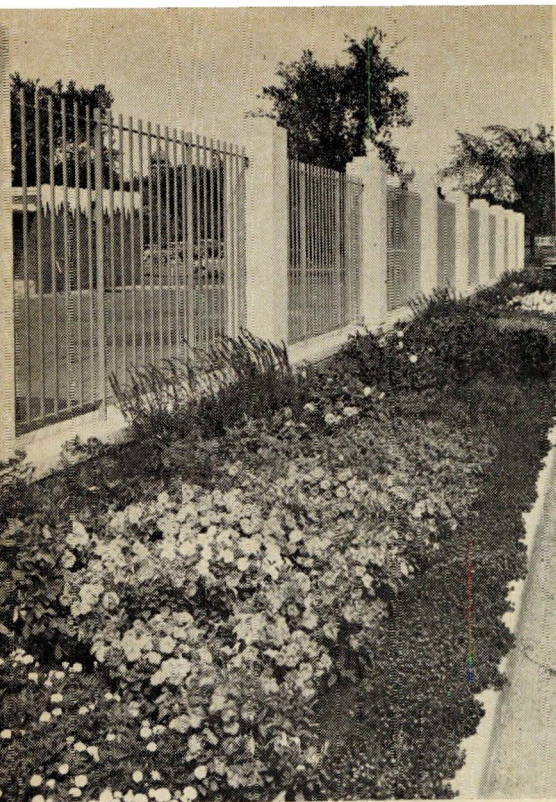
If you would like to have variety in your meals, dig out those recipe books and look under Potatoes. If your recipe books don't give a wide variety of serving this vegetable, write to Information Division, Canada Department of Agriculture, Ottawa, Canada, and ask for Potatoes, Publication 1058. This booklet has about 50 recipes for potato dishes.

Remember, one medium-sized fresh potato is no more fattening than one slice of bread or one large apple or one large orange. A potato is about one-third as fattening as one piece of cake or slice of pie. But if you are a calorie counter, beware of adding generous quantities of gravy or butter to the potatoes.

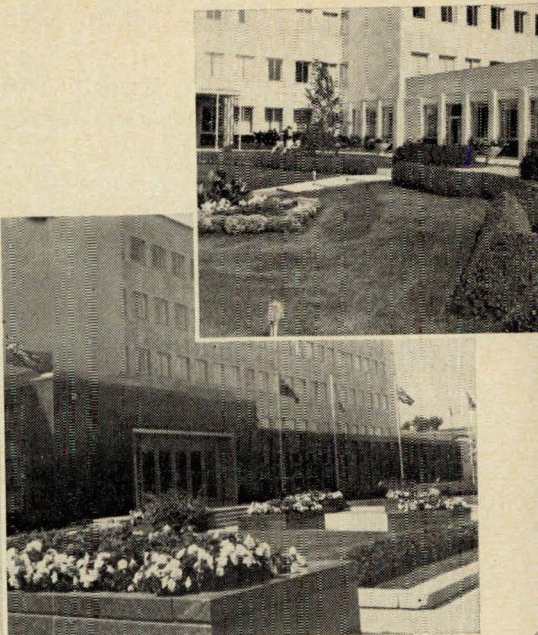
See, also, *Harvesting and Storage of Potatoes*, THE PRAIRIE GARDEN, 1965.—Editor

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At left is shown the north property in its second year of planting. Below are pictured back and front gardens featuring planters and clipped hedges.



The Great-West Life Grounds

(EDITOR'S NOTE: When you are in Winnipeg any summer, don't just drive by the Great-West Life Grounds. Park your car in the visitors' lot and enjoy this beautiful garden in the middle of the busy city.)

The head office of this well known company undoubtedly is one of the most beautiful of the modern buildings in our city. With eight acres of land, the building enjoys an extensive setting, and this spaciousness has made possible a bold planning of landscape. The building was occupied on May 19, 1959, and dedicated on June 8 following; landscaping began on May 1. Dr. W. R. Leslie, formerly superintendent of the Canada Department of Agriculture Experimental Farm, Morden, Man., has been landscape consultant for the company and created the plan of layout of the grounds.

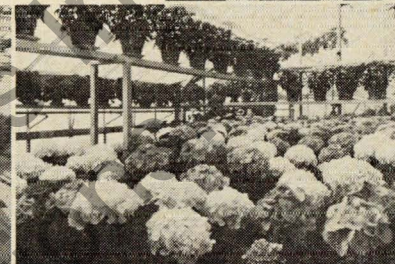
The aim in planning has been to maintain a continuing interest throughout the year in the color harmony in the grounds. Showy bark and persistent berries and fruit augment the greenery of conifers to provide a "winter garden" effect during the season of dormancy.

The land had been piled deep with stiff clay and gumbo excavated for the huge basement, and to prepare for sodding the three acres of lawn, six inches of topsoil and three inches of peat moss were spread and worked into the upper layer. Water for the grass and the flower beds is pumped from the nearby Assiniboine River through underground piping.

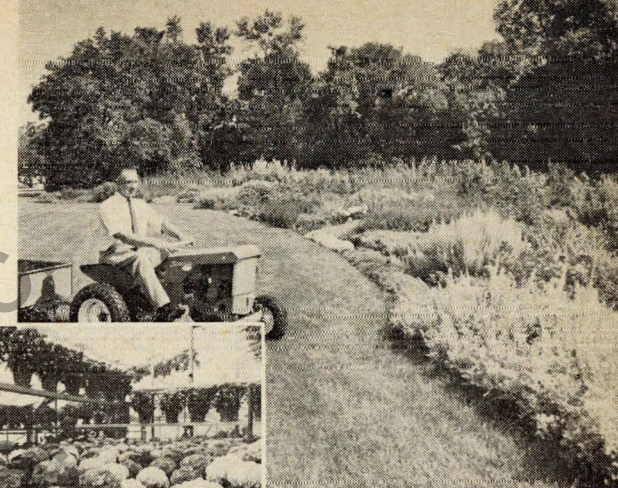
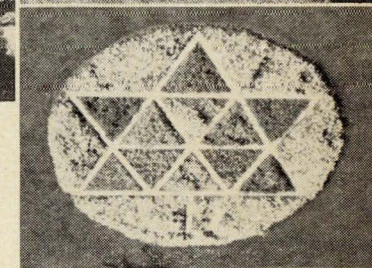
The informal garden in the rear of the building includes a formal feature—a sunken garden with a pool, a fountain, and a sculptured figure. Comfortable benches invite people to pause and enjoy an idyllic setting among flowers and distinctive shrubbery.

A feature of the main lawn is an avenue of American elm trees, planted

At right are shown riverbank flower border, the year after planting. Below are pictured the sunken garden taken from the rooftop; the conservatory with potted flowering plants ready for use in the office; and the Centennial emblem flower bed.



By JACK BOUWMAN
Head Gardener, Great-West
Life Assurance Company
Winnipeg, Manitoba



as large trees, about 25 feet high and up to eight inches in diameter, after being transported a distance of 15 miles. All lived but it is interesting to note that for the first three years they displayed but slight ambition to form new growth, having left the great proportion of their feeder roots back in their former location. But all these trees now are thriving, having overcome the heavy shock of digging, and are responding readily to annual spring feeding of ammonium phosphate.

The overall plan of the grounds follows the prairie custom of landscaping—lands of trees and shrubs here and there on stretches of grass, with plantation outlines in natural flowing lines. The tree and shrub plantings along the upper bank of the Assiniboine River are arranged in masses of color, with reds, yellows, goldens, greens, and purples of varying intensities. In front of the trees and lower woody ornamentals runs a long, curving, mixed flower border of varying depth. Perennials make up the base and main part of the herbaceous area but patches of annual flowers are added each spring to provide a maximum floral display during the height of summer. The public find the riverside plantings a source of ever changing beauty and attraction.

On the north side of the property an ornamental iron fence is partly hidden by flowering shrubs, perennial flowers, bedding plants and some vines. To westward is a screen of closely planted Siberian elm, fronted with fruit-bearing trees. Single rows of dogwood and cotoneaster act as dividers in the parking area.

The front of the building, facing eastward, is treated simply with accent trees, low shrubs, low hedges trimmed to conic form, and evergreen shrubs used with restraint at the entrances. The marble planters require special planting and extra care, and are filled afresh each spring with showy flowers and some tropicals for skyline relief.

In the formal gardens various kinds of shrubs have been tried for making dwarf clipped hedges, but the winter salting of city sidewalks and streets

has proved harmful for some species. Only Alpine currant and Claveys dwarf honeysuckle have survived.

On the boulevards a series of ovals of shrub roses, each numbering about a dozen plants, were planted. Troubles have risen from high-lime conditions and from winter-strewn salt blown on them in snow removal. Some ovals remain impressive in performance but others are now seasonal homes for flowering bedding plants.

The sight and sound of running water in the fountain-fed pool bring a special touch of charm to the overall scenery. Water imparts a feeling of magic that is strictly its own. Vines draping the latticework, and large urns adorned with select plants, skirt the sunken garden and patio, and make the grounds of this company one of the lovely resorts of Winnipeg.

As additions, celebrating the Canadian Centennial year, two features decked the frontal area, large circles filled with gay flowers. One represented the 11 triangles forming the Centennial Emblem; the other the unique design emblem of the Pan-American Games held so very successfully in Manitoba last summer.

A last word relates to the interior of the building. Foliage and special tropical plants fill the built-in planters and give freshness and brightness to the reception hall, the dining room and other indoor areas. A small conservatory supplies the building with some flowering plants.

Plants existed long before the arrival of man and are able to exist without him. But man depends upon plants and quickly perishes in their absence. It is well that we mortals enjoy the privilege of tending plants so that they perform in health, vigor and beauty.

“More than Meets the Eye”

By H. F. HARP

Canada Department of Agriculture Research Station, Morden, Manitoba

We are apt to think of the British as being old-fashioned, a bit behind the times. Perhaps they are in some things, but judging by what was seen in the British Pavilion at EXPO 1967, in Montreal, they have made a tremendous contribution to the world and are still leaders in many phases of industry and agriculture.

There have been, and still are, famous British plant collectors, research workers and plant breeders, and there have been gardeners in that green and pleasant land since gardening first began. Trees and shrubs, roses and herbaceous perennials, gathered from far away places, have been improved by plant breeding and selecting, and are now at home in the parks and gardens of England as well as in a lot of other countries. The perennial aster is only one of a number of lowly plants, taken from its native haunts, refined and returned to grace the autumn border with masses of colorful flowers.

When I visited England a few years ago, returning after 36 years absence, I was astounded at the size and efficiency of several nursery companies. At Hoddesdon in Hertfordshire, not far from London, Thomas Rochford and Sons have 22 acres of greenhouses covering the largest collection of house plants in the world. Every plant sent out from this “plant factory” carries the botanical and the common name, country of origin and a code label. Plants with pink labels are the easiest to grow; those with blue have more exacting requirements; and those carrying a yellow label are delicate, requiring warm,

draught-free rooms and special care to keep them thrifty. The plants are moved from greenhouse to shipping room by conveyor belt and there are machine-washed before being shipped. A specially packed Rochford house plant can leave London airport on Monday, and be in Sydney, Australia, by Wednesday, hardly realizing it has left home.

One of the most intriguing innovations at Rochford's is a machine for potting plants. One man with two assistants can pot 400 cyclamens in an hour. Old-time gardeners would turn in their graves!

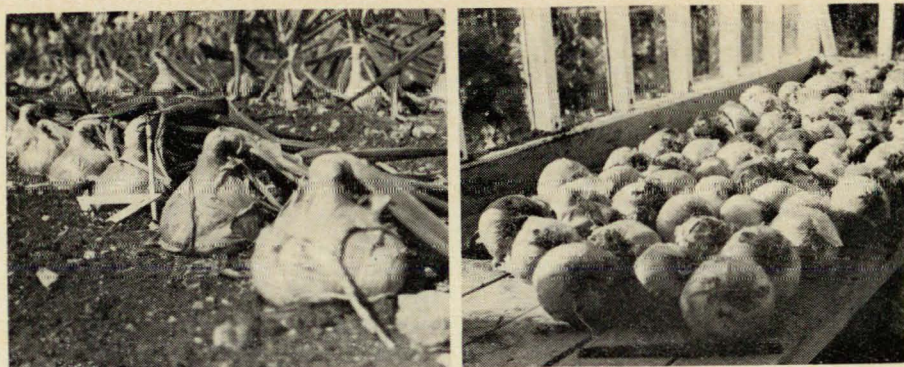
In the flat East Anglia country, Alan Bloom runs a wholesale herbaceous plant nursery where perennials are produced by the hundreds of thousands, including the Morden Pink Lythrum. And even in England I found out that running a nursery is not “all beer and skittles.” The English nurseryman is beset with the same problems as the prairie nurseryman: delays in transit, losses due to bad weather, and above all, a serious shortage of skilled help. Mr. Bloom complains that a box of perennials, shipped from his nursery, traveled at an average speed of 10 miles a day for distances of 100 to 150 miles. This slow transport turns healthy plants into material fit only for the compost pile. Alan Bloom has pioneered in the use of herbaceous perennials in bold island beds replacing annuals in parks and large gardens. A fine example is seen at his nursery and at the Royal Horticultural Society gardens, Wisley, near London.

Where man makes a garden you'll find plants from distant lands; some settle down and are fully hardy and well adapted. Others, of borderline hardiness, may survive for a time but succumb when the going gets rough.

The terrible winter of 1962-63 played havoc in English gardens. Tender pines from the Mediterranean regions, broad-leaved evergreens of one kind or another, and even hollies and the dwarf *Picea glauca albertiana conica* browned badly. Since that time Alan Bloom takes no chances with certain herbaceous plants such as the Redhot Poker (*Kniphofia*), Cardinal flower (*Lobelia cardinalis*), and other tender perennials worth protecting. A layer of straw put on in November remains until mid-March to ward off hard frost. If the winter is mild the straw serves as a mulch to keep down the winter-hardy weeds.

England has produced some great nurserymen, some great gardeners—women no less esteemed than men. Miss Ellen Wilmott and Miss Gertrude Jekyll are world renowned. Miss Wilmott was said to be beautiful, extravagant. She employed 80 gardeners on her estate at Great Warley. She was eccentric, scholarly, with a lively interest in music and painting. Miss Jekyll, who counted her a dear friend, describes her as the greatest of women gardeners. In Queen Victoria's Diamond Jubilee year she was awarded the Victoria Medal of Honor and was made a life member of the Royal Horticultural Society, serving on the Narcissus, Tulip and Lily committees. Miss Gertrude Jekyll published *Wood and Garden* in 1899, followed by *Color Schemes for the Garden* which ran to five editions.

Both these illustrious gardeners were devoted to a new and natural form of gardening, a form that was anathema to those who favored the popular ornate and highly decorative style of the Victorian era. They lived gentle, noble lives leaving a legacy of garden lore. “There are those,” says Miss Jekyll, “who do not care for music or painting; those to whom architectural refinement is an unknown language; but a love of flowers, however shallow, is a sentiment that makes for human kindness and sympathy.” Heaven knows we need this today.



Left: Crop in August nearing maximum size. Right: On the greenhouse bench, drying for winter storage. Twelve-inch ruler indicates size.

Sweet Spanish Onions

By J. R. ALMEY, B.S.A., Winnipeg, Manitoba

There is something intriguing about growing these giants of the onion family. They are not a common sight, therefore those who enjoy eating them raw or cooked find them attractive. To grow them is not difficult providing we follow closely a few basic principles.

Let us take a look at some of their main requirements. Due to the fact that they need a long growing season we have to extend our normal growing period by starting the seed early indoors, before the end of January (under fluorescent lighting or in a greenhouse). The garden soil must be in good tilth but firm. Shade from trees or buildings must be avoided. Cultivation should cease early in the season (mid-July) because their slender roots are close to the surface and spread outward from the row. No check to their growth should take place at transplanting time. Move to the garden in early spring as soon as the season permits, plant very shallow, almost merely sitting on top of the surface with their roots only below.

From the seed flat they are transplanted when about two inches high, spaced in flats 1½ to 2 inches apart. When planted to the garden they should be about the thickness of a lead pencil and well hardened off so that they can take wind and sun without injury. Remove them from the flats with as much soil adhering to the roots as possible, avoiding injury to the roots. Give them a good watering and then pull a little loose dry soil up around them so that they remain upright until their roots ably anchor them. When first hoed or weeded the soil can be leveled away from the plants.

With reference to fertilizers, the onions as shown in picture No. 1 are growing on light, gravelly soil following several crops of potatoes and gladiolus which were heavily fertilized with phosphate (0-45-0). No irrigation water was applied, and for the season 1967 practically no rain fell after July 23rd. They were harvested on September 11th. The variety was Ailsa Craig; good strains of this are hard to beat for size.

Preparation for harvesting begins when the tops are bent over, as shown in picture No. 1. The second row shows the plants still standing. Bending quickly slows up growth, while the unbent ones continue to increase in size, but may cause problems in ripening them for storage. Very few of these plants have the typical onion thin neck, therefore little natural ripening occurs.

While one risks the entry of neck rot organisms by bending over the tops, it is necessary with this type of onion. Tops usually are too thick and fleshy to twist off, so must be cut with about two inches of neck left with the bulb. They cannot be left in the field after digging. I find it is necessary to loosen the bulbs with the garden fork or they will break off, leaving part of the bulb with the root in the ground. They should be kept in a warm, well ventilated storage room or greenhouse for ten days to two weeks. Picture No. 2 shows them drying on the greenhouse bench shaded from direct sunlight. After sufficient drying the bulbs go to the basement vegetable room where the temperature is around 50°F. and will stay close to that until outdoor temperatures drop to 10 or more degrees below zero. With this outside temperature the storeroom will drop to about 32°F. The average weight is two pounds; a few go up to 2½ pounds. In the past I have met little difficulty in storing and having a few onions left over for replanting in the spring for seed purposes.

Vegetable Varieties for Northeast Saskatchewan

By R. H. ANDERSON, B.S.A.

Horticulturist, Research Station, Canada Department of Agriculture
Melfort, Saskatchewan

The climate of northeast Saskatchewan generally is favorable for the production of most horticultural crops, but the low temperatures and relatively short, though rapid, growing seasons make the choice of suitable varieties highly important. Variety testing is therefore an important phase of the vegetable work at the Melfort Research Station.

Each year about 200 varieties representing 20 different vegetables are evaluated for yield, maturity, quality and general adaptability. Every year new vegetable varieties are introduced by plant breeders and seed companies, and are tested together with some of the older varieties. The list of available and adapted varieties is extensive and only a few of the best will be listed here. Descriptive notes necessarily are brief.

Mary Washington asparagus has been the best variety and has consistently outyielded Martha Washington, Paradise and Viking in that order. Wax podded beans have improved little and the older varieties such as Round Pod Kidney wax and Cherokee are still among the best. Two good green podded varieties are Top Crop which is early, 5¼ inches long, straight and stringless, and Sprite which is mid-season, partially curved, 5½ inches long and thick. Garnet beet has an excellent dark color, is round and has a short top. Deep Cylindra and Formanova are dark red, long and slender, with top quality, and are very good slicers.

Jade Cross brussels sprouts has been much superior to any other variety in yield and quality. Cleopatra is still the favored broccoli variety and Royal Purple has been satisfactory. Several new varieties of cabbage can be added to the recommended list. Pee Wee, Junior and Little Leaguer are early, small, firm and good for summer use. Houston Evergreen, Greenback and Evergreen are late varieties, medium in size, and hold their color well in storage. The large-headed varieties are not desirable for home use except for sauerkraut.

Fifty-six varieties or strains of carrots have been tested and none have proved more adaptable to this area than the Nantes strains and Chantenay.

These have good storing qualities and excellent texture and flavor. Long-rooted varieties are not suited to the soil and result in a high percent of non-marketable roots. Dominant, Ideal and Idol Original cauliflowers are fairly new and good, the first the best tested so far.

In an 18 variety corn test in 1967, Spancross significantly outyielded all other varieties and matured as early as Dorinny. Goldmine, a medium early and good-quality corn, was the highest yielder in 1965 and 1966. Other recommended varieties are Earliking and Golden Beauty. Ten varieties of cucumber were in test in 1967 and Supercrop significantly outyielded all others. It is a hybrid and good both for pickling and for slicing. Other varieties with slightly lower yield but well adapted to the area are Morden Morecrop, Spartan Dawn and Straight 8.

Best results with head lettuce have been obtained from transplants, especially during dry seasons when seeding directly in the garden has been unsuccessful. Butter King has been the best butterhead type and Imperial 456 and Pennlake have been good crisp head varieties. Muskmelon and watermelons seldom mature in this area without special care. Honey Rock and Wheatcity muskmelon and New Hampshire Midget watermelon will mature good quality fruit when clear plastic film is used as a mulch or as a cloche.

Direct garden-seeded onions seldom produce satisfactory bulbs. Transplant onions develop satisfactorily and mature good-sized bulbs. Utah Sweet Spanish and Riverside Sweet Spanish consistently produce larger bulbs than any other variety, but do not keep as long in storage as some of the smaller though firmer bulbs obtained from varieties Fiesta, Autumn Spice and Brown Beauty. Onward, Wando and Perfection W.R. pea varieties produced the highest yields in 1967. Onward, Stratagem, World's Record and Tasty Freeze have been top yielders of shelled peas over a 5-year period. Lincoln has been the best medium early-maturing variety.

Norland and Warba potatoes are recommended for early use, Norland also for storage although some years it produces a dark product when cooked. Netted Gem does very well in many districts most years; some years it does not mature properly.

The older squash and pumpkin varieties with strong vining growth require a lot of garden space, a habit not liked by the home gardener; bush types are available now. A squash variety named Bush Type Buttercup was tried in 1967 but turned out to have a vining habit. Gold Nugget is a good bush variety. In pumpkins the variety Sugar is still recommended, but if space is limited Cheyenne Bush should be grown. Many varieties of rhubarb have been tested but only three have proved quite resistant to red leaf disease, MacDonald, Early Sunrise and Canada Red. All have well colored flesh, are heavy yielders and of excellent quality.

The tomato is one of the most important vegetables grown in the area and one of the most difficult to grow. A variety that has the ability to set fruit under cool conditions and will mature early, is required. Our present varieties do not have all the desirable characteristics desired and the performance of the varieties vary from year to year. Several varieties that have fairly consistently produced fair to good yields of field-ripened fruits are in order of preference: Swift, Meteor, Mustang, Bush Beefsteak and Scotia. All are determinate types.

We refer you to vegetable articles in previous PRAIRIE GARDENS as follows: 1964 (3); 1965 (6); 1966 (1); 1967 (2).—Editor

Fall Planting of Certain Vegetables

By JAMES ROBINSON
Regina, Saskatchewan

The winter is long. The snow is deep. And underneath the snow, small, fine seeds lie dormant, waiting for the snow to melt and the ground to thaw and warm.

What seeds are we writing about? Those that fell from the ripened seed pods in late autumn? Or the annual weed seeds that have an unfailing knack of reproducing themselves? No! We are referring to those garden seeds we purposely sowed in the fall. Fall sowing of certain seeds is a realistic project, and a very rewarding one. In addition to stimulating interest, early maturity also is an attraction.

The required seeds are purchased early so that they are on hand when needed. The soil is dug and raked after the current crop has been harvested. You wait until your ears are chilly and your nose is moist, at the same time keeping posted through the nearest meteorological station for weather forecasts on the possibility of heavy snow. Having the weather cold and the soil dry is the desired aim. Germination is to be strictly avoided.

Experience has shown that the seeds for fall sowing should be covered somewhat more than for normal spring sowing. That is, if you sow seeds one inch deep in the spring, then sow an inch and a half deep in the fall. The same requirement applies to the quantity of seeds sown. Thus, if one ounce is sown in the spring, then an ounce and a half are recommended for the fall. Precise measurement is not an essential, but it simply means that for fall sowing you should increase somewhat the quantity of seed used and the depth at which it is sown. Avoid old and leftover seed.

Make sure that the rows are marked not only for location but also for seed variety. This enables you to observe progress in the spring; and should there be some climatic reason for poor germination it will be obvious where to resow. Before the normal spring sowing time has arrived, you will know whether your efforts have borne fruit or not. If unsuccessful, your loss is only the seed.

Does fall planting ever fail? Over a 19-year period, two years could be classed as failures, and two as half failures. Can anything be grown? No! Beans, tomatoes, squash, cucumbers and such like obviously are not for fall sowing. Peas seem to rot before it is warm enough for germination. Those that can reasonably be expected to germinate are carrots, beets, parsnips, lettuce, broccoli, Swiss chard and dills.

Sow (broadcast) the seed of carrots, beets and parsnips in rows six to eight inches wide, 15 to 18 inches apart. This permits thinning and use when the carrots are pencil-thick, and beets the size of large marbles; and still leave sufficient plants to grow to maturity in the rows.

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Extending the Season of Garden-Picked Corn and Tomatoes

By CHARLES WALKOF, Ph.D.

Canada Department of Agriculture Research Station, Morden, Manitoba

In our short summer seasons the delight and pleasure of eating vegetables within minutes of harvesting them are much too brief. Therefore, to be available for a longer time it is essential to provide means whereby they can be kept in relatively good condition after harvesting. Some vegetables can be frozen and others can be held fresh in special storage conditions and still retain a fair degree of good eating quality.

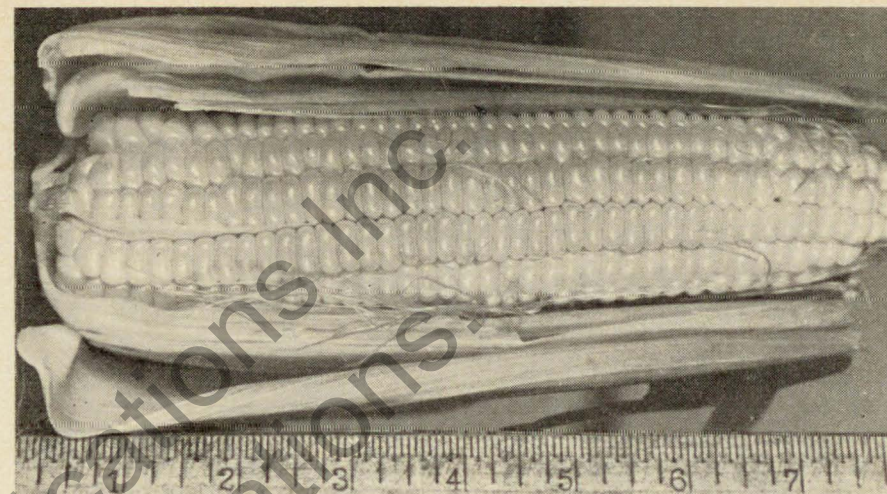
Among the vegetables that are generally popular and which seem to be available in a fresh condition for only a brief period in the summer are, in particular, sweet corn and tomatoes. Both vegetables can be frozen and this helps to make them available for a longer period. The freezing process should be rapid, especially for tomatoes. Their use after thawing is restricted to salads and soup preparations.

Sweet corn frequently is frozen on the cob or with the kernels cut off. But few gardeners know that corn will be delicious two or three weeks after it is harvested when it is frozen intact in the husk. The kernels should be of a light, creamy consistency when the ears are harvested and the whole ear is frozen without removing the husk. This method is good only for a maximum of three weeks although some reports claim that the ears have been good when cooked after they had been frozen four to five weeks.

Sweet corn ears frozen this way are particularly good for roasting in an outdoor barbecue pit. Actually, freshly picked ears of corn can be prepared in the same way and the result is a most delicious meal. The secret for success is to leave the husks intact, just the way the ears come off the corn plant, and then bury them in the hot embers of the barbecue pit. It is very

At left: A promising, firm-fruited well colored tomato with favorable acidity for ripening indoors. One of the better Morden strains. Seed is not yet available for distribution.

Below: Mustang, the first bush F₁ hybrid tomato to be introduced for home gardens, from Morden, is still one of the best types for ripening indoors.



A heavy husk around the ear of sweet corn, such as in the Sugar Prince hybrid, is desirable when roasting the ears in the glowing embers of a barbecue pit.

important to have the corn ears under and completely covered with a heavy layer of red hot embers. In 20 to 30 minutes the corn is ready for eating.

Tomato plants often have large quantities of green tomatoes when fall frosts terminate their harvest. It has been a common practise to put some of these green tomatoes in a cool place to ripen gradually and thereby produce ripe fruit for several weeks in the fall. This is not always successful due to the use of varieties that are unsuited for the purpose and to inadequate storage for the green tomatoes.

Tomatoes must be firm-fruited to keep well when they are ripened indoors. When lying in boxes or on a floor the weight of the tomato causes the underside of the fruit to flatten and this may be the first place it begins to deteriorate and rot. Wrapping tomatoes individually with paper or clean rags helps to cushion them and thus prevent softening. However, the best tomatoes for ripening indoors are those naturally firm such as is typical of the varieties Starfire, Manitoba and Fireball.

A tomato that is low in acid seldom ripens well indoors. The natural acidity of the fruit is an important aid to prevent molds and bacterial rots developing. Accordingly varieties known to have desirable acidity, such as Starfire and Fireball, are particularly adapted for indoor ripening. In addition to its germicidal properties, acidity contributes also to the developing of flavor in tomatoes. Bland or low acid tomatoes seldom have the rich and aromatic flavor typical of this vegetable. Our reference to high acidity does not involve sourness or a sharp tanginess which may make fruit distasteful.

Color is a most important characteristic of a good tomato. A pale or inferior color may be associated with poor flavor in the minds of people. Therefore a variety with a rich red color which is retained to a high degree when tomatoes ripen in the dark, such as the Starfire variety, are particularly useful for ripening indoors.

Research now in progress at the Morden Research Station involves the breeding of tomato varieties that have the necessary requirements for ripening satisfactorily indoors. Such varieties must be firm, contain a satisfactory acid content, and possess color which will develop a rich red pigment in the dark. Several promising breeding strains are being tested although further

improvement may be needed. The objective of this work is to produce a tomato which will remain in good condition for several months in a temperature of 50°F. to 55°F. and then ripen into a satisfactory product for table use. Thus field grown tomatoes produced in the Prairie Provinces and ripened in storage some day may be available in November and possibly even later.

Perennial Vegetables on the Prairies

By **BERT SANDERCOCK, M.Sc.**

Horticulturist, Vegetable Crops, Manitoba Department of Agriculture
Winnipeg, Manitoba

Perennial vegetable crops in the home garden have received very little recognition but over the years they have provided a delightful change to the too often standard meal which included carrots, beans, peas or corn. They are the first to show above ground in the spring, and as such give proof that spring is well on its way and summer just around the corner.

There are few vegetables whose eating quality can equal that full-bodied flavor of young, tender, creamed asparagus tips on toast for lunch or with roast beef for dinner. Rhubarb served as a rich, wine-colored sauce also is an item of keen delight. The fresh product straight from the garden provides the children with a cherished moment on a bright spring day as they pause for a rest from their strenuous play. There are few of us who can not recall the sight of a small child with a little jar of sugar in one hand and munching from a long stalk of crisp red rhubarb held in the other. Rhubarb has a rich, tangy flavor which is enjoyed in many forms; the number is limited only by one's imagination and culinary desires.

Asparagus and rhubarb are the two most commonly known perennial vegetables in the prairie provinces but chives, perennial onions and horseradish also are well known to many home gardeners. The artichoke is enjoyed by numerous households but is not hardy enough to survive the severe winter weather so common to the prairie regions.

Asparagus. Although asparagus can be grown on a variety of soils, fertile, well drained loam type soils are preferred. The matter of location is important as this crop, once established, will remain for many years. The most popular variety is Mary Washington.

To establish an asparagus bed, one year old roots grown from seed should be transplanted early in the spring. The most satisfactory growth over the years will be obtained if the roots are placed in a trench six to eight inches deep, the buds facing up and covered with one to 1½ inches of soil. As the plants begin to grow, more soil can be worked into the furrow. Roots 18 to 24 inches apart in rows four to five feet wide will give excellent production over time. Some cutting is permitted after two seasons of full growth but excessive and thoughtless cutting may cause permanent injury. Cutting during any season should terminate by the end of June. This will give the plant an opportunity to replenish its food supply in the roots for next year's crop.

Weeds are the most serious problem in growing this crop, and can be controlled fairly adequately by a thorough working of the bed just as the first spears appear in the spring and following the last harvest in late June. Working the soil right over the row will not hurt the plant in either case as long as the cultivation is not so deep as to damage the roots (not deeper than four inches).

Asparagus roots are heavy feeders and good responses have been obtained with the addition of two cups of 27-14-0 or a similar fertilizer per 100 square feet, broadcast before the final cultivation in late June.

Rhubarb. As with asparagus, rhubarb may be grown on a wide range of soils but does best on rich, well drained loams. Where earliness is important, sandy loams are preferred.

Rhubarb is generally propagated by division of the crowns; each division should have a strong, vigorous bud. Two to four divisions are sufficient to produce enough stalks for the average family. The divisions are planted with buds approximately two inches below the soil surface. The distance between plants varies between two and four feet. The most popular variety for the prairie region is McDonald, but other varieties, such as Valentine and Red Canada, have produced satisfactorily. Divisions of these varieties can be purchased in the spring at most garden centres.

Rhubarb requires large quantities of nutrients for optimum growth, applied as well rotted manure or as chemical fertilizer. Two cups of a fertilizer such as 23-23-0 broadcast over an area of 100 square feet will give satisfactory growth. First harvesting may come during the second year but generally a full harvest is delayed until the third year. In harvesting the stalks should be pulled, not cut. When plants become crowded and the stalks extremely small, new plants should be set out and the old beds destroyed.

Chives(cive). This hardy perennial is found in many family gardens. The small leaves are hollow and somewhat grasslike, and at the base thicken to a slight bulbous enlargement. The leaves are cut as needed for seasoning. The chive plants generally are started from seed and after that propagation is by division of the clumps. The plant is a perennial but it is a good idea to take up the clumps and replant every few years. The culture and general care of chives is similar to that of onions. Clumps may be taken up and potted in the fall for growing on the kitchen window during the winter.

Perennial Onions. These onions generally are listed as White Welsh bunching onions in seed catalogues. They are perfectly hardy and grow as clumps of plants slightly enlarged at the base. The plants may be propagated by division or seed. The most common method is to sow the seed in the summer for the production of early spring bunching onions. Cultural requirements are similar to those of onions.

Horseradish. This plant may be found growing along fences and walks in many farm gardens. It responds well to a deep, rich, loamy soil which has an adequate supply of moisture. The plant is propagated from root cuttings from the side roots of a mature plant. These are planted in a deep furrow which allows the cuttings to be set to three to four inches below soil surface. Spacing should be 10 to 15 inches within the row. Planting usually is done in the spring to give the crop a full season's growth.

The crop is hardy and the roots may be left in the ground all winter, but it is better to dig them in the fall so that they are available when wanted. They may be stored under conditions similar to that for other root crops. Care should be taken to prevent the roots from withering.

Perennial vegetables, if in a suitable area of the garden so that they may be properly cared for, can add an interesting and delightful addition to your daily vegetable menu.

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Growing Raspberries in Regina

By N. E. HUSTON
Regina, Saskatchewan

Money will buy most things, but it will not buy one of the greatest luxuries available to prairie people—fresh, high-quality strawberries and raspberries on the table all summer and in the freezer for the rest of the year.

I have been growing berries in Regina for about 20 years; it has taken me most of that time to learn how. Our cold soil and dry summers are far from ideal for growing berries; but if you are prepared to take the trouble you can be sure of success. The first half dozen years I grew raspberries I could make a picking in ten or fifteen minutes. Now it takes about two hours from the same size patch.

A raspberry patch should last at least four or five years, so before planting you should work in at least six inches of well-rotted manure to raise the moisture-holding capacity of the soil. The area to be planted should be flat and leveled out before planting, with a ridge of soil around the bed so you can retain water within the area when watering. Do not plant raspberries in a low spot; the plot must have good drainage. Rows should be at least five feet apart and the original canes set 18 inches to 24 inches apart in the rows. Every 15 feet along the row, you should put a post and run a wire about three feet off the ground between these posts.

About the first of July, you should go over your planting and thin out the new canes, leaving only the sturdiest. Usually it is recommended that canes average about six inches apart in the row, but if you are sure you are going to water adequately you can grow them closer than this. The first year you probably will not get too many surplus canes, but in succeeding years you will always have to thin out your canes considerably. If you do not thin out, you will reduce your crop. More canes do not mean more fruit. Do not allow any fruit to form for the first year.

Water and Fertilizer

Any berry is mostly water, so if you do not water sufficiently you will simply reduce the crop. From the time the leaves are on in the spring until the crop is almost finished, they require at least an inch of water each week, rain or shine. Hoping for rain is no substitute for adequate water.

When watering, you should let the water run down a shallow ditch beside the plants and keep on watering until moisture has come to the surface all around your plot outside the ridge of soil. You should stop watering when the last of the berries are beginning to ripen. Let the canes harden off until late October and then give them a good soaking to carry them through the winter. I usually give raspberries a fairly heavy application of 11-48-0 fertilizer around the first of June, a light application three or four weeks later, and nothing after this until the next year.

Winter Care. As soon as the canes finish bearing, the old canes should be cut off as close to the ground as possible and burned, green leaves and all. At the same time, take out and burn any poor new canes. Then in early November, bend your canes over parallel to the row and put bricks or cement blocks over the tips to hold them down. I cover my canes with a roll of sacking made by opening up gunny sacks and stapling them together. I roll this over the canes and hold the edges down with bricks or boards.

Following this system, I have yet to find a variety that is too tender for Regina. My best variety is Bonanza originated in California.

Spring Care. When the snow is gone and the ground is dry enough to walk on, and after April 15, take off the sacking and bricks and let the canes straighten themselves. Do not try to straighten them. Leave the canes as they are until they start to make leaves; then go through them and take out any that are not making leaves. Thin out so that you do not have more than four canes to the foot.

It is not easy to cut out a strong cane that has come through the winter in good shape, but you are just kidding yourself if you try to grow them too thick. When you have them thinned out tie every three or four canes together with string three feet off the ground, and attach them to the wire. Cut the canes off just above the wire. Once again, it is not easy to lop off a good three or four feet from a good husky cane, but if you want berries do it.

Insect Pests and Disease

The only serious insect pest I have encountered is mites. You need a strong magnifying glass or a microscope even to see them, but if they get away on you they can take your whole crop. You can control them if you spray your canes in early June and late June with a miticide such as Tedion or Kelthane.

Despite that my last planting of raspberries came from reputable nurseries, the planting developed just about every disease in the book from anthracnose to spur blight. Besides this, they were loaded with virus. Based on my experience, I think that raspberry canes from regular sources are a poor risk. Because of the inroads of virus and other diseases, the life of a planting and the crop is reduced considerably. Fortunately, plant science has come up with an answer to this problem that is available to those in the know.

For many years now the staff of the Ottawa Research Station, Canada Department of Agriculture, have been working on a program to produce disease-free strawberries and raspberries. They take stock of different varieties and use involved scientific methods to remove virus and other diseases from the plants. This disease-free material is then reproduced under controlled greenhouse conditions that keep them free from disease.

Each year, thousands of raspberry cuttings from their plants are rooted at Ottawa and the rooted cuttings supplied to selected nurseries who must conform to strict regulations. The canes thus produced are available to the public. One of the nurseries in this program is Blue Mountain Nursery and Orchards Ltd., R.R. No. 1, Clarksburg, Ontario. Certified raspberry plants are bundled in lots of 50, which is the minimum quantity per variety, and the price is very reasonable considering the background of each cane.

Varieties. Over the years, Bonanza has been my best variety, but I do not think it matters too much what variety you grow. I had 11 varieties in 1967 and all had large, good-quality berries, so if you are prepared to look after them properly I would say you can grow any variety. If you cannot give them the attention I have outlined then probably you should grow Boyne. One other important point, do not plant too many unless you have a wife who is willing to pick them.

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Plumcherry Selection

Some Thoughts on Prairie Fruit Growing

By **WALTER SCHOWALTER**
Rumsey, Alberta

Since I planted my first sandcherry bushes 30 years ago, fruit growing has undergone quite a change. At that time everything we could raise for ourselves represented a real saving, and what is more we could buy an apple tree for 50 cents! Nowadays it is no longer profitable to putter at anything in a small way, but the great value of a hobby is that it doesn't have to pay off. When the job, business, or farm aren't going so well it is better than medicine to be able to do something for sheer pleasure.

Will large-scale fruit growing ever come to the prairies? I believe it is quite possible as soon as someone produces a commercial sized apple on a tree as hardy and productive as the Osman crabapple. It seems to me that not enough work has been done in breeding up our first cross crabs. About the only first cross crab that can make any pretensions of improvement is the Dolgo-Mecca cross P22-22. It surpasses most of the second crosses in size and canning quality.

Testing something over a hundred apple and crab varieties without planting the place down to trees has been a real challenge, and not without its headaches. At one time I had 25 varieties of apples grafted on one Siberian crab tree, most of them bearing. I have tried planting three trees in one hole, which works fine if one is prepared to do some drastic pruning. I recommend this idea to people with town lots. Now I am planting four feet apart in hedges. But if my aim was to grow fruit I wouldn't plant apples, crabs and pears closer than 25 feet apart, tree plums and Opata plumcherries 20 feet apart, and all other tree fruits 15 feet. We all tend to plant too close. And I would not be without a good irrigation system.

Most large apples would be better if grafted on a hardy trunk. There are lots of varieties that are hardy to the tip, and produce lots of fruit. Then one spring we wake up and realize that the trunk has been girdled by winter-killing. Which points up a weakness of multi-graft testing.

Fireblight has not been a problem here, possibly because I prune out ruthlessly anything suspicious looking. There are several conditions that resemble the early stages of fireblight, but why wait and take chances? Observations at my neighbors' places indicate that in this district Brooks 27 and Dawn crabs are very susceptible, but Rescue is almost immune. Reports from some other districts disagree. Are there strains of fireblight as there are strains of wheat rust?

Zonation maps are good general guides, but are by no means perfect. Every zone has areas where better or worse conditions prevail. I think the

main requisite is good air drainage. A gardener living in a valley may find it hard to raise crabapples, while his neighbor a mile up the hill may be producing a respectable crop of standard apples.

The following varieties have done well for me, and are worth further trial:

Apples and Applecrabs. Heyer 12, Rescue, Trail, Rosilda, Moris, Breakey, Mount, M360, M367, Brooks 14, Collet, Dr. Bill, Drewry, Moscow Pear, Adanac, Goodland. This list probably will change in the next few years as there are lots of new ones coming on.

Crabs. Every grower has his favorites. I like Dolgo, Osman and Columbia, though they are not perfect. I have been looking for a Dolgo that will not rot as soon as it is bruised.

Tree Plums. All natives are hardy and productive unless we have unusual spring frosts, and all commonly grown varieties make good jam and jelly. For canning probably Bounty is the best, though none are my idea of good. Pembina has been our hardiest and most productive hybrid. It is too soon to report on Korean and other new varieties.

Plumcherries. Opata is the most productive. Dura is the best canner, though it has a hint of astringency. Manor is very good for pies and jam. Heaver has good jam-making qualities, though it is too astringent for canning. I am anxiously waiting for the Patterson selections to bear.

Sandcherries. All varieties are good for jam. Brooks is largest; Manmoor my choice for canning.

Other Cherries. The Northern Limit strain of Nanking cherry produces well year after year regardless of spring frosts. Mongolian cherries are slower to produce, but the jelly is excellent. Quebec cherry seedlings have been of chokecherry type, but larger, more productive, milder and better for jelly.

Pears. My two Patterson pears surprised me pleasantly by producing this past season. Andrew blossomed the second year after planting, but had no pollinator. Phillip took six years to bear. The latter is fairly good for cooking, having good juice and texture, and not much acid and astringency. Andrew is smaller and not quite as good. Both have been hardy to the tip so far.

Other Fruits. Apricots and grapes do not seem to like my soil. Beta grape lacks vigor, and apricots kill back some years. I have given up hope of harvesting fruit from these.

Other articles on fruit in recent issues of THE PRAIRIE GARDEN are: 1964 (2); 1965 (4); 1966 (1); 1967 (2).—Editor

Plant

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Successes in Budding Procedures

By PERCY H. WRIGHT, B.A.
Saskatoon, Saskatchewan

The controversy about which is the better, the T-bud or the plate-bud, in the propagation of fruit trees and many other trees and shrubs which require understocks, has raged for a long time. Not that the T-bud fails to give satisfaction in locations and years when moisture supplies are sufficient during the budding season. When we lived in the moist Carrot River country of northeast Saskatchewan, the T-bud gave us reasonably good catches and the failures, 15 per cent or so, were doubtless to be attributed to doing the budding too late in the season. It is hard to avoid a hunch that those who favor the T-bud do so because they feel that the budpiece is at least partly protected by the small amount of bark from the corners of the T that fold over it.

The plate-bud, in our experience, has the following advantages over the T-bud:

(1) It can be done considerably faster. In the time you put on 100 T-buds you can put on 150 plate-buds.

(2) If the bud fails to catch, the wound made heals over in less than a quarter of the time.

(3) To put on a T-bud, your understock must be at least pencil size. To put on a plate-bud, it can be less than half that caliber. This difference is important, because the sooner in the life of the understock that the budding is done the better, and the greater the chance of success.

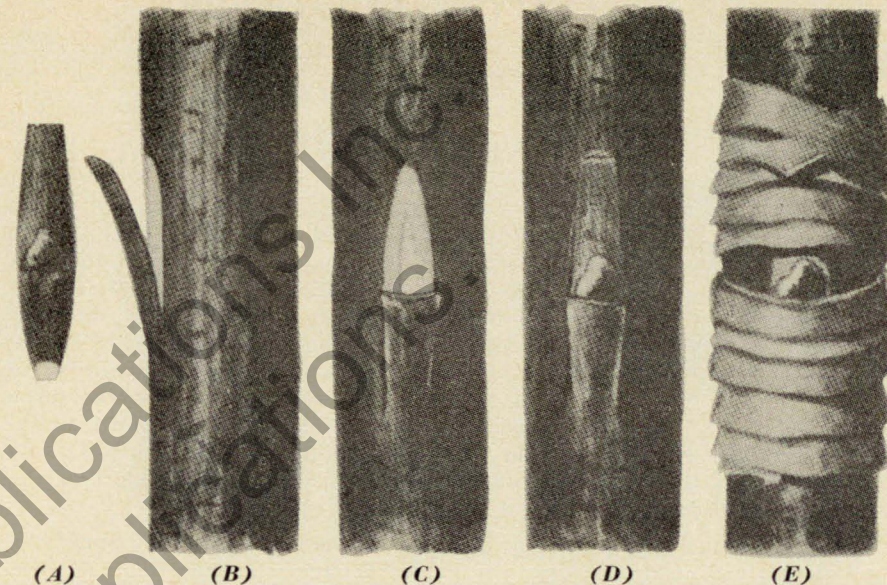
(4) It happens very often in the short season of the Prairie Provinces that the understocks do not become large enough to bud (at least when using the T-bud) during the first season of growth, and become too large by the second season of growth. If you try to use the T-bud on understocks that are much more than pencil size, the bark that folds over the budpiece is so thick that it practically smothers out the bud. These second-year understocks can conveniently be budded by the plate method, in even larger sizes, because there is no bark to lift. You must, however, put the budpiece on only one side of the space you cut, because its width is not enough to straddle that space. Sometimes you can put another budpiece on the other side of the same cut, thus increasing your chances of success. When you do, both buds almost always will grow.

(5) You can continue the budding season for a week or two after the T-bud procedure is impossible because the bark is not lifting.

(6) Rapid growth in the understock is not nearly so important if you use the plate-bud as if you use the T-bud. This year (1967), I put 180 plate-buds on 140 trees which had made practically no increase of diameter since they were planted in May (because of lack of rain in that extremely dry summer), yet I got more than 95 per cent to catch. It seems that if the tree is alive at all, it will take a bud, provided that the plate-bud is the chosen method.

(7) The plate-bud not only is a quick and convenient method of budding understocks, but also is a quick and convenient method of budding individual branches on established trees for making multi-variety trees or converting a useless tree to a valuable one.

To make a plate-bud catch, however, the wrapping with rubber must be done more carefully than if the T-bud is used, for there is something to the



(A) Bud showing wedge at base of shield produced by first cut. B—Bark flap after making cut in rootstock. C—Front view of B after trimming. The inserted bud is shown at D, and at E the method of binding with a strip of rubber, or raffia. Note that the bud is left exposed.

hunch that the T-bud budpiece is better protected from desiccation than the plate-bud.

My personal method of wrapping is to use two rubber bands. The first is wrapped above and below the actual bud in the ordinary way, pulling the rubber sufficiently to provide a fair amount of tension. The second rubber is wrapped at slight tension, and goes over the bud itself. The effect of the second rubber is a double one: to reduce moisture loss from the budpiece practically to zero, and to make sure that the bud itself, where we particularly want union to occur, is pressed firmly against the stock.

My hunch is that the T-bud, when it fails, often fails because when you lift the bark the cambium layer lifts off with the bark instead of adhering to the wood. If a few cambium cells remain on the wood, the cambium of the budpiece may not have too serious difficulty in uniting with them, but if they are too few failure must result. Another hunch is that when the weather is dry and the growth of the understock is slow, a larger proportion of the cambium cells adhere to the bark instead of to the wood. The proportion that adhere to the wood appear to lessen to almost none some days before the bark ceases to lift. Whatever method is used, it is apparently important to have a highly flexible budpiece, not a stiff, woody one.

Important, too, is to choose "fat," strong buds whichever type of budding is done. To get such well nourished buds, choose new shoots of the current season's growth which are of good caliber, and discard weak buds at the base as well as small, immature buds at the top. In the case of Rosybloom ornamental crabapples, all buds look small in comparison with buds of apples, but they will catch quite well if buds are selected which for this type of *Malus* are of good size. Even though the buds should be substantial, they should still be supple, not woody, so that they make a close contact with the understock.



Harry A. Graves . . .

“Mr. Horticulture
of North Dakota”

Harry A. Graves, citizen and plantsman of the Northern Great Plains, after a generation of years of service as North Dakota State Horticulturist has vacated that continuously very busy spot. In 1967 he entered a new life, that of a private citizen, free of exacting programs and daily and night drives to far-flung meetings. He relinquished also the office of executive secretary of the State Horticultural Society as well as editor of the society's monthly journal, North Dakota Horticulture. Furthermore, he resigned from the Board of Directors of the International Peace Garden at the annual spring meeting.

At the annual September meeting of the State Horticultural Society, a presentation was made to him. Mr. Ernest George, director, Federal Field Station, Mandan, in officiating dubbed Graves “Mr. Horticulture of North Dakota.” This recognition follows the one in June by the North Dakota Federation of Garden Clubs when a scholarship in his name was arranged. The award will be to a student in horticulture and/or related subjects at North Dakota State University.

The temptation to fill several pages recounting the many and much varied accomplishments of this industrious and kindly neighbor must be resisted here. But we salute Harry Graves, and wish him satisfaction and happiness in his new freedom from routine and timetable responsibilities. We hope he will find more time to visit the Canadian prairies and engage in his outdoor hobbies, photography, fishing, harness horse racing, and fraternizing with his fellow gardeners.

He is editor of The Rosarian, a newsletter of the Red River Rose Society. As a Life Member of the International Peace Garden he will continue to be concerned in the steady unfoldment of that great enterprise. He served actively for 15 years, respectively as leader in the Planning Committee, vice-president, and chairman of various committees. The Porter Garden is one of many features he fathered in the famous garden in the Turtle Mountains.

Looking backward, it is stirring to recall the wonderful team of Harry Graves and his companion, Dr. A. F. Yeager, plant breeder and plant scientist. They attended meetings of the Northern Great Plains Section, American Society for Horticultural Science; made frequent visits to the Morden Experimental Farm, Canada Department of Agriculture, the Dropmore plantations of Dr. F. L. Skinner, and occasional plant hunting forays into Manitoba. Wherever they went they imparted stimulus and enriching fellowship. When Yeager was lured to Michigan, his partner of many stirring years stayed on the job. And how he was on the job! His influence on North Dakota gardening has been far-reaching. Moreover, fortunately, it has overflowed northward into Manitoba and Saskatchewan. Incidentally, Mrs. Graves is a native of Saskatchewan. Long live Mr. and Mrs. Harry Graves!

Are Better Plums for the Prairies Possible?

By ROBERT SIMONET
Edmonton, Alberta

Although a fair number of hardy plum varieties are available to prairie gardeners, this fruit is not grown to any large extent. Some varieties bear very good plums when fully ripe but become very astringent when cooked for preserve or jam. Even a large amount of sugar fails to suppress this strong taste. As only a small part of the crop can be used as fresh fruit it may well be that the poor quality of the preserve product is the main cause of this low popularity.

Varieties of the Canada Plum (*Prunus nigra*) such as Assiniboine, Robert and Norther, are very hardy and set a good fruit crop in most seasons. These plums are of good size and quality as fresh fruit but are very astringent when cooked. It has been suggested that this strong taste originated in the pits or the skins, but I find that when both are removed the pulp when cooked shows no improvement.

Some varieties of the Manchurian Plum (*P. salicina*) (Manchurian strain), of which some of the better known are Ptitsin numbers 7, 9, 10 and 12, give crop in most seasons. Their fruit usually is smaller than that of the Canada Plum and shows somewhat less astringency when cooked but is still far from fair quality.

Some hybrids of these two species are now under test but it is too early to evaluate them. Some older hybrids of the Canada Plum with the Japanese Plum (*P. salicina*) of which Pembina and Ojibwa are well known selections, are not fully hardy nor of better quality when preserved. The Japanese Plum varieties, as grown in California, are far too tender to stand prairie winters. They bear very large fruit of high quality when fresh but also fail badly in the preserving test.

Another series of hybrids of the Japanese Plum have been grown on the prairies for many years, but here the other parent was the Sandcherry (*P. besseyi*). The early hybrid selections of these Cherryplums had small dark fruit much closer to the Sandcherry than the Japanese Plum. Later selections from second and third generations have larger fruit. Manor, Dura and Heaver are some of the better known varieties. From the Sandcherry parent these show tartness in the fresh fruit as well as in the preserved product. Newer selections probably are better but have not been widely tested yet. The Sandcherry itself is, of course, a much closer species to the plums than to the true cherries. I find that the fruit quality varies widely within the species.

Some bushes have fruit almost as astringent as that of the Chokecherry (*P. virginiana*), and others bear quite mild fruit which is mild also when cooked. Sandcherries have also another advantage over the plums, that of hanging on the bushes long after they are fully ripe in contrast to plums which drop off when barely ripe.

I think that there is a very good chance that much better plums than any varieties now being grown on the prairies could be raised by crossing the better selections of the Manchurian Plums with the milder Sandcherries.

It may be possible also that the Nanking Cherry (*P. tomentosa*) may be included in the parentage of some better plums. This small cherry is quite

mild and sweet when ripe and has good preserving qualities. As it is known to produce fertile hybrids with the Sandcherry, there is a fair chance that these hybrids may originate something of high value when crossed with hardy plum selections.

The large fruited, high quality European Plums (*P. domestica*) have 48 chromosomes, as also has a smaller-fruited species (*P. insititia*). Another, *P. spinosa*, is tetraploid with 32, and still another, *P. cerasifera*, has 16 chromosomes. It has been surmised that the species with 48 chromosomes came from natural hybrids between species with 16 and 32 in which abnormal cell divisions resulted in new species with 48 chromosomes.

P. spinosa, although fairly small-fruited, is said to be fairly hardy and might be of some value as a parent of better plums for the prairies, more so now that it is known that sterile hybrids of plants with different chromosome numbers can be treated with colchicine to restore fertility by doubling the chromosome number of the sterile hybrid.

Prairie gardeners have a chance to try their luck in this branch of fruit breeding by raising and testing seedlings from varieties they may have in their gardens. I think the Cherryplums are most likely to give good results, especially if good Sandcherries or Manchurian Plums are growing nearby.

In conclusion, I would say that the work of breeding better plums for the prairies is only in its initial stages. More use of the best possible species and varieties should result in much improved hardy plums for everyone to enjoy.

Seed Stratification

By S. H. NELSON, Ph.D.

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Saskatoon, Saskatchewan

It is well known that seeds of most of our trees and shrubs are incapable of germinating immediately after they are harvested. Some are incomplete and need a further period to complete the development of missing parts; others have a mechanical barrier for the absorption of water so necessary for germination; and many cannot germinate because of some physiological "block" that inhibits germination. Dry storage normally will correct the first trouble, but some seeds still need treatment to break dormancy even after this after-ripening period. Mechanical abrasion, chemical treatments and stratification are all used to remove moisture barriers, and finally, stratification is used to remove physiological "blocks".

Stratification is really a moist treatment and artificially we emulate nature by providing a warm moist or a cool moist treatment depending upon when the seeds are shed naturally. Admittedly, we normally think of stratification as one cool moist treatment, but some seeds need a warm treatment, some need a combination of warm and cool treatments, and still others need a repeated cool treatment with a growing period in between to separately break the double dormancy of root and shoot development.

I suppose the term stratification is derived from the old practice of alternating layers of moist sand and seed in a cool atmosphere. Today peat moss, a much lighter medium, has largely replaced sand and the seeds are thoroughly mixed with the peat moss. Rather than open containers, sealed containers, particularly polyethylene bags, are being used. This innovation has proved very beneficial because there is not a progressive loss of moisture

during the storage period, but it also has necessitated a more careful control of moisture in the medium when it is placed in storage. Although we refer to moist peat moss, it should be barely moist to the touch. Because this medium and seed normally are packaged at room temperature, there is a very noticeable rise in relative humidity and condensation when the bags are moved to the lower temperature.

It should be remembered that the stratification of seeds, like most other plant growth activities, is not controlled by a single factor. Rather, it is a combination of factors interacting with each other. Furthermore, the controlling influences are not too specific but exercise their influence gradually over a fairly wide gradient. These controlling influences for most seeds are temperature, moisture content of the medium, duration of treatment, and in some instances quality of seed.

Although we normally think of temperature when considering cool stratification, there is very little influence of temperature over a relatively wide range (33 to 41 degrees F.) and no noticeable interaction with the other factors.

There is, however, a noticeable influence from moisture content of the medium. In general, increasing moisture not only raises the percentage of successful stratification but also increases the rate of germination after sowing. This occurs up to the optimum levels of moisture and then detrimental effects as fungus growth and premature germination, tend progressively to lower the stand of seedlings. Because there is a marked interaction between moisture content and duration (the higher the moisture the less storage necessary), it is suggested that lower moisture and longer storage be used to safeguard against fungus growth, and in particular premature germination if seeding should be delayed by inclement weather. For peat moss a ratio of 1 or 1 1/4 parts water : 1 part air-dried peat moss by weight is most satisfactory. Some germination, however, will occur at ratios as low as 1/4 water : 1 peat moss.

There is also a marked effect of duration on successful stratification. Usually there are a few seeds in a population which will germinate without stratification and the percentage and rapidity of germination rise with longer storage until the optimum conditions are reached. The optimum duration varies with seed type, and germination in the media occurs after this stage is reached. Again, as mentioned before, there is an interaction between moisture and duration. Accordingly there are different combinations of moisture and duration which yield approximately the same results. In general, germination hastens as both moisture and duration increase and then drops off rather rapidly after the optimum as the detrimental effects of both express themselves.

There is some indication, particularly in apple, that seed quality is affected by the weather during the pollination and fertilization period. In general, inclement weather at blossom time seems to be correlated with the necessity of a slightly higher moisture content or a slightly longer duration.

With peat moss and polyethylene bags it is very simple for any homeowner to stratify a few seeds in the household refrigerator without difficulty.

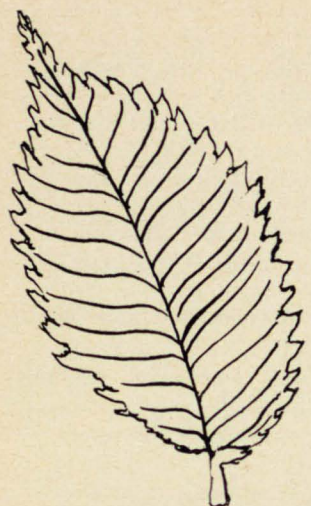
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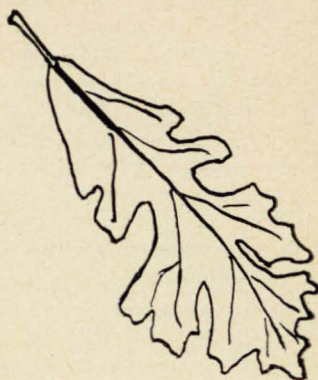
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The Color and Function of Leaves



By G. S. REYCRAFT, B.A., F.R.H.S.

Green is the color of life. After the long drab darkness of winter, what is more wonderful than the first glimpses of green as the leaves on our trees and shrubs unfold and brighten up our spring landscape?

How many of us fully realize how vital a function these leaves really perform. So let's take a leaf — any leaf, and look at it closely. You will see that the two sides are unlike. The upper side is often glossy and waxy and darker than the underside, which sometimes even has a protective coat of down. Each side of the leaf is different because they perform two separate functions: respiration on the lower surface, work with the sun on the upper.

Plants must take in oxygen and a small amount of carbon from the air to live and grow. They do this through their leaves which breathe through their pores on their sheltered underside — so many and so minute that they average about 100 to an area the size of an ordinary pinhead. These pores usually are slit-shaped like the pupils of a cat's eyes — and just as cat's eyes expand in darkness or contract in bright light, so leaf pores respond to atmospheric changes. On hot days, lest the leaf wilt from water loss through evaporation, its pores may almost close, opening up and closing in response to the heat of the sun. The pores of a leaf also help to bring water up from the roots of the plant. Evaporation at the pores causes a partial vacuum within the cells, and this suctionlike effect is communicated from cell to cell back through the leafstalks, down the main stem and down into the ground. Thread-fine columns of water, boosted by root pressure from below, are thus sucked up, like soda through a straw. All this goes on dead against gravity, right up to the top of the tallest tree.

Meanwhile on the upper side of the leaf, the side exposed to the sunlight, other wondrous things are going on. The leaf is using solar energy to power the greatest industrial plant on earth. This foliage factory uses for machinery the green coloring matter in the leaf, called chlorophyll. The energy of the sun activates the chlorophyll. With this energy the chlorophyll smashes open the molecules of the water (H_2O), and the oxygen and carbon which the leaf has taken in through its pores from the air, and reassembles these atoms of oxygen, carbon and hydrogen into new compounds constituting sugars and starches, the basic foods required for growth, through a process which we call photosynthesis.

Chlorophyll has been called the green blood of the world! It is carried in the leaf in minute green discs, which, like the corpuscles in our blood, can

move about almost as if they led a life of their own. When the sunshine is too strong, they can turn edge on, or sink or go to the sides of the cells. When the sunshine diminishes they can turn broadside and rise to the top of the leaf to make the most of the light.

Further, leaves help to provide us with oxygen. For when the leaf by photosynthesis breaks up the water and carbon dioxide (CO_2) into their elements, a lot of oxygen is left over, that it breathes out through its pores in such quantities that all our air is wonderfully refreshed. Thus you could say that we live under a sort of an oxygen tent together with an air conditioning unit, for the air around leaves is faintly cooled by the evaporation of water from the leaf pores.

Now as summer blends into autumn, we see our bower of green leaves put on new colors. They are not really new as they are actually the natural pigments of certain foods produced by the leaves, which are merely masked by chlorophyll, in the summer.

At this season of the year chlorophyll ceases to be manufactured in the leaf and what is there dissipates — the leaf factory is closing down for the year. The visual results are that the two yellow pigments, carotin and xanthophyll, contained in the leaf show through and turn our leaves yellow. Many plants differ in time and degree in the breakdown of chlorophyll in the leaf and this naturally causes the leaves of various plants to color up, some earlier, some later. Also, where the breakdown of chlorophyll in the leaf is neither soon enough nor complete enough, the leaves turn from green to brown or show only a tinge of yellow.

Now you may ask: "But where do we get our red and scarlet coloring in our leaves?" The answer is a third pigment in the leaf called anthocyanin the quantity of which is regulated by the amount of sugars and tannins accumulated in the leaf. Again you may ask: "Why are some autumns more colorful than others?" The reason is simply, the weather. Warm, bright sunny days in the fall allow the leaves to manufacture sugar. When these days are followed by cool nights of below $45^\circ F$. the sugar in the leaves is "trapped." There is little or no translocation of sugars and other materials from the leaf to other parts of the plant. The accumulation of these products results in the manufacture of the red anthocyanin pigment that gives us our reds and, in combination with our yellow pigments, our golds. On the other hand, dull weather, even shade, reduces the amount of sugar and tannins produced in the leaves and consequently the amount of the red anthocyanin available to give the leaves their most brilliant colorings. Finally, it is recognized that there often is considerable range of intensity of coloring within a species; each is credited with a distinctive general effect. Some examples of woody plants esteemed for the dress glory they take on locally are:

Flaming Red: Native woods: Smooth, Sumac; Riverside Creeper which is the native form of what is known as Virginia Creeper; Red Maple in acid soil; Nannyberry; Saskatoon; Blueberry; Sand Cherry; Pincherry. Imported ornamentals: Winged Euonymus; Amur Maple; Shining Rose (*Rosa nitida*, the wild rose of Newfoundland); Japanese Barberry; Mongolian Oak.

Dull Reds and Purples: Native woods: Redosier Dogwood; Chokecherry; Blackberry; Shubert Chokecherry; Mountainash; American Cranberrybush; Downy Arrowwood. Imported: European Mountainash; Kesselring Dogwood; Tatarian Dogwood; Smoketree (a Sumac); Cistena Cherry; Sutherland and several others of the Rosybloom Crabapple varieties.

Yellow and Golden: Native woods: Trembling Aspen; Paper Birch; Green Ash; Bittersweet; Cottonwood; Hackberry; Black Walnut; Basswood; Buckeye; Silver Maple; Larch; Elm (inclined to be a bit dull).

Bronzy, Orange-Reds, and Red-Oranges: Native woods: Hawthorns; Sugar Maple; Wild Plum; Mountain Maple; Hazels; Wild Roses; Ironwood; Showy Mountainash; Buckeye or American Horse Chestnut.

No Change in Autumn: Buffaloberry; Lilacs (common) but the Early Lilac becomes velvety purple; many Willows; Potentilla; many Clematis; Russianolive; Silverberry; some Honeysuckles; Boxelder, "Manitoba Maple" in local parlance; many Apple trees; Bur Oak.

To Paint or Not to Paint Fruit Trees

By P. J. PETERS, B.S.A.

Horticulturist, Fruit Crops, Manitoba Department of Agriculture
Winnipeg, Manitoba

Our climate is not the most suitable for growing quality apples and great credit is due to the Morden Experimental Farm* and many other dedicated individuals for developing hardy, good-quality apple varieties.

The Manitoba project of demonstration orchards is very useful in pointing out essential requirements for successful orcharding. Adequate shelterbelts are an absolute must; even the hardiest crabapple trees do better when shelter is provided. Soil with good internal drainage is necessary for producing healthy trees. Then, too, apple trees need water. The dry summer of 1967 was extremely hard on fruit trees that did not receive irrigation.

There are other ways of helping apple trees survive our winters. Apple trees grown under sod, or at least a summer cover crop, tend to mature earlier in fall; and matured trees are less susceptible to winter injury. A good watering in late fall is a means of cutting down the desiccation or drying out of the tree. Painting trunk and branches of apple trees with white interior latex paint has proved also to be most beneficial.

Why paint? Who has not seen the cracked, split, brown and smelly bark of apple trees in spring? Some varieties, like Breakey, are very susceptible to this condition, known as sunscald. When these same trees are painted late in fall, sunscald can be prevented. The white paint reflects rather than absorbs the light and heat of bright sunlight in February, March and April. The trees stay dormant until the soil warms up in May, and leaf out later but catch up in a couple of weeks.

Painting appears to do even more than prevent sunscald. Whenever we get winter kill, the killed portion is completely dried out. Painting cuts down this drying out. Our painted orchards have cut losses due to sunscald and drying out by 90 per cent.

Painting trees is work. Trunks and branches to half inch thickness should be painted, best done on a day in October when temperatures are about 45°F. or 50°F. Only white interior latex paint, slightly thinned with water, should be used. To date we have used brushes for applying the paint. Spray painting no doubt can cut down the work but would waste more paint.

Should painting be done annually? The answer is yes. It will become a touch up job, though. It should be remembered, however, that painting is only one aid in helping orchards to be successful. Shelter, good soil drainage, proper cultural practices, and irrigation are absolutely necessary for growing apple trees. All paint can do is to help preserve the health of healthy trees.

*Canada Department of Agriculture, Research Branch, Morden, Manitoba.

Soliloquy

By FRED RICE
Winnipeg, Manitoba

I imagine that those who pick up a copy of THE PRAIRIE GARDEN do so through their interest in gardening. Fortunate indeed are we that so many talented folk share with us their knowledge and experience in horticulture.

As a backyard gardener privileged to have known and been associated with many horticulturists over the past 30 odd years I think it only fitting that we acknowledge the contributions made by so many of the great horticulturists, right here in our midst. We are apt to take so much for granted, without considering the painstaking research, breeding programs and selection that have made household words of so many world famous plants developed right here on the Canadian prairies.

The Stevenson Gold Medal awarded periodically does in a more or less tangible way acknowledge outstanding contributions to horticulture, but let us never lose sight of the fact that these dedicated people along with their co-workers have given us so much to enjoy and appreciate.

Those of us now approaching the sunset may still enjoy the afterglow by encouraging our younger friends to develop the same love of gardening and the real satisfaction of getting hands in the dirt and seeing those delicate little seedlings struggle against great odds and develop into the things of beauty they ultimately become.

I am encouraged by the interest of some of my quite young friends who are constantly dropping in while I am up to my elbows in dirt, curious as to this or that. Why peat moss? What is 16-20-0? Why so far apart? And so on. It helps too if there just happens to be a few spare plants or seeds and it is surprising how often with a bit of encouragement these young folk are keen to try to grow something too. It is not too long until they are back making comparisons and with obvious pride reporting on their accomplishments.

What more rewarding hobby or pursuit than gardening, to say nothing of the many friendships resulting?

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“Start to Do Your Part”

By R. F. GOMME, M.Sc.

Secretary, Ontario Horticultural Association, Toronto, Ontario

Community organizations of every type face a greater challenge today than ever before in their endeavor to continue and enlarge their programs and objectives. Challenges are greater today, but so are opportunities, as Canada enters the first year of her second century.

This new era of our nation follows one of the most spectacular and successful years in our history, when we tackled projects and challenges which we have talked about for years; and it took a Centennial spurt of enthusiasm to foster their reality.

It is not surprising that the loyal workers on these numerous community projects were a very small percentage of the population. This was another example of the old saying that people are divided into two classes: those willing to do the work, and those willing to let them. Unfortunately, the group of willing observers has grown, while the other has diminished.

Let us take a moment to analyze our own community. Likely we have service clubs, several organizations for various age groups in our churches and schools, organized sports, and many others. These combined contribute outstanding work and finances toward the betterment of our community. But wait a moment! Is there an organized group in your community which has as its objective the encouragement of a hobby or an art which can be of interest and use to persons of all ages. An interest which is healthy, creative, fascinating and lucrative, and disregards the color, race, religion, politics and language of those who are eligible and welcome to join it? It may be surprising that a horticultural society or a garden club usually can fulfill these qualifications.

Isn't a group of this stature with so many opportunities and tangible assets worth bragging about? Perhaps we can be compared to the man who asked the real estate agent to sell his home as he wanted to buy something different. The following night the owner observed a newspaper advertisement of a property with all of the appeal that he was looking for. After a telephone call he was amazed to learn that the property listed was his own. He said, "I did not realize it was so good!"

Perhaps each and every member of every organization should put their greatest asset to work — ENTHUSIASM. Everyone possesses it. It can't be worn out. It is the greatest therapy for an individual; a community; and a country.

Enthusiasm like anything else must be applied in a proper, organized manner.

If enthusiasm is lacking we should search out the reasons. If membership and attendance are lacking we should find out why.

Our first step is to appoint committees. This is where we should select persons that we are confident will do the best job, but we should add new faces to the committee each year. The number of people in a committee isn't important. It is frequently said that a committee should comprise three persons with two away on vacation.

People are reluctant to offer their services for committees or any extra work and perhaps this verse explains the reason why.

At meetings by an effort of will,

I always contrive to stay perfectly still.

For it takes only a moment of annoyance or pity,

And wham! There I am on another committee.

Our year's program should be planned early and every event irrespective of its importance should *start* and *stop* on time.

An analysis of programs of the past will aid in planning for the future. Perhaps the best method to improve meetings is ask those for whom it is planned — "the people."

A questionnaire sheet may be helpful or a forum or buzz session with the members may prove interesting. This can be easily done by using part of a regular program to introduce discussion on how future meetings will be planned and developed. Then you should form groups of persons, half a dozen people in each, who in turn will select their own chairman. Their job will be to decide, in a 10 to 15 minute period, the main topics and activities that they would most like to have in future meetings.

Each chairman should be given the opportunity to explain the recommendations and feelings of their group.

Already you have involved your members in your program. This practice should be continued whenever and wherever possible. It is natural to want to have a part in the organization and share in the success achieved.

You may be amazed at the response from your members in the programs of which they are a part. Every feasible idea should be considered, even including the social fellowship which is an ideal opportunity to meet your neighbor if nothing else.

All the work involved in planning better programs of the people's choice will be futile without proper and complete communications. You can plan the very best program but if it is not properly and promptly advertised it will not be successful. The importance of publicity is sometimes compared to a fellow winking at a girl in the dark. He knows what he is doing, but no one else does.

Be sure that everyone in your community knows what your organization is doing. Perhaps a visit to the program director of the radio station or editor of the daily newspaper will prove worthwhile. If public service announcements are permitted, and they usually are, provide meeting notices on a regular basis. Endeavor to send them earlier than usual as they may receive a better "spot" and thus give you much more publicity at no cost.

If meeting notices seem to be an ineffective expenditure, perhaps a new format or a different colored paper or ink may spark curiosity and thus result in greater attendance.

Have you tried to interest more persons in your organization by providing an honorary membership for the president or chairman of other associations or groups in your community?

If the membership card is formally presented someone must come to receive it and, in so doing, may learn about your group.

The sharing of your programs and activities with others may provide a much closer tie-in within the community and thus a better place in which to live. You may be surprised to learn that many people are waiting for the invitation!

In recent years it seems that community organizations have too few persons doing too much and too many doing too little. An adjustment is required with more people accepting their just responsibilities. Now is the time to *start* and do your *part*.

If you do do your part, your community cannot help but be a better place to live.

Pruning Pointers for Lovers of Ornamental Trees and Shrubs

By P. J. MORAN, B.Sc.(Agr.)

Executive Director, Wascana Centre Authority, Regina, Saskatchewan

After the winter months have passed and the daytime temperatures are such that residents can get outside in reasonable comfort, there is the usual instant urge to perform some horticultural task. Pruning tools, sharpened during the winter months, usually become the means whereby trees and shrubs are operated on in the release of energies by home gardeners. Much of the pruning activity, however, is stimulated by impulse rather than analysis of what is required and best for the tree or shrub.

The fundamental reasons for pruning are to remove diseased, damaged or dead parts; to keep plants in a strong and vigorous condition and to assure maximum flowering and fruiting; to compensate for loss of roots at time of transplanting; and to train plants to some desirable form.

In the case of diseased trees, it is desirable to remove infected portions as soon as possible since healthy portions may soon become infected. Fireblight in apples, pears and mountainash is a typical example of a bacterial disease which moves rapidly once initial infection occurs and this will be transmitted readily to other susceptible plants. Infected branches should be removed before the sap begins to flow in the spring and cuts should be made below the infected area. Pruning tools should be sterilized after each cut and the removed branches burned. Damaged or dead parts of a tree are always a sure source of initial infection from diseases and, like humans, trees in a general state of weakness frequently are attacked by other organisms. Diseased, damaged or dead parts of a tree are frequently the ideal locations for harboring insects and such portions should be removed as soon as they are apparent.

Pruning trees, particularly shade trees, in their early stages of growth can ultimately produce stronger and more vigorous specimens. Fruit trees grown on the prairies should be pruned early to produce a multiple stem form of growth approximately 12 to 15 inches above soil level for maximum strength and vigor. A gradual process of removing the lower branches on shade trees and selecting strong branches to form a strong framework for the tree should be initiated during the early stages of growth. The American elm will produce several branches at the same location, which frequently have narrow crotches, and subsequently a general weakness which results in easy breakage. Therefore selection should be made at an early date for branches with wide crotches.

To insure maximum flowering in many of our ornamental trees and shrubs, it is important that pruning be done at the proper time. Pruning at the improper time may result in the removal of many flower buds from the plant. Heavy pruning of lilacs in the spring results in many of the potential flower spikes being removed, so it is undesirable to prune lilacs at this time. Since our ornamental flowering crabapples produce many of their blossoms on spurs of two, three and four-year-old wood, heavy pruning will remove many of the desirable blossoms. To insure maximum fruit production in apples and crabapples, excessive pruning should be avoided. Maximum fruit production normally is on the healthiest wood, so weaker wood should be gradually eliminated. An open-formed tree is desirable for maximum exposure to sunlight in the production of fruit and to facilitate spraying.

The selection of proper plants in their natural form is one of the basic considerations in good landscape design but frequently clipped hedges and plants trained in some particular form are required and achieved through proper pruning.

Pruning Tools

The types of tools used by homeowners to prune trees, shrubs and vines are interesting, and while some do more harm than good, other unusual instruments are used with considerable skill and effectiveness. Butcher knives, hatchets, pliers, grass shears, metal shears and various carpenter saws either are difficult to handle or produce unwanted results. Razor-sharp knives and machetes can be used effectively by skilled persons and I have observed the use of the latter to keep a well clipped hedge in excellent shape.

There are specific tools designed to aid most effectively in proper pruning practices. The pruning knife is available in various sizes with the 4-inch size perhaps the most popular. The folding blade is curved, ending in a sharp point. The curved knife was designed to help prevent it from slipping off the twig being cut; the sharp point is used to trim the rough edges of large cuts and in cleaning up tree wounds. The pruning knife is very much like a linoleum knife in appearance but has a folding blade rather than a rigid blade. Cuts on branches of up to approximately one-half inch can be made with a pruning knife.

Hand-pruning shears or secateurs come in various sizes and makes and are used to make cuts on branches up to approximately three-quarters of an inch in diameter. They may either be overlapping blades as in a pair of household scissors, or they may be the anvil type in which there is one cutting blade moving against a soft metal cutting block. The latter is sometimes referred to as snap-cut shears. Both have their advantages and disadvantages. The overlapping blade type usually enables one to make sharper cuts closer to branches and stems, but if the blades become sprung a poor cut normally results. The anvil or snap-cut shears will continue to make acceptable cuts when slightly out of adjustment but flush cuts next to branches or main stems are more difficult. Since this is one of the most useful pruning tools for most home residents, a pair with good steel blades is desirable and cheap models should be avoided. Greater ease in cutting branches with this tool will be achieved if a slight twisting motion is employed and the branch is pushed away from the cutting blade.

Lopping shears are similar to hand shears but are of heavier construction and have longer handles to employ greater leverage in cutting branches up to approximately 1½ inches in diameter. It is not as easy to get into difficult areas with this tool but they make a faster and cleaner cut than with a pruning saw.

Pruning saws are employed to make cuts which are too large for hand or lopping shears; they too come in various types and sizes. One of the most useful saws is the type somewhat similar in appearance to a hacksaw, or ones used by butchers, with replaceable blades and the frame ending in a sharp point. The pointed portion enables one to get into areas where other interfering branches normally would make a cut impossible. Adjustments at each end of the blade, making it possible to swivel the blade, provide further assistance in cutting at difficult angles. Some pruning saw blades are curved to get at difficult locations, and some employ both sides of the blade enabling both coarse and fine cuts to be made with the same saw. For large cuts, a wide-blade saw similar to a carpenter saw is used.

Shears and saws on long poles, referred to as pole clippers and pole saws, are used to make cuts at the tips of branches and other locations which cannot be reached in any other way.

Deciduous Trees

Trees are developed with considerable time and patience on the Great Plains of Western Canada and much of this work can be quickly lost by indiscriminate pruning. The excessive pruning by some people could be greatly reduced if they would select trees adapted to the location they wish to plant and by selecting the tree of proper height, spread and character in keeping with the landscape requirements. Once the adapted tree has been selected, the pruning should be to train it in its natural form. Wide angle crotches of branches to the main stem or those closer to 90 degrees are stronger and subsequently more desirable than those branches with acute angle crotches which are inherently weak. Specimens should be trained for this type of structural strength, and pruning should be done early because the wounds will heal faster and disfigure the tree less.

In trees such as ornamental crabapples, early pruning will reduce the number of water sprouts developing at the base of the tree which occurs in more mature trees when heavy pruning is done. It should be recognized also that in such ornamental flowering trees, blooming will start sooner when pruned very lightly, since heavier pruning encourages more vegetative growth and less flower bud development. Diseased, dead or crossing branches should be removed and any pruning into live wood is best delayed until after blooming, but should be done promptly to avoid removal of blossom wood developing during the summer.

Shade trees normally have branches removed from the main trunk four to eight feet above ground level. These should not be removed in the early stages of the plant's growth but should be headed back to encourage the growth of the main leader and other laterals, and to assist in food production for this latter purpose. The lower branches should ultimately be removed before they are two inches in diameter and cuts should be flush with the trunk for rapid healing. Where shade trees with single-stemmed leaders are required and the main leader has been broken off, it should be cut back to the next side branch and the side branch tied up in an upright position as the new leader. Other competing branches as a leader should be removed.

There is no question that some damaged, diseased or rubbing branches will occur, and where large branches exceed an approximate diameter of two inches it is desirable to make a double cut to avoid tearing the bark as the branch breaks away from the trunk. The double cut is achieved by making an undercut four to ten inches away from the main trunk or branch approximately half way through the branch or until a slight binding pressure is felt on the saw. The second cut is made from the top, a few inches further out than the undercut, until the branch drops or is lowered free. The remaining stub is then cut flush with the main trunk or branch to ensure proper healing.

Branches over one inch in diameter should have remaining cut sections covered with a wound dressing and although white lead, linseed oil paint has some value, a commercial asphalt base material such as Bracco can be used successfully to cover wounds. Paints containing turpentine, creosote or other thinners should not be used. If bark wounds are being treated, the cambium layer of cells can be treated initially with shellac or spar varnish before the tree dressing is applied.

When upright branches on young trees are cut back to a lateral bud or branch, the cut should be made at a slight angle to ensure water run-off. Too sharp an angle of cut close to a bud will cause drying out and death of the bud.

Deciduous Shrubs

Many homeowners find that they neglected to familiarize themselves with the mature height and breadth of the shrubs they plant, and subsequently the plants require considerable trimming or pruning. To reduce the amount of pruning required, it is recommended that you familiarize yourself with the ultimate size of shrubs required in the landscape. Avoid screening that attractive view through your picture window by being selective in your foundation plantings. Even with the proper selection of shrubby material, certain pruning will be required and to do this effectively, a knowledge of the growing characteristics of the plants is required.

There will always be the usual requirements of removing dead, diseased and damaged parts but there may be other needs for pruning to induce flowering, type of wood, and shape of shrubs. While dead and damaged branches may be removed at any time during the growing season, generally the best time is during the dormant spring season when it can be combined with the removal of diseased branches.

To induce flowering in shrubs, growth characteristics must be understood because failure to prune at the proper time may cause restriction of flower bud development or the removal of flower buds after they have developed. Many shrubs produce flowers on the current season's wood, that is new growth which develops between spring and fall, and in this case spring pruning should be intense. In some instances, it may require pruning to ground level in spring which encourages the production of new wood.

Such shrubs as False Indigo (*Amorpha fruticosa*), Amur Tamarisk (*Tamarix pentandra*), Snowhill Hydrangea (*Hydrangea arborescens grandiflora*), Ural False Spirea (*Sorbaria sorbifolia*), and those species of spirea which form their blossoms on wood of the current season such as Billiard Spirea (*Spiraea Billardii*) and Bumalda Spirea (*Spiraea bumalda*), including the varieties Froebel's and Anthony Waterer, should be pruned almost to ground level. Hybrid Tea roses fit into this same group of shrubs. They should not be pruned back to ground level but the weak shoots should be removed and the strong shoots headed back to two or three eyes.

Other flowering shrubs produce their flower buds on the previous year's growth and spring pruning would reduce considerably flower production at blooming time. Since their next year's flower buds begin to develop shortly after they have finished flowering, pruning should be done immediately after flowering. In cases where severe thinning or pruning is required, it may be done in the spring but flower production will be seriously curtailed. Shrubs such as lilacs, honeysuckles, species of spireas including Oriental (*Spiraea media sericea*), Pikow (*Spiraea pikoviensis*), and Korean (*Spiraea trichocarpa*), currants, caraganas and viburnum are early flowering shrubs which are ideally pruned after flowering.

The red bark of willows, the red and yellow bark of dogwoods, and the yellow foliage of the golden elders always produce their best color on new growth. It is desirable to retain the vigor and symmetry of these shrubs and so the frequent removal of old wood only should be encouraged and should constitute an annual thinning process, and in some cases include the heading back of remaining branches. These shrubs do produce flowers and fruit on old wood and consequently intense heavy pruning should be avoided.

Some thinning at least every three to five years and removing one-quarter to one-fifth of the growth are required in those other shrubs where the symmetry or natural form is desired, and for increased flower and vigor. Examples are cherries, plums, almonds, cotoneasters, sumac, elderberries, mockorange and

shrub roses. The old wood and excessive spring pruning will reduce their flowering capability. The opposite is the case with Hybrid Tea, Floribunda and Hybrid Perpetual roses.

Evergreens

Amateur gardeners have frequently been advised to avoid pruning evergreens if they are not too sure how to go about it. The advice is well founded because, unlike deciduous trees, evergreens fail to recover from over zealous pruning. The fact of the matter is that many evergreens do not have latent or adventitious buds on old wood or behind that area on a branch where foliage prevails. Proper timing is the most significant consideration in the pruning of evergreens and an understanding of the degree of intensity of the pruning process will avoid serious damage. Three groups of evergreens require different pruning considerations.

Spruce, fir, larch and balsam should be pruned only on new growth, that is the current year's shoots. Timing is important here and pruning should be done after the newly formed buds can be seen on this wood and before those same buds begin to grow in the spring. Bud development on new shoots will be observed during the early part of May the following year. Thus any required pruning normally will be done from early July to early fall or from early spring until early May, and cuts should be slightly above a bud. Shearing the new growth of these plants is frequently practised, before new buds develop, to increase their density.

Pruning pine is even more critical, and must be done to the extended buds or "candles" of new growth just when the tips of the new needles are showing. This stage of development usually will occur from early to mid-June and can be done with hand pruners or by pinching or breaking the new growth between the fingers. Unlike spruce, pine do not form buds along the new growth but do form new buds at the base of the cut. The density of Mugo Pine can be improved and a more compact plant will result by pruning the ends of the new candle-like growth in mid-June. The maximum desired height in this plant can be retained merely by removing completely the entire new growth at this time.

The fine-foliaged conifers such as Thuja or Cedar and Juniper usually are clipped rather than the individual branches being pruned. Since the natural habit of growth of these plants is dense and compact, with many small shoots making up the tips of the branches, it would be difficult to prune each tip individually. The best time for clipping is when the new growth is completed in early summer while it is soft and easy to cut. Clipping can be done at other times of the year but avoid clipping in late fall or in that area of branches free of foliage. The amount removed should not exceed the annual growth of the evergreen and it is desirable to leave a small amount of the current season's growth. Pyramidal and conical evergreens may be shaped or controlled in height in this manner.

The major need for pruning conifers will in all likelihood be confined to the selection or restoration of a new main leader in spruce, and the pruning of new "candle" growth in pine to improve their density and compactness or limit their height. Frequently, the new terminal bud will become damaged or fail to develop in spruce and a new leader will have to be trained in an upright position by bending the longest lateral branch at the top of the tree in an upright position, and tying a straight stick or rod to the branch and main stem of the tree to act as a splint which can be removed in one year's time.

See also *Pruning Ornamental Trees (Illustrated)*, THE PRAIRIE GARDEN, 1964, (available).—Editor.

Alberta Centennial Award in Horticulture

The Alberta Horticultural Association's first Centennial Award, a medalion engraved "Alberta Horticultural Association's Centennial Award, P. D. Hargrave, 1967", was given to P. D. (Dunc) Hargrave, superintendent of the Provincial Horticultural Station, Brooks, by Lorne White, association president, at the members' annual field day at the station, August 27, 1967. Mr. White said that the award was in recognition of Mr. Hargrave's "outstanding contributions in the field of horticulture."

A special committee set up by the association's directors, will make similar awards in the future, though not necessarily on an annual basis, to both professional and amateur gardeners.

Mr. Hargrave was born in Edmonton and after high school days there studied at the Olds School of Agriculture in 1928-29. He continued at the University of Alberta from 1929 to 1932 and in the latter year graduated with the degree of Bachelor of Science, Agriculture, specializing in horticulture and genetics. After graduation, he worked for two years with the Edmonton firm, Walter Ramsay Ltd., familiarizing himself with greenhouse management.

His next three years were spent again at the University of Alberta where he gained his Master's degree in the Faculty of Agriculture, majoring in horticulture with a minor in cytology. He joined the staff at the Brooks station in 1936 and was appointed superintendent in 1943. He has done post graduate study at the University of Minnesota; and has won a British Council Scholarship tenable at the University of London in 1948-49.

His wide experience in theoretical, technical and practical horticulture, along with his dedication to his profession, has resulted in his making many outstanding contributions to western horticulture. He has been active also in agricultural and horticultural society work, as well as having been the author of twelve publications on horticulture. THE PRAIRIE GARDEN is pleased to have this opportunity of expressing congratulations to Mr. Hargrave.

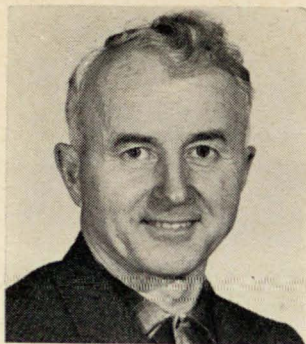


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L. Martinovsky Awarded Saskatchewan Certificate of Merit

By D. R. ROBINSON, B.S.A.
Extension Division,
University of Saskatchewan, Saskatoon

At the 1967 convention of the Saskatchewan Horticultural Societies' Association the Certificate of Merit was awarded to L. Martinovsky of Gerald, Saskatchewan. This Certificate is given to amateur or non-professional gardeners in Saskatchewan who have made an outstanding contribution to prairie horticulture.

Mr. Martinovsky is of Czech ancestry and was born in the Valor district of Saskatchewan in 1910. He began farming in Gerald (near Esterhazy of potash fame) and became interested in horticulture in 1933. The gardens surrounding his Gerald home have a wide variety of cultivated plants and native species sheltered by natural groves of aspen poplar. His horticultural interests cover a wide field but he has, to some extent, specialized in fruits and outdoor bulbs. At present his orchard includes 48 varieties of apples and crabapples; during recent years he has grown 28 varieties of plums, 15 of cherries and cherry hybrids, eight of pears and five varieties of apricots. In the early 1950's he started growing filberts, walnuts and butternuts. Presently, small fruits are represented by Boyne, Killarney and Washington raspberries, and by Jubilee and Red Rich strawberries. He also grows many varieties and species of lilies; of particular note are his beautiful trumpet lilies.

Perhaps the early and relatively heavy snow covering of the deep park belt is a factor in winter survival. The trumpet lilies referred to are *L. centifolium* and *L. regale* or closely related hybrids. Uncommon bulbs grown out-of-doors with considerable success include daffodils, hyacinths, narcissi, crocuses, scillas, grape hyacinths and Hall's amaryllis, *Lyoris squamigera*. Other uncommon plants grown with satisfactory results are the double marsh marigold and the foxtail lily (*Eremurus*). Native plants are represented by the the crocus anemone, three-flowered aven, the yellow form of the western red lily, a double form of the buttercup, and the yellow lady's slipper.

Mr. Martinovsky has grown many seedlings and among those which merit consideration are three selections of perennial phlox, a lily seedling, and a cream and canary-yellow delphinium. Three standard apples have been propagated for further testing, Kathleen, Francis and Hermansky. The last variety will keep in storage until February. Another plant of interest is a green ash seedling with variegated, crinkled leaves.

During the past 20 years Mr. Martinovsky has judged at numerous fairs and horticultural shows in eastern Saskatchewan. He has a fine small museum of relics of the pioneer days and a collection of about 360 Indian artifacts. Keenly interested in ornithology, he joined the Yorkton Natural History Society shortly after it was organized in 1942. His several hobbies keep him fully occupied but it was for his work in the field of horticulture that he was honored on this occasion.

Classification of Roses

By MRS. W. A. MacDONALD
Winnipeg, Manitoba



HT



Gr.

Hybrid Tea (HT). Large blooms, usually double, borne singly or more than one to a stem. Buds may be pointed, round, oval or urn-shaped. Flowers are of good form, long stemmed, in a wide variety of color; many are fragrant. Plants bloom practically all summer.

Hybrid Perpetual (HP). Flowers large and usually very fragrant, in colors of white, pinks, reds, but not yellow. Plants are tall, vigorous and upright; foliage is dull green. Bloom freely in June and occasionally until frost.

Grandiflora (Gr). Flowers medium to large, with the form and quality of Hybrid Teas; borne singly or on stems with multiple blooms; some are fragrant. Plants are free-flowering and usually taller than Hybrid Teas.

Floribunda (F). Blooms are semi-double or double and of various sizes, borne singly or in medium to large clusters, wide color range; many varieties are fragrant. Plants are of varying heights; free-flowering all season.

Polyantha (Pol). Flowers are small, produced in large clusters, rarely fragrant; but the small, bushy plants bloom freely. They are useful as borders and for low edgings.

Miniature (Min). Flowers are small, averaging one inch across, usually of Hybrid Tea form, borne singly or in clusters. Plants are bushy and compact; should be less than one foot high. Ideal for pot plants or rock gardens.

Climber (Cl) and Rambler (R). Normally of vigorous growth requiring supports, with large flowers usually borne singly. Most varieties bloom on old wood only; they are recurrent. There is, however, a new type of Climber that does bloom on the current season's wood, bearing large clusters of colorful flowers at intervals from early July until frost. There are also many climbing forms of Hybrid Teas, Floribundas and Polyantas which produce blooms characteristic of the variety that has been budded on the understock. Ramblers bloom only once a year; the small flowers are borne in clusters.

Shrubs (S). Bushy shrubs of vigorous growth. A miscellaneous group which include many species of roses and their hybrids. Blooms are profuse; may come singly or in clusters. Some plants are recurrent, but many produce blooms for only a limited time. Foliage is attractive, as are the bright fruits in the fall.

Tree or Standard. The desired variety is budded at the top of a straight trunk (usually Rugosa) about two to four feet tall. Certain Ramblers are used to produce the weeping form of Standards. Often the trunk also is budded on hardy understock to avoid sucker growth. Tree roses will bloom freely; often the flowers are larger than those produced on the parent bush plant. It should be noted, however, that these roses need special winter production in prairie gardens.

See earlier articles on roses in THE PRAIRIE GARDEN on all phases of rose culture on the prairies; 1963, 3; 1964, 5; 1965, 2; 1966, 4; 1967, 2.—Editor

The Rose . . .

My Favorite Flowering Shrub

By WALTER SCHOWALTER
Rumsey, Alberta



A repeat-blooming wild rose selection

Once the flowering almonds and the crab-apples are out of bloom, and the lilacs and spireas have faded, most people are content to forget about flowering shrubs until next spring. Why not plant some hardy roses and extend the season until heavy fall frosts?

Oh, I know there are those who consider anything not a hybrid tea as a wild rose, not fit to grow. What is wrong with growing a wild rose?

Perhaps the most striking flowering shrubs I have ever seen were some 8-foot specimens of single Altai rose blooming in the town of Sylvan Lake, Alberta.

Worried about snout beetles? A program of spraying with DDT will not provide all the answers, but it will work marvels. If you have wild roses growing near, it is more practical to spray them than attempt to eradicate the patch.

Are some of your favorites not quite hardy? It is a simple matter to bend over a bush in the fall, and anchor it with a log or a rock so that the snow can drift over it. Pruning? After getting rid of suckers and dead wood, remove over-age shoots at ground level. Simple, isn't it?

The June bloomers probably make the greatest show. Double white Altai starts the season with a bush full of fluffy snowballs. If only it did not produce such a super-abundance of suckers! I have my eye on Beauty of Dropmore as a possible replacement. The flowers are almost of Hybrid Tea type. Then there is that 3-foot mound known as Burnet, or Scotch White, remaining one of a bridal bouquet.

There is a real need for better yellows. The gorgeous, golden Persian Yellow flourishes on a miserable bush. Harison's Yellow makes a much better bush, but it is only sulphur yellow. Scotch Yellow is a nice primrose yellow, but the flowers are not as good as the others. Percy Wright has been working on the problem and I must try some of his better yellows.

No hardy red quite compares with Alike, or *Gallica grandiflora*. The semi-single light scarlet flowers flaming against the dark green foliage are a sight not to be forgotten. A very reliable red is Kamschatka, a once blooming *Rugosa* of Hansa type but with smaller and duller foliage.

The queen of the pinks is undoubtedly Betty Bland, a tall and slender June bride. The bright red canes and berries add something to the winter landscape as well. Too bad its suckering habit is so persistent. Wasagaming is an exceptionally beautifully formed rose, though its coloring leaves something to be desired, and the bush tends to flop. For color contrast be sure to plant a red leaf rose, *Rosa rubrifolia*, a giant which can reach the height of nine feet. This one may kill back some winters, but as the tiny flowers are not very noticeable that shouldn't matter too much.

Hansa is still the favorite repeat-bloomer, and rightly so. Nevertheless, I feel that the variety has been overplanted to the point of monotony in some

places, and in a dry season the color fades to an unattractive magenta. Mrs. Anthony Waterer is even closer to purple but has a deeper shade than Hansa. Therese Bugnet combines the height and red stems of Betty Bland with the everblooming habit of Hansa. I am very fond of Will Alderman. Its rose pink blossoms are almost of Hybrid Perpetual type, and they keep coming all summer. Attractive glossy foliage helps to round out its list of virtues. The pure fresh pink of Prairie Dawn, together with its distinctive break from the usual *Rugosa* type, make this one a welcome addition to prairie gardens.

If you want something different, plant the Grootendorst roses. These look more like carnations than roses, and they come in reds, pinks, and whites. They are not as hardy as the above types, but as they bloom heavily on new wood that is nothing to worry about.

So far I haven't grown any really satisfactory climbing roses. Two which bloom on new wood and are hardier than the average Hybrid Tea are Red Dawn and Korde's Red. Both are nice roses, but they will never climb for me.

The cabbage and other "old" rose types have not proved too successful. Most of them tend to scorch or ball in our climate. We need varieties with heavier and hardier petals.

Among the newer roses two deserve special mention. Robert Erskine's Beauty of Leafland is the nearest I have seen to a Hybrid Tea on a perfectly hardy bush. The form is perfect, and the cream and pink coloring exquisite, but it will need more testing. Isabel Skinner may well be the first of a race of hardy everblooming bedding roses. Considering that this is only one quarter hardy shrub its hardiness is unbelievable. Of course, it is only an ordinary pink in color, and the flower reminds one of an old-fashioned double poppy. All the same, this is a major breakthrough and we may expect to see better roses of the same breeding.

Another strain of hardier high quality roses is being produced by Robert Simonet. I am greatly impressed by Red Clusters, a seedling of this Red Dawn by a hardy variety.

For those who have not had too much luck with hybrid teas I recommend the Hybrid Perpetuals. Frau Karl Druschki and Captain Hayward have survived here for years. The Brownell Sub-Zero roses are not as long-lived, but come through vigorously without much winter cover, and they bloom well under adverse conditions. Curly Pink and Queen of the Lakes are two of the best selections, and all of the group are worth trying.

There is another good article on Hardy Shrub-Roses in THE PRAIRIE GARDEN for 1966, by Percy H. Wright, Saskatoon, Sask.



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Growing Dahlias . . . the Flower of Beauty

By CHARLES F. CROWE
Past President, Saskatchewan Horticultural Societies Association
Regina, Saskatchewan

The dahlia, a native of America and highly developed in California, is a widely grown plant today. It is individualistic in fragrance, color and size, and is easy and quite cheap to grow and propagate. The original dahlia was a small, single flower with eight petals. Its habitat was in the high plateaus of Mexico but it was grown almost a century ago in Europe, particularly in Madrid, Spain. The name Dahlia came from the Swedish botanist, Dr. Andreas Dahl.

Dahlias will grow in almost any type of soil, but the most suitable is a well drained medium or light sandy loam with well rotted manure added. The heavy clay soil of Regina can be improved by adding sand and humus, and the lighter soil encourages growth of the tuber. By adding well rotted manure or compost to Regina's heavy and cold soil it can be lightened and warmed, two most needed soil qualities for dahlia growing. I add also some wood ashes.

A dahlia will blossom in from 90 to 105 days from date of planting. One should grow this beauty for fun and for variety of color and blossom. They can be grown from seed, from slips and from tubers. A wide variety can be secured from seeds sown in flats about the second week in April; transplanted into individual 3- or 4-inch pots after the second pair of leaves appear; and grown in these pots until they can be moved into the garden after danger of frost is over.

When you use tubers, one with an eye should be selected. About mid-April, place two or three tubers in a real sandy soil. I use boxes 10 inches by 10 inches by 4 inches. A shoot will appear after about ten days. Continue the culture in these boxes until time to transplant the tubers into the garden, in a hole about eight inches deep and five or six inches in diameter. Drop a tablespoon of bonemeal in the bottom of the hole and mix well into the soil. Cover with an inch of good topsoil. Plant carefully with the tuber lying flat. Add more soil to cover, and an inch by inch stake about 3½ feet tall about two inches from the dahlia stalk, packing soil until the hole is filled. Water thoroughly. I start my dahlias under lights in the basement.

To grow good blossoms the plants must be watered well. A plant requires a pail of water per day for good growth. Cultivate shallowly and fertilize, using 11-48-0. Work fertilizer in well but not too deeply. Mulch between the plants with compost, grass clippings or well rotted manure to retain moisture and prevent the plant fibers from hardening. If the plant fibers harden you will not get a large blossom, or a well formed blossom.

Dahlias require room and air for healthy growth. They should be planted about three feet apart in full sunlight, and sheltered from strong winds. Promote large blossoms for show purposes by disbudding and disbranching. Remove all buds except the central or terminal bud, and small branches at the axils of pairs of leaves. It is wise to leave some of the lateral branches for further blossoms.

To harvest dahlias you wait until the frost has blackened the leaves and then leave in the ground for a few days or approximately a week. Cut

stalks off about five inches above ground. Dig the roots by spading deeply about a foot around the stalk, lifting clumps carefully to avoid injuring the tubers. Clean dirt off the tubers and lay plant on its side to dry for a few hours. After this store the tubers.

There are several ways to store tubers: packed in vermiculite, in sawdust, in sand, or wrapped well in newspaper. I have had reasonably good luck by wrapping the tubers in newspaper and then putting the wrapped tubers in plastic bags and stacking them in cardboard boxes in the coolest part of the basement. A satisfactory storing temperature is around 50°F. One must check the tubers several times in January and February for rot and mold. If rot develops, cut out and sprinkle the wound with powdered sulphur.

When April arrives, examine your tubers and prepare them for separation. If the tubers are dry, store them in moist sand or peat moss for a few days; the tuber will expand and eyes will show. Use a sharp knife to separate the tubers, making sure that each has one eye showing on the attached stalk. Be careful in cutting so the tuber neck is not broken or injured. The tubers are now ready for planting.

Dahlias can be grown with pride and delight to produce landscape effect, in borders, in beds and for show. To show large blossoms or other varieties, cut them early in the morning or late in the evening when the plant is full of water. Immerse immediately in cold water and keep in a cool place until showing. One can maintain the firmness of petals by spraying florets with a fine mist spray of cool water.

Centennial Plantings

By JO McCREA
Manitoba Centennial Corporation, Winnipeg, Manitoba

Historically, trees have been planted the world over to symbolize hope for the future; traditionally, permanence has meant the fruit of the land. It was fitting, therefore, that Canada's Centennial year saw millions of trees, shrubs and flowers planted from coast to coast.

Probably no one has ever counted the individual trees in the famous forest of the world; but if all the trees planted in Manitoba during 1967 had been in one vast area, Manitoba could now boast, as a further tourist attraction, an enormous forest. It is doubtful if any school child in the province has not been present in at least one tree planting ceremony during Centennial year.

Industrial and fraternal organizations, town councils and chambers of commerce, schools and private businesses, Government agencies and private citizens, all have undertaken planting projects which, during the summer of 1967, and during the Pan-American Games in Manitoba, turned our province into a veritable garden. The beauty and the benefits of these trees, shrubs and various other plantings will be enjoyed by generations to come.

Add to this the rivers of paint, the new fences, the renovated buildings, the new edifices rising in some 200 towns and villages, and the general clean-up which replaced many eyesores with beauty, and Manitoba has begun an improvement program during 1967 which will continue to and through Manitoba's Centennial in 1970.

Provincial Government agencies led the drive with a large program of park improvements, boulevard and road approaches plantings. In order to meet the growing recreational demands of Manitobans and their visitors, the

Manitoba Parks Branch is engaged in a continuing program of re-development, expansion and improvement of park system areas. Under the impetus of the Centennial Parks program, several new resort and outdoor sports projects were started, and several are completed.

Bird's Hill, officially opened July 1, is Manitoba's major birthday present to its citizens. The 8,300 acre multi-purpose park fills a pressing need for a large natural day-use recreation area for the Metropolitan Winnipeg area. It contains an 80-acre man-made lake, among its many other attractions. For Manitoba's 1970 anniversary, Bird's Hill park will have as well a golf course, a Nature centre, a pavilion building and a variety of other additions.

All together, the Manitoba Parks Branch is engaged in the improvement or the creation of 12 major parks throughout the province, including its northern area, the Mecca of sports-minded American tourists.

Of a total of 214 Manitoba municipalities eligible for the Federal-Provincial Centennial grants program, 201 rural municipalities participated. Of the 191 projects pertinent to this report, 88 were parks or improvements to existing parks.

Manitoba schools, through their Home and School Associations, or under the sponsorship of service clubs, planted 10,000 trees in the spring of 1967, supplied by the Province of Manitoba.

The one unique program of Community Improvement in Manitoba during 1967 was "The Juba Jaunt." Mayor Stephen Juba of Winnipeg, made a tour of the province, to encourage improvements in villages, towns, cities and farming communities. He spoke to thousands of citizens, urging them to put on birthday dress for their Pan-American Games visitors. And it paid off! Athletes and spectators exclaimed over the beauties of Manitoba, and hundreds have taken the trouble to write and say how beautiful are the trees and gardens.

Manitobans responded magnificently to the encouragement and opportunity to make our province beautiful. With us, it's a grand beginning. We're looking to a continuing planting and beautification program until, in 1970, we achieve in large measure the beauty of our rich province.

Hopefully, in 1970 highway approaches and the long stretches of flat prairie roads will be relieved by trees and shrubs. Automotive graveyards must come in for their share of attention, at least fencing the blots of ugliness they create on the landscape. The impetus of rural community paint-up and plant-up must not be lost. Those towns and villages who undertook face-lifting projects have already felt the benefits in increased tourist business, and in the enhanced pride of their residents in their town.

As in every Centennial project in Manitoba during 1967, personal involvement in community beautification is essential. If each household in Manitoba in preparation for 1970 and our province's 100th birthday, will take a hard look at their own property and resolve to improve the house, the garden, the fence and the garage to its potential beauty, Manitobans will acquire a new pride in their province. The enthusiasm of one planting project on a street creates a chain reaction with the neighbors. One freshly painted house inspires the next one to take a critical look at their property. A landscaping project, or a new tree, often produces an imitative program with a neighbor. And everyone benefits.

Advice and assistance are available in every area of beautification. Pressure from citizens to private industry can result in clean-up programs. Each resident of Manitoba is urged to do his share in preparation for 1970, so that our birthday dress for Manitoba's Centennial will be as near total as possible.



Minnedosa



Souris

New Varieties of Monarda for the Prairies

By H. H. MARSHALL

Research Branch, Canada Department of Agriculture, Brandon, Manitoba

Monarda species have many characters that could make them valuable border plants. Several of the 16 species native in temperate North America are large two- to four-foot plants. Flowers, borne in heads in midsummer, range through shades of purple and red to white. Being members of the mint family, the plants are strongly and sometimes pleasantly scented. Monardas are known by many common names due to their wide distribution, distinctive colors and odors. I prefer to use the generic name *Monarda* since none of these names are more easily pronounced or remembered.

Monarda was introduced to Europe long ago, along with many other American plants. (Nicolas Monardes, 1571, a Spanish physician and botanist). First selections were made from races found in the southeastern United States. None of these varieties, or more recent selections from America, are hardy throughout the prairies.

A breeding program at the Brandon Research Station, using as parents the native lilac-flowered species and the scarlet-flowered *M. didyma* from the eastern United States, is producing many hardy selections in a wide range of colors. Other breeding techniques are creating lines with larger leaves and flowers. Still other lines are sterile, thereby conserving energy for greater flower production. A lavender-scented type has been acquired recently.

Two varieties were named in 1965 and released to propagators. Both have been added to the recommended list of perennial flowers for Manitoba and plants now are obtainable from nurseries. Souris is a vigorous hybrid 30 to 42 inches in height; flowers are a deep reddish purple. Minnedosa is a white-flowered form of the native species, 24 to 30 inches in height. Both flower in July, Minnedosa a week earlier than Souris. Pink and red-flowered selections should be available in a few years. Croftway Pink may serve for the present.

There have been no serious problems in growing Monarda in sunny locations in good soil. The root system consists of a large number of stolons up to a foot long. Plants can be propagated easily but soon become crowded. A small division should be moved to a new location each May for flowering the following one or two years. Insect and disease control has not been difficult with measures used to combat similar pests on other plants.

Editorial note—Henry R. Marshall, horticulturist and head gardener, Canada Research Station, Brandon, Manitoba, is doing a lot of bold plant breeding with ornamental plants. His work with Heucheras, Monardas, Roses, Chrysanthemums, and native flora, is contributing added beauty and enjoyment to Canadian gardening.

Gladiolus Culture in the Lethbridge Area

By JAMES G. ARCHIBALD

Lethbridge District Horticultural Society, Lethbridge, Alberta

Soil Preparation. Almost any good garden soil is suitable for gladiolus growing. In Alberta they are grown in soils ranging from black as at Edmonton, to sandy as at Taber and Medicine Hat, and to the heavy soils in the Lethbridge-Coaldale area. An application of well rotted manure at time of digging or tilling soil will give good results. A commercial fertilizer, such as 11-48-0, is commonly used, broadcast at not over three pounds per 100 square feet of surface, at time of digging. Soil should be worked to about eight inches in depth, breaking up lumps and smoothing off the surface. A sunny location is ideal, with some wind protection.

Buying Gladiolus. Too many people buy mixed corms (bulbs) at bargain prices which generally are poor varieties and do not produce good spikes. Usually, there are too many white colors which some people do not like. If you have not grown glads to any extent and have not been getting catalogues, go to someone, or find out from your local horticultural society who grows glads, and see if you cannot get bulbs of good varieties from him. If this is not possible, borrow his catalogues, seek advice on varieties, and order your bulbs in colors desired. Many varieties are excellent cutters for house flowers as well as suitable for exhibitions. Keep the varieties named by using wooden markers, or wire and aluminum tags, on which you may write the name with a china pencil. Thus, if you like certain varieties, you will be able to order more of the same another year.

Planting Bulbs. Now that your soil has been worked up ahead it will be warmed up probably after April 20. If the season is backward and cold, you may wish to plant later, say into early May. Start at one side of the garden, a foot or so away from the fence or shrubs, and set up a string marker. A trench five to six inches deep can be dug with a hoe or a spade. Plant bulbs which probably will be showing signs of sprouting by this time, with root area down. If room is a factor plant six inches apart, but eight- to ten-inch spacing is better. Cover with a garden rake. Now move string and sticks over about 20 inches and continue to plant. Every time another variety is planted place your tag at the start of that variety.

Growing Glads. Glads respond to plenty of water and although it is not necessary to drown them they do well in moist soil. Sprinkling may be all right until they are six to ten inches high, but irrigating between the rows after this likely will give you better results. At ten inches in height hilling can be done, leaving a natural trench in which to run water slowly. In hot weather it may be necessary to water once a week or every ten days. Surface watering will force roots too near the surface; deep watering will send roots down to anchor the plant. If plants are not growing vertically, the soil can be stepped on and the plant will be forced to an upright position. Weeds must be kept out at all times and by hoeing for weeds some shallow cultivation is beneficial. A suitable insecticide should be sprayed at weekly intervals. Possibly one of the safest to use is Malathion at a rate of one ounce per gallon of water. Spraying should be started when plants are six inches high. Thrip is the common insect attacking gladiolus, and is so tiny that it is hard to see, but is ever present in most cities and towns.

Cutting the Flower. A sharp knife should be used and long stems cut by forcing the knife down one side of the stem, through the stem and up the

other side. Always leave as many leaves on plant as possible so as to develop the bulb for next year. Plants where leaves have been cut off usually make small, poor bulbs. Continue to water normally so as to develop the bulb. Remember that in cutting a glad for exhibition pick with straight stems and long heads which show promise of good placement, and cut when two or three bottom florets are open. Lay the spike on a small stake and fasten with twistems to hold the stem straight. Set in deep water below the bottom floret for a day or so before show. Carry to the show on the stake and then remove and set up for exhibit. Beautiful arrangements can be made in vases and baskets from your own flowers for your own home.

Digging and Storing. About the end of September or early October, pull or loosen with a fork and lift the glads. Use a pruning snip or shears to cut off the stem right above the bulb; do not leave any stem. Many articles on glads, recommend leaving two to three inches of stem; but when you buy from a good grower you will always note no stem. Place bulbs in shallow box not over two inches deep and move to warm storage such as a garage or a building where it is warm and does not freeze. Dust bulbs lightly with DDT. About a month may be required to cure or dry the old roots and the outer layers of skin or tissue cover. At this time, the old root can be pinched off by hand, but do not remove any more outside skin than you can help. Peeled bulbs will dry out and make poor flowers next year. Place bulbs again in shallow boxes and dust once more with the same insecticide.

Thrip comes with glad bulbs, and under usual household storage will suck on the bulb all winter and give it a corky appearance. After cleaning, bulbs should be stored in a dark, cool room; an ideal temperature is 40°F.-45°F. About April 1 bulbs should be brought into warm storage, so that they may get some life and start signs of small roots, before planting; this will make them bloom earlier. For short season, northern areas, it is advisable to even get a sprout on the bulbs up to three inches long before planting. It is not necessary to do this at Lethbridge unless growing for a very early show. This completes the cycle of caring for and growing glads and almost anyone should be able to produce good flowers with proper care.

See further information on gladiolus in *The Prairie Garden*: 1964 (2); 1965 (2); 1967 (2).—Editor

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ALBERTA

Half a Century Growing Sweet Peas

By MRS. M. A. JOHNSON
Minnedosa, Manitoba

Sweet peas are a garden flower everyone should grow. They reward you for any labor entailed. Even if neglected they struggle to give some bloom; and if treated with loving care they will give you fine blooms for exhibition or home decoration.

Usually we sow our sweet peas in the same place around the middle of May and are generous with the seed. We have grown all the varieties at different times but now seem to have a preference for Cuthbertsons. They grow in full sun and are allowed to climb on an old chicken wire trellis which has served this purpose for many years.

When the plants are up we give the vines a little help to start them on the wires. They require a good soaking with the hose occasionally if the weather is dry, and will respond favorably to much watering and generous feeding. They enjoy any plant food available. In 1967 we gave them sulphate of iron as an experiment and at last measurement the vines were 7½ feet tall, a lush green, and full of long-stemmed flowers until the frost. During the peak of the season I cut flowers every second day. After frost we lay the vines down and dig them roughly into the earth for fertilizer — an idea handed down to us from a former generation. The vines and foliage of sweet peas, as with other legumes, contain considerable nourishment.

We lived in Brandon before coming to Minnedosa in 1904 and old friends who visited us here in 1913 persuaded us to enter our sweet peas in the Brandon Horticultural Show that year as their honorary secretary was presenting a cup for the best collection of sweet peas. My only transportation to Brandon was by slow train which in those days took many hours to travel the 30 miles or so, after hanging around Rapid City Junction for a couple of hours.

After many difficulties I managed to get my sweet peas there and won the trophy — the first horticultural trophy to come to Minnedosa; I still have that trophy. A local horticultural society was then formed and one of the citizens offered a \$10 prize for sweet peas which was a lot of money in those days, and this encouraged growing them in Minnedosa.

The professional growers tell us that for prize-winning sweet peas you should have only one vine every so many inches and grow them to one stem by pruning and disbudding, etc., but then I wouldn't have any sweet peas to give to my friends.

We grow also the perennial sweet pea, *Lathyrus latifolius*. These usually start to bloom late in June and are a mass of bloom as long as you keep them cut. The blooms and foliage are lovely for arrangements. They have many blooms on a stem and come in colors of deep red, pink and white. They are very beautiful and last well when cut.

Editor's Note—Mr. and Mrs. M. A. Johnson, who are 89 and 86 years of age respectively, have been growing prize sweet peas, dahlias, and all manner of garden plants in Minnedosa since the early 1900's. Last November they celebrated their 63rd wedding anniversary. Both are active in the Minnedosa Horticultural Society; they are life members and life directors of that society. Each year Mr. and Mrs. Johnson exhibit beautiful baskets and arrangements of flowers and fine entries of sweet peas, pansies, dahlias, etc.



Figure 1. Cold storage treatment and flowering of tulips.

MP—Moist Peat Moss (Treat. 3)
DP—Dry Peat Moss (Treat. 4)
PL—Plastic (Treat. 5)

PA—Paper (Treat. 6)
MS—Moist Soil (Treat. 1)
DS—Dry Soil (Treat. 2)

Flowering Tulips and Daffodils in the Home

By E. A. MAGINNES, Ph.D.

Department of Horticulture, Extension Division, University of Saskatchewan,
Saskatoon, Saskatchewan

Flowering of bulbs in the home has become less popular in recent years, primarily because most modern homes lack cold storages or are kept too warm. At one time, the basement of most homes was cool enough to force most bulbs, but much use of the basement (rumpus room, bedrooms and suites) gives temperatures too high. Tulips, for instance, require a cold-treatment at 50°F. or lower, to produce normal, well formed flowers.

Usually, bulbs are potted in soil, watered, and set in natural or refrigerated storage or, in some areas, in an outdoor pit. The outdoor pit can be risky under Saskatchewan temperatures, and this would suggest the family refrigerator instead. Because this is not too satisfactory, the cold-treatment of bulbs in peat moss in plastic bags immediately before potting was experimented with. Thus a relatively large number of bulbs could be stored in fairly small space in the family refrigerator. The results of two seasons' work with tulips (Paul Richter 1965-66 and Wm. Pitt 1966-67), and daffodils (King Alfred, 1965-66 and 1966-67), are encouraging. During this period, the following treatments were subjected to 8, 10 and 12 weeks of storage.

(1) Bulbs potted in soil and watered when needed during storage. (2) Bulbs potted in soil and not watered during storage. (3) Stored in sealed plastic bags containing moist peat moss (small amounts of water were added to peat moss until the moisture just started to become visible on one's fingers

after compressing a sample). (4) Stored in sealed plastic bags containing dry peat moss. (5) Stored in sealed plastic bags, no peat moss. (6) Stored in sealed paper bags, no peat moss.

Before storage, all bulbs were dusted with a fungicide. During 1965-66, the bulbs were stored in a standard refrigerator at approximately 40°F. to 42°F., and in 1966-67, in a walk-in refrigerator at approximately 35°F. to 36°F.

Tulips were observed to flower regardless of treatment but those in watered soil (Treat. 1) and moist peat moss (Treat. 3), produced the best results as illustrated in Figure 1. Bulbs stored in moist peat moss flowered a few days before those in watered soil, but otherwise they were equal. The difference in storage temperatures between the two seasons did not appear to influence flowering.

Daffodils did not respond to the same degree as tulips. Only the daffodils in watered soil and moist peat moss flowered satisfactorily, with the longest storage treatment tending to produce the best results. The 1966-67 results for daffodils were not as good as those of 1965-66, probably because of the difference in storage temperatures. More work, however, is necessary to determine this point.

On the basis of this work, it would appear that tulips can be grown satisfactorily after receiving a cold treatment of at least eight weeks in moist peat moss in the family refrigerator (Treat. 3). Treatments longer than 12 weeks would not appear desirable because an excessive amount of roots would be developed prior to planting.

At the present time, growing daffodils by this method would be recommended for those wanting to experiment. Our results would tend to indicate that bulbs stored in moist peat moss for 12 weeks in the family refrigerator will produce satisfactory results (Treat. 3). Temperatures colder than the family refrigerator would appear to be detrimental.

Storing bulbs in moist peat moss in the refrigerator has proved as satisfactory as storing bulbs potted in soil. This will allow everyone in warm homes and apartments to successfully grow tulips and daffodils.—Reprinted from THE GARDENERS' BULLETIN.

Miniature African Violets

By MRS. C. W. BEATTIE
Winnipeg African Violet Society, Winnipeg, Manitoba

Fairly new to violet enthusiasts, but growing rapidly in popularity, is the Miniature Violet. As the word implies, it is "diminutive or minute" but nevertheless a perfectly formed violet. The true miniature does not grow larger than four inches in diameter, and for exhibition purposes is described as "under six inches, in a pot not over 2½ inches."

The miniature is grown and always remains in a 2½ inch pot. It is tailor-made for apartments and small homes where plant space is restricted. That window above the kitchen sink with its small sill makes a perfect spot for miniatures, as the sill will hold up to 12 plants. Not only is this space perfect for them, but they are able to take advantage of daylight and all the steam generated in a kitchen, thus enjoying excellent humidity.

The lamp tables in the living room also make a perfect location for these plants; no need for fluorescent lights when your plants can be placed under the reading lamps and, in attractive containers, add a lovely touch to the

room for when properly grown they are a mass of color, the florets almost completely covering the leaves.

Culture of the miniature is the same as for a normal-sized violet, with the exception that it is wise to transplant them to fresh earth every six months and remove the outer leaves, thus helping to keep them miniature. As they tend to sucker freely, one must be on the alert and remove suckers as they appear. The soil used and the watering and fertilizing remain the same as for the ordinary violet. But as they are grown in small pots they dry out faster than plants in standard-sized pots, so a proper watering plan must be carefully followed. If grown under fluorescent lights, they should be 12 to 14 inches from the lights.

The following are excellent choices in miniatures: Tiny Rose, a double rose with very tiny leaves; Tiny Pink, a double pink; Peacock, a single purple; Morning Star, a pink single.

The following are semi-miniatures (just slightly larger than the true miniature): Tiny Tinker, double, plum color, with a waxy leaf; Bloom Burst, pink; Fancy Pants, mottled purple and white.

For the second time in its history, the African Violet Society of Canada will be holding its annual Convention and Show in Western Canada. Winnipeg has been chosen as the location for the 1968 Show, on June 6 and 7, at the Marlborough Hotel. Exhibitors need not be members of an African Violet Society, and may come from any part of Canada or the United States. Watch your local newspapers for the Show Schedule and the Rules and Regulations.

A Gardener's Work Is Never Done

By HECTOR MACDONALD, F.R.H.S.
Retired Supervisor, Assiniboine Park, Winnipeg, Manitoba

Don't kid yourselves, friends. That is only too true. I'm telling you, in case you have not realized that fact.

For over 50 years I battled aphids, droughts, storms, red spiders, frosts, and all the afflictions that a plantsman's life is heir to. Then came retirement age and pension, and resolutions. No more gardening — not even a house plant! Robbie Burns knew the score when he said "The best laid plans of mice and men gang aft a-gley."

First slip was friends sympathizing with my better half. "Minnie" you do need a plant in that corner. You just take this one, dear." What could I do? I was beat right there.

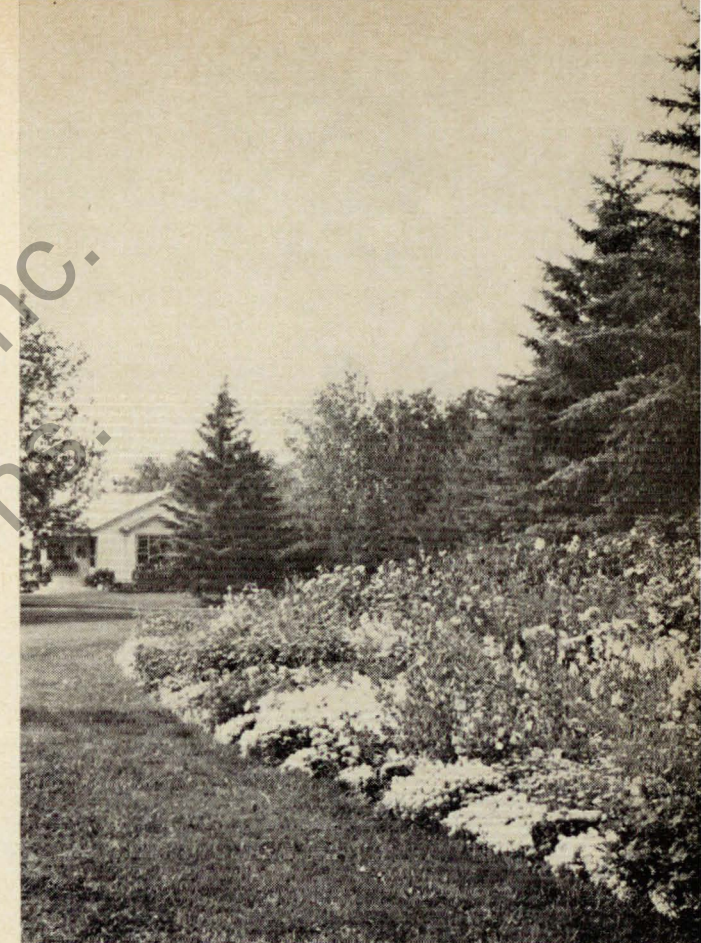
Next step downhill was when a long-time friend asked me to do a little radio program as a favor. The net was closing in. However, to be honest, I enjoy my little sessions with a microphone and a tape recorder, and of course the extra pocket money.

My downfall was complete when the owner of a seed company handling nursery stock as well as seed, came around with his company's catalogue; and said: "You old son of a gun (or a similar expression), we figure you need to be kept out of mischief, so get busy and reorganize this catalogue." So now I analyze sales and costs, check illustrations, and recommend varieties. My days are full of gardening. Once a gardener, always a gardener!



Window boxes and flower beds frame the front entrance of the Poulton's charming country home

Flowers in infinite variety fill several hundred feet of flower beds in the Poulton garden, many of them such old favorites as marigolds, poppies, pansies, sweet william, larkspur, calendula in one or more varieties



This is one of the three lily pools in the Harry Poulton farmyard. Waterbugs carve crazy patterns across their surfaces even as the water reflects the beauty of sky and leaf

Flowers, Flowers Everywhere

By ELVA FLETCHER, *The Country Guide*

Gardening in the prairies is always a challenge. Winters are long and cold, air low in humidity, precipitation uncertain. But the challenge means little to Harry Poulton, of Quill Lake, in Saskatchewan's treed and rolling parkland.

The Poultons moved to the Twin Creek area back in the dusty thirties. There they had been frustrated not only in their efforts to farm successfully but in their attempts to grow flowers, fruits and vegetables that are a part of living to both of them. Now their attempts have borne fruit for they have a productive farm and they grow practically everything that can be grown in the prairies in one of Saskatchewan's most beautiful farmyards.

Their first tiny home — in a little clearing — has since given way to a larger one. The wilderness around the little clearing has been replaced with the five acres of lawns, shrubs and hedges and trees that backdrop hundreds of feet of softly curved flower beds. A variety of individual planters focus attention on specific varieties — tuberous begonias and geraniums, for example, — and skittering waterbugs and glittering gold fish liven the watery depths of three different pools.

The Poultons like their flowers (fruits and vegetables, too, for that matter) big and beautiful. They grow them in bold splashes of color, plant hundreds of annuals each year, a lot of them grown in the Poulton greenhouse, and use perennials freely. Twelve-pound heads of Copenhagen market cabbage are commonplace at the Poultons. So are extra long bean and pea pods. Their secret for success: they cultivate, they cultivate and then they cultivate some more!





Flowering plum being moved in the spring, on chain sling

Moving of Established Trees

By H. N. MUNROE, N.P.D.
Development Foreman
Wascana Centre Authority
Regina, Saskatchewan

The average twentieth century man doesn't have the time nor the patience to watch a sapling grow into a large, gracious tree. Homeowners want shade on their patio before the concrete sets; architects require large trees to complement their large buildings; and clients in general want immediate effect.

The average person may be surprised at the elaborate procedures I am going to suggest in a large tree moving operation. We all can point out the rough, careless job where the tree survived, but I believe that with a little extra care, thought and effort a tree can be moved and will suffer very little if any set-back.

It is becoming common practice to move mature trees, up to 15-inch diameter, but the cost mounts rapidly with size. While you may be able to transplant a 3-inch diameter birch for \$50.00, it may cost upwards of \$300.00 to move the same tree with 15-inch diameter. Because of the costs only healthy, first-quality trees, with well formed top characteristics, and well developed fibrous root systems, should be considered for moving.

There are varying opinions on the best time to move large trees but generally speaking the spring and fall seasons are best. Winter movings have been done with good success but the costs are much greater due to unfavorable working conditions. Regardless of season, the following general conditions should prevail before the operation begins: the soil should be in a moist,

friable condition; the plant should be in a dormant state of growth; and the soil temperature should be warm enough to permit root growth immediately after planting. Another great aid in the success of a transplanting operation is the preparation of the tree by root pruning one year in advance, to encourage fibrous root development within the area of the root ball.

B and B or Baling and Burlaping is practised on deciduous trees with a diameter larger than 2½ inches and on all evergreen trees. The soil ball diameter should be nine to 12 inches for every inch of trunk diameter one foot above the ground. Once the size is determined you mark a circle around the tree and dig a trench straight down on the outside, past the lateral roots, allowing ample working room so that you will be able to taper the bottom third of the ball until it is about one-half the diameter of the top. The total depth of the ball will be determined by the root system and the type of soil, but a rule of thumb is that the ball will be half as deep as the diameter (i.e. if the diameter is eight feet the ball depth will be about four feet). The top edge of the ball is rounded off, the torn roots are pruned, and the ball is ready for burlap and drum lacing. The burlap is wrapped around the ball, covering it from top to bottom, and nails are used as pins to hold the burlap in place. A rope, ¼ to ½ inch depending on ball size, is placed six to 12 inches in from the top of the ball and tied, then a rope is wound around the bottom of the ball and tied relatively snug. Next, the ball is laced by tying one end of a long rope to the top rope and lacing it up and down all around the ball. The slack is taken up and a final tie is made to the top rope. The tree is now ready for transport.

The transport depends on several conditions such as the size and weight of the ball, the distance the tree is being moved, the number of trees being moved, and the planting site. Whichever is used, extreme care should be practiced as this is when many transplanting operations fail. Such things as major limbs being broken and soil balls crumbling are common if the loading and transporting are rushed. A tree with a soil ball up to two feet in diameter can be moved by hand; trees with soil balls from two to four feet in diameter are commonly moved using conventional front end loaders; and trees with soil balls larger than four feet will have to be moved with special tree sling equipment and conventional cranes to do the lifting. We use a model C Bessler tree sling of heavy belting material for tree balls up to seven feet in diameter, and a Model E tree sling of cable and belting for soil balls up to 13 feet in diameter. A 13-foot soil ball will weigh between 12 and 14 tons depending on the soil. We rent a crane for loading the tree and use a low-bed truck for transporting. I would like to recommend that moving trees larger than four or five inches in diameter be done only by people in the business as specialized equipment is required.

Failure to observe certain fundamental planting practices often causes the death or severe setback of a tree. At a selected planting site a hole is dug at least two feet larger in diameter than the tree ball that will be placed in it. We use backhoe equipment to dig the holes wherever possible, as the cost of labor is great. The top soil is moved to one side on the site and the sub-soil is hauled away. The hole is dug about six inches deeper than the tree ball and the top soil is laid in the bottom of the hole, mounding it in the centre. After the tree is carefully positioned, the sling is removed, and the burlap is removed or folded down. The tree is backfilled with a planting soil mix of four parts top soil, and one part well rotted manure, and covered in 6-inch lifts, and tamping each lift. The top three or four inches of soil are not tamped and a soil ring is made around the outside of the hole so that the tree can be adequately watered.

Thuja occidentalis (Arborvitae) with burlap and drum lacing



Pinus Sylvestris—large 14" diameter, and ball size 11'—belt sling



Before the tree is watered it should be securely staked by guying. Three stakes or deadmen are set in the ground six to ten feet from the tree in the shape of a triangle. Lag hooks are placed in the trunk of the tree and guy cables and turn buckles are attached, holding the tree firmly. The turn buckle is used so the cable can be kept snug until the new root system is well established. Pruning the top is necessary in any transplanting to compensate for the loss of roots, but the amount of pruning depends on the planting operation and the material being moved. On evergreens, we prune broken and injured branches as well as a little corrective pruning. Deciduous trees should be headed back and thinned out so you remove approximately one-third of the top growth to compensate for the root loss. In doing the pruning you should keep in mind good pruning practices and maintain the natural shape of the tree.

The maintenance a tree receives after transplanting is important. A newly transplanted tree must be watered thoroughly after it is set in place, but additional watering must be intelligently applied as over-watering will drive the oxygen out of the soil and cause the roots to die or harmful root fungus disease to set in. Mulching with straw or leaf mold may be practiced during the first year to aid root development. If a tree is moved from a protected area out into the open, the trunk and larger branches should be wrapped with paper to prevent sunscald.

Transplanting the Larger Tree

By F. B. STEVENSON

Stevensons' Evergreen Nursery, Morris, Manitoba

Occasionally it is necessary or desirable to move a mature tree and this can be done successfully if a little care and a few precautions are taken with the operation. The equipment found on most farms usually is sufficient to do the job. A front-end loader will save much of the heavy work of lifting and moving the tree to its new location.

Some trees move more readily than others. Spruce, cedar, ash and elm have compact root systems and move more readily than trees with sparse root systems such as most of the pines.

Before starting shovels should be ground to a keen edge. A sharp shovel will cut easily through a root an inch thick. Other aid required is some heavy burlap, light rope or heavy twine, binder twine and twine needles for sewing; and if a front-end loader is not available a few planks upon which to slide the tree out of the hole.

If conditions are dry at planting time the trees should be watered four or five days in advance. Before starting to dig evergreens the lower branches should be raised up and tied by winding several strands of twine around them. Broad-leafed trees usually are trimmed to a bare stem and do not require tying.

The size of the ball is determined by the size of the tree. A spruce eight feet tall should have a ball of soil 40 to 48 inches in diameter, and 20 inches in depth. When moving trees in lighter soils it may be advisable to make the ball a little smaller if there is a chance of the ball breaking during the moving.

A circular trench is next dug around the tree. It should be a foot wide and the depth of the ball required. If the ball has a tendency to crumble a

few strands of twine tied tightly around it will hold it in place. When the trench is completed a band of burlap is sewn with twine around the ball, stitching it back and forth in a lacing fashion and drawing the burlap tightly around the ball.

The next step is to tunnel under the ball until only about one-third of the ball is left to hold the tree upright. A strand of heavy twine is then placed across the top of the ball, down the side, underneath and up the other side, pulling it through a loop in the first end of the twine and tying it tightly at the center of the ball. This should be done several times, drawing each strand tight and tying.

A sloping trench is now dug on the most convenient side of the tree. If a front-end loader is used the bucket is lowered into the trench and pushed under the tree as far as it will go. The tree should be raised slowly, making sure all roots are cut, or they will pull the ball apart. If the tree's new home is not too far distant it may be taken there in the bucket and lowered into the hole. If a front-end loader is not being used the tree can be pulled out of the hole on wet planks, with a tractor and chain. Two or three strands of rope or chain are wound around the ball to pull from.

When replanting the tree burlap and twine are left intact and the tree is planted four to six inches deeper than it grew originally. The soil needs to be well firmed around the ball and thoroughly watered after planting is completed.

Most evergreens require little or no pruning. Broad-leafed trees should be pruned back to roughly one-third of their original foliage. Pruning is done with the desired form in mind. If a tall tree is intended the stem is pruned bare leaving three or four of the main branches to form a head. These should be cut back to one half their length.

Large trees should be braced to prevent them being loosened by the wind. This is done by wrapping the trunk with burlap at a point about two-thirds of the height of the tree, and tying guy ropes from the wrapping to stakes at three or more placed around the tree.

Most trees move readily in spring or fall. Birch trees should be moved in spring only.

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A Horticultural Venture

By RAY NYROOS

Supervisor of Forestry, Parks and Recreation Department
City of Edmonton, Alberta

A new fashion in Horticulture with a conspicuous touch of beauty was experienced in downtown Edmonton in the spring of 1966. What is not considered to be very new in horticultural circles proved to be a novel idea which undoubtedly stirred up some mixed feelings and reactions among the downtown business people.

The invasion of 100 trees in tubs one morning in early June was the cause of these reactions. Yes, Edmonton had embarked on a downtown beautification program with the use of trees in tubs.

Planting of trees in a busy downtown business area, whether it be in containers or directly in prepared beds in the sidewalk, requires much planning. The selection of species, choice of containers, and suitable location for trees, all need to be explored beforehand. Needless to say, a downtown business area has to be looked over not once, but many times, before suitable locations for trees can be established. The business signs, parking meters, bus stops, underground and overhead utilities and their locations, are important and must be considered carefully.

A tree should not be placed where it causes obstruction and could allow the program to cause resentment rather than enjoyment. The trees themselves have to be attractive and properly maintained throughout the growing season or they will detract from, rather than enhance, their environment. With these requirements in focus and with no previous records of tub culture to refer to in the prairie region, the program was implemented.

The selection of species was made on the basis of hardiness, durability and attractiveness, with a few species used strictly on a trial basis. The following chart will indicate the species and their performance during the first growing season.

Species	Growth Rate	General Comments
<i>Syringa amurensis japonica</i>	1" - 6"	Leaf scorch on the margins
<i>Syringa</i> hybrid standards.....	3"	Growing well
<i>Betula papyrifera</i>	2" - 4"	Growing well; good foliage
<i>Caragana arborescens lorbergii</i>	Not recorded	Leaves not fully developed
<i>Caragana arborescens pendula</i>	1" - 3"	Leaves not fully developed
<i>Malus</i> hybrid—Almey.....	Not recorded	Not recorded
<i>Prunus padus commutata</i>	3" - 6"	Slow in developing
<i>Populus griffin</i>	6" - 12"	Growing well
<i>Sorbus aucuparia</i>	8"	
<i>Prunus maackii</i>	Not recorded	Not recorded
<i>Tilia cordata</i>	1" - 2"	Certain species slow developing
<i>Larix decidua</i>	2"	Leaves stunted; slow developing

The performance survey was made approximately 1½ months after the trees had been planted in the tubs.

The tubs were constructed from half wine barrels, painted, with four short iron pipes for stand support, and drainage holes three inches off the

bottom. The selection of tubs is important, and should be based on the overall size, for ease of handling, for roominess, to allow for three to five years root expansion; and sturdiness, to stand up for about five years. The wine barrels used seemed to fit these requirements well. The soil mixture consisted of seven parts loam, three parts granulated sorbex and two parts coarse sand, supplemented with fertilizer. A water reservoir consisting of a three inch layer of coarse gravel was provided to carry the trees over between waterings.

Dwarf marigolds were planted in the tubs for color effect but are not recommended since the flowers prove to be irresistible to passers-by, and usually end up as boutonnières.

Maintenance—Regular day to day clean up is required to prevent any accumulation of refuse in the tubs. Watering of course is most important. The trees should not be left too long without water, but at the same time watering can be overdone. In extreme cases and with moisture-loving species twice a week should prove sufficient. Fertilizer is applied as a growth stimulant. The appearance and vigor of the species should be the guide, rather than response to heavy feeding. Insect control is best done at night or early morning to avoid annoyance to the public caused by spray drift.

A quick look at the performance chart will show that most species did relatively well under these conditions. The Japanese tree lilac, mountainash and Griffin poplar produced the best growth. The linden were relatively slow during the first growing season and this probably was due to lack of root hairs, since in the second year the response was much more favorable. The growth rate under normal conditions for all the species ranged from 12 inches for the linden to four feet for the poplar.

To prevent injury from snow removal, the trees and tubs were removed from the streets at the end of the growing season, stored outside in a sheltered area, and heavily mulched with wood chips. All the species came through the winter without severe setback and only an odd branch suffered winter-kill.

Looking at it not only from the horticultural aspect and the costs involved, but also the public reaction and compliments, it must be described as a successful and worthwhile program. Since this was a first year program there is no doubt many problems still remain to be ironed out.

The following points are worth considering before attempting a similar type of program: Condition of trees at planting time. Pre-planting care, to develop a fibrous root system. Soil condition and mixture in regards to species used. Exposure, shade, reflections, heat, rain, etc., in selecting locations. Application of a transpiration retardant. Facilities for winter storage.

* * *

The more we get to know about our plants, the more interesting they become—H. F. HARP (The Prairie Gardener).

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Flower Arranging . . . A Rewarding Art

By ONALEE C. RUDD, B.I.D.

Extension Specialist—Home Design, Manitoba Department of Agriculture
Winnipeg, Manitoba

From the beginning of time, man has felt a need to be creative, to express himself. Even the caveman found it necessary to draw his simple but expressive forms on the walls of caves.

In every culture, too, it has been found that man feels a need for beauty. Of course, the concept of what is beautiful has changed down through the ages. Today, tiny bound feet would be considered ugly, although at one time this was thought to be an essential feature for a truly beautiful Chinese woman.

Man discovered long ago that flowers can help satisfy our yearning for creativity and beauty. "Since there is no rice, let us arrange flowers for a lovely bowl" is a Haiku of the Japanese poet, Basho, who lived several centuries ago. How simply and yet how accurately Basho put it! It almost reflects the simplicity and beauty of a Japanese flower arrangement.

Why not try your hand at flower arranging? It is a most satisfying method of self-expression. And even if your first arrangements fail, you still can enjoy the beauty of the flowers. One of the most appealing things about a flower arrangement, particularly when working with fresh flowers, is that it is not permanent. There is always the opportunity to try again. With most crafts and forms of art, your home and those of your friends and relatives eventually become saturated with your creations. One can use just so many original oil paintings in the home. No need to worry with floral arrangements; if an arrangement is not successful, one can be consoled by knowing that, given time, it will die and can be thrown out!

Flower arranging need not be limited to the spring and summer months. During the late summer and fall, why not collect items from your garden, grain from the fields and weeds from the roadside to be used during the winter months? In the early fall, fresh flowers and dried weeds can be combined. As Christmas approaches try spraying dried weeds, grain and flowers with white and gold paint and adding a few trinkets for a festive touch.

Have you ever stopped to enjoy the beauty of a bare branch? Carefully selected and well placed, it can become an arrangement in itself. Before you know it, you will be replacing your bare branch with ones that are beginning to show buds or perhaps with pussy willows. Soon afterwards you can add spring flowers. Another season has begun! This year, don't just stick your blossoming branches into a vase. For added pleasure and beauty, cut a very few of them and arrange them carefully.

Flower arranging in its simplest form certainly is not difficult. For the avid enthusiasts there are many excellent books on the market. Among them are:

Better Homes and Gardens: "Flower Arranging," Meredith Publishing Company, New York City, 10016-1957.

Julia Clements: "Color Book of Flower Arrangements," "First Steps with Flowers," "Show Pieces," C. Arthur Pearson, Limited, London, England.

Geneal Condon: "The Art of Flower Preservation," A Sunset Book, Lane Book Co., Menlo Park, Calif.-1962.

F. F. Rockwell and E. C. Grayson: "The Complete Book of Flower Arrangement," Doubleday & Co., Inc., New York City-1947.

F. F. Rockwell and E. C. Grayson: "New Complete Book of Flower Arrangement," Doubleday & Company, Inc.-1960.

Onalee C. Rudd: "Say It with Flowers," Publications Branch, Manitoba Department of Agriculture, 711 Norquay Building, Winnipeg, Manitoba (free).

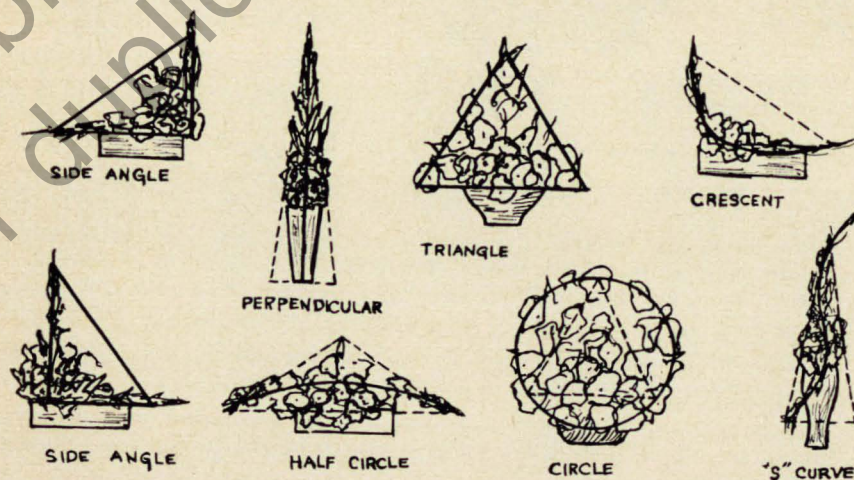
Mrs. William J. Ullenbruch: "Flower Arranging," Extension Bulletin 410, Home and Family Series, Michigan State University, East Lansing, Michigan 48823 (\$1.50).

These are not essential if you wish to just dabble in the art. Then all you need is a few simple containers, a needle point holder or two, some florist clay to fasten them to the containers, perhaps some Oasis, a sharp knife, a few flowers and some foliage.

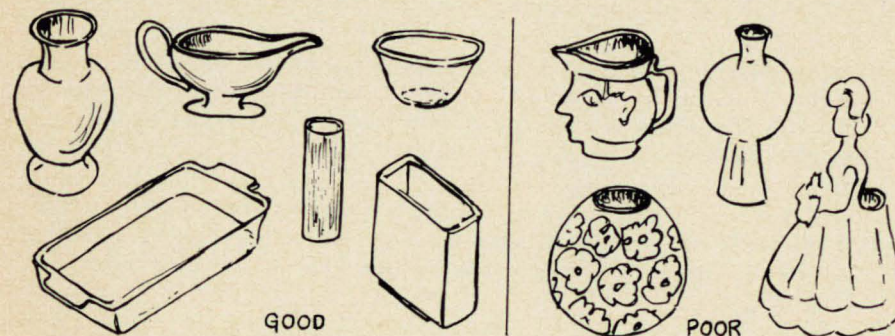
Here is a very simplified approach to arranging flowers. Try it. If you enjoy it, start reading, obtain a good book and watch for ideas.

YOUR ARRANGEMENT—STEP BY STEP*

1. Start with an idea of the type of arrangement you wish to create. What shape is the completed arrangement to be—a circle, crescent or triangle? Keep in mind that you wish to build an arrangement that will fit the space it is to occupy.



2. Select a simple container. Choose a size, shape, color and texture that will go well with your flowers.

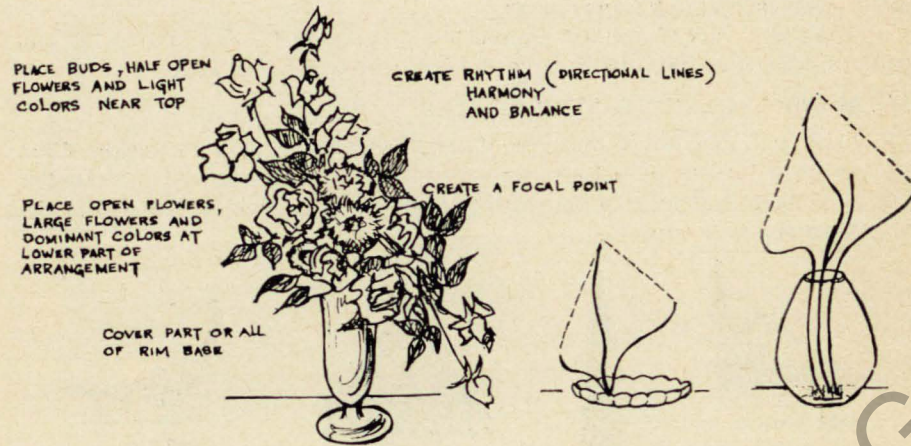


*Onalee C. Rudd: "Say It With Flowers."

Decide upon the type of holder to use. Secure the holder firmly and fill the container with water.

- Never treat flowers as a disorganized blur of form and color. Begin with a triangle. Place a central flower to establish the height of the arrangement ($1\frac{1}{2}$ times the width of a low container or $2\frac{1}{2}$ times the height of a tall vase).

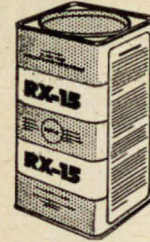
Next place the second or next highest branch or flower two-thirds the height of the tallest line, and the third or lowest, one-third as high. This forms a basic triangle.



- Now fill in the triangle according to the shape you wish to establish. Begin with your largest flowers or foliage and work to the smallest, rather than working with all sizes and degrees of importance at the same time.
- When you are using only a few flowers, an odd number is more pleasing. That is three, five, seven and so on.
- The largest and heaviest flowers (as well as the darkest and brightest ones) should be placed low to give visual weight to the arrangement.
- Let one color predominate.
- Variety as well as scale, harmony and balance are important.
- A good design has open spaces around the edges to give a more natural look.
- Stress a centre of interest or focal point in the lower part of the arrangement. This can be most easily achieved with flowers grouped together towards the centre of the arrangement that are larger and/or darker or brighter in color.
- If the holder shows, hide it with leaves or other materials. Remember, too, flower arranging is not necessarily a woman's art. Men seem to have a special knack. And what better way is there of encouraging a child to appreciate beauty and nature than letting him work with flowers?

Also refer to the following PRAIRIE GARDENS (all still available). *Big Fun in Flower Arrangements*, 1964; *Dried Arrangements* 1964; *Judging Flower Arrangements*, 1967; *Snippy Tips (Conditioning Cut Flowers)*, 1965.—Editor.

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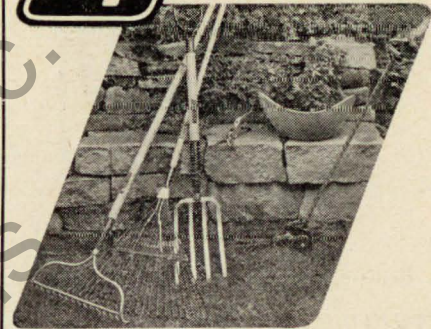
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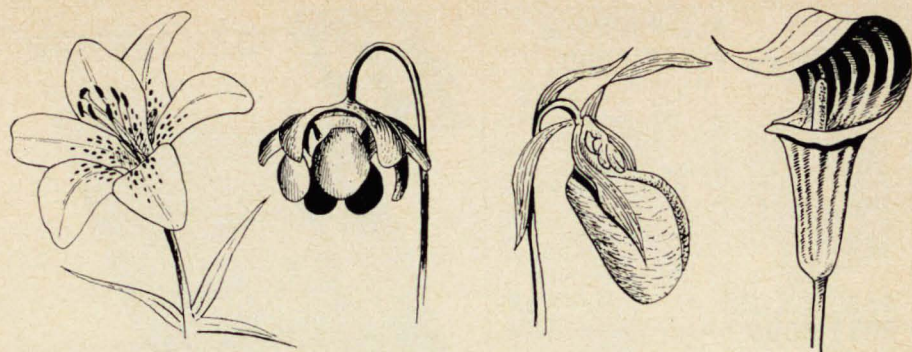


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What About Our Wild Flowers?

By BETSY and ANGUS H. SHORTT
Winnipeg, Manitoba

Manitoba is endowed with a rich bounty of native flora, due to the wide varieties of habitat found within its boundaries.

In the north are tundra regions, carpeted with a profusion of dwarf-growing rosette-type plants such as Lapland Rosebay, Mountain Avens, and Alpine Azalea. To the east we have the Precambrian rock country with its spruce and tamarac swamps where grow sundews, pitcher plants, orchids and trailing arbutus.

The aspen parklands can be a kaleidoscope of color with Indian paint brushes, showy and yellow lady's slippers, lobelia and grass of parnassus; the prairie marshes cradle yellow waterlilies, zigzag bladderwort, swamp candle and arrowhead; the rivers and lakes are jewelled with the white water and calla lilies, wild iris and lady's thumb. On the open prairies few flowers surpass the prairie lily, the black-eyed susan, gaillardia, bergamot, harebell and blazing star, while in the arid southwest corner one finds such treasures as the shooting star, cacti and purple coneflowers.

Within each of these areas grow varieties of flowering plants not found in other sections of the province.

Let us hope that we will never lose these floral treasures. For who has not been thrilled when taking a walk in the woods, suddenly to find at your feet a breathtaking display — a clump of small yellow lady's slippers; or again to drive along a quiet country road where the wild rose bushes form a bordering hedge adorned with pink and fragrant blooms, and come to a stretch where the ditches are carpeted with mauve lobelia and white grass of parnassus or the unexpected blue of the gentian; or to see the open woodlands ablaze with the yellow and scarlet Indian paint brushes or the rosy-hued painted cup. When one has ventured into the shadowed mystery of a bog and felt the deep, cool carpet of moss underfoot and glimpsed the beauty of rare orchids, sundew and pitcher plants to be found there, one experiences a deep sense of thankfulness for the beauties of Nature in our province.

In recent years, concern has been expressed by many of our botanists and nature lovers about the future of some of our most colorful wild flowers.

Principal concern is the rapid disappearance in many localities of the prairie lily (*Lilium philadelphicum*), showy (*Cypripedium reginae*) and large yellow lady's slippers (*Cypripedium calceolus*), bottle gentian (*Gentiana andrewsii*), and prairie crocus (*Anemone patens*).

The prime reason for the disappearance of these plants is destruction of habitat, but indiscriminate picking and uprooting also have contributed. Widespread land clearing results in the elimination of native flora due to factors which have caused disruption of the natural plant succession cycles. Destruction of habitat has accelerated during the past 20 years.

The building of roads and opening up of wilderness areas pose an ever-present threat. This is particularly noticeable in the region of Victoria Beach and throughout parts of the Whiteshell. In these areas the graceful moccasin flower (*Cypripedium acaule*) has all but vanished from areas where it once was common. The same is true of our largest and most striking orchid, the showy lady's slipper (once sold freely on Portage Avenue until prohibited by law).

As an example of the rapid changes brought about by human activities, we have but to consider small areas of rich flora that existed within the boundaries of what is now Metropolitan Winnipeg. In the Silver Heights district up until a few years ago, one could find the large yellow and showy lady's slipper orchids, coral root orchid (*Corallorhiza maculata*), monarda (*Monarda fistulosa*), obedient plant (*Dracocephalum nuttallii*), prairie lily and bottle gentian in the poplar and oak woods and patches of open prairie that fringed upon the few houses and a golf course that existed at that time, adding a touch of the natural wilderness within the growing suburb. Areas that offered similar floral treasures were Tuxedo Park, Charleswood, North and East Kildonan, St. Vital and others. These have all but disappeared.

A similarly rich and unique area for wild flowers was at Stony Mountain, only a few miles north of Winnipeg; unfortunately this area has been lost. It was here that Hector Macdonald found the rare cliff-brake (*Pellaea glabella*). In his recent book *Native Manitoba Plants in Bog, Bush and Prairie*,² he states "Many of our loveliest flowers are becoming scarce; some are nearly gone." Of the 420 species described, he lists 26 that should be protected:

Bog Laurel (*Kalmia polifolia*); Canada Yew (*Taxus canadensis*); Blood-root (*Sanguinaria canadensis*); Blue Cohosh (*Canlophyllum thalictroides*); Bottle Gentian (*Gentiana andrewsii*); Fringed Polygala (*Polygala paucifolia*); Jack-in-the-Pulpit (*Arisaema triphyllum*); Moccasin Flower (*Cypripedium acaule*); One-flowered Wintergreen (*Monesis uniflora*); Showy Lady's Slipper (*Cypripedium reginae*); Trailing Arbutus (*Epigaea repens*); Venus's Slipper (*Calypso bulbosa*); Moonwort (*Botrychium lunaria*); Polypody (*Polypodium virginianum*); Grass of Parnassus (*Parnassia palustris*); Marsh Marigold (*Caltha palustris*); Monkey Flower (*Mimulus ringens*); Pitcher Plant (*Sarracenia purpurea*); Scented Water Lily (*Nymphaea odorata*); Skunk Cabbage (*Symplocarpus foetidus*); Yellow Water Lily (*Nuphar variegatum*); Beard Tongue (*Pentstemon gracilis*); Fringed Gentian (*Gentiana crinita*); Yellow Lady's Slipper (*Cypripedium calceolus*); Prairie Lily (*Lilium philadelphicum*); Townsendia (*Townsendia exscapa*).

It seems to us that in order to protect our wild flowers in natural surroundings, the setting aside of carefully selected areas such as Birds Hill Provincial Park offers the best solution. This area which is extremely rich in wild flowers is only 15 miles from downtown Winnipeg and has been designated a wildlife preserve within which all native flora and fauna are fully protected. Trails will provide access to all who wish to explore for themselves and enjoy nature unspoiled.

A project which has merit is establishment of wild flower gardens in parks where many of our more colorful and interesting plants could be grown. Mr. Macdonald did this with great success in St. Vital Park. He grew success-

²Publication No. 452, Manitoba Department of Agriculture.

fully a wide variety of plants including cacti from the southwest area of the province. This was a great attraction to park visitors and brought home to thousands a new glimpse of the richness of native flora to be found in our province. Unfortunately the exigencies of World War II forced closing of this park and Mr. Macdonald's transfer to Kildonan Park, and the wild flower garden was abandoned. It was a very worthwhile undertaking that should be integrated into future park planning. Such a garden offers those who are unable to travel into the country an opportunity to see and enjoy these lovely flowers.

In view of the steadily increasing pressure of drainage and land clearing, it is essential that steps be taken now to set aside other carefully chosen segments in each of the various habitat types within the province, and to ensure that our rich heritage of wild flowers is preserved for the enjoyment of future generations.

HORTICULTURAL HORIZONS

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

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

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

Horticultural Horizons (150 pages, 48 colored illustrations) may be obtained at the price of \$4.00 from the Economics and Publications Branch, Manitoba Department of Agriculture, 711 Norquay Building, Winnipeg 1, Manitoba.

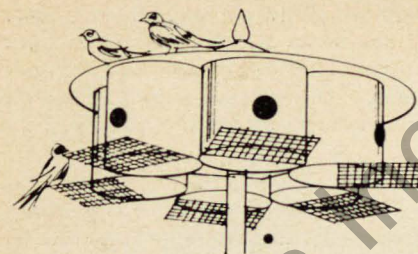
FLOWERS FOR YOUR CHURCH

By ADELAIDE B. WILSON and LOIS WILSON

Flowers For Your Church is a clear, concise, profusely illustrated book, and a timely one, published for the guidance of those who arrange the flowers in modern as well as in traditional buildings, for committees decorating vestibules, meeting rooms, and tables for banquets, and for those planning and maintaining a church garden.

The authors, Adelaide B. Wilson and Lois Wilson, the latter garden editor for *Chatelaine* magazine, present ideas for every type of building and for every season in the Christian calendar, also a helpful vocabulary of the church and lists of plant material for various purposes.

Both are well qualified for their subject. They have written books on flower arrangements, and have a wide reputation as lecturers, demonstrators and judges at flower shows. Their talents, experience and dedication have brought church folk a timely, instructive and outstanding book of 148 pages, including 12 in color and 62 black and white photographs, at a price of \$7.95. Publishers' representatives are George J. McLeod Ltd., Toronto, Ontario.



The Gay, Friendly Martins

By J. P. DE WET
Winnipeg, Manitoba

Certainly, always welcome at our home among the summer migrants are the gay, friendly martins.

True, we are very glad to see the other migrants arrive, the early juncos, the various sparrows and other north-nesting birds. The robins particularly so for their cheery chirpings during the day and well into the evening; for their industrious searching for earthworms and indeed also for cutworms in our flower beds; and for their long, long stay. The dates that we first see them are carefully noted each spring for comparison with previous springs. But the robins may be caught by a late snowstorm, like the 8.2-inch fall on April 27, 1966, in Winnipeg when they were fed from nearby homes. (We saw our first robin on April 8.)

Not so the purple martins, for their comings always are preceded by scouts to find out first if the weather is good, and the food supply is adequate. Then when your colony arrive and occupy the accommodations set up for them—then you know that the weather has settled, and spring really is here.

On May 2 last year we noted that the scouts were examining the new, 6-room house (see drawing) set up April 22 to replace the old, 4-room house which had become too weatherworn for further occupation. A pair of sparrows settled for one room the same day. We were not too sure that the scouts would recommend the house; they don't share their opinions with you. Other scouts called later; and on May 22 we saw that the expected visitors had arrived; and three pairs had selected and were occupying their respective rooms.

The purple martins make sure that you know they have arrived. Their nearly ceaseless chatterings confirm that they enjoy life near you and like the house you have provided. We never tire of watching their graceful flying and gliding in pursuit of the winged insects which are their food. Our martin house stands amid a setting of a few small trees and a number of low shrubs, mostly shrub roses. They don't mind me working right under their house, but do show concern over strangers.

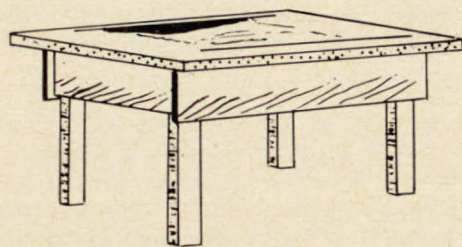
They are the only birds that I know that will nest in full view and allow you to watch them raising their young families—which is all they come north to do. Around the first week of September they are off again southward, (in 1967, on September 4). Three and a half months of pleasant family life! About that time also the leaves have begun to fall from the maple trees. And an early frost may not be long delayed.

The purple martins are our largest swallows and the most numerous of the swallow family which include also such favorites as the barn swallows and the tree swallows. They breed from southern Canada to Baja California and central Mexico, the Gulf of Mexico coast, and southern Florida; in Manitoba from The Pas southward, perhaps absent from the southwest corner. They spend the winter months of North America in South America.* They like nesting in a social group and will readily fill man-provided houses with many compartments.

I bought our martin house in 1966 while on a midsummer visit to friends in North Dakota. It is made of prepainted aluminum which reflects the sun's heat and cannot rust, rot or corrode. The house exterior is white and the roof a soft pastel green. The ventilation is very good. The circular, 7-inch diameter, removable floors are made of ½-inch Celotex with an outside woven wire perch. The entrances are 11 inches apart.

The entire house weighs 6 pounds and is mounted 12 feet above ground on an 8-foot long, 1-inch galvanized pipe which, after removing a supporting bolt and nut, slides into a 9-foot long, 1¼-inch galvanized pipe anchored 30 inches below ground in concrete. Thus the house is easily reached for cleaning and taking out the room floors to prevent sparrows and other unwanted birds from moving in. They are replaced in the spring. If desired, a second storey can be added below the first storey.

*The Birds of Canada, by W. Earl Godfrey



Gardening with the Birds

By F. B. STEVENSON
Stevensons' Evergreen Nursery,
Morris, Manitoba

Wise is the gardener who encourages birds to come into his garden. They are a most valuable aid in insect control and one hour spent observing a nest as the old birds feed the growing fledglings is convincing proof.

A few years ago a pair of Yellow Warblers nested in a rose bush beneath our living-room window, an excellent place to observe them. It was a full time task for the old birds to feed the growing fledglings for it was only eight days from hatching until the young birds were almost full grown and ready to leave the nest. To make such rapid growth the young birds will eat their weight in insects every day.

Many of our garden birds live mostly on insects. These include Warblers, Wrens, Robins and Catbirds. Orioles feast on aphids. Swallows, Kingbirds and Nighthawks feed on flying insects, including many mosquitoes, catching them on the wing in their wide beaks.

Robins and Catbirds are effective in controlling cutworms. Our garden is bordered on two sides by a coulee. Blackbirds nest in numbers in the bulrushes and we have never been troubled with cutworms. True they will eat some of the corn in the fall, but this can be countered by planting a row or two of sunflowers a distance from the corn. The Blackbirds will go to the sunflowers and leave the corn alone. Sometimes Orioles will take a few peas; plant a few rows for them, they are worth having around as songsters.

Many birds are a valuable help in weed control by eating weed seeds. Mourning Doves live entirely on seeds. Goldfinches love thistle seed and use thistle down for their nests. Sparrows and Finches also are seed eaters.

Mountainash berries are relished by Robins and Catbirds in late August. Nanking cherries serve a dual purpose in the bird world. Hummingbirds love to sip their honey in May and many birds feed on the fruit in July. The hawthorns also are good.

A bird bath is excellent for attracting birds to the garden. It will need hosing down occasionally and should be set on a pad of crushed stone or similar material to keep it tidy. Fresh water daily is welcomed.

Wet birds cannot rise quickly nor fly strongly and special care must be taken to protect them from wandering cats. The edge of the bath should be not more than an inch or two above the water level because birds do not go freely to a bath from which they cannot watch for the possible approach of an enemy. Moreover, baths should be at least 12 feet from high grass or other plant growth which may hide an enemy.

Not all advertised baths meet these requirements. But it is easy to make a satisfactory one of galvanized iron bent to form a vessel three feet long and two feet wide, three inches deep across the middle and sloping to no depth at both ends. Any tinsmith or light metal worker will readily make one (see above). The bath is mounted on a wooden frame which raises it 18 inches from the ground, and is encircled with a platform six inches wide on which the birds enjoy sunning themselves after a bath or just after a drink. The bath



may be painted a dark green, with fine sand sprinkled over the paint while it is still wet, especially on the encircling rest space.

Pine Grosbeaks and Bohemian Waxwings enjoy berries and fruit that stay on the trees all winter. Many of the Rosybloom crabapples are very good, but the Columbia crabapple is best of all. A few winters ago I counted over 80 Waxwings that fed in a Columbia apple tree. The following April 40 Robins were seen feeding in the same tree.

Feeding boxes should be up in October. Birds are migrating then and many of the northern birds will stay if they find food. Chickadees, Nuthatches, and Woodpeckers come readily to the feeding station. Pieces of suet or pork rinds will attract Woodpeckers and Nuthatches. Bread crumbs and sunflower seeds are excellent for the boxes. Some years Evening Grosbeaks are plentiful; we have had as many as 45 feeding on sunflower seeds at one time.

And so, gardeners, consider the birds. You will be rewarded with the beauty of song and color, and you will be helping the conservation of our none-too-plentiful wildlife. Finally, write to the Conservation Education Section, Department of Mines and Natural Resources, Winnipeg, and ask for their Check List of the Birds of Manitoba.

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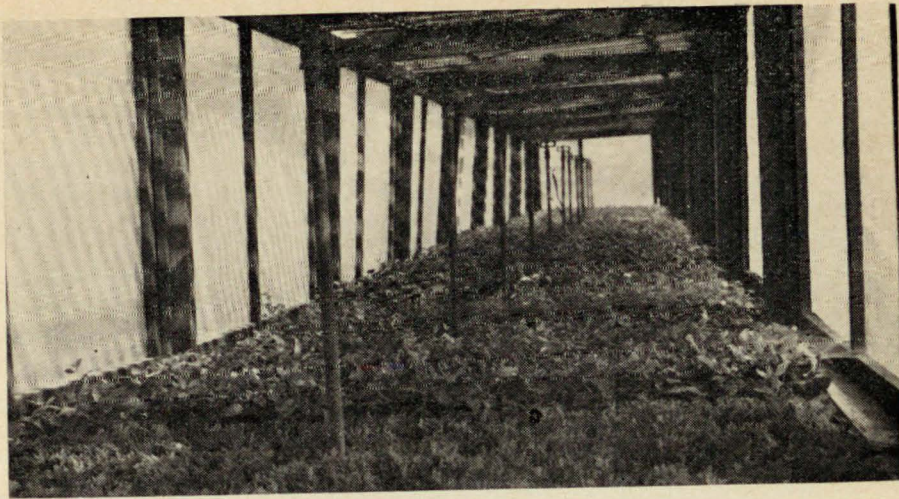


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Mist Propagation

By L. E. AUBIN, N.P.D.
Aubin Nurseries, Carman, Manitoba

For many years plant propagation appeared to be mysterious and difficult, and it was felt that this talent belonged only to a select few. But with the introduction of mist a few years ago, an entirely new concept has come into practice. One might say that almost anyone with interest in plants can have fair to good results by using mist.

In 1962, in Aubin Nurseries, we decided to erect a mist frame in order to expand our production. Prior to this, Dr. Stewart Nelson, now at the University of Saskatchewan, had written a bulletin on the use of mist and this bulletin was ideal for us since it illustrated in detail how to construct such a frame.

The mist frame was built 40 feet long, four feet wide and four feet high. Six inches of crushed rock was spread on the bottom to ensure adequate drainage. The rooting medium was six inches of sharp sand over the rock. The sides of the frame were panels of two mil. polyethylene to keep the mist from blowing away in the summer breezes. The frame is covered with lath shading at the time the cuttings are stuck, but is left open to the air after rooting begins.

The mist nozzles are in the centre of the bed approximately four feet apart. With the water pressure at 40 to 50 pounds, this gives satisfactory coverage of the entire area. Entry of the mist is controlled from a solenoid valve wired to a 30-minute time clock, thus providing an intermittent mist over the whole bed. A 24-hour time clock starts the system at daybreak and shuts it off at sunset.

Here at Carman, we try to start our cuttings in these outdoor mist frames between the first and the second weeks of June, depending on the season. Usually we finish by July 20. It has been our experience that if we insert cuttings past this date, the percentage is lower and rooting does not occur as rapidly.

The cuttings are inserted in rows one inch to 1½ inches apart on the square to take advantage of all available space. We have six frames in all at the present time. We remove the plants from two frames and plant directly to the field in early July (with irrigation). By re-cropping two more frames this gives us an estimated annual production of 100,000 to 120,000 rooted cuttings. Generally speaking, most genera will root well in a month or less; but a 3-month rooting period is not uncommon for evergreens.

When the plants are rooted they may be handled in three different ways, each having its own merits and drawbacks. The first one that we tried was to transplant the cutting immediately after it was rooted (in early August). The plants were set into a cold frame on 4-inch centres, using heavy shade and watering daily. The advantage of this method is that it can be used at a time when some of our staff are not as busy as in the spring. Here losses can be extremely high both in transplanting and winter-killing. We have found this to be very true among certain genera and species.

The second method we have experimented with was to leave the cuttings in the bed covered with a mulch until the following spring, but we lost plants from winter-killing and from mice damage. The problem here is that in the spring when nurserymen are extremely busy, it is difficult to find someone to take charge of lifting the plants. As a rule unskilled employees cannot identify dormant plants, and thus varieties can become very badly mixed up.

This fall (1967) we have tried the third method. The cuttings are lifted in early November, wrapped bare-root in polyethylene and stored in a building until spring. The building is completely temperature controlled with refrigeration and automatically humidified. This provides perfect conditions for the plants during the winter months. The rooted cuttings are then ready for shipment to other nurserymen and for planting direct in our own fields the following spring.

Up to this point mist propagation looks relatively simple. But with every project one undertakes, problems are sure to arise and so it is with mist. One of the pitfalls is that of nozzles plugging with dirt and algae particles. It is not unusual for a man to spend his whole day cleaning nozzles so that they will perform efficiently. This occurs even when precautions are taken such as the use of stone filters and screens. Some nurserymen who haven't the patience have scrapped their entire mist system because of this. Another grave danger to the cutting crop is that of fungus; this disease can sweep in and rot out a large area of material in a very short time. Last of all but not least is that all plants do not root. Percentage may range from zero to 100 per cent, depending on the genera and species.

It takes a few years working with mist to find out exactly what will root and what will not. It is important that one knows how to treat each individual species. Plants are like people, all are different. Nevertheless it is a wonderful way to increase production. I am satisfied with the results that have been obtained over the past few years and will continue to use mist until something better comes along.

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Native Manitoba Plants

By HECTOR MACDONALD, F.R.H.S.

Native Manitoba Plants in Bog, Bush and Prairie, by Hector MacDonald, Winnipeg, is a new publication (No. 452) of the Manitoba Department of Agriculture, which should be in the library of everyone whose occupation or leisure takes him away from the cities and towns into the open areas.

The foreword to this most useful booklet says that it has been prepared to acquaint people with our native plants, to recognize them, to appreciate their beauty, and most of all to help in their preservation. The author has described these plants in a booklet of 90 pages, under eight titles or chapters, illustrating each plant with his own drawing to make recognition easier. In all 420 plants are identified both under the familiar name and the botanical name. The booklet may be obtained upon request from the publications Branch, Manitoba Department of Agriculture, Norquay Building, Winnipeg 1, Man.

Mr. MacDonald is particularly well qualified for his work. His basic training in horticultural subjects was gained at the Royal Botanical Garden, Edinburgh, and he commenced his work on the Canadian prairies in 1924 under the late Dr. F. L. Skinner, of Dropmore. He later joined the staff of the Winnipeg Parks Board and was given the task of establishing a garden of native plants in the St. Vital park. This work was discontinued during the Second World War years and he was appointed supervisor of Kildonan Park. Thereafter, until his retirement in October, 1964, he was supervisor at Assiniboine Park. On August 26, 1966, the Mid-Continent Regional Parks and Recreation Conference in Winnipeg presented him with their 1966 Award of Merit.

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And vanities that pass
Are clothed in arrogance.
But grass is meek. The strong
Need pride nor arrogance.
As blood is in the heart,
As strength is in the sea,
So grass is in the earth.
And sings as bright a song —
As pure and humble mirth —
As sings in blood the heart,
As sings in strength the sea.
For grass is sea and sun,
Is dust of earth in song,
Is blood in vein and bone:
Most humble and most strong.

John Howland Beaumont,
in S. A. Panorama.

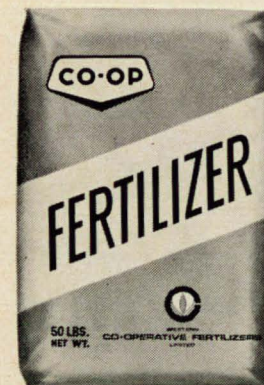
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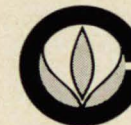
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Reading for Your Gardening

References approved for the help of Prairie Gardeners:

Journals, local:

Alberta Horticulturist, Alberta Horticultural Association, Box 1085, Lacombe, Alberta. Published four times yearly. Two years \$1.00.

The Gardeners' Bulletin, Extension Division, University of Saskatchewan, Saskatoon. A quarterly. Annual subscription \$0.50.

Garden columns in city and rural papers, daily, weekly, monthly.

Canada Department of Agriculture publications, Information Division, Ottawa, Ontario.

- 868, Manures and compost. 16 pp. 1962.
 849, Plums for cold areas. 16 pp. 1954.
 1121, Sprinkler irrigation requirements for tree fruits. 32 pp.
 Tree fruits for the prairies. 32 pp. 1965.
 1246, The Saskatoon. 8 pp. 1966.
 1282, Growing cranberries. 24 pp. 1966.
 880, Diseases and insect pests of raspberries and other cane fruits. 32 pp. 1964.
 915, Diseases, insects and mites of stone fruits. 50 pp. 1962.
 1115, Control of mice, rabbits and deer in orchards. 12 pp. 1965.
 1143, Control of the currant fruit fly. 4 pp. 1962.
 1268, The raspberry crown borer, 4 pp. 1966.
 1205, How to grow mushrooms. 16 pp. 1965.
 Wild Rice (folder). 1959.
 861, Mushroom collecting for beginners. 32 pp. 1958.
 1058, Potatoes. 28 pp. 1959.
 1033, Vegetables for prairie gardens. 24 pp. 1958.
 1070, Vegetable gardening practices for the Prairie Provinces. 20 pp.
 796, Annual flowers. 32 pp. 1966.
 908, Garden rose growing. 24 pp. 1960.
 970, Growing herbaceous perennials. 24 pp. 1956.
 994, Culture of ornamental trees. 32 pp. 1957.
 995, Trees for ornamental planting.
 996, Flowering bulbs. 32 pp. 1962.
 1017, Woody climbers and ground covers. 20 pp. 1957.
 1153, Hedges for the prairies. 32 pp. 1963.
 1168, Transplanting trees and shrubs. 4 pp. 1963.
 1229, Growing gladiolus. 20 pp. 1965.
 1243, The rock garden. 12 pp. 1966.
 1271, Hardy asters for the autumn garden. 4 pp. 1966.
 1276, Storing bulbs. 8 pp. 1966.
 933, Flies and their control. 8 pp. 1955.
 934, Control of mites in the home. 16 pp. 1963.
 1247, Diseases and pests of turfgrass in the Prairie Provinces. 12 pp. 1966.
 1298, Control of ants. 12 pp. 1966.
 1337, How to Build a Plastic Crop Shelter or Greenhouse. 11 pp. 1967.
 1103, Mist Beds for Root Cuttings. 11 pp. 1965.

Priced: (Obtainable only from the Queen's Printer).

- 1016, Living with house plants. \$1.30. 88 pp. 1958.
 1182, Planning your garden. 44 pp. 1963. \$1.00.

- 983, Wild plants of the Canadian Prairies. 536 pp. \$3.00 or \$4.00.
 1066, Ecology of aspen parkland of Western Canada. 170 pp. 1961. \$4.00.
 1112, Edible and poisonous mushrooms. 312 pp. 1962. \$7.75.
 1113, Collection and care of botanical specimens. 136 pp. 1963. \$2.50.

*Provincial bulletins and circulars are obtained from:

Extension Service, Alberta Department of Agriculture, Edmonton.

Extension Department, University of Saskatchewan, Saskatoon.

Publications Branch, Manitoba Department of Agriculture, Norquay Building, Winnipeg 1.

*Complete listing in THE PRAIRIE GARDEN for 1964.

Public Libraries possess for the reading public a well selected assortment of reference books on gardening and botany.

A "Pruning Manual for Ornamental Trees and Shrubs," prepared by R. H. Knowles of the University of Alberta, is now available.

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