

THE 1973 PRAIRIE GARDEN

Western Canada's Only Gardening Annual

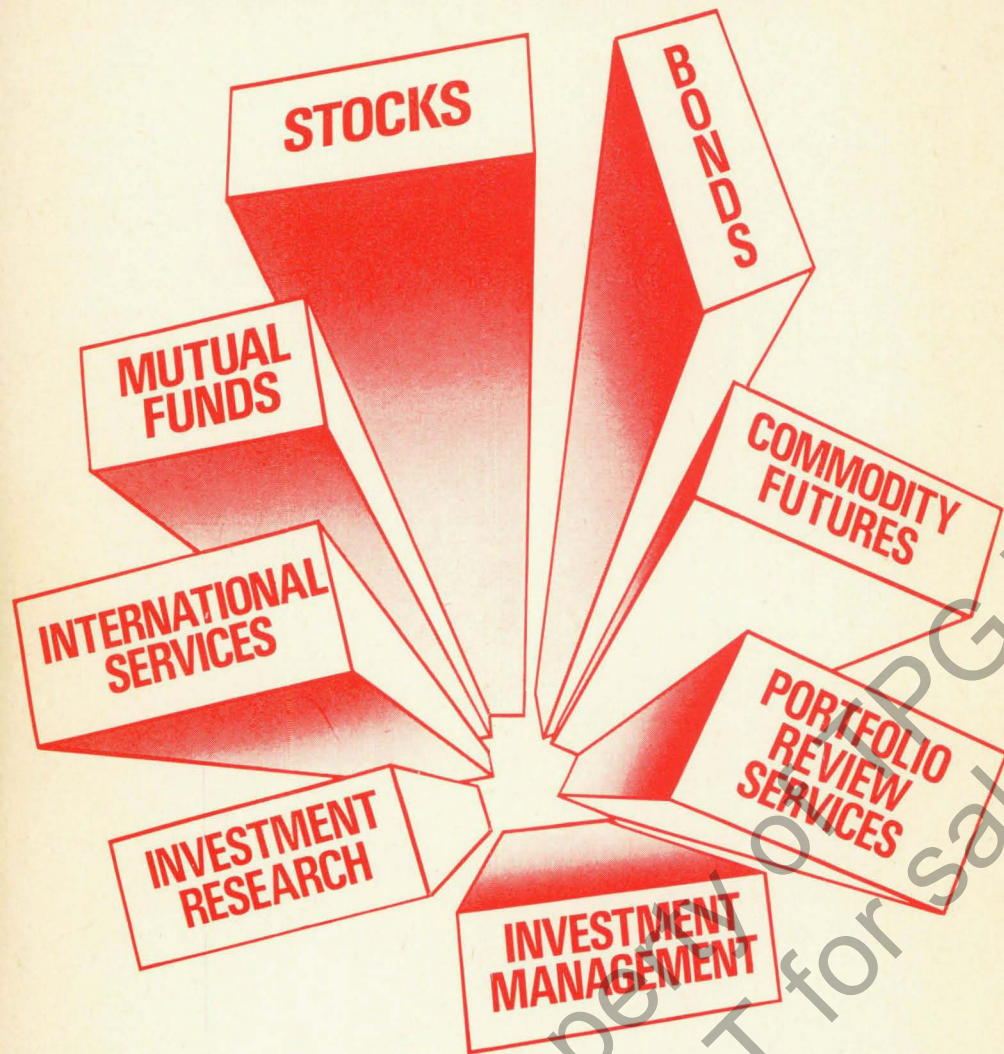
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Written by and for Prairie Gardeners and Homeowners.

The Prairie Garden

WESTERN CANADA'S ONLY GARDENING ANNUAL

WRITTEN BY AND FOR WESTERN GARDENERS AND HOMEOWNERS

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

Published by
WINNIPEG HORTICULTURAL SOCIETY

Winnipeg, Manitoba — 30th Annual Edition, February, 1973

The Prairie Garden 1973

Annually for 30 years The Prairie Garden has gone to some ten to twelve thousand homes in the Great Plains area. Our purpose: to disseminate practical gardening information relating directly to the types and varieties of plants that will grow under the exacting climate conditions of our Western plains.

This year we are stressing **HERBACEOUS PERENNIALS**. We feel that the in-depth coverage of this specific **Theme** will result in our publication becoming an even better reference source. We have included a **Special Identification Section** consisting of 32 pages of color and black and white photographs that will help you become more familiar with a number of well-known and lesser known perennials that are worthy of a place in your garden.

Next year our **Theme** will be **Landscaping the Home Grounds**.

We wish to express sincere thanks to our contributors who have made this book possible.

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The Prairie Garden, 92 Queenston St., Winnipeg, Man. R3N 0W5

Cover Picture: Heuchera, See Page 33.

Information Please

We suggest that you supplement your Prairie Garden Library with free horticultural bulletins from your federal and provincial governments or universities.

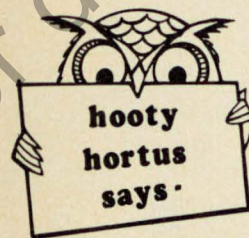
Write and ask for List of Horticultural Publications available from:
Alberta — Publications, Alberta Department of Agriculture, Agriculture Building, 9718 — 107th Street, Edmonton, Alberta.

Saskatchewan — Publications, Extension Division, University of Saskatchewan, Saskatoon, Saskatchewan.

Manitoba — Publications Branch, Manitoba Department of Agriculture, 702 Norquay Building, Winnipeg, Manitoba R3C 0P4.

We also recommend the following as excellent additions to your gardening library.

From Information Canada Center, 393 Portage Avenue, Winnipeg, Manitoba, R3B 2C6 or shipped prepaid from this address. Living With House Plants, by Alan Chan, price \$1.50 each. Planning Your Garden, by R. Warren Oliver, price \$1.00 each. Ornamental Shrubs For Canada, by Sherk and Buckley, price \$3.50 each. Native Trees of Canada, price \$5.00 each. Wild Plants of the Canadian Prairies, R.C. Hosie, price \$4.50 each. Two other outstanding reference books on prairie horticulture are: The Prairie Gardener by H.F. Harp, price \$8.95 each from bookstores or from M.G. Hurtig Ltd., 10411 Jasper Avenue, Edmonton, Alberta. Better Ways to Successful Gardening in Western Canada, by Isabelle and Charles Young, price \$3.95 each plus 30 cents for mailing, from The Albertan, 830 — 10 Avenue S. W. Calgary, Alberta.



Common Names of Plants can be Confusing. Common names of plants are sometimes the same as their botanical names, such as Begonia and Petunia. Often they are not, and vary widely from country to country or even region to region, where one common name may refer to several entirely different plants.

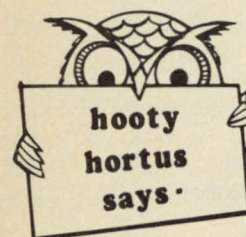
To overcome this a botanical vocabulary was evolved and used to give some precision to plant classification. Latin and Greek words were used, most of them with Latin endings, because at the time this system was first devised some two hundred years ago, Latin was the international language of science and knowledge.

A good example of the confusion caused by the use of common names only can be illustrated by referring to Dusty Miller. This name is usually given to *Centaurea cineraria* and *Centaurea gymocarpa*. In our region they are tender perennials used as annuals, the former having cut lacy leaves compared with the fuller leaves of the latter. However even recognised garden reference books, along with botanical names, refer to hardy perennials *Artemisia stelleriana*, *Lychnis coronaria*, *Senecio cineraria* and *Senecio leucostachys* as Dusty Miller. Of course one of the reasons is that all these plants have a similar silvery tinge to their foliage.

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Here are some Basic Plant Biology Terms. **Phylum**, any of the broad basic divisions of the plant family. **Class**, a group of plants having a common basic structure and ranking below a phylum and above an order. **Order**, next larger than the family and smaller than the class. **Family**, a subdivision in the classification of plants ranking above a genus and below an order. Family names of plants have the suffix *aceae*. **Genus**, a classification of plants with distinguishing characteristics; a genus is the main subdivision of a family and includes one or more species. A genus name is capitalized and precedes the species name which is not capitalized. **Species**, a single distinct kind of plant, having certain distinguishing characteristics. **Variety**, is a naturally occurring variation within a species. **Cultivar** is a controlled breeding cross or a cultivated variety within a species.



New Floriculture Program

A New Floriculture Program is available at **Olds College, Olds, Alberta**. The program consists of a ten-month training period augmented by six months on-the-job training in industry before certification. Students spend approximately one-third of their time in each of three basic areas, Greenhouse crop production, Floral Design and Business Management.

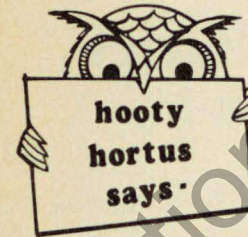
The crop production section includes the management and cultural practices involved in the growing of major cut flowers, pot plants and ornamental indoor plants. Courses in botany, soils, insects and diseases support the crop production program. Students have the opportunity during their course work to gain greenhouse experience and grow commercial flower crops, house plants, pot plants and bedding plants. Courses in design offer the students the opportunity to develop skill through extensive practice. Commercial designers from industry will make a major contribution toward design instruction.

Recognizing that Floriculture Program graduates will be exercising

their skills in a commercial environment, a full compliment of business courses are offered. Courses such as business management and human relations will appeal to future store management aspirants, while courses such as business mathematics, accounting, and retail management will be of immediate benefit in the day-to-day operations of a retail store. A generous number of options and electives are available.

The horticultural division is well equipped with modern facilities and housed in a spacious ten-classroom Plant Science complex. Seven thousand square feet of greenhouse space provides a practical laboratory for commercial glasshouse crops and demonstrations.

Olds College is located on Highway 2A, fifty-five miles North of Calgary and has a 1280 acre campus containing modern functional buildings. It is a residential co-education institution with accommodation for five hundred students. Contact the Registrar, Olds College for more details.



Hardy Chrysanthemums for the Prairies? Most years the cultivars developed by western plant breeders over the last 25 years will give you a profusion of bloom from late July to hard frost. During the late summer when the other perennials have finished blooming, and even after the tender annuals have succumbed to frost they will continue to brighten up your garden with their masses of colorful flowers.

These garden chrysanthemums are not long-lived perennials like peonies and daylilies but with proper care in dividing and replanting they can normally be maintained in good health year after year.

The one big problem with garden chrysanthemums on the prairies is their unpredictable behavior. They can go through winter after winter with little loss and then comes a year when many of them die. It would appear that variances of winter and early spring weather has more to do with their hardiness than the particular cultivars you are growing.

Among the most reliable chrysanthemums for garden planting now available are those developed at the Canada Research Centre at Morden, Manitoba. The names of some of those are Morden Cameo, Candy, Canary, and Morden Gold, also ten newer cultivars named after our Fathers of Confederation. The color photograph in the Identification Section of this issue, of the Chrysanthemums at the Morden Research Centre is evidence of this.

There is also a hardy series of chrysanthemums that was developed by H.H. Marshall at the Canada Research Centre in Brandon, Manitoba under the names of Susan Brandon, Jocelyn Brandon, etc.

I think the most important advice I can give you is, buy your young plants from local nurserymen. If they have been grown in your area they should be the most reliable cultivars for your garden.

With regards to culture I suggest that old plants be lifted every two years in early May or as soon as growth is clearly evident, and the healthy stolons (basal shoots) detached for replanting in new soil. Growth will be rapid during June and you should have healthy blooming plants by late July or early August.

In letters received from Morden, Manitoba and research stations at Brooks and Lacombe, Alberta they advise that to safeguard their stocks of chrysanthemum cultivars they have adopted the practice of potting up a plant of each cultivar in the late fall, storing in a root cellar until early spring when they are brought into the greenhouse. When new growth is sufficient cuttings are taken to supply whatever is required for the new season. In a smaller way I have used a pit in the ground up against the house foundation to assure continuation of some of my more favored cultivars.

History of Perennials in Winnipeg's Major Parks

GUNTER A. SCHOCH

It may be difficult to establish when the first perennials were planted in Winnipeg. However, applying this question to the Winnipeg Parks' system, a precise answer is quite possible.

After the Manitoba Legislature passed the Public Parks' Act on April 20, 1892, the Winnipeg City Council gave final reading to a by-law establishing the Public Parks Board on January 9, 1893. As early as the first year of its existence, the Board recognized the need for "a large suburban park". The wisdom and foresight of this decision cannot be over emphasized, considering that at that time Winnipeg's population amounted to only 30,000.

Ten years passed by when, finally, in 1904, a 283-acre site of woodland and prairie was purchased at the location today occupied by Assiniboine Park. A plan, prepared by a landscape architect from Montreal, was approved by the Parks Board in 1905. Some construction commenced in 1906 and it was reported in the following year that "several flower-beds were prepared and planted with perennials". A plant nursery and associated trial grounds were also initiated in 1907 in the area which later became the English Garden. It was decided that all procurable wild flowers native to Manitoba would be planted in the flower-beds and labelled with botanical and common names.

In 1908, the Formal Garden, still in existence in the south-east corner of Assiniboine Park, was completed. A total of 1,972 shrubs and 1,920 perennials were planted. Although the perennials were replaced in later years by annual flowers, the shrubs lasted for 60 years until replaced in 1969 by lower growing woody ornamentals.

Between 1908 and 1914, almost 3,000 perennials were planted in Assiniboine Park. Unfortunately, the reports did not indicate the species primarily used. In the 1917 Annual Report of the Public Parks Board, it was again suggested that "permanent plantings of perennials be used wherever possible, to lessen the annual cost of summer bedding plants".

In 1923, it was proposed that the nursery be phased out and replaced with an informal flower garden. Mr. George Champion, Superintendent of the Public Parks Board, prepared the plans for this project, later to be known as the English Garden. However, landscape construction did not begin until 1927. By the fall of 1928, extensive plantings had been completed and 600 rose bushes were grouped around the central portion of the garden, the location of the newly installed circular Lily Pond. In the summer of 1929, the English Garden was officially opened to the public and has been one of Assiniboine Park's prime attractions ever since.



A picture from the 1909 Annual Report of the Public Parks Board, showing the just completed Formal Garden in Assiniboine Park, displaying 1,920 perennials. The perimeter planting of spruce trees is still in existence, now 40 - 50 feet high. In the background is the first Pavilion which was destroyed by fire in 1929.

In comparison to the early years, only 2,184 perennials were planted in the park between 1915 and 1931. This decline in the planting program parallels closely the increase of new parks and recreation facilities throughout the City.

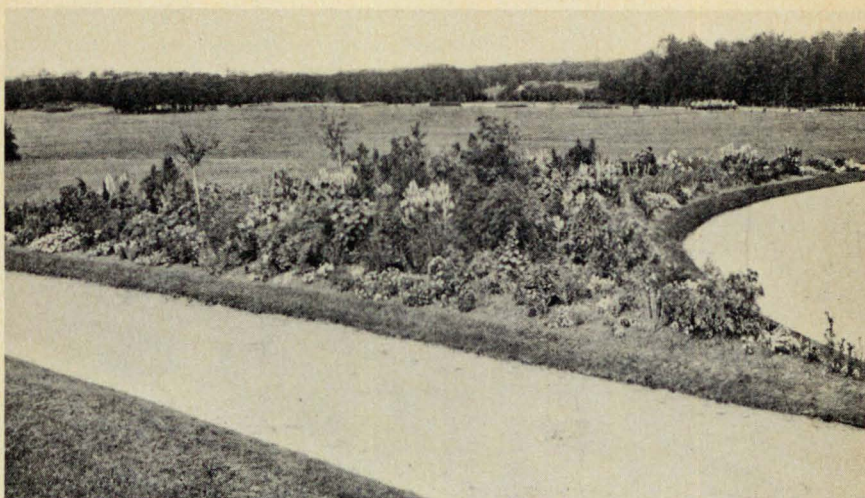
During the 1930's, St. Vital Park became the location of perhaps the most ambitious perennial planting project in Winnipeg's history. After the three-acre lake was excavated by relief workers during 1931, it was decided that large plantings of native flowers and shrubs would be established around the lake. A competent horticulturist, Mr. Hector Macdonald, was hired to be in charge of this project.

The first flower-beds were laid out

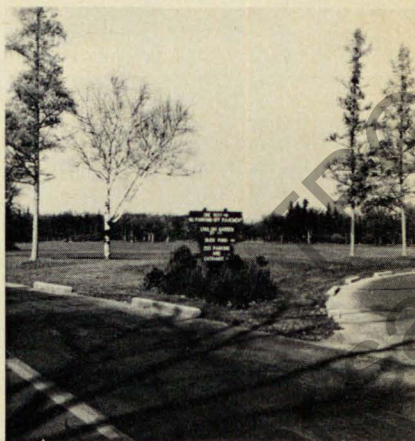
in 1933 and even specific plant requirements were provided for, by preparing a bog site with peat. By 1934, a total of 234 species of native perennials were planted. The following year, 1935, the flower-beds were increased to 35,000 square feet, and a total of 280 species meanwhile had been established. By 1936, almost every native perennial species within 50 miles of Winnipeg was represented in this display.

Unfortunately, lack of funds resulted in the closing of St. Vital Park to the public in 1940. The following year, Mr. Hector Macdonald was transferred to Kildonan Park. Together with him, the rarer species of wild flowers were moved to Kildonan Park. A quarter of a century passed by before another major planting project, including perennials, was undertaken in St. Vital Park. In 1965, an interesting rock garden was constructed near the lake, planted with evergreens, perennials and annuals.

The major land purchased by the City, to establish Kildonan Park, was



The triangle east of Assiniboine Park Pavilion was first photographed in 1909, after it had been newly planted with perennials and surrounded by 8 - 10-foot walks. In later years, the flowers were replaced by shrubs which had to be removed during the Sixties for reasons of traffic safety on the 24-foot-wide roads. Today, only the corners are planted with low evergreens.

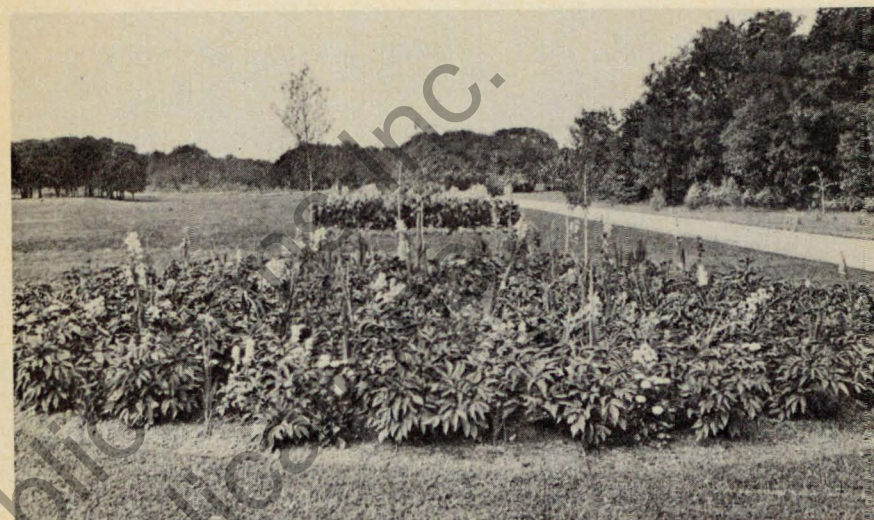


undertaken in 1909. Preliminary work was carried out during the following year, and Mr. George Champion prepared the plan for the entire park which was approved by the Parks Board in 1910. Clearing, landscaping, and construction commenced in 1911. The formal flower garden, in its present location, was completed in 1916 and the beds were planted with spring-flowering bulbs for the first time. During the five years of park development, a total of 584 perennials were planted in Kildonan Park.

The first World War and its after effects had brought the development of Kildonan Park virtually to a standstill, and no mention is made of

perennial plantings in the annual reports. Finally, in 1929, the park nursery was phased out to become the site of the informal flower garden. It is still located in the same area, across the Lord Selkirk Creek from the Fairy Tale House. Initially, 330 shrubs and 290 perennials were planted. In 1934, the informal garden was enlarged, new beds prepared, and additional perennials planted.

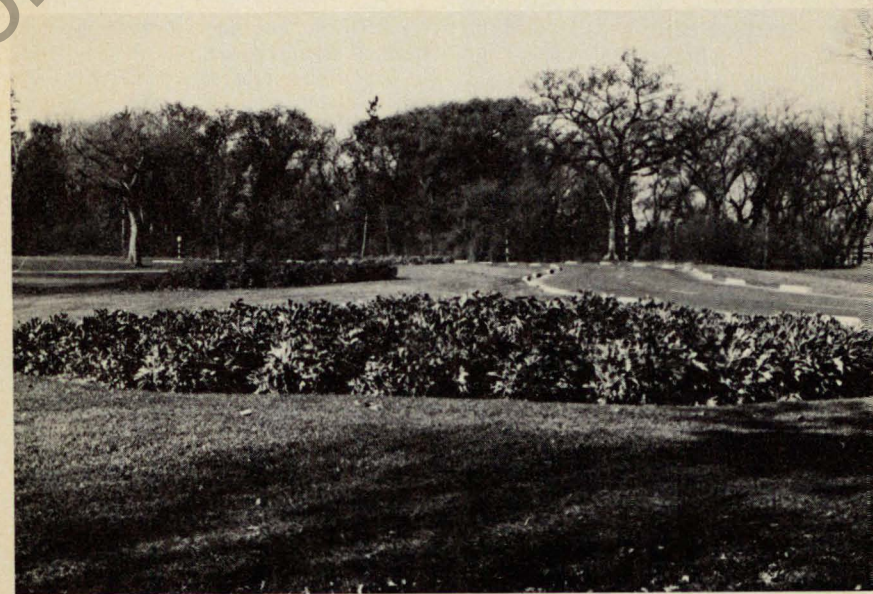
Both gardens in Kildonan Park were

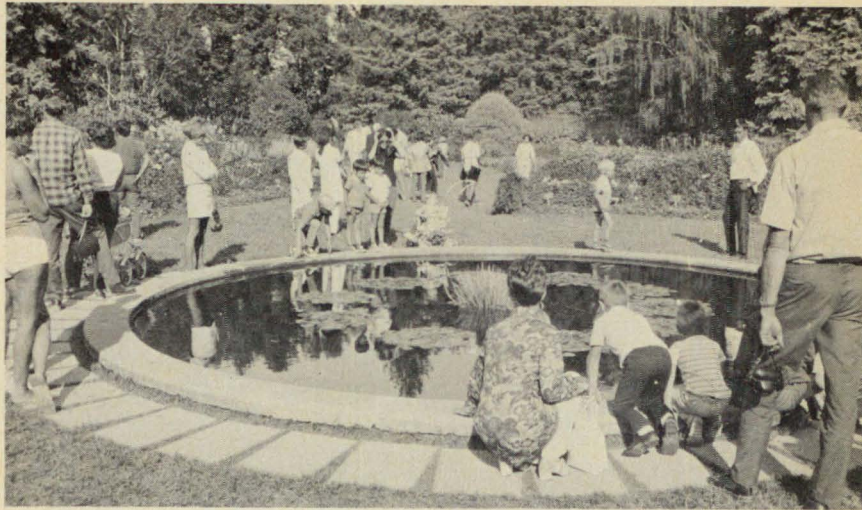


well maintained until the 1950 Flood destroyed 120 shrubs and many perennials which had to be replaced the following year.

Fifteen years passed before another major perennial planting project was

The circular peony beds along Perimeter Drive in Assiniboine Park were already in existence in 1909, shown here underplanted with gladioli. The more recent photo indicates that this scenery has changed little in the past 60 years, except for wider roads and larger trees.





commenced in Kildonan Park. In 1965, the landscaping around the new Peguis Pavilion was started where, particularly, the large rock garden became a much admired home of colorful annuals and perennials.

A custom of earlier years was reinstated in 1967, when 10,000 tulip bulbs were planted in beds around the Pavilion. In more recent years, the circular beds of the formal garden were also included in this early spring floral display, receiving many favourable comments from park visitors.

The informal garden has received much attention in the last few years and has been constantly upgraded and improved. It is second to the English Garden in Assiniboine Park only because of its smaller size.

The extensive landscaping projects, undertaken during the past 10 years throughout the system of major parks and streets, has included a fair number of perennial plantings. Some have already been mentioned above, others were included in the Assiniboine Park Zoo, and several bridge interchanges. More perennials are planned for future

The circular lily pond in the English Garden was constructed in 1928. As the prime feature of the most popular floral display on the Prairies, it has maintained its magnetic attractiveness for over four decades and is still admired by 225,000 visitors annually.

The "Boy with the Boot", a bronze statue of unknown origin, can claim quite a history for itself. At one time, it stood guard in front of Winnipeg's old City Hall. In 1953, it was placed near the entrance to the English Garden, at the edge of a small pond, surrounded by a rock garden.



Kildonan Park can boast three major floral exhibits: the Formal Garden prepared in 1916; the Informal Garden in 1929, still displaying hundreds of perennials; and, shown in this picture, the Rock Garden at Peguis Pavilion, developed in 1965.

St. Vital Park became the site of Winnipeg's most ambitious wildflower planting project, in 1930. Ten years later, due to lack of funds and public interest, it had to be discontinued. After another quarter of a century had passed, this rock garden, planted with annuals and perennials, was created near the three-acre lake.

use in conjunction with shrub plantings, especially perennials with low-maintenance requirements, such as lythrum, will be planted more extensively in Winnipeg's major parks.

Aside from new projects, a constant addition and replacement program for perennials, of course, is required in any park system. The growing facilities at the Assiniboine Park Conservatory provide not only 15,000 perennials, representing delphinium, geum, heuchera, hollyhocks, shasta daisy, sweet william, verbena, viola, and many others. From a small start 65 years ago, Winnipeg's major parks have become the most popular display areas for perennials throughout Manitoba.

Why Herbaceous Perennials

W. R. LESLIE

The theme rises from the question asked the gardener: "Why do you prefer perennials to annuals?" The reply:

It is not so much a matter of preference as one of values. Actually the two complement each other to thrilling effects in natural undisturbed wilderness places. Although the majority of cherished local wild flowers, inherited as a very generous legacy from nature, where they still bloom exuberantly, are perennials, — as anemones, bloodroot, avens, scarlet gaura, prairie mallow, buttercups, violets, lady-slipper, gaillardia, fleabane, pussytoes, prickly pear, mammillaria, beebalm, shooting-star, mints, sage, gumplant, paintbrush, vetches, lily, gayfeathers, coneflowers, goldenrods, asters, and ornamental grasses; the virgin grassy plains were also brightly gemmed by a number of gay annuals as cleome and sunflowers. Rather than rivals, perennials and annuals are associates!

For the home grounds the most gratifying results come from building a mixed border. It makes a sturdy continuing show, being comprised of perennials to form its backbone and sparkled with occasional masses of annual and bedding plants to impart extra vitality, and abundance of flower beauty during summer by being thoughtfully chosen and suitably placed as to position and quantity.

A perennial plant is one which lives three or more years, having fleshy stems that usually wither down to soil surface by late fall. Next April-May new tops emerge to again blossom and flourish. The gardener enjoys their loyal return as he does that of migratory birds which come back in early season to supply the orchestra and generally enliven the realm. Along with oldtime human intimates, they are fond possessions.

The term perennial as employed here refers to those hardy long-lived plants, and also includes biennials plants which in their first year normally germinate from seed and make stature but delay flowering and seed-age until their second year, at the end of which they die. Examples are Canterbury-bells, sweet williams, forget-me-nots, foxglove, pansies, wallflowers and hollyhocks. Included is the class of bulbous plants, which with moderate care, live on and on. Notable examples are squills, tulips, grape hyacinths, irises, fritillaries, alliums, gladiolus, cannas, and lilies. Their herbaceous tops wilt to the crown at season end. Then some are taken up to be cellar-wintered, while some others are replanted.

Annuals, strictly speaking, are plants which begin and end their whole life cycle in one calendar year. Seed germinates to form the top which blooms, sets seed and ripens it. Thereupon the plant dies. However, in the

modern garden it is customary to adopt a prominent number of choice plants that are definitely in the perennial category, and treat them as annuals. By starting them early and transplanting them into the garden after the last of spring frosts, it is practical to have abundant bloom from them during summer in borders and in containers. Valued among these bedding plants are petunias, snapdragons, begonias, geraniums, impatiens, salvia, primroses, coleus, dusty miller centaurea, dahlias, and chrysanthemums. To maintain a stock economically, bulbous plants are largely wintered indoors.

The true annual is recognized by the complete stoppage of growth processes once seed has ripened. The end of the road has come, as seen in wheat and mustards. In marked contrast, the perennial plant may have buds, fresh flowers, green fruit, fruit with mellow ripe seed and at the same time be extending shoot growth ambitiously. Tomato is a well-known example.

Biennials, for practical purposes, do not rate as a significant class since they are readily made serve as annual flowers either to bloom in the current summer, as pansies; or, by sowing the seed in the garden in July to make display the following year, as hollyhock.

In adorning the home grounds three main classes of plants are used: — ornamental shrubs; herbaceous perennials, including bulbs; annuals and bedders. The owner must need choose showy shrubs if limited to but one class. They contribute attractiveness every month of the year. Second choice is perennials. They usher the new flowering season before the last snowdrift has melted behind the hedge-row. From these days in April until

substantial autumn frosts halt plant activity, a wide diversity of perennial plants beautify the scene. The third class, and an important one, annuals and bedders, glorifies the middle of summer. Teaming together, the three general classes of decorative plants comprise the working materials with which members of the family achieve desired landscape pictures to gratify themselves and to add community pride and pleasure to neighbors.

In spite of the relative ratings or placings, each class is vital, as is each leg of a three-legged stool. But old-time friends, — shrubs and perennials,

do build up cherished attachments. To quote H.F. Harp, author of that most basic garden book for the Great Plains region, *The PRAIRIE GARDENER* "The more intimate we become with our plants, the more we enjoy them".

Some THOUGHTS on PERENNIALS:

The PASSING PARADE. People welcome springtime eagerly, while dusky trembling catkins droop from twigs of poplar, birch, and alder, and silvery woolly flower heads gleam on pussywillow bushes, it is delightful to watch the borders colour up with Siberian squills, anemones, adonis, bergenia, moss phlox and other early-bird perennials. They lead off in bringing rainbow color effects to the borders.

May month is a period of many kinds of charming flowers. June is the zenith of perennial flower variety before annuals have reached an impressive stage. Among favorites performing in these early weeks are tulips, Iceland poppies, irises, peonies, columbines, oriental poppies, yarrow, primulas, Italian bugloss, daylilies, and delphiniums.

July and August, the holiday months, in large measure are accorded to the annuals for brilliance in display. But these have gallant support from a wide array of reliable perennials. Included are shasta daisy, campanula, beebalm, coral-bells, plaintainlily, babysbreath, lythrum, Italian asters, globe-thistle, seaholly, lilies, obedient-plant, and monkshoods.

September and October, when the bulk of the annuals have wearied and faded out, perennials stage one of the most glorious shows of the whole year. Performers include goldenglow, giant daisy, cone-flowers, goldenrods, sneeze-weeds, monkshoods playing secondary roles to the two dominant rulers, — garden chrysanthemums and Michaelmas daisies or perennial asters. These flowers radiate glow on the landscape, adding to the grand carnival exhibited by the excited woods which have their leaves turned warmly luminous with shining yellows, clear goldens, vivid scarlets, and fiery reds which are somewhat modified in intensity with quieter tones in bronzes, mauves, purples.

ADAPTATION. Native perennials have remarkable capabilities to thrive in many different kinds of places. They live in grassy meadows, in woods, on hillsides, rocky alpine areas, and in marsh, swamp, and bog. Some tolerate limy soil. Others grow only in acid conditions. There are sun-lovers and those which do best in light shade. Numerous species want moist earth, as marsh marigold. Others demand dry feet, as prickly pear cactus.

Water has magic. Ponds provide homes for various plants. The home pond is attractive when freckled with hardy waterlilies.

MARATHON PLANTS. Small estates are obliged to select plants which have prolonged mileage because there

is room for but a few kinds. Those which demand much ground, and are colorful for only a fleeting period, are by-passed in favor of those long weeks of interest. Among such are aubrieta or rock-cress, Iceland poppy, golden marguerite or Anthemis, yarrow achillea 'Perry's White', carnation 'Shadow Valley', pinks, shasta daisy, babysbreath 'Rosy Veil', heliopsis, blue aster, Carpathian bellflower, balloon-flower, Missouri evening primrose, lythrums, scarlet potentilla, Kansas gayfeather, sea-lavender, obedient-plant and violas.

FORM and TEXTURE. Hardy perennials provide every shape one could wish. These are narrow and erect; spiked like an exclamation mark; globular; conic; columnar; flat; trailing; broad spreading; or pendulous, arching fountain-like. Stature varies from that of creeping ground covers as sedum and periwinkles, to the giant plume-poppy or macleaya, Joe-Pye weed or Eupatorium, and Tatarian cephalaria. Texture ranges from coarse, stiff, rigid, to fine, dainty, soft plummy, and feathery. Rugged tones are incorporated by such plants as yucca or Spanish bayonet. Accent plants are arresting subjects as eremurus or foxtail lily, canna, 'Morden Rose' lythrum.

Plants with large, broad, coarse leaves, as bergenia and ligularia, appear to dwarf distance and discount the size of the place, whereas those with small leaves and fine texture enhance space and flatter small holdings. The coarse items are for large places.

COLORS. Are available in extensive array, ranging from bleached white through the warm parts of the spectrum to dark purple which is almost black. The aim in constructing the landscape picture is to maintain harmony. To safeguard this, those masses with colors which appear to clash are separated

with a thin flanking of white or of silvery foliage, used in small quantities. For examples, put a buffer between pinks and reds; and between tiger lilies and magenta phlox. Congenial are different shades of the same color; scarlet and blue; yellow with purple; blue and goldens; maroon and gold.

FRAGRANCE brings an added factor to the flower border. P.J. Melle writes: "To me fragrance is as sound a criterion for the inclusion and exclusion of plants in landscaping as are stature and texture. It seems important, especially in the evening, when color and texture recede, the scene is translated into darkening masses and silhouettes and one's mind is disposed for stillness and rest. It is then that the spices of the garden come forth and pervade our tranquility."

Aroma, scent, perfume, spiciness, fragrance may be absent, or present in delicate, moderate, or oppressively heavy amount. Quality varies from dainty sweet, through spice and aromatic to repulsive. Pleasing volatile oils are emitted from many plants, as rocket, lily of the valley, most bearded irises, beebalm, mints, balms, lavender, violets. Offensive odors are given off by a few plants. The most harshly odorous of the common perennials seems to be asiabell (*Codonopsis ovata*), whose attractive campanula-like flowers on being bruised become real stinkers, being penetratingly skunky. Unpleasant odors are featured by some red flowered trilliums, some red peonies, some chrysanthemums, some wormwoods, and Pyrenees lily.

Fragrance comes from the flowers of some plants; from the foliage of others; and in some favored ones from both flower and leaf.

The herbaceous perennial border provides the gardener and his family with a hobby possessing wide scope

for practice of art, skill, imagination, and a source of recurring home enjoyments.

The scholarly Thomas Jefferson reported to his fellow citizens: "No occupation is so delightful to me as the culture of a garden. Such a variety of subjects, — someone always coming to perfection, the failure of one thing repaired by the success of another, and instead of one harvest, a continued one throughout the year. But though an old man, I am a young gardener".



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No Space for Perennials?

E. J. WALKER

For the purpose of this article, perennials referred to are herbaceous plants that generally renew their top growth.

Within today's urban living pattern, two common restrictions or guides to contemporary home landscaping are, smaller garden spaces and the desire to spend less time on the maintenance of the outdoor space. In the case of apartments and condominiums, the lack of space demands the use of smaller plant material, often in containers. On the decorative side the ornamental park is expressed in miniature in tray landscaping and modern roof gardens, while the functional vegetable or crop garden is expressed by herb gardens.

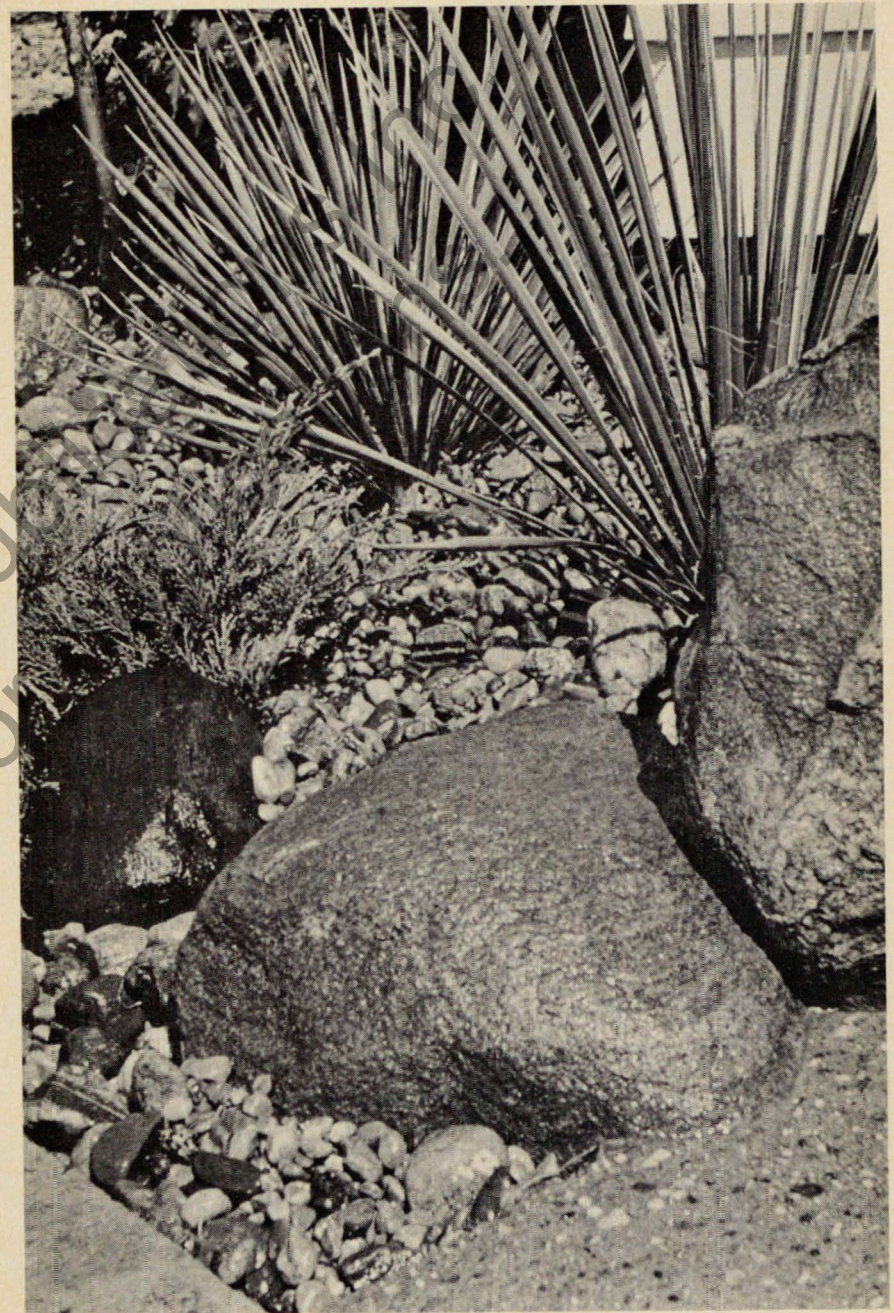
Herbaceous perennials have value over other horticultural classifications under these limitations of space, maintenance and impact value. The use of perennials in containers permits the apartment or townhouse dweller (and the single family home resident) to: get maximum impact of flower, fragrance or foliage from the plant then move it out of the picture; save on space and weight of the plant; contain the root-invading nature of most kitchen herbs and plants like goutweed, fleecflower and any decorative grasses that enter the plant composition.

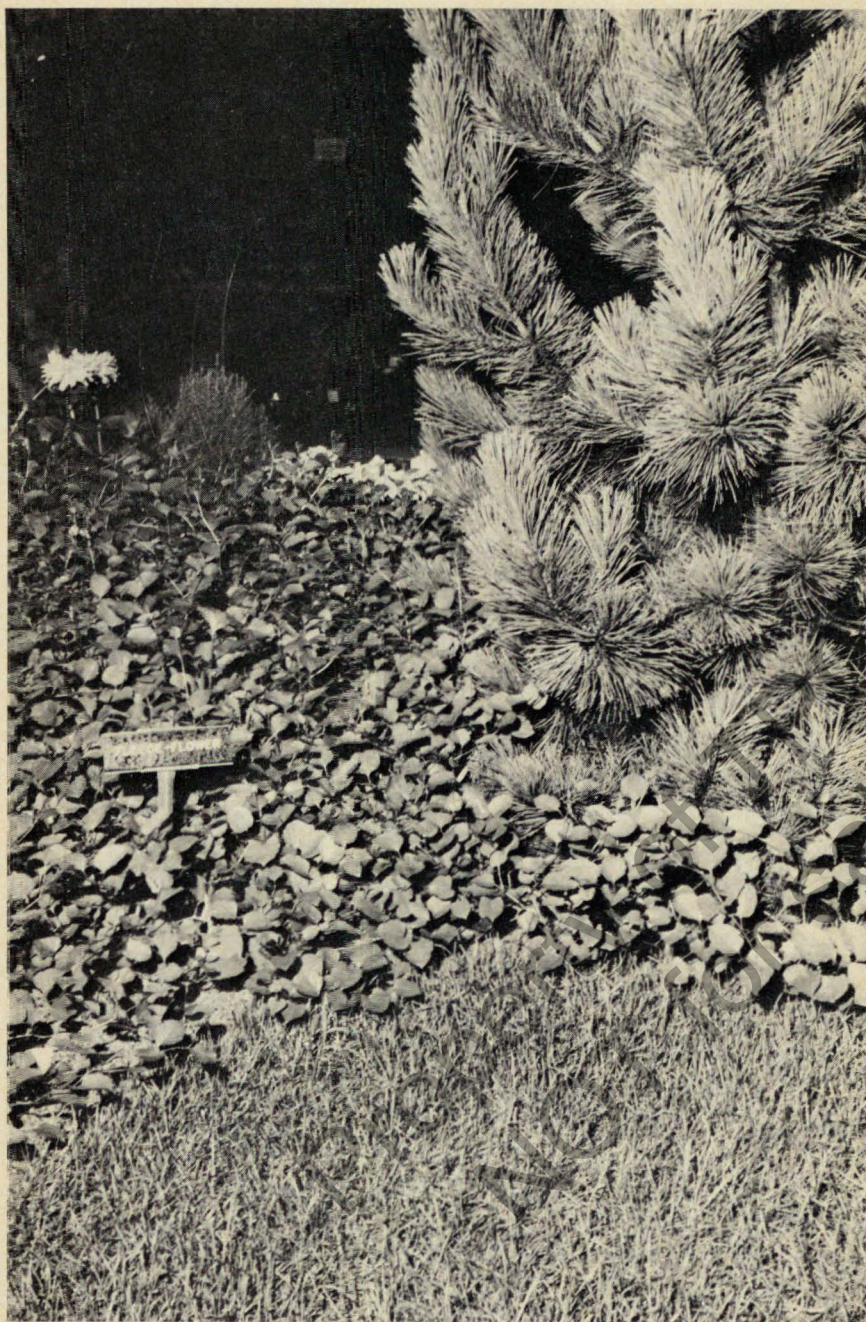
It is unlikely that private outdoor space exists around the townhouse —

condominium complex to justify owning, and storing, a lawn mower. Also, constantly cutting grass doesn't fit with the idea of low maintenance. If the cover is not turf, then a substitute surfacing material should be selected. Apart from the actual walking — sitting area, pebbles, rocks and perennials, some in decorative containers sitting on the pebbles, and others planted directly into the soil as ground covers, are a logical answer for a surfacing material. The small patio generally hasn't room for a large tree but usually has plenty of vertical walls and screens adaptable for perennial and annual vines. Some ornamental gourds, other annual vines, as well as perennials, should be used to soften the usually harsh constriction of the outdoor architecture.

These are the main uses that I can see for herbaceous perennials in contemporary landscaping. To become the floor of the garden as ground cover in combination with richness of paving such as pebbles, exposed aggregate or brick. To become the walls and roof of the garden as vines and plants in both standing and hanging containers.

As my knowledge of perennial varieties is limited I can only mention those that have a personal appeal and which I would use in landscape design. Firstly, use only those that present an interesting structure, texture and form





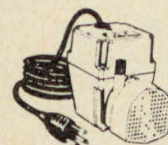
combinations independent of flowering and colour. In other words it must have interest in a black and white photograph. With that basic criteria, all colour will become a bonus. Secondly, use only those perennials (vines excluded here) that hold their flowers distinctly above the leaf portions.

The list from which I would select is as follows:

Echinops ritro (globethistle), *Artemisia schmidtiana* (silver mound), *Heuchera* (coralbells), *Polygonum Reynoutria* (fleeceflower), decorative grasses (ribbon, phragmites, etc.), *Yucca glauca* (small soapwood yucca), *Cimicifuga racemosa* (bugbane), *Bergenia cordifolia* (heartleaf bergenia),

Hemerocallis (daylily), *Hosta caerulea* (blue plantainlily), *Aegopodium podagraria variegatum* (variegated goutweed).

Each of these plants should have the space and setting to individually, or in groups of the same plant, be seen without numerous other plants calling for attention. I may involve a combination of rocks, woody perennials, evergreens or constructed backdrops such as a bench or a screen fence. These will serve as a neutral foil to best show off the perennial. Too often the perennial planting, although a "riot of colour" is also both visually and culturally, a "battleground of competition".



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Lythrum

H. T. ALLEN

The use of common names to designate plant genera or species often leads to some identification confusion. This does not necessarily apply to *Lythrum* as there are three species of importance to the prairies and these are represented by cultivars from selection and breeding programs. *Lythrum* belongs to the Loosestrife Family and both the generic and family names may be found in catalogues and references as common names for the genus and species; thus this plant group is known as Lythrum or Loosestrife, the species *Lythrum alatum* as Winged Lythrum or Loosestrife, *L. salicaria* as Purple Lythrum or Loosestrife, *L. virgatum* as Wand Lythrum or Loosestrife. A point of confusion might arise in that the genus *Lysimachia*, of the Primrose Family, is also known as Loosestrife which is a common name, in part, for several of the species.

Quoting from the Standard Cyclopedia of Horticulture by L.H. Bailey is the following notation on Lythrum:

"Lythrums grow about 2 to 3 feet high in the wild, but improve markedly in cultivation, often attaining 4 to 5 feet and flowering freely. Some of them are called willow-herbs from their strong, erect habit and willow-like leaves. They are of easy culture in any moist soil, and are usually planted amid shrubbery, where they hold their own. They are denizens of low grounds,

swamps and meadows, often growing in the water. They flower in summer and are propagated by division."

CULTIVARS:

Morden Pink is widely grown and is possibly the most popular cultivar on the prairies. It arose as a bud sport of the Wand Lythrum and was introduced by the Research Station, Morden, Manitoba in 1937. It is particularly noted for its pure-pink flower color and long period of bloom, from early July to fall.

Two other cultivars produced at Morden, Morden Gleam and Morden Rose, were a result of crossing Morden Pink with the Winged Lythrum. Morden Gleam produces flowers of a rose-pink color on plants that are vigorous with many side shoots that tend to extend the flowering period. Morden Rose is more compact with broad, glossy leaves and bright, rose-red flowers.

Other cultivars to be found in the trade include Dr. Skinner's Dropmore Purple, noted for its long sprays of purple flowers; and Mr. Roberts, an introduction from Holland, that is more dwarfish in habit, has deep rose-red flowers and foliage that colors in the fall.

CULTURE:

Although Lythrums thrive in moist

locations, they will tolerate semi-dry conditions and grow well in full sun or partial shade. Any good garden soil is suitable, but in sites where the soil is poor or dry, the addition of materials such as peat moss will help to improve the tilth and water holding properties. Mulching, to retain moisture in dry situations, would also be a good practise, and during extended periods of drought, periodic and thorough waterings may be necessary.

Lythrums are best planted in the spring and although fall planting can be successful it is not recommended. The impatient gardener should bear in mind that plants may take a year or more to become well established, and new spring growth lags behind that of many other perennials.

PROPAGATION:

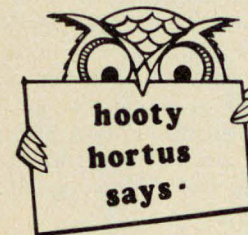
Old plants that have become too large or have decreased in vigor may be divided but it is best to use the newer outside portions for new plantings. Cuttings taken from new growth

in early summer root readily in water or such materials as sand or vermiculite, and when rooted, they should be planted in a sheltered location, mulched for winter protection, and set out as required. Lythrums can also be propagated from seed.

USES:

Depending upon the site, growing conditions, and the cultivar, the height attained may range from 2 to 5 feet. The period of bloom is of long duration, the plant habit is erect, and because of these factors Lythrums should receive a place of prominence in border plantings. They mix well with shrubbery and are naturals for planting around ponds, along streams or in other moist locations.

It may not be correct landscaping, but Lythrums may provide a colorful planting along foundations of homes where the space between a side-walk and foundation is too narrow for shrubbery or wide-spreading perennials.



House Plant Tips — Feeding house plants. New house plants recently acquired from greenhouses or florists usually have enough nourishment in the soil to keep them growing well for at least three months. From

then on regular feeding every two or three weeks with a water soluble house plant fertilizer in your watering will continue healthy growth. Reduce your feeding applications during the short day cold winter months when plants are growing less actively. Never make a mixture stronger than recommended by the manufacturer. Never feed a dry plant. Never fertilize a newly potted or dormant plant. Never fertilize an obviously ailing plant; first get it back to good health.

Overfeeding shows up in rapid new growth. The plant may also wilt. A white crust of built-up salts may also show up on the surface of the soil or on the outside of clay pots. Underfeeding causes the leaves to fade to a pale green and lower leaves will gradually turn yellow and drop. Any new leaves will also be small.

Use of Perennials as Groundcover

Rock Garden Perennials

R. H. KNOWLES

While the builder of rock gardens will be much concerned with covering soil, rock or gravel with plant material, the conventional groundcover will be of very little value to him. Such materials, while useful and much admired in other locations, are generally a little too lively for the somewhat limited spaces of the rock garden and in addition, too few of them possess the capacity for flowering that is valued so highly. The foregoing is nothing more than a statement of fact and actually no reason for concern, because the array of ground hugging, perennial flowering, mound builders, carpet makers and colonizers for rock garden use is so large and so varied that the enthusiast will likely find himself more concerned with what not to plant rather than what to select.

The alpine and desert species that make up the inventory of rock garden plants have had to modify their structures in order to survive in a rigorous environment and are thus admirably suited to this kind of garden. In most instances it is the leaves and stems that have been modified, while the flower size and flowering capacity of the plants have remained virtually unaffected. This type of modification has meant that the rockery plant will likely occupy less space and provide as many flowers as its progenitor, but very likely not be too aggressive.

It is interesting to note that plants from boreal situations are not considered a part of the rock garden flora as are the alpine. When we generalize about the two, we customarily equate plants of the arctic tundra with those of the alpine regions and yet there is a marked difference in the two environments with respect to the light duration factor. Plants from both environments have had to contend with low temperature, high winds and short growing seasons, but the boreal plant has had the advantage of continuous light throughout the summer. Because of this single factor, the same reductions in leaf size and stem length that characterize the delightful dwarfs of the mountain top are not always reflected in the plants of the north. Indeed, the differences may be so marked many of us would have great difficulty in recognizing two plants of the same species, were we to compare a plant from the arctic with its alpine counterpart.

The choice of plants for ground cover in the rock garden must be determined by the requirements of each particular problem. If, for example, the problem is one of creating the illusion that plant and rock have been associated for a long time then the builder will likely select from the group of tiny cushion-like *saxatiles* that clasp the primary rocks as if they were getting nourishment from them

directly. On the other hand when the need is for rock to rock carpet, a plant that tillers horizontally or one that is a fairly aggressive creeper will be more appropriate. Should visual punctuation be needed then the six to eight inch high, two foot diameter mound-former would be more highly valued.

Of course no rock garden would be complete without the colonizers, the little plants, that, like coral, multiply from a single antecedant in the cracks and crannies between rocks. The value of these plants lies in their ability to hold the soil, to provide an interesting colour and texture, and a flower display of unusual character.

The flowering season is something to be concerned about when dealing with rock garden ground covers. If the garden is of modest proportions then these elements will be called upon to provide a long season of bloom. If the garden is a large one however, then the extended season of interest may be achieved through some other means and this factor may be of little consequence.

When blooming season is important it is necessary to resort to things other than alpine perennials because these, as a general rule, have completed their flowering by early summer. For this reason desert plants can be used to play a complimentary role. These materials share the distinction of being good rockery perennials and provide color and interest from late spring through until the autumn frosts.

The following selection of rockery ground cover materials is based on their habit of growth.

SAXATILES OR DWARF CUSHIONS

Silene acaulis – A small pink cushion when in flower that is well suited to crevice planting. All *Silenes*

are not rockery plants but there are other members of the genus that are worth looking at, for this type of job.

Douglasia vitaliana – A European alpine of great value. In early spring the flat mats of grey-green foliage are covered with bright yellow flowers.

Draba repens – Tight mats of green foliage with golden yellow flowers in early spring.

Encrusted *Saxifrages* – The species *S. aizoon*, *S. cochlearis* and *S. hostii* are plants with lime encrusted leaves that form silvery rosettes. The plants are of easy culture and will withstand a good deal of sunlight. In addition these plants and their cultivars produce decorative flower heads that are raised well above the foliage.

Aethionema oppositifolium – This small ground hugging rosette plant prefers very sunny situations. The flowers are pale lilac, the rosettes of leaves blue-grey.

CARPET PLANTS

Phlox borealis – Without a doubt this is the best of the carpet phloxes. Foliage is narrow, durable, bright green, during the summer and the flowers, a showy pink, are produced in great profusion in late May.

Thymus serpyllum – There are a number of cultivars and one botanical variety of this species that are very worthwhile. All are vigorous carpet makers through which small bulbs may be grown. The cultivars *albus*, *carneus*, and *coccineus* respectively produce white, dark red and bright pink flowers. The sub-species *lanuginosus* is noted more for its grey leaves and heavy carpet and, since it can overpower dwarf cushion plants, it must be combined with more vigorous up-

right plant material.

Veronica – There are a great many creeping *Veronicas* with usually blue, but sometimes white or pink flowers. The following are recommended *V. pectinata*, *V. armena* and *V. prostrata*.

Dryas – Two *Dryas* species and a hybrid are often used in rock gardens where they build low thick mats of interesting foliage and flowers. *D. octopetala* is a boreal species that provides masses of white flowers in late spring.

D. drummondii has nodding yellow flowers while the hybrid *D.X. sundermannii* has creamy yellow flowers and is freer growing than either of the other. Although the flowering season is relatively short the unusual twisted hairy seed heads continue to provide a good deal of interest for the rest of the summer.

MOUND BUILDERS

Arabis albida – This plant must be the queen of the mound-formers. The species has many cultivars each of which has something just a little different to offer in flower or leaf colour. Flowers of the species are white, the leaves grey or silvery and the plant a neat mound 8" - 10" high. *Arabis* is generally sheared after the flowering season in order to prevent old flowers from going to seed.

Aubretia deltoidea – This plant is similar in many respects to *Arabis* but its flowers are purplish. If it is managed the same way as *Arabis* after flowering, the mounds will retain their density.

Callianthemum rutifolium – This little plant is a spectacular mound of white flowers when in bloom, but somewhat disappointing later. After flowering it tends to open out from

the centre so that it does not retain its neatness of form.

COLONIZERS

Sempervivum – This group of little plants is not only one of the more interesting from the textural point of view but also from the flowering standpoint. Flowers are not produced in a carpet but are raised up above the rosettes to give an interesting overlay of colour and form. There are many species and varieties in this popular group, however there are three that everyone should have as a starter set. These are *S. arachnoideum*, *S. atropuopureum* and *S. reginae amaliae*.

S. arachnoideum has a visible "spiderweb" over each rosette and it produces pink flowers. *S. atropuopureum* has purple rosettes and red flowers, while *S. reginae amaliae* has the distinction of producing a very large (3") rosette in which the leaves are purplish at the tip and green at the base. The flowers are yellow.

It may be of interest to mention that each rosette or offset that produces flowers dies afterwards, however, the colonies are continually producing new plants, hence, the loss is seldom noticed.

SUCCULENTS AND CACTI

Sedum – In the rock gardens of the Prairie Provinces this is the only genus of succulents that can be relied upon. These plants are interesting from a textural point of view, however, in almost all cases, colour is low-key compared with other rockery plants. The value of the *Sedums* lies in their ability to cover the ground and provide flowers and colour during the summer and early fall.

Only one plant *S. acre* is ground

hugging and comparable to the low growing alpine species. It produces bright yellow blossoms from masses of small green scale-like leaves and stems. Other yellow flowering *Sedums* are *S. kamchaticum* and its variegated form; *S. middendorffianum* and *S. sarmentosum*. All these latter are carpeting plants producing flowers on 6" stems. *S. middendorffianum* in addition has leaves that turn bronze in the fall.

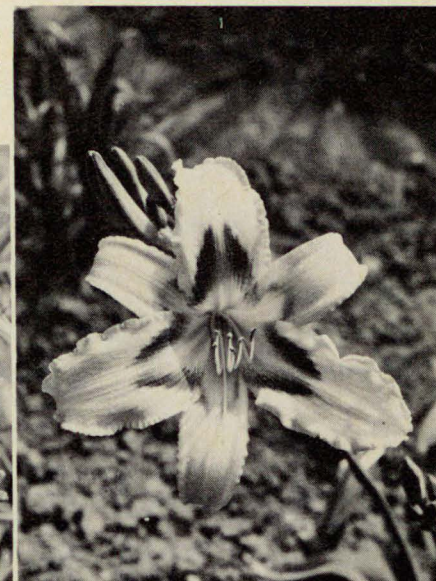
S. spurium var. **Dragon's Blood** is a good red flowered kind, with bronzy red buds and stems.

Two native cacti are recommended

for rock garden use because of their hardiness, and attractive flowers. The prickly pear cactus, *Opuntia polyacantha* is more aggressive and it will provide not only an interesting plant for a hot dry part of the rockery but it will also give a display of brilliant yellow blossoms during the summer months.

The other species *Mammillaria vivipara* is smaller and does not show the same ability to colonize as the previous species. It is however, an attractive plant with dark red flowers and an interesting cushion form.

Daylilies, for sun or partial shade, hardy, longliving, easy to grow. Numerous varieties available. See Landscaping with Perennials, page 73.



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Perennials for Shady Places

ROGER H. VICK

Are you already growing the more common perennials, and would like to try something a little more challenging or unusual? Then it is time to look at some plants, (from Europe for example) that will not tolerate our sudden leap from an arctic winter into a tropical summer, at least not when planted in an exposed position.

The shady spot where the sun rarely or never shines is often looked upon as a problem area, to be filled with anything that will survive. On the contrary, shade is an advantage in growing many herbaceous perennials, the only disadvantage being the associated disadvantage of drought.

If a shady place in the garden is also sucked dry by trees or shrubs, or a building prevents the reception of natural precipitation, then the area must be supplied with supplemental water in order to produce satisfactory results. Rare indeed is the plant that will tolerate both lack of sunshine and lack of moisture. Once this fact is accepted we have no problem in filling our shady garden with contented plants and a wealth of bloom the whole season long.

It is a good idea in a situation of deep shade to allow a little more space between plants than one would in the open, so that available light and air circulation is not hindered. Consider also reflected light, and the possibility of painting adjacent walls or fences

white.

Here follows a list of 50 genera of hardy herbaceous perennials tried for several years at the Botanic Garden of The University of Alberta. All are thriving in a shady situation, and with ample summer moisture. No winter protection is provided, but if the tops are removed in the late fall for the sake of tidiness, or for seed collection or winter bouquet material, then a foot or so is always left standing to aid the accumulation of snow.

To twist an old proverb "one man's flower, is another man's weed", and in compiling this basic list of satisfactory shade plants, even those too vigorous for us have been included. It remains for the individual grower to be selective according to local environmental conditions, and from personal experience modify this list of . . .

SHADE PLANTS FOR THE PRAIRIES

Aconitum – Monks Hood

Most are tall, non-spreading, and less likely to need staking than the similar *Delphinium*. Poisonous, (all parts).

Actaea – Baneberry

Woodland plants with showy berries that are red or white with a black dot. Sometimes called Doll's-Eyes. Also a

black berried species from Europe. Berries poisonous.

† *Aegopodium podagraria* var. *variegatum* – Variegated Goutweed

A good groundcover, but invasive when the roots are not restricted.

† * *Ajuga reptans* – Carpet Bugle

The selection 'Atropurpurea' most vigorous, and a fast groundcover without being too invasive. Also green-leaved and variegated forms. Foliage plants only.

Anemone sylvestris – Snowdrop **Anemone**

To 4 feet tall. White flowers 2" across in spring.

* *Aranuncus sylvestris* – Goat's Beard

Attains 4 feet or more in height, less in deep shade. Somewhat resembles an over-grown *Astilbe*.

* *Asarum canadense* – Wild Ginger

Native to B.C. Also the usually preferred *A. europaeum*. Both slow to become established, but worthwhile.

Astilbe davidii – False Spirea

Hardy and vigorous to about 3 feet. The smaller named cultivars such as 'Pink Pearl' and 'Erica' are slow.

Astrantia major – Masterwort

2 - 3 feet. Pinkish bracts, mid-season. A good space-filler.

Bergenia crassifolia – Siberian Tea

Evergreen leaves, reminding some of rhubarb, but with showy pink flowers in May. Ours are all hybrids with the similar *B. cordifolia*.

† *Campanula persicifolia* – Bellflower

Division every other season results in masses of blue-purple (or white) bells being produced over a long season; but undivided plants soon refuse to flower.

* *Chelidonium majus* – Greater

Celandine

A boisterous member of the Poppy family with small yellow flowers. Also a double flowered form (fl.pl.)

Cimicifuga racemosa – Black Snake-root

To 6 feet tall including the finger shaped racemes of cream flowers. Mid-season. For large borders etc.

† * *Convallaria majalis* – Lily-of-the-Valley

Common groundcover/filler, white nodding bells. Also *C. transcaucasica* from Russia, larger in all parts, shows promise here.

† *Coronilla varia* – Crown Vetch

A long season of pink flowers, but too vigorous for us in shade and moist soil.

Corydalis nobilis – Corydalis

About 9 inches tall. White flowers tipped yellow with a purple dot; spring. Other *Corydalis* are worth trying for early bloom and fine foliage.

* *Cypripedium calceolus* – Yellow Lady's Slipper

A native orchid. Much appreciated by growers of wild plants.

* *Dicentra spectabilis* – Bleeding Heart

To 3 feet tall with arching sprays of pink hearts; spring. Dies down early, but lasts better in the shade. Also *D. formosa* the Western Bleeding Heart.

Digitalis grandiflora – Yellow Foxglove

About 2 feet tall, yellow flowers marked with brown. July-August. Self sows.

Dodecatheon – Shooting Star

Several attractive species, *D. meadia* perhaps the most popular.

† * *Epimedium X rubrun* – Barrenwort

Low growing and early flowering,

crimson flushed yellow or white. Said to succeed even under trees.

Filipendula – **Meadowsweet**

Excellent in wet places where space is not limited. Good ones tried are *FF. camtschatica*, *palmata*, *ulmaria*, and a good double form of the latter. (Note: *F. hexapetala* for sun and good drainage only.)

† * *Glechoma hederacea* – **Creeping Charlie**

Groundcover. Caution, keep this one and his girl-friend Jenny (see *Lysimachia nummularia*) away from lawns and rock gardens.

† * *Geranium sanguineum* – **Cranesbill**

Not to be confused with the bedding-out plant commonly called Geranium. This is barely 1 foot tall, red-purple flowers from spring to late summer. Also variety *lancastrisense* with light pink flowers. Other taller spp. such as *G. pratense* are coarse and rather weedy.

† *Hemerocallis* – **Daylily**

Only tolerates shade, but often used for 'difficult' places. A most uncomplaining plant, with varieties that together provide flower from late June through September.

† *Heuchera* – **Coral Bells**

Not as reliably hardy with us as the other plants listed, but the cultivar 'Brandon Pink' is doing well.

Hosta – **Plantain Lily**

Slow to become established, and many named ones probably not hardy here.

Iris sibirica – **Siberian Iris**

(Includes *I. orientalis*) A moisture loving tall Iris (2 - 4 feet) with many named selections, some of the best here being: 'Gatineau', 'Nippigon', 'Papillon', 'Perry's Blue', 'Pickanock',

and 'Yukon'. The white flowered forms are not as vigorous as the above purples.

Lamium maculatum – **Dead Nettle**

Groundcover. Leaves variegated. The variety roseum with pink flowers evident all season is a good form.

† *Lilium* – **Lily**

Lilies for shade include *LL. henryi*, *martigon* and *tigrinum*. *L. regale* is good but not persistent here. Try some of the Prairie hybrids.

† *Lysimachia nummularia* – **Creeping Jenny**

A prostrate and vigorous groundcover with yellow midseason flowers. Also, the erect and almost as energetic *L. punctata* the Yellow Loosestrife.

† * *Lythrum salicaria* – **Purple Loosestrife**

To 7 feet tall here in moist locations. August flowering. Good named ones are 'Dropmore Purple', 'Morden Pink' and 'Pink Spire'.

* *Matteuccia struthiopteris* – **Ostrich-Plume Fern**

Native. Although flowerless, the ferns provide interesting contrast for shady areas. Other native ferns are occasionally brought under cultivation for moist shady areas.

Meconopsis cambrica – **Welsh Poppy**

Growing 2 feet tall; yellow flowered; self sowing. Also, for semi-shade, the tall blue-flowered *M. betonicifolia* or Himalayan Poppy.

* *Myosotis sylvatica* – **Forget-Me-Not**

One of the few truly blue flowers, produced over a long season. Plants are often short lived so regular propagation is advisable.

† * *Pachysandra terminalis* – **Japanese Spurge**

A useful evergreen sub-shrub, usually included with this group. An 8 inch

groundcover for deep shade. Flowers absent or insignificant. The variegated form is less persistent.

* *Podophyllum emodi* – **Mayapple**

Interesting specimen plant. Produces large eye-catching pendulous red fruit. Native to the Himalayas.

Polemonium caeruleum – **Jacob's Ladder**

Fine textured foliage and blue or white flowers. Seedlings should be selected for required height, flowers, and resistance to mildew.

Polygonatum multiflorum – **Solomon's Seal**

Specimen plants with delicate white flowers suspended from arching stems. June.

Primula – **Primrose**

Many species and cultivars have proven completely satisfactory for this region if provided with some shade and summer moisture.

Prunella grandiflora – **Self-Heal** selection

'Pink Loveliness' is an attractive and dainty cultivar of this species, closely related to the weedy Self-Heal *P. vulgaris*.

Pulmonaria officinalis – **Lungwort**

One of the earliest herbaceous flowers of spring. Mottled foliage is unique.

† *Sanguinaria canadense* – **Bloodroot**

A fine wild plant of eastern North America. White flowers in spring, the plant dying down by mid-summer. Double flowered in the form 'Multiplex'.

† * *Symphytum officinale* – **Comfrey**

In the same plant family as the Forget-Me-Not, but coarse and spreading, 3 feet or more in height. Included here because of its tolerance to shade, but weedy with us and recommended

only for wild corners.

* *Trillium* – **Wake-Robin**

About 18 inches tall, *T. Grandiflorum* the Trinity Lily has white upturned flowers that become pinkish as they age; surprisingly long lasting for a spring bloom. Native to eastern North America.

Trollius europaeus – **Globe Flower**

Like giant double buttercups. Selection of seedlings is necessary as they vary in many respects. 'Earliest of All' and 'Miss M Russell' have done well. Other species of *Trollius* are also very satisfactory.

Valeriana officinalis – **Valerian**

About 4 - 5 feet tall, with pale-pink flowers in August. Likely to pop up in unexpected places due to self sowing, but very useful in an informal border.

† * *Vinca minor* – **Periwinkle**

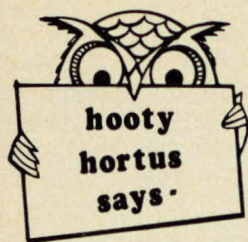
Trailing evergreen sub-shrubs, included here as they are generally considered with this group. Excellent for shade. The various named ones so far tried 'Atropurpurea', 'Azura Flore Pleno' (double), 'Bowles Variety' and 'Multiplex' all adapt well. Only the white flowered form (var. *alba*) and the variegated leaf form ('Variegata') are dragging their heels.

Viola cornuta – **Violet**

A short-lived perennial, but self sowing; flowers from mid-summer to late fall. Try also the related *V. odorata* var. *alba*, and *V.o.* 'Royal Robe'.

All the above prefer some shade, those marked * TOLERATE DEEP SHADE.

Reliable soil moisture is an advantage to all, but those marked † TOLERATE SOME LACK OF MOISTURE.



Marigolds and Zinnias are two easy-to grow long blooming annuals for the garden. You can plant them in flats indoors in late April. They germinate in a few days, can be thinned and replanted in a few weeks

and out into the garden within a month to harden off before planting into the border when danger of frost is past. Seeds can also be planted directly into the garden in May for later bloom.

Today's marigolds are a joy to the home gardener. There is no need to mention varieties here. Take your choice from the many new and improved varieties now available. Colors run through all shades of yellow into gold and orange, with a choice of double and carnation types, some with blooms up to five inches across. They bloom for months and are unexcelled either close up or at a distance. It is because of this that more and more people are using masses of marigolds to fill in their regular foundation planting with continual color for the summer months.

There are also dwarf French marigolds growing to a height of six to twelve inches with small single or double blooms in colors of yellow and orange, and a combination of the two. They make a grand edging for borders and planters. I like the Petites with their masses of small double blooms in blends of gold and orange.

Zinnias are also a must in any garden with their wide range of brilliant color types and size of flowers and height of plants. This annual blooms from summer until late fall. Zinnias may be used effectively in solid beds, or in combination with other flowers. The catalogues and seed counters will offer you a wide selection with massive blooms to six inches across with cactus, dahlia and curled quilled petal types.

There are also the miniature zinnias. One of the best is the small flowered Thumbelina. It is a neat compact plant growing to six inches in height. Flowers are double and semi-double, and come in many lovely colors. It is well suited for the front of the border.

DAFFODILS

*That come before the swallow dares, and take
The winds of March with beauty; violets dim
But sweeter than the lids of Juno's eyes.*

SHAKESPEARE (Winter's Tale)



Photo by Lawrence Stuckey

Heuchera — The *Heuchera*, Alumroot or Coralbells is a late spring-flowering member of the Saxifrage family. The plants form clumps of lobed leaves and bear small white, pink to red flowers on 12-inch spikes.

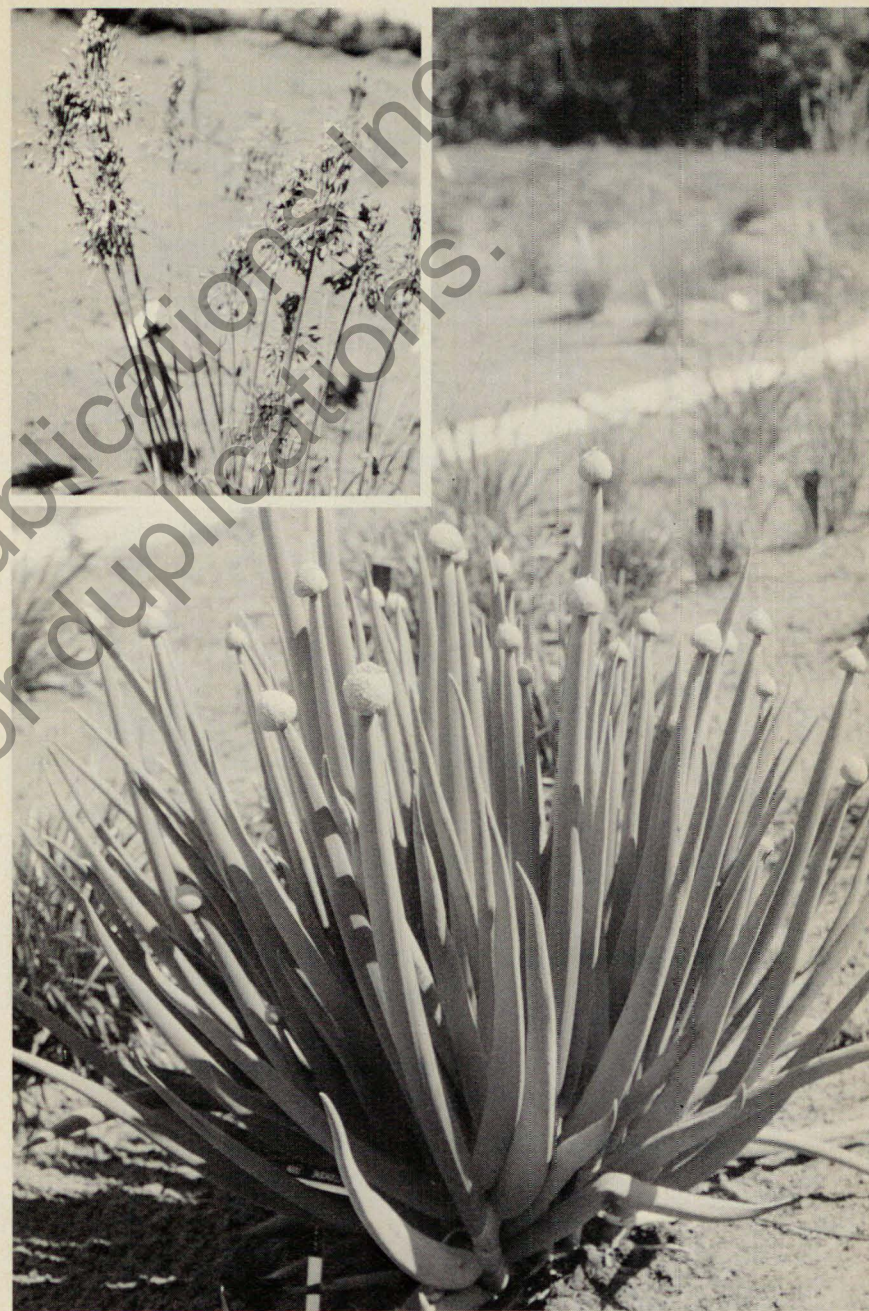
One of these spikes is shown on our front cover. A full story on the new hardy species of this plant, developed by H.H. Marshall, will be found under Coral Bells, in this issue.

Special Identification Section on Herbaceous Perennials



Babysbreath — *Gypsophila paniculata*. Grows to a height of three or four feet and bears a profusion of small white flowers in July and August. Bristol Fairy is one of the better varieties. It is often used as a filler with other garden flowers and arrangements. As the plants take a lot of room in the garden they should be spaced at least four feet apart. The cultivar Rosy Veil, growing about 15 inches in height, is a useful plant for the front border of the perennial garden.

Allium — **Flowering Onion**. These are hardy flowering bulbs with interesting flower heads, from white to various shades of blue, violet, purple, rose and yellow. A number of them make very attractive plants in the border or rock garden. See Ornamental Alliums by Roger H. Vick in this issue.





Columbine: Of the species and types of columbine, *Aquilegia*, suitable for prairie gardens the most satisfactory is likely to be the long-spurred hybrids. These have attractive, glaucous foliage and graceful flowers on stems up to two feet tall; blooms appear in June. Due to roots being frequently invaded by borers columbine is not usually

long-lived, two years plus. New plants can be readily obtained from seeds sown in May, and columbine succeeds best in a well-drained loam soil in partial shade.

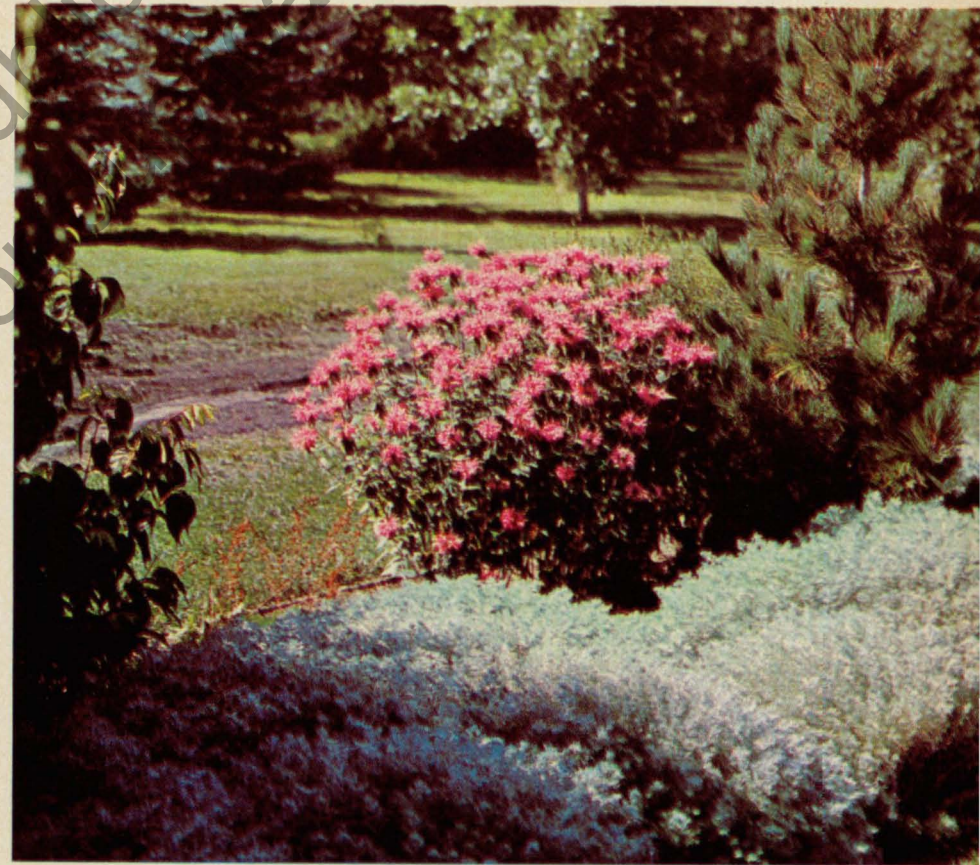
Fan columbine, *A. flabellata*, with smaller flowers on shorter stems comes into bloom earlier than long-spurred hybrids.

Beebalm — *Monarda*: This is a native North American member of the Mint family. It has aromatic leaves and bears lilac-colored flowers during the summer. The plants are propagated by division and should be grown in well drained soils and sunny locations. They are very susceptible to powdery mildew and older plants, incline to die-out in the centre. It is recommended that a small division of the original plant be taken and moved to a new location each May for flowering the next one to two years. Plants can be

propagated easily as the root system consists of a large number of stolons up to a foot long.

The locally grown cultivars are hybrids of *Monarda didyma* and *Monarda fistulosa*. Some of these are 'Wawanesa', a deep purplish red, 'Minnedosa', a white, 'Souris', a deep reddish purple and 'Neepawa', a red.

In the foreground, the low-growing plants with silky silver foliage is a species of *Artemisia*, valued for its foliage in providing contrast to other foliage and plants.





Carnations (Pinks) – *Dianthus*: This genus provides us with many attractive plants for greenhouse and garden culture. In the garden they prefer a sunny, well-drained location and a sandy loam soil.

Species most commonly recommended are: Maiden Pink, *D. deltoides*, an attractive border plant of low trailing habit with small rose-pink flowers in June and July. Flower stems should be sheared off when the flowers fade, and the rooting of new flower stems near the main crown may be encouraged by mounding them with a sandy soil mix, two inches deep. Foliage remains attractive throughout the season. Cottage Pink, *D. plumarius* grows ten to twelve inches high with different colored flowers. They are unfortunately a rather short lived perennial. Deep snow cover is desirable in winter.

Phlox – *Phlox decussata*: These tall herbaceous perennial phloxes are a colorful, late summer group of hybrids. Although numerous cultivars are available we recommend only the following as truly hardy in the prairie regions: 'Prairie Princess' and 'White Pyramid' - white, 'Ada Blackjack' - pink and 'Moose Jaw' - mauve. They are shallow-rooted and must be kept moist during hot summer weather. They are best planted in the spring in deep moist soil that drains well. They are propagated by divisions, stem and root cuttings.

The summer phloxes *P. paniculata* the showy, colorful pictures which you see in eastern catalogues, are not fully hardy in prairie gardens.

***Campanula* – Bellflower.** The following species are fully hardy, succeed in full sun in a well drained soil, make vigorous growth, and crowns require dividing frequently, in spring or fall for best results. Flowers are bellshaped and regular.

1. Carpathian bellflower, *C. carpatica*, may grow to a height of 12 inches, and is suitable for use at the front of a border or in a rock garden. Blossoms are solitary in white and shades of blue on wiry stems, and develop for several weeks, beginning in late June.

2. Cluster bellflower, *C. glomerata*, produces flower stems up to 18 inches, topped by dense clusters of purple blossoms in late June or early July. Cluster bellflower makes aggressive growth by underground stolons and may encroach on space allotted to other plants. Its flower color will not

clash with white or yellow.

3. Peach or Peachleaf bellflower, *C. persicifolia*, can succeed in partial shade. Crowns are protected against drying winds by narrow basal leaves up to six inches long. Blossoms on very short stems are produced on strong branching stems beginning after mid-June, and succession blooming can be encouraged by snipping off the faded individual blooms. Colors are the same as in Carpathian bellflower, and double forms are available.

N.B. One species of bellflower frequently observed in gardens should be avoided, namely, *C. rapunculoides*. Blossoms are more mauve than blue and are produced in spikes up to 18 inches. The plant can choke out other plants nearby and is difficult to control or eradicate.



Phlox 'Prairie Princess'



Platycodons — The *Platycodon* or Balloonflower is a hardy, herbaceous perennial, summer-flowering member of the Bellflower family. The species is *Platycodon grandiflorum* and the name is derived from the large balloon-shaped flower buds. The plant grows 12 to 18 inches high, bearing large blue bell-shaped flowers. Propagation is by divisions in the spring or by seed. There are available numerous

seed-grown cultivars in a wider color range, double flowers and dwarf forms. The Balloonflower will grow in most good garden soils in sunny locations and does not like to be disturbed.



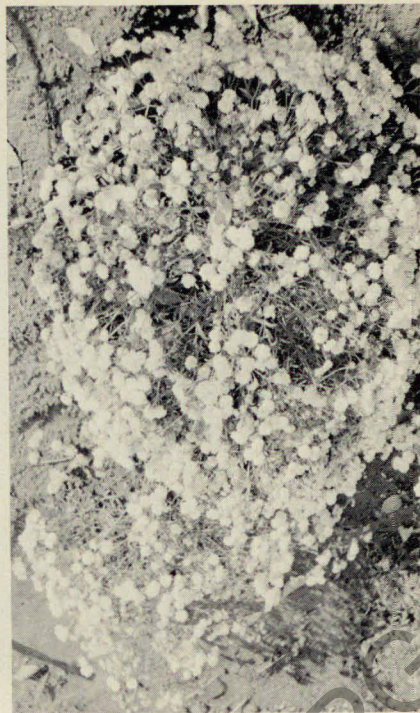
Yellow Ray Flower, *Ligularia* species (in the background).

The hardy species, *L. speciosa*, can provide a bright contrast when associated with blue delphinium and scarlet lychnis. Because of its large, coarse, long-stalked leaves and height of flower stems (3 feet plus), it must be given a place **behind** perennials with more delicate and pleasing foliage. It has no special soil requirements. Its season of bloom on nodding stems is early July, and new plants may be obtained from seeds or by dividing old crowns, preferably in early spring. Its use in a small garden is questionable when neater kinds can be selected.

Lychnis (in the foreground). The most common *Lychnis* is *L. chalconica*,

commonly called Jerusalem or Maltese Cross because of the shape of the individual flowers. It is extremely hardy and has been a popular plant for the flower border because it is early blooming, attractive and easily grown, achieving a height of 3½ feet. It has large heads of pure scarlet flowers which last for some time. It prefers a sandy loam soil with plenty of well-rotted manure. It is usually grown from seed and generally will seed itself in the garden.

Another *Lychnis* is *L. Coronaria*, or Rose Campion, a two- to three-foot tall plant having its leaves and stems thickly covered with white hairs. Its flowers are pink, purple or white which are produced in July or August. It is also easily grown from seed.



Peony — *Paeonia*: The well-known common peony succeeds best in a rich soil to provide a deep root run. Space required is about 30 inches from other plants. Planting (or replanting) is best done around mid-September (first allow fleshy root to wilt). Soil should be well settled (not freshly dug) to insure that growth crowns will not be more than two inches below soil surface when planted. Support stems early to enhance the beauty of the blooms and remove side buds, when small, if exhibition blooms rather than sprays are wished. To prevent seed development do not delay removing faded flower heads.

For further information on peonies see Peony Notes by S. Sheard in The Prairie Garden for 1970.

Yarrow-Achillea ... *A. ptarmica* — The Pearl: Like other achilleas, The Pearl spreads by underground stems so must be prevented from encroaching on other plants. The Pearl is valuable as a cut flower. Yarrows, in general, are vigorous, drought resistant, free-flowering over a long period and require a minimum of care.

St. Bruno's Lily — *Paradisea liliastrum*: A loamy soil and a position in partial shade are desirable for this perennial. It produces long-lasting, grassy foliage and pure white, fragrant, lily-like flowers in early July on stems up to 18 inches tall. Old plants may be easily divided in spring. →



St. Bruno's Lily



Perennial Rockery



Fernleaf Peony

Moss Phlox — The dwarf, hardy perennial Moss Phloxes are early, pink-flowered, spring-blooming plants suitable for use in rock gardens and as ground covers. The most common is *Phlox subulata* and cultivars, but *P. amoena* and *P. borealis* are also available.

The Moss Phloxes are easy to cultivate, thriving in loamy soil in an open, sunny, well-drained location. They are easily propagated by divisions or stem cuttings. Some *P. subulata* cultivars available are 'Alba', 'Autumn-Rose' and 'Temiskaming'.

← Moss Phlox

Peony — *Paeonia* species: The earliest to bloom is the fernleaf peony, *P. tenuifolia*, usually in late May. Its blossoms are deep crimson, single or double. A place in the sun and deep loam soil are desirable. Planting around mid-September is recommended and plants need not be disturbed or replanted for many years.

Information on the well-known common peony is included in the black and white photograph portion of this Section. An excellent informative article, Peony Notes by S. Sheard is contained in our 1970 Prairie Garden.

Perennial Rockery: This rockery picture taken on June 20th show just how attractive a setting certain low growing perennials can achieve. In the foreground is *Arabis albida*. Earlier, it was a mass of small white flowers. Directly above is **Mother of Thyme** — *Thymus serpyllum* with its mass of rosy red flowers and above that is white **Evergreen Candytuft** — *Iberis sempervivens*. Among other perennials dwarf white **Creeping Babysbreath** — *Gypsophila repens* can be seen. **Yellow Iceland Poppies** — *Papaver nudicaule* also brighten up the scene. These blooms also come in orange and white while a new cultivar 'Champagne Bubbles' has a greater color range.

For data on *Arabis albida* and other low growing perennials turn to Rock Garden Perennials by R. H. Knowles in this issue. There are also articles on Rock Gardens in our 1965-67 and 1972 issues.

Monkshood — *Aconitum napellus*: The Aconitums are hardy plants growing five feet high and blooming in July-August. They should be located at the back of the border, and can be interplanted with delphiniums. The flowers are a dull blue in color. The plants survive in well drained, sandy loam soil, and will withstand some shade.

Propagation is by separating the clump of roots in fall or spring, but seeds can be sown in April-May in the greenhouse and plants set in the garden when they are large enough. Aconitums do not like to be disturbed and should not be transplanted unless it is necessary to do so. As the fleshy part of the roots is quite poisonous, care should be taken as to where it is planted.

Sea lavender — *Limonium latifolia*: Sea lavender is a long-lived, deeply rooted perennial which survives in any well drained soil. Development of the leathery, wide entire leaves is relatively slow in spring, and the sprays of lavender-blue blossoms appear in late July or early August. These sprays when dried, tough brittle, are useful in making winter arrangements. Young plants may be obtained from seeds or as divisions of older plants.

The *Hemerocallis* or **Daylilies** are a hardy herbaceous perennial member of the Lily family. As the name Daylily indicates, the individual flowers are short-lived, but are borne over a period of several weeks during the summer. The plants grow from 1 to 3 feet high and bear orange, yellow and mahogany lily-like flowers. They are of Euro-asian origin, but many types are naturalized in North America.

The Daylilies thrive in any good garden soil and prefer a sunny location. They are especially heat tolerant and drought resistant. There are numerous species and cultivars available. They are propagated by divisions in either spring or fall.

Poppies — The hardy perennial poppies grown on the Prairies are generally *Papaver orientale*, the Oriental Poppy and *P. nudicaule*, the Iceland Poppy. Both kinds will grow in most soils which are well-drained and prefer full sun.

The Oriental Poppy grows to about 2 feet high, with large cut leaves and large cup-shaped flowers in early summer. The older red flowered forms may be grown from seed, but the newer white, pink and orange cultivars should be propagated by root cuttings in late summer. This poppy has a thick, fleshy root and dislikes being disturbed.

The Giant Autumn Daisy — *Chrysanthemum uliginosum*: its main claim for attention is its showing of blooms when days are cool and night frosts imminent in September or early October. The white blooms with yellow centre are borne in clusters on strong stems clothed with dark green lobed leaves. Because stems grow to a height of four feet or more this daisy should be planted to form a background for other flowers. If planted near a back lane fence it may successfully compete with grass and weeds, even if neglected.

Delphiniums — The *Delphinium* is often called "the queen of the perennial border" and may have flowers on stems four to six feet or more tall, which are single or double, self-colored or bi-colored, and may have a "central eye" or bee of contrasting shade. Actually the bee is a formation of four petals, while the showy parts surrounding the bee are sepals.

Delphiniums traditionally come in purple shades but modern hybridizers now have been able to produce plants with flowers of pink, blue, white and even red. Pacific hybrids are well known, being about four feet in height with dense spikes of large flowers. Since the Pacific hybrids were originated, several new ones have arrived which come relatively true from seed, such as Black Knight (deep purple), Galahad (White with no black bee), Astrolat and Elaine which are pink.

Delphiniums like a loose, loamy well-drained soil and should be located at the back of the perennial border. If seeded early enough in the greenhouse in spring, plants can be expected to bloom in the fall. Normally, nursery-grown plants are planted in the spring. Well established clumps of roots may need to be divided every few years.

It is wise to limit the number of stalks growing in each clump in order to have blooms of better quality and size. Staking when growth starts in the spring is most necessary as stems are easily broken from the weight of a heavy flower spike, particularly during a rain. Plants can be located in clumps allowing about two feet between each plant.

Gas Plant — *Dictamnus* species: Gas Plant has a strong, fleshy root and dislikes being disturbed. As with other perennials with fleshy roots planting in September is recommended. Blossoms appear in June and spikes are attractive for a relatively long period.

Lythrum — Loosestrife: Old plants of *Lythrum* should be replaced by new ones every few years. Cuttings may be made from side shoots on flower stems in July; they will root readily in sand or water. Blossoms appear in July on stems from two to five feet in height. Also see *Lythrum* by H.T. Allen in this issue.

Trollius — Globe Flower: The European species which blooms in early June succeeds best in a rich, moist soil in semi-shade. Blossoms are like large buttercups and excel as cut flowers. Crowns may be divided in late summer or early fall and faded stems should be left to protect crowns over winter.

Further reference to this plant can be found in *Perennials For Shady Places* by Roger H. Vick in this issue.

Geum — Avens: Fully hardy varieties of *Geum* are not readily available. A location in partial shade may help to insure survival over winter. Blossoms are usually produced in July on stems up to 2 feet tall. New plants must be obtained by division of established crowns if true colors are wished.



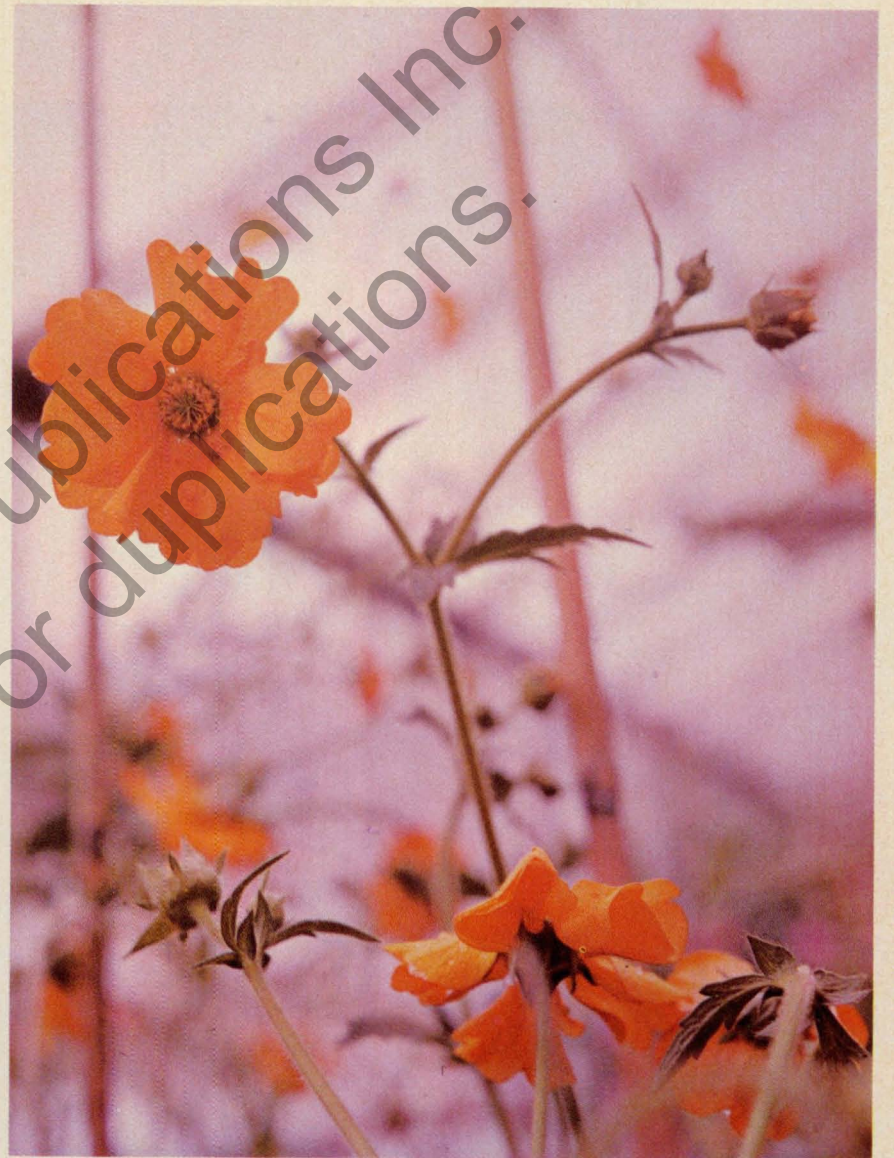
Lythrum



Gas Plant



Trollius



See bottom of page 47

Geum

Photo by Lawrence Stuckey

The following black and white photographs are of plants referred to by Roger H. Vick in his article Perennials for Shady Places, contained in this issue.



Bellflower — *Campanula persicifolia*



Yellow Lady's Slipper — *Cypripedium calceolus*



Lupine: In the Russell strain of lupine, *Lupinus*, there is a wide range of bright colors in the spikes of blooms. Plants are of medium height and remain attractive after blossoms fade. A site in partial shade, where soil moisture does not become deficient is desirable; blossoms may be expected in early July. Two or three plants in a group will provide contrasts in bloom colors. Soil slightly acid or neutral in reaction is a must. Allow natural seedlings to develop by permitting some seed pods to ripen and by

disturbing the soil around the plants as little as possible; reason for this step is that survival of seedlings following transplanting may be low and disappointing.

Iris: For complete information covering varieties and cultural information turn to *Iris in Prairie Gardens* by Wayne Brooks, in this issue; also *Growing the Bearded Iris* by T. Johnson in our 1970 *Prairie Garden*.



Variegated Stonecrop — *Sedum* species: This low-growing, free-flowering stonecrop is a useful perennial for the rock garden or as a border plant. Established plants may be replanted or divided in spring. A light top dressing (one inch) of loam soil over the stems in the fall aids in the over-wintering of the plants.

For more information on *Sedums* and other groundcover perennials turn to *Use of Perennials as Groundcover* by R. H. Knowles, in this issue.





Yellow Foxglove — *Digitalis grandiflora*



Shooting Star — *Dodecatheon*



Shadow Valley Carnation – *Dianthus caryophyllas*. This is a lively little carnation with semi-double red flowers (non fragrant) blooming on 10-inch stems in July and August. Unfortunately its hardiness is unpredictable. Plant only in protected areas. In any event, come September, cuttings taken from this plant will root readily in a medium such as perlite. With sufficient light, such as fluorescent fixtures, you should have no trouble in bringing these rooted cuttings into bloom in the house not too long after Christmas. Then these plants and further rooted cuttings can give you a supply of plants for setting out in your border in early June.

Perennial Border (foreground) – **Mediterranean Chrysanthemum**, *C. Corymbosum* – makes a bushy two foot plant with ferny green leaves and composite heads of white daisies on strong stems. Blooms later part of June into July. Old plants tend to weaken and die so division of old crowns is recommended every four years; discard weakened central parts. New plants from volunteer or self-sown seedlings can also be obtained (directly behind) – *Lychnis* with its scarlet blooms.



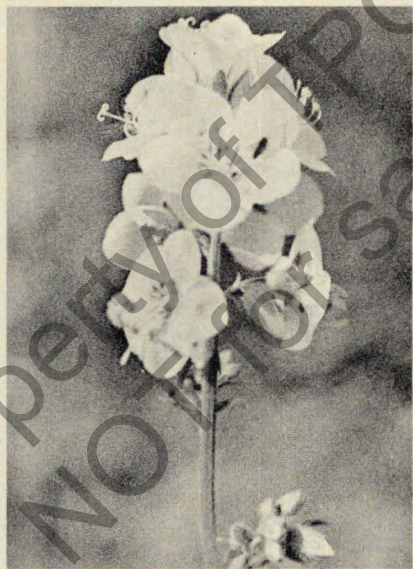
Meadowsweet — *Filipendula*



Geranium — *Geranium pratense*



Ostrich Plume Fern — *Matteuccia struthiopteris*



Jacob's Ladder — *Polemonium caeruleum*



Wake Robin — *Trillium*



Bleeding Heart: The species most commonly grown is *Dicentra spectabilis*. Heart-shaped pendant blossoms are produced on graceful stems of medium height above pale green foliage. Growth begins early in spring and may be damaged by frosts unless the plants are placed in shade where soil remains frozen and where there is snow cover as late as possible. Late May or early June is usual time of flowering. Fleshy roots penetrate the soil deeply and plants need not be disturbed or divided for many years. Best time to transplant bleeding heart is late August.

The fringed bleeding heart, *D. eximia*, is a dwarf plant and blooms later than *D. spectabilis*.

Lily, Lemon Lady — This is only one of the many outstanding hardy lilies developed by the late Dr. F.L. Skinner, Skinner's Nursery, Dropmore, Manitoba. The lily is classified as a bulb. We have however, included it here, among the perennials, because of its important place in the perennial border.

Today A.J. Porter, Honeywood, Nurseries, Parkside, Saskatchewan, has and is continuing to hybridize a growing number of beautiful lilies that will grow and flourish, year after year, on our western plains. He has received many awards for his outstanding work.



Photo by Lawrence Stuckey

We refer you to the following articles contained in previous Prairie Gardens, that will give you complete information on these new hardy varieties and on the culture of this valuable portion of the prairie garden.

The Prairie Garden, 1966 — Time and Method of Planting are Important

with Lilies — A.J. Porter.

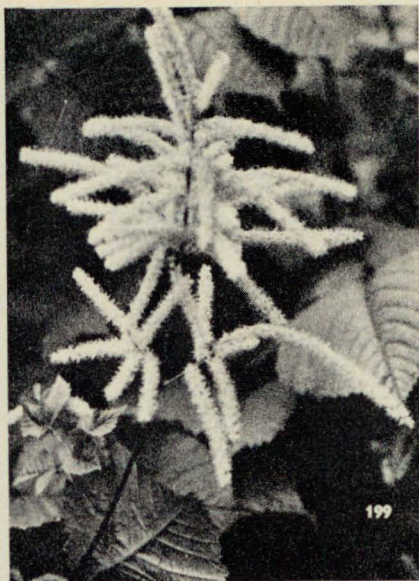
The Prairie Garden, 1970 — Lilies for the Seventies — Mrs. E.J. Stansfield.

The Prairie Garden, 1971 — Lilies for the Prairies — A.J. Porter.

The Prairie Garden, 1972 — Lilies in the Swan River Valley — Mrs. P. Pierpont.



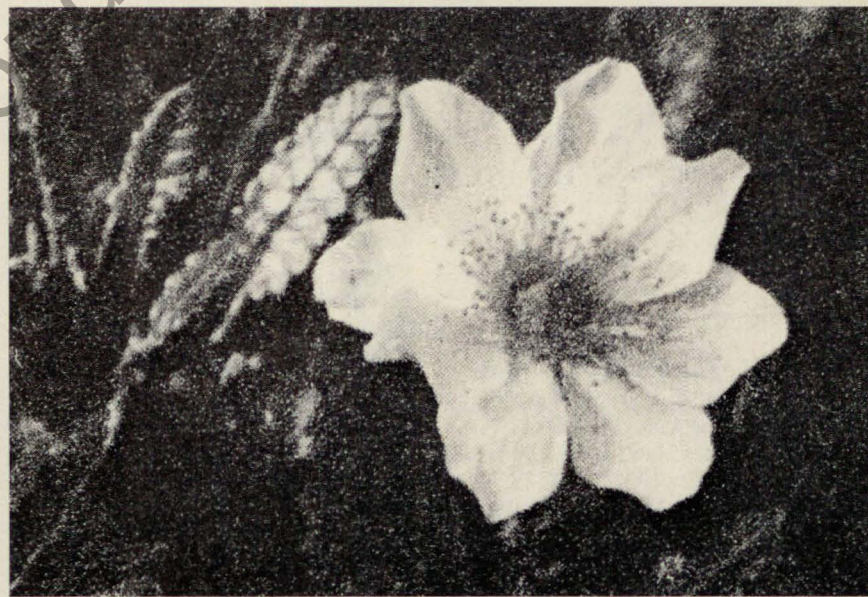
Valerian — *Valeriana officinalis*



Goats' Beard — *Aruncus sylvestris*



Silene acaulis



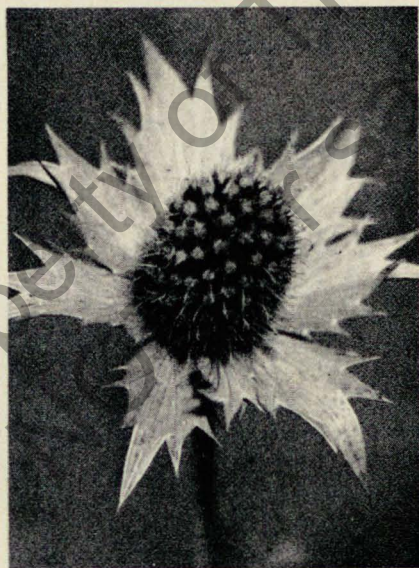
Mountain Avens — *Dryas octopetala*

The photographs on the next page and on page 65 are of plants referred to by R. H. Knowles in his article Rock Garden Perennials, contained in this issue.

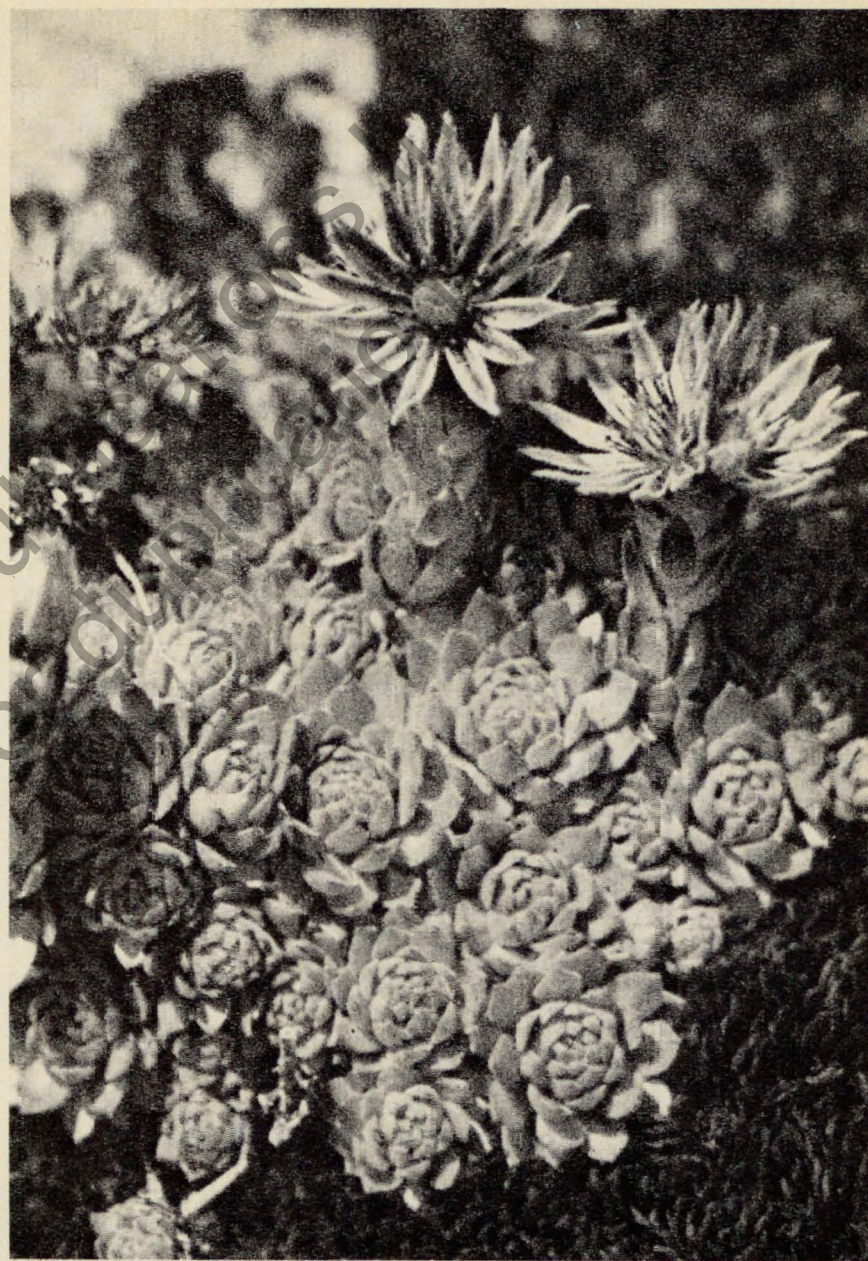


Hardy **Chrysanthemum** plantings at the Canada Research Station, Morden, Manitoba.

For information on this valuable addition to prairie gardens see article contained in this edition.



Seaholly — *Eryngium maritimum*: Seaholly is an 18-inch high plant with grey leaves and light blue flower heads belonging to the family *Umbelliferae*. It likes a sunny, well-drained area with sandy-loam soil. The plant does not like being disturbed and so should be planted in its permanent home. It can be propagated by dividing roots, but can also be grown from seed sown inside in April-May. See page 46.



Hens and Chickens — *Sempervivum montanum*

Bloom Periods of Perennials

JOHN WALKER

Where the selection of herbaceous perennial flowers, and their arrangement in the flower border are made carefully, the frequently heard objection: "their period of bloom is short", is more or less overcome. It is true that the blossoming period of some kinds is of relatively short duration, and is influenced by weather conditions, but the overall period when perennial flowers as a group are in bloom can extend from early spring to early fall.

In the following short lists reliable perennial flowers have been grouped according to blossoming date, i.e. date when first blossoms open. This date may vary as much as 10 days or more between seasons depending on factors

of climate, such as earliness of spring, sunshine, seasonal temperature and moisture. Date of first bloom open will also be influenced by location, exposure in the garden and the specific variety. Height of growth may also be influenced by the factors of climate.

All of the perennial flowers listed may be expected to succeed in the average prairie garden, and, under normal moisture conditions the majority should survive for a number of years without the need of replanting or replacing.

Symbols used to denote plant height are:

D — dwarf, up to 12 inches;
M — medium, 12 to 24 inches;
T — over 24 inches.

GROUP 1 May 1 to 15

Dwarf Iris, *Iris pumila* — D
Lily of the Valley, *Convallaria majalis* — D
Siberian Fritillary, *Fritillaria pallidiflora* — D
Siberian Squill, *Scilla sibirica* — D
(usually before May 1)
Tarda Tulip, *Tulipa tarda* — D
Wall Cress, *Arabis albida* — D

GROUP 2 May 15 to 31

Common Bleeding Heart, *Dicentra spectabilis* — M
Cortuso Primrose, *Primula cortusoides* — D
European Globe Flower, *Trollius europaeus* — M
Fernleaf Peony, *Paeonia tenuifolia* — M
Golden Tuft, *Alyssum saxatile* — D
Iceland Poppy, *Papaver nudicaule* — D
(performs like a biennial)
Moss Pink, *Phlox subulata* — D

Pansy, *Viola species* — D
(before May 1 when survives winter)
Perennial Golden Flax, *Linum flavum* — D-M
Sweet Rocket, *Hesperis matronalis* — M
(biennial in habit)
Cottage, Early, Red Emperor, *Tulipa species* — D-M
Whitlow Grass, *Draba sibirica* — D

GROUP 3 June 1 to 15

Alpine Rock Aster, *Aster alpinus* — D
Carpet Bugleweed, *Ajuga reptans and Hybrids* — D
Columbine, *Aquilegia species and Hybrids* — M
Coralbells, *Heuchera sanguinea and Hybrids* — D-M
Creeping Babysbreath, *Gypsophila repens* — D

Evergreen Candytuft, *Iberis sempervirens* — D
Florist's Pyrethrum (Painted Daisy), *Chrysanthemum coccineum* — M-T
Gas Plant (dittany), *Dictamnus albus* — M-T
Golden Moss (Mossy Stonecrop), *Sedum acre* — D
Bearded Iris, *Iris germanica* — M
Siberian Iris, *Iris sibirica* — M
Candlestick Lily, *Lilium dauricum* — M
Caucasian Lily, *Lilium monadelphum* — M-T
Coral Lily, *Lilium pumilum* — M
Oriental Poppy, *Papaver orientale* — M
Persian Nepeta (Catnip), *Nepeta Mussini and Hybrids* — M
Grass Pink, *Dianthus plumarius* — D
Maiden Pink, *Dianthus deltoides* — D
Prostrate speedwell, *Veronica prostrata* — D
Rock Soapwort, *Saponaria oeymoides* — D
Silverleaf Cranesbill, *Geranium argenteum* — M
Snowdrop, *Anemone sylvestris* — M
Anemone, *Cerastium tomentosum* — D
Snow-In-Summer, *Clematis integrifolia* — M
Solitary Clematis, *Clematis integrifolia* — M
Yellow Thermopsis, *Thermopsis canceolata* — M-T

GROUP 4 June 15 to 30

Cluster Bellflower, *Campanula glomerata* — D-M
Peachleaf Bellflower, *Campanula persicifolia* — M
Caucasian Cranesbill, *Geranium ibericum* — M
Mediterranean Chrysanthemum, *C. corymbosum* — T
Shasta Daisy, *C. Maximum* — M
(treat as biennial)

Colombine, *Thalictrum aquilegifolium* — T
Meadowrue, *Paeonia albifolia hybrids* — M-T
Common Peony, *Valeriana officinalis* — T
Common Valerian, *Filipendula hexapetala* — M
Dropwort, *Erigeron Hybrids* — M
Fleabane, *Anthemix tinctoria* — M
Golden Marguerite, (yellow camomile)
Lilium amabile — M
Lilium Scottiae — M
Korean Lily, *Lilium elegans* — D-M
Skinner Lily, *Lilium philadelphicum* — D-M
Thunberg Lily, *Patterson, Stenographer* — M-T
Wood Lily, *Lychnis chalconica* — T
Hybrid varieties, *Thymus serpyllum and hybrids* — D
Maltese Cross, *Heliopsis scabra* — T
Mother of Thyme, *Lupinus species* — T
Orange Sunflower, *Penstemon glaber* — D-M
Russell Lupines, *Sedum kamischaticum* — D
Sawsepal
Beardtongue, *Penstemon glaber* — D-M
Orange Stonecrop, *Sedum kamischaticum* — D

Variiegated Stonecrop, *Sedum kamt. V. variegatum* — D
Sweet William, *Dianthus barbatus* — D-M
(treat as biennial)
Woolly Speedwell, *Veronica incana* — D

GROUP 5 July 1 to 15

Babysbreath, *Gypsophila paniculata* — M
Bee Balm, *Monarda hybrids* — M
Carpathian Bellflower, *Campanula carpatica* — D
Campion Hybrid, *Lychnis heageana* — D-M
Daylily, *Emerocallis species and Varieties* — M-T
European Meadow Sweet, *Filipendula ulmaria* — T
Prairie Meadow-sweet, *Filipendula rubra venusta* — T
Golden Ray Flower, *Ligularia speciosa* — T
Ground Clematis, *Clematis recta* — M-T
Braun's Houseleek, *Sempervivum Brauni* — D
Hen and Chickens, *Sempervivum tectorum* — D
Hybrid Dianthus, *Dianthus X Sweet Wivelsfield* — M
Garden Larkspur, *Delphinium Hybrids* — T
Slender Siberian Larkspur, *Delphinium grandiflorum* — M
David Lily, *Lilium Davidi (Willmottiae)* — T
Maxwill Lily, *Lilium X Maxwill* — T
Loosestrife, *Lythrum Hybrids* — M-T
Meadow Sage, *Salvia pratensis* — M
Aconita
Monkshood, *Aconitum Napellus* — T
Bicolor Monkshood, *Aconitum Nap. bicolor* — T
Plantain Lily, *Hosta species* — D-M
Pyramid White Phlox, *Phlox hybrid* — M-T
Rose Centaurea, *Centaurea pulcherrima* — M-T
Sea Holly, *Eryngium planum* — M-T
Siberian Globe Flower, *Trollius ledebouri* — M
Spike Speedwell, *Veronica spicata* — D-M

GROUP 6 July 15 to 31

Chinese Meadowrue, *Thalictrum dipterocarpum* — T
False Dragonhead, *Physostegia virginiana* — M-T
Perennial Phlox, *Phlox species and Hybrids* — M-T
Virginia spiderwort, *Tradescantia virginiana* — M

GROUP 7 After August 1

Giant Daisy, *Chrysanthemum uliginosum* — T
Orange Leichtlini Lily, *Lilium leichtlini V. Maximowiczii* — M-T
Tiger Lily, *Lilium tigrinum* — T
(Single and double)
Michaelmas Daisy, *Aster species and hybrids* — L-M-T
Ewer's Stonecrop, *Sedum ewersi* — D
Showy Stonecrop, *Sedum spectabile* — D-M
Wideleaf Sea Lavender, *Limonium latifolium* — M

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Newer Herbaceous Perennials

W. A. CUMMING

A Merit Trial Garden was set up at the Morden Research Station in 1959 in co-operation with the Ornamentals Committee of the Western Canadian Society for Horticulture. Plant breeders in the three prairie provinces and the adjoining northern plains states were afforded the privilege of having their new ornamental plant introductions evaluated in these trials. On the recommendation of the committee, and based on performance in the trials, the Western Canadian Society for Horticulture has given 'Merit Awards' to four new herbaceous ornamental introductions to date.

In 1965, Henry H. Marshall's hybrid coralbells, **Heuchera** 'Brandon Pink' shared the honors of the first two merit awards presented by the Society along with his hybrid rose 'Assiniboine'. Since then Mr. Marshall has introduced another hybrid coralbells named 'Brandon Glow'. These new **Heuchera** cultivars are discussed in an article by Mr. Marshall which appears elsewhere in this publication.

Twenty-four new lily cultivars are represented in the trials and two of these, 'Redland' and 'Orange Light' gained Merit Awards in 1971 for their originator and introducer, Mr. A. J. Porter of Parkside, Saskatchewan. It takes several years to evaluate a lily and some of the more recent additions to the merit trials have not been in long enough to assess their full value. From

among those which have, three additional Porter cultivars, 'Delicious', 'Firebright' and 'Sunbright', have performed well. The Patterson cultivar 'Honey Queen', introduced by the University of Saskatchewan, is outstanding in its color class. **Lilium** 'Stuart Criddle' bred by Stuart Criddle of Aweme, Manitoba and named and introduced by H. H. Marshall from the Brandon Research Station in 1965, is an outstanding dwarfier growing upward facing yellow lily.

One garden chrysanthemum cultivar, 'Morden Cameo', won an award in 1969 for its originator, Mr. H. F. Harp, then of the Morden Research Station, since retired. It is a high quality 'mum', fully double, white flowers with cream centres. Another Harp introduction from the Morden Research Station is 'Morden Canary', probably the hardiest border type chrysanthemum so far introduced. Its abundance of flowers are semi-double, bright yellow in color and it produces a striking display when massed in a border. Two Marshall introductions from the Brandon Research Station, 'Cindy Brandon' a semi-double bronze-red and 'Vicky Brandon' a large flowered double yellow, continue to perform well and have proven quite hardy. Generally speaking, garden chrysanthemums are very local in their adaptation and home gardeners would be wise to select cultivars which have proven themselves

in their locality.

Among other outstanding new herbaceous perennials in the Merit Trials at Morden are a group of **Monarda** or beebalm hybrids which are being bred and developed by H. H. Marshall who started his work with this genus at the Brandon Research Station and is continuing it at the Morden Research Station. The cultivars, 'Souris', with reddish-purple flowers, and 'Neepawa', with deep pink flowers, are both doing well and are available from nurserymen. **Phlox**, 'Prairie Princess', bred by John Walker and introduced from the University of Manitoba, is an excellent white flowering phlox and a welcome addition to the taller growing hardy cultivars of this genus. **Aster** 'Two Lakes', a mat forming alpine aster introduced by J. A. Wallace of Beaverlodge, Alberta, is quite showy with its half inch mauve blooms, borne on 6 to 8 inch stems over a long period. **Aster** 'Marine' is a taller growing cultivar with deep violet-mauve flowers in late September. It was bred and introduced by H. F. Harp of the Morden Research Station.

There are many other new herbaceous perennials in the Merit Trial Gardens but because they are not yet readily available from commercial sources mention of them will have to await a future progress report.

A Brief for Botany

(A rhyme distributed at the American Horticultural Congress, Seattle: Sept. 1972)

There should be no monotony

In studying your Botany,
It helps to train and spur the brain
.... Unless you haven't got any.

It teaches you, does Botany

To know the plants and spot-any,
And learn just why they live and die,
In case you plant or pot-any.

You learn from reading Botany

Of woolly plants and cottony,
That grow on earth and what they're worth,
And why some spots have not-any.

You sketch the plant in Botany,

You learn to chart and plot-any,
Like Corn or Oats. You jot down notes,
If you know how to jot-any.

Your time, if you'll allot any,

Will teach you how and what any
Old plant or tree will do or be,
And that's the use of Botany.

Author Unknown.

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Landscaping with Perennials

H. F. HARP

In borders herbaceous perennials are grown, in most instances, with hardy bulbs and sometimes annuals are included to give extra color when the perennials are in a mid-summer slump. In recent years in England, there has been a trend to feature herbaceous perennials in island plantings in parks and private gardens. Certain varieties are chosen for their long-season interest in continuous bloom or attractive foliage.

This new way of displaying perennials may well be adapted in prairie gardens to cut down on the work involved in maintaining a border of mixed perennials. In substituting herbaceous perennials for annuals in some parts of the garden, you may sacrifice color for a brief period but make up for it with something of interest from early spring until late fall when most of the annuals are killed by frost.

Peonies and bleedinghearts are being used effectively in foundation borders to give early color; the peonies give full value in a brief but brilliant splash of color and handsome foliage for the rest of the season. The bleedinghearts may look shabby once the flowers fade and there is the tendency to start growth too early, which may result in damage from a late spring frost.

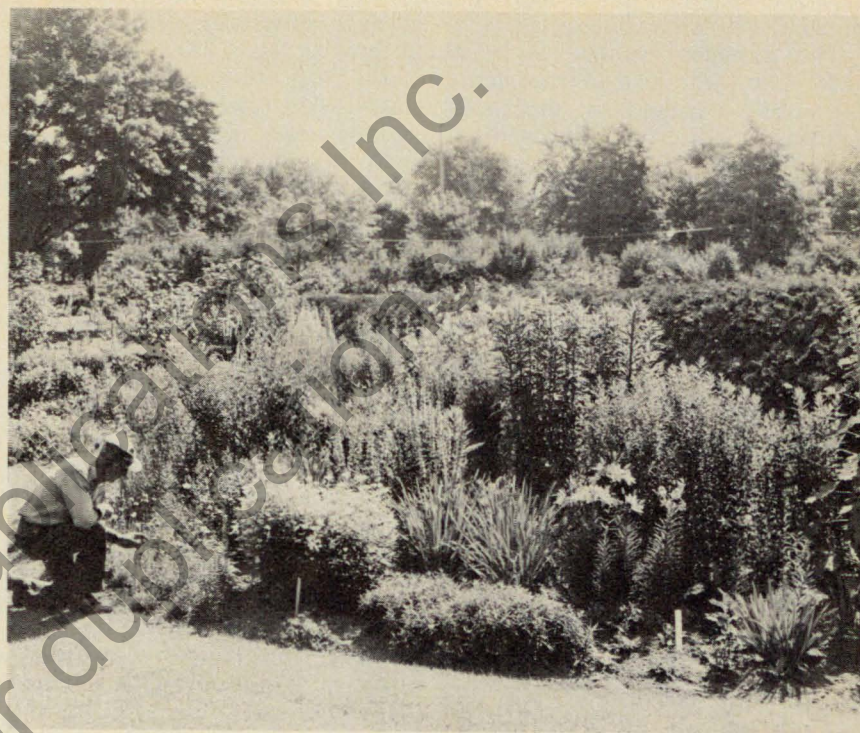
In a small garden a few well chosen herbaceous perennials can be grouped

in certain areas where they can be seen to the best advantage and maintained with less work than when they are included in a border of mixed perennials. Some are more suitable than others, as some have a brief flare-up of bloom then look shabby for the rest of the summer. On the other hand, certain kinds, not so showy in bloom, compensate with lasting attractive foliage.

I have always had a fondness for the balloon-flower (*Platycodon grandiflora*), a close relative of the *campanulas* or bellflowers. These are found growing wild in Manchuria and Korea. Several forms are available, some with purple and white flowers and one has petals veined with rosy-magenta markings. The balloon-flower has one peculiarity, unusual with Asiatic plants; it starts into growth very late in the spring. The emerging shoots can be easily cut off by careless hoeing.

The balloon-flower is a good choice for a sunny spot where the soil is freely drained. It grows a foot and a half high with good foliage and flowers with pointed petals that swell in the bud to form tiny balloons.

Delphiniums provide some of the best shades of true blue, but too often the hollow stems fail to support the heavy spikes of bloom in a summer storm. Broken stems are cut off to encourage new growth yielding secondary spikes in September. Watering and



fertilizing will help ensure this. Delphiniums are not recommended as feature plants in the landscape for the reason already mentioned and because the foliage is not attractive after the plants have finished blooming.

The veronicas or speedwells are a large and interesting race of plants which include a number of useful herbaceous perennials, some almost prostrate, others five feet tall. The woody species, once included with veronicas, are now called herbs. These are mostly broadleaved evergreens from New Zealand and much too tender for prairie gardens. The woolly speedwell (*Veronica incana*) has silver-gray leaves and spikes of blue or pink flowers on foot-high plants; a white-flowered form is inferior. The woolly

speedwell withstands the hot sun and dry soil reasonably well and may be used to make patches of gray foliage — an interesting contrast with greenery.

The Evening Primrose tribe includes a number of showy plants but not all are full hardy. One of the best is the Missouri Evening Primrose (*Oenothera missouriensis*) found wild in the central United States and westward to Nebraska. It makes a spreading plant not much more than a foot high with glossy, dark-green leaves and sturdy stems that are somewhat woody at the base. The large, pale-yellow flowers with prominent stamens are saucer-shaped and are fairly freely produced from July until late in the summer. The seedpods with their curious wide wings may be used with dried flowers

to make lovely winter bouquets.

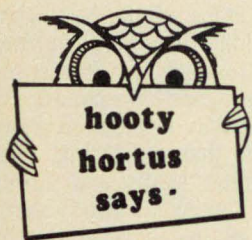
The common yarrow (*Achillea millefolium*), with its dark-green, fern-like leaves is a useful plant, though its root wanderings may be deplored by some gardeners. The dense, finely-cut foliage provides a good foil for the flat clusters of cerise-colored flowers which are borne on two-foot stems in July and, if the spent blooms are cut off promptly, for the rest of the summer. It stands all kinds of abuse in hot sun and dry soil, the mats of green leaves stay healthy and attractive until the snow comes. The sneezewort (*Achillea ptarmica*) is one of the most common plants in prairie gardens and, like the common yarrow, it wanders at the root. Two double-flowered kinds are popular, The Pearl and Boule de Neige. In the perennial border the sneezewort may be cursed for its rampant growth but this will be an asset where it is used to cover a bare or dry spot in the soil.

Perhaps most gardeners think of shrubs when spireas are mentioned, but there are a number of herbaceous perennials commonly called spirea which are actually meadowsweets with the genus established as *Filipendula*. The Dropwort meadowsweet (*Fili-*

pendula hexapetala) has neat rosettes of fern-like leaves, from the center of which arise slender stems bearing creamy-white plumes in July. The meadowsweets do well in moist soil and part shade but take kindly to full sun and drier soil. This fern-leaf meadowsweet would be well worth growing even if it never bloomed — the leaves are handsome and stay green and without blemish from pest or disease all through the summer and fall.

The European meadowsweet (*Filipendula ulmaria*) has broad leaves, lighter on the undersides, and very susceptible to attacks of spider-mites. It grows up to five feet high with billowy panicles of double or single creamy-white flowers in July. The Prairie Meadowsweet or Queen of the Prairie (*Filipendula rubra*) has large palmate leaves and plumes of pink flowers in July. It grows to five feet or taller in moist soil and half shade.

Another useful plant for featuring in odd spots around the garden is the Giant Rockfoil. Once called *Saxifraga megasea* but now known as *Bergenia*, it makes a spreading foot-high plant with large leathery leaves and dense heads of rosy-magenta flowers in May.



THE PRAIRIE GARDEN THEME in 1974 will be LANDSCAPING. You needn't however wait until next year for information on this subject. Looking at the Nine Year 1964-1972 PRAIRIE GARDEN

INDEX listings on page 1 you will note that there are 51 separate articles under PLANNING THE HOME GROUNDS. All these back issues, with the exception of the 1964 PRAIRIE GARDEN are still available. This INDEX also indicated the variety and number of other gardening subjects we have presented over the last nine years.

The common Chalk Plant (*Gypsophila paniculata*) is valued chiefly for its use in bouquets. A hybrid called Rosyveil or Rosenschleier is popular in prairie gardens where it is usually seen fronting the perennial border or in the rock garden. It makes a low, spreading plant with narrow, gray-green leaves and carmine-pink flowers from July until the end of the summer, the flowers deepening in color as the season advances and the weather gets cooler. A patch of Rosyveil *gypsophila* set out in a hot spot will need no attention except to cut off the spent blooms and give the plants a once-a-year clean-up in the spring.

The old-fashioned Daylilies in all shades of yellow give full value in long-season interest. In sun or shade the strap-shaped leaves are healthy and attractive through the summer and fall. One of the most accommodating is the Tawny Daylilie (*Hemerocallis fulva*) with four-foot stems of tawny-orange flowers in July and August. A double-flowered variety called Kwanso is available and one with variegated leaves makes a splendid specimen plant, however, it seems to have a tendency to revert to green leaves where the soil is high in nitrogen. Several Sea Hollies make good border plants. They have shiny, rigid, deeply cut leaves and bluish thistle-like flowers with spiny bracts. The Sea Holly will stand all kinds of rough usage; the thick roots can penetrate the soil deeply to sustain the plant in periods of drought. The flower heads, though rather stiff, make suitable foil for bouquets of yellow flowers.

Herbaceous perennials can be shown off to good advantage in various places around the garden where annuals and shrubs have been tried with little success. Often a search through prairie nursery-men's catalogues will turn up many suitable varieties.

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Sub No. 1, Box 58,
Moose Jaw, Sask.
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- Shellview Sod Farms
Box 94, Shellbrook, Sask.
- Giesbrecht Landscaping, 244-5095
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Increasing Your Lillies

E.A. MAGINNES

The increasing popularity of lilies on the prairies can be accounted for by the existence of:

1. hardy lilies that are adaptable to a wide range of soil and environmental conditions;
2. a wide range in flower colours;
3. a wide range in time of flowering.

Also these facts probably account for the University of Saskatchewan receiving numerous requests annually for information on the various aspects of increasing lilies. The five methods inquired about are propagation by seeds, bulbils, stem bulblets, division and scales.

SEEDS

Even though lilies do not normally come true from seed, there are some persons that enjoy the challenge of this method of propagation. Lilies can be broadly divided into two groups depending on how their seeds germinate. There are those that will start to grow rather quickly after seeding (epigeal) and those that require two to three months at 70 degrees F (room temperature) followed by two to three months at 40 degrees F (domestic refrigerator) before growth will proceed (hypogaeal). For the latter type, the seeds can be placed in plastic bags containing moistened peat moss or vermiculite for treatment and then

planted.

Because most of the lilies generally encountered on the prairie mature their seeds late in the season, and are of the type that will start to grow immediately, it is our practice to sow the seeds right after harvest and place them in a greenhouse at 70 degrees. Placing them indoors under artificial lights would also be satisfactory. This will reduce the time to flowering considerably.

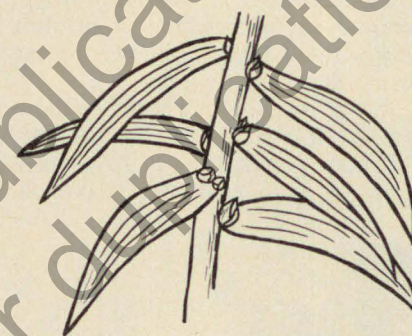
In preparation for sowing, seed pans are basically filled with a 1:1:1 mixture of soil, sand and peat moss. Next, the pans are covered with a ¼ inch layer of screened peat moss followed by sowing of the seeds and topping with a ¼-inch layer of screened peat moss. After watering the pans can be placed in plastic bags for the germination period. They should not



receive direct sunlight during this time. Seedlings started indoors should be hardened off before planting outdoors the next spring.

BULBILS

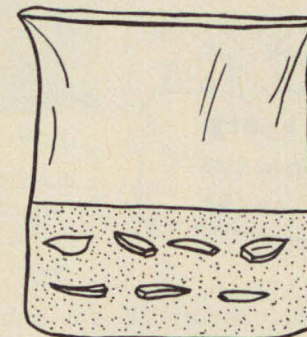
Each year many people observe small, dark, pea-like growths in the leaf axils of tiger lilies, but do not realize their significance. These growths, which are common to some but not all lilies, are known as bulbils or aerial bulbs.



If these bulbils are harvested in late summer, when fully ripe, they can be planted directly into a seedbed outdoors in a similar manner to the seeding of garden peas. This method will produce good-sized bulbs in about two years.

STEM BULBLETS

Some varieties of lilies produce numerous small bulblets on the portion of stem between the bulb and ground level. These bulblets can be harvested when a bulb is dug or by carefully removing them from the earth above a bulb without disturbing the bulb. Bulblets can be planted outdoors in beds; six inches apart within the rows, six inches between the rows and two inches deep. In at least two years they should reach a mature size.



DIVISION

Most lilies, if left in the same location for three to four years will produce sufficient bulbs in that area to cause overcrowding. The problem of overcrowding can be overcome by digging and dividing the bulbs in September. The majority of our lilies grown on the prairies can be divided by gently teasing the bulbs apart. However, types that produce bulbs as an extension of a horizontal, underground rootstock will have to be divided with a knife. Once the bulbs have been dug and divided they can be replanted immediately or stored in a cool location for a brief period prior to planting.

SCALES

Because lily bulbs are made up of numerous overlapping scales in concentric layers, they are rather well adapted to mass duplication by scaling. This method of reproduction involves snapping off individual scales at their point of attachment to the basal plate. (It is the basal plate portion of a bulb that serves to hold the scales together).

Although the scales can be handled in various ways, our preferred method is to dust the scales in a fungicide immediately after removal and place them in layers in a plastic bag contain-

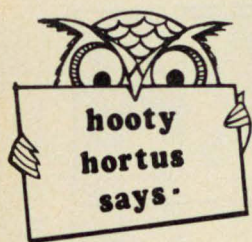
ing dampened peat moss. Dampened peat moss can be described as peat moss which has had as much water as possible added to it, but yet no free water can be squeezed from it. When the scales are bagged the tops are sealed and the bags placed in a storage room at about 80 degrees F.

If this process is carried out in mid to late September the scales will produce well developed bulblets with roots by January 1st. At this time we remove the well developed bulblets and store them at 40 degrees F until planting time next spring. The scales are rebagged and returned to storage so that another set of bulblets can be produced. When planting time arrives the well developed bulblets are removed once again. Then the bulblets and scales are planted outdoors in beds;

six inches apart within the rows, six inches between the rows and two inches deep. Normally, at least two years are required before flowering commences.

Scaling need not be only carried out at digging time. When flowering has ceased, actively growing bulbs may have the soil carefully excavated from about them, without disturbing the basal roots and remove a few good firm scales. The scales are then handled in a manner similar to that described above. Also, bulbs large enough to flower can have a few firm scales removed for propagation at planting time without hindering flowering the next season.

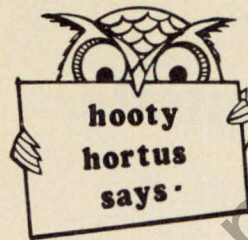
If any, or all, of the above methods of propagation have created a challenge, it is hoped that you will have many hours of enjoyment and relaxation.



not just a house.

This tree doesn't exactly frame this house.

Landscaping is like painting a picture with the lawn providing the canvas, the trees the frame, the shrubs relieving the sharp lines and the flowers adding a dash of color. The results, pride of ownership in a home,



Your second year Poinsettia — did the upper bracts stay green? Here is the secret. To activate the plant chemistry that changes the upper bracts or leaves from green to the color you had in the beginning the poinsettia must have approximately 16 hours of complete darkness — the kind it would have if you shut the plant in a cupboard from 4 p.m. to 8 p.m. every evening for six weeks or until the bracts start to turn color. This is because the plant is so sensitive to light that even low intensities such as street lights, the lights of passing cars or the turning on of a room light for a few moments in the evening can delay or prevent coloring up. Without these short days and uninterrupted long nights your plant will stay its normal green. How about putting a hood or cloth over your plant for the required 16 hours of darkness?

Should you wish to keep your present Poinsettia, wait until the bracts lose color and start to drop off. Now place your plant in a cool place, 50 degrees if possible, and gradually allow it to dry off, but not so dry that the stems shrivel. Let the plant rest for about six weeks then repot and bring into life again with warmth and moisture. New shoots will soon appear. Keep in a sunny window or out in the garden for the summer. Bring in before the nights get cool and start your short day and long night treatment.



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From Seed and by Plant Division

Propagation of Perennials

LARRY GANS

The two methods by which perennials may be obtained are: (a) by seed; (b) by plant division.

For most horticulturists or new home owners method (a) would be recommended for economy, interest, and a personal challenge. After all, is not most of the fun and pleasure, in the growing?

Propagation by plant division may be considered after your seeded plants have been in the garden for a few years. Or, if you choose to establish a perennial border immediately, then purchase field grown nursery stock.

The greatest advantage of seeding your own perennials is that you may choose the exact variety, size, and color that may be required for the specific setting or location.

Before we go into the culture of growing; let us examine what a "perennial" really is. A perennial is a living organism (a hardy plant) which with proper conditions of light, water and food will bloom and live for a number of years. Once established it will provide colorful stately blossoms and will require much less care than annuals. If started early enough perennials can bloom the first year and in the second season follow a normal growth pattern.

Since perennials in their seedling stage do not transplant easily, the container chosen for germination should be one that will allow handling

with a minimum of disturbance to the root system. Small 1½" - 2" peat pots are excellent. One step seed starters containing a sowing medium encased in a plastic netting are good also. When set in water these starters will expand to seven times their size. There are also 1½" cubicle plastic trays in moulds of 12 to 24 or 48 sections that serve well.

For the horticulturist who chooses to grow his own seedlings, perennials or annuals, the use of Milled Spagnum Moss; Sure Fire Gro Mix; or Peat Lite Mix will greatly reduce the problem of "damping off disease". This plant medium is light, sterile and will allow you to grow the most difficult plants. It reduces the need for constant watching and will promote ideal growth.

Like all other things, sowing seed takes a little planning. There are three stages of temperature for good germination — i.e. warm 65°-75°F; cool 45°-55°F; or freezing. To begin sort your seeds in these groups. You will then know which ones can be sown together. Reference as to correct temperatures are 65°-75°, a sunny window, hot bed, danger of frost is past, summer, when weather is warm; 45°-55° — early spring when soil is cool or early fall. Freezing-plant in earliest spring or late fall.

The seed itself is once again segregated into 3 classes — e.g. 1. Tiny (*heuchera*) 2. Small (*delphinium*) 3.

Large (*lupines*). Tiny seed requires no covering at all, for small or large seed the general rule is twice their thickness.

In using the plant medium previously mentioned, once it has been pre-soaked, use approximately ½ cups of water to 4 cups of material; no further water may be required. If so, a fine spray of room temperature water may be added. It is very important that during the germination stage the seeds are never allowed to dry out.

Light and temperature is a factor for good growth of your seedlings. If a window sill is chosen cold night draughts must be avoided. Fluorescent light provides a good atmosphere because the length of time the light is on can be controlled. My experience with this type of growing has been greatly improved since the introduction of fresh air and a fan was used to keep the air circulating.

As seedlings continue to grow the transfer to a cold frame will help them greatly to overcome the sudden shock of being introduced directly outdoors. By all means a greenhouse under full sunlight is ideal.

If one does not have the space or facilities to start seedlings of perennials indoors, success can be obtained by carefully labeling small plots or locations directly in the garden. These plants can then be relocated the following season.

To propagate perennials by plant division a clean sharp spade is required.

The time of year may vary for specific plants; depending on purpose of the change — i.e. for sub-dividing an established bed early fall is fine. In planting a new border or transplanting I prefer early spring as damage through winter is eliminated and the plants have a full season to grow.

When removing a plant for dividing from the soil one should first circle the entire plant with a straight depression of the spade, gently pressing the soil towards the plant. Secondly follow the same circle but at a lower level and at a definite angle, this should allow the plant to come out in a ball of soil.

A smaller hand trowel or sharp tool can then be used to separate your plant into smaller sections. This practice of division is recommended at least every three or four years in order to maintain healthier more vigorous growing stock. It will also enable you to replenish the soil with some of the nutrients the plant may require at its lower root system.

The division and transplanting of perennials as any other plants should be done quickly so none of the fine feeding roots are allowed to dry.

Now that we know a little more about starting perennials from seed and have some guidance how to subdivide mature plants, why not make a point of starting some of your favorite perennials now.

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Coral Bells

H. H. MARSHALL

The genus *Heuchera* consists of about 50 species of North American herbaceous perennials. The rhizomes and roots have a high tannin content, giving the common name Alum Root to several species. The calyx, which is the most conspicuous part of the flower in *Heuchera*, is usually green or yellowish but it may contain a red pigment superimposed on green or without green. *H. sanguinea*, Coral Bells, found from Arizona to Mexico varies from pink to red. *Heuchera* foliage is frequently evergreen, resembling a geranium leaf in outline and texture.

The original Coral Bells from the southwestern states is not hardy on the prairies. It can be crossed with several related species including *H. richardsonii*, the native Alum Root. This species is common on dry prairies throughout Western Canada.

The first hybrid, 'Brandon Pink', is a vigorous, near evergreen plant that grows particularly well in a sunny, well drained spot. It will survive severe drought but blooms better when moderately moist. The 2-foot wiry, leafless flower stalks resist wind damage very well. A large plant may carry 50 or more stalks each with a close panicle of small, bellshaped pink flowers. It is particularly good for mixing with large flowers, both in a border and in arrangements.

Brandon Glow' was a later selection

which has a deeper pink color and a more open panicle of wider bellshaped flowers. It is a little shorter than 'Brandon Pink'. The intense red of certain strains of *H. sanguinea* is difficult to obtain in combination with hardiness and vigor. R.J. Simonet and I are still looking for a real good red. The Bressingham hybrids are hardier than the original but less hardy than 'Brandon Pink'.

Coral Bells can be increased easily by at least two methods. The easiest for a home gardener is to divide an old plant. Pieces of rhizome as large as your little finger, with a few leaves, will grow if planted in late August. Larger pieces often have roots and may be planted in fall or early spring. With moderate moisture almost every piece will grow.

If you have facilities for starting cuttings in early summer, each of these finger size pieces can be further subdivided. Each leaf can be cut with a small slice of rhizome attached and will produce roots quickly in a mist frame. Of course, they are small and take a little longer but a very large increase can be obtained.

Coral Bells grow slowly but they should flower in their second year, grow larger and more showy for five years and continue to bloom for ten years. Aphids and hollyhock rust sometimes need to be controlled. In a sunny, well drained spot *Heuchera*, or



HEUCHERA DIVISIONS

Coral Bells, can be a very attractive companion for Iris, Aquilegia or Penstemon.

Large divisions transplant easily, while smaller divisions or single leaf cuttings may be used when a large increase is required.

*When the green woods laugh with the voice of joy,
And the dimpling stream runs laughing by.*—WILLIAM BLAKE.

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Iris in Prairie Gardens

WAYNE BROOKS

Iris have appeared in myth, legend, and religion since the dawn of recorded history. In Crete, the Iris was the flower of prince and priest. In Greece the Iris was a personification of the goddess Iris. The Mohammedans carried the white Iris albicans everywhere. According to one authority, many of the lilies of biblican times may even be Iris. During the early 1800's, the growing of Iris was popular in France and by 1860 Iris were common in England. The growing of Irises was not popular in North America until the late 1800's. Irises were a fairly common flower in early gardens of the West. *Iris pumila* can still be found on abandoned homesteads;

Irises are among the earliest flowers to bloom in spring and should give up to a month of bloom when several kinds are used. By following a few simple cultural practices, the growing of Iris is almost certainly to be a success.

PLANTING:

The generally accepted time to transplant Iris is in early August. This ensures that the plants are well established before winter sets in. In general, Iris are divided into two major groups; those with rhizomes, and those with bulbs. For our gardens, those with rhizomes are most important. When clumps of plants become

too large or show lack of vigor they are lifted, washed and cut into sections as in diagram I. The individual rhizome pieces are planted so as the top is even with the soil surface as in diagram II. Care should be taken not to plant too deeply.

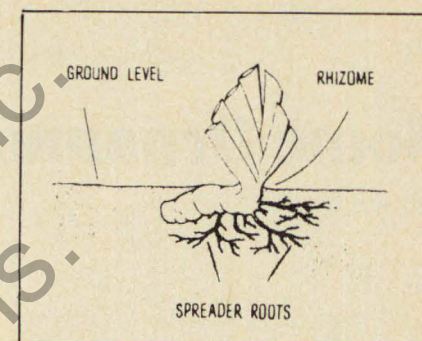
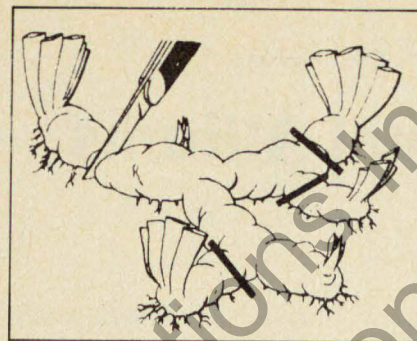
SOIL AND LOCATION:

Any good garden soil which is well drained is suitable for Iris. Plenty of sunshine is preferred by most Iris. Although some Iris thrive in moist locations, the most common group, the bearded Iris are subject to root rot if the soil is not drained properly. Organic matter such as compost, well rotted manure or peat moss will improve most heavy soils. A complete fertilizer such as 10-30-10 (low in nitrogen) may be incorporated in the bed at the rate of 1 pound to 80-100 square foot prior to planting. If the planting area can be prepared 4-8 weeks ahead of planting, the area will settle properly. Iris can be used in the perennial border as background plants, in rock gardens, as well as by brooks and streams.

SPACING:

In group plantings, Iris should be planted at least 10 inches apart. When planting in rows, the plants are best spaced about two feet apart.

IRIS SPECIES AND VARIETIES:



As a rule, *Iris germanica*, *Iris siberica* and *Iris pumila* are the most common Iris. Following is a list of Iris species by variety, color and height. A list of not so common Iris is included for those who want to try something different. The list of varieties is only partial as there are hundreds available.

Iris germanica (Bearded Iris). Height 12 - 24 inches.

Pinks: Cloud Cap, Dawn Reflection, Pretty Carol, Wine and Roses.

Reds: Pacemaker, Maytime, Solid Mahogany, Fireball, Fire Magic, Jungle Fires.

Yellows: Solid Gold, Ola Kala, Prairie Sunset.

Blues: South Pacific, Harbour Blue, Blue Rhythm, Blue Sapphire, Blue Shimmer.

Whites: Cliffs of Dover, Arctic Fury, Autumn Snowdrift.

Iris siberica (Siberian Iris). Height 24 - 40 inches.

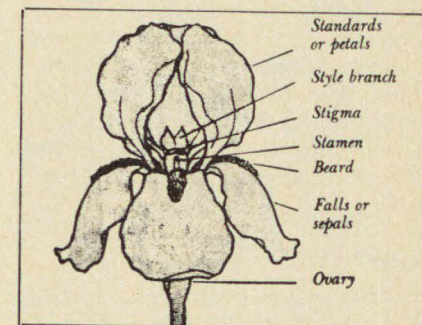
Mostly blue and purple in color. Caesar's Brother, Galineau, Skeena, Cool Spring, Placid Waters, China Blue, and Blue Moon.

Iris pumila (Dwarf Iris). Height 8 - 12 inches.

Diagram I: (Left) shows typical Iris rhizomes being cut to produce individual pieces.

Diagram II: (Right) shows a single rhizome piece after planting.

Iris flower parts.



Available as mainly blues and purples.

Already, Atomic Blue, Black Baby, Blue Frost and Blue Whiskers.

Other Iris:

Iris flarussima - Goldbeard Iris

Iris graminea - Grass Iris

Iris pseudacorus - Yellow flag Iris*

Iris ruthenica - Pilgrim Iris

Iris spuria - Seashore Iris

Iris versicolor - Blue Flag Iris

Iris virginica - Virginia Iris*

* Good for moist locations.

Some Ornamental Alliums

ROGER H. VICK

Of more than 500 known species of Allium, a handful have won the praise of gardeners and gourmets the world over ... onion, garlic, chives, leek, and shallot. Perhaps of these 'domestics' of the kitchen garden, those species that are worthy from an ornamental standpoint are frequently overlooked. Could it be the family odor that holds them back? For a squeeze will reveal their background at once! Unmolested however, the Allium (like the skunk) is perfectly innocuous, and makes a reliable, colorful and interesting addition to the sunny herbaceous border or rock garden.

HARDINESS:

In testing some of the members of this group at the Botanic Garden of The University of Alberta, one of the first advantages noticed was their overall hardiness, as a large majority of the species so far tried have come through our Prairie winters in perfect condition. Wet and heavy soils are more likely to cause loss than our low winter temperatures. Safe in the dormancy of their bulbs, they are best left in the ground, and should not be raised and stored as one would the Gladiolus.

Some possible exceptions to this hardiness trait are *A. giganteum** *A. neapolitanum**, plus a few exotic

species that are not offered in the trade.

AGGRESSIVENESS:

Hardy yes, but aggressive? Not often. They are not plants to reach out invasive roots to usurp the territory of any modest neighbor, but only gradually increase the size and number of their bulbs within their allotted space.

The chief method of maintaining the world Allium population is achieved by most species through an abundance of seed, so the wise gardener takes the precaution of removing the seed heads before they ripen. Certain other species, such as *A. vineale* produce small bulbs (bulbils) either with, or instead of the flowers. If such a species is grown it should be watched lest it become weedy, although to date no Allium has escaped from our trial plots.

PROPAGATION:

Seed is usually viable and germinates readily, but for fast results, or to propagate superior selection, simply divide the parent plant.

The 'tufted' type such as chives which lack well defined bulbs can be dug up and pulled or cut apart. The bulbous types can be lifted when the tops show signs of withering, and should be separated and re-planted

immediately.

The season for dividing or transplanting Alliums is not critical, but of course the disturbance of any plant just before or during flowering is an un-necessary set-back.

FLOWERING:

The season of bloom depends upon the species, and to some extent upon weather conditions and location. A variety of species provide color from early June to late September.

Individual flowers are small but are normally produced in dense drooping clusters, or in tight globular heads.

The flower colors range from white, pink, violet, blue, to purple, plus pale green and bright yellow.

FORM:

Common chives illustrates the typical form of the plant, with its upright round hollow foliage, and the flower head produced on an essentially leaf free stem: but some have flat leaves, or insignificant foliage that soon withers, some are clump or solitary stemmed rather than tufted, and the mature height of those tested ranges from about 6" to 36".

SITUATION:

All species tried so far thrive best in a well drained sunny aspect, but there will be one or two exceptions. Bearing this in mind, their place in the garden will be chosen to show off either flower, stem, or foliage. While flower is the strong point of some, most contribute more to the landscape design with their upright stature and unique appearance, providing contrast in an area that may otherwise tend toward monotony.

SELECTION:

My choice for a rock garden situation would be *A. narcissiflorum** (about 6" tall: flowers nodding deep-pink: flowering in July); *A. cyathophorum* variety *farreri* (usually about 12": deep-purple: July); *A. cyaneum** (10", purple: early August); *A. karataviense** is frequently offered in the Canadian trade, as it's broad low foliage and balls of colorless flowers 3" across has created a demand as an unusual rock garden subject. Plant this one in compact groups for best effect.

Two of the most showy Alliums in flower are *A. pulchellum* (24": purple: July, August or September) and *A. flavum* (12": yellow, July, August or September). These last two are closely related, have a similar cascading flower form, and complement each other well.

Two other distinctive species that have deep-purple flowers but poor foliage, are *A. sphaerocephalum* (18" to 26": Very dark purple; August); and *A. rotundum* (18": royal-purple: July) similar, but with larger (2") heads of rather lax flowers.

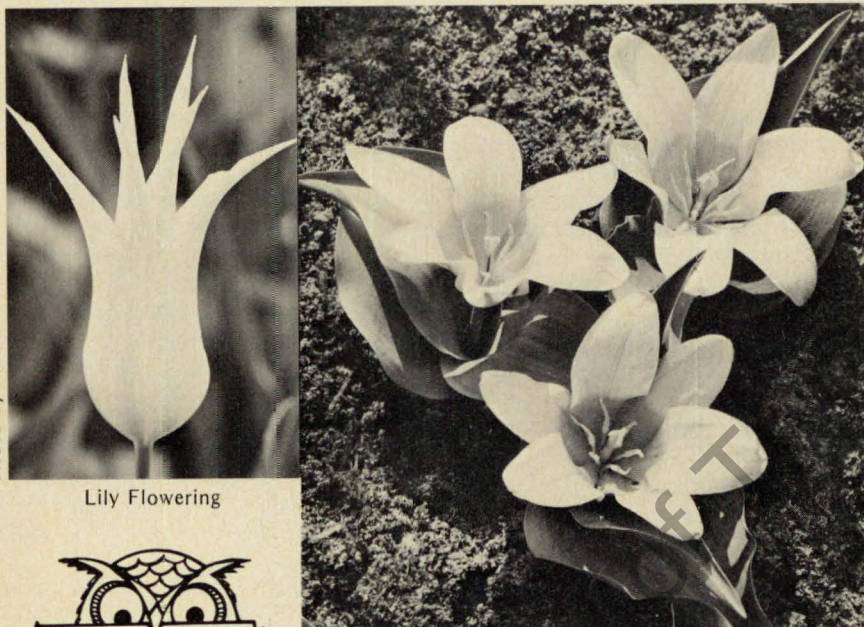
For height, and accent-plant interest try *A. fistulosum* the "Welsh Onion" (at last, one with a common name!) with a stout inflated stem topped by a ludicrously small flower head; this species is very similar to *A. altaicum*, (24" to 32": green-white: July-August). Another similar plant is *A. pskemense* (26": white: July) that develops a curious swelling half way up the hollow stem.

For a tall one with pale flowers plant *A. ramosum* (to 35": white/violet: July) or the almost identical *A. tuberosum* "Chinese Chives" which flowers a month later.

For growers of our native plants, three Alliums indigenous to Alberta would also be of interest, *A. cernuum* the "Nodding Wild Onion" (18" to 24": red-purple: June); *A. textile* the

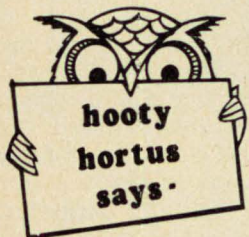
"Prairie Onion" (12": white: June); and *A. schoenoprasum* variety *sibiricum* "Wild Chives" or "Giant Chives" (18": purple: June).

For extra vigor, where most plants



Lily Flowering

Species



With your regular plantings of tulips next fall why not include a few clumps of the "newer" tulips such as the Species or "botanical" tulips. They are the first to bloom and make a spectacular entrance with their gaily colored blossoms on short stems. There are also the Early Doubles with flowers the size of a fully-open large garden rose, and the late Double or Peony-Flowered. One of the most striking is the LILY-flowered which blossoms in May. They are long lasting with a wide choice of bright colors.

Season of mists and mellow fruitfulness,

Close bosom friend of the maturing sun;

Conspiring with him how to load and bless

With fruit the vines that round the thatch-eaves run.—KEATS

have a hard time to survive, don't overlook the ornamental value of the Common Chives, of which there is a white-flowered form. And in the same category the ubiquitous *A. senescens*, not often described in popular garden literature, but, perhaps due to its wealth of viable seed, turning up frequently under a number of aliases. About 24" tall, with round heads of violet flowers (sometimes over 2" in diameter) held just above flattened and slightly twisted leaves, it produces variable forms from seed, and only the better ones should be retained.

AVAILABILITY:

Whenever new or uncommon plants are discussed the question of availability always arises. Our collection has been acquired through several sources available to the individual gardener, and the addresses of these are listed below*:

C.A. Cruickshank Ltd., 1015 Mt. Pleasant Rd., Toronto 12, Ont. (bulbs)

Jack Drake, Aviemore, Inverness-shire, Scotland. (seed)

The Royal Horticultural Society, Vincent Sq. London SW1, England. (seed through membership)

Skinner's Nursery Ltd., Roblin, Manitoba. (bulbs)

Thompson & Morgan Ltd., London Rd., Ipswich, Suffolk, England. (seed)

The three Alliums offered by Skinner's Nursery in their 1972 catalogue have not yet been conclusively tested here, but should be well worthwhile growing. They are *A. azureum** (blue), *A. ostrowskianum** (wine), and *A. zebdanense** (white).

The Botanic Garden also exchanges seed with like institutions, a channel unfortunately not accessible to the individual. We are, however, able to offer seed to Members of the Botanic Garden so that these rare plants can find their way into Canadian gardens.

TO THE PLANT SPECIALIST.

The Alliums mentioned above are just a few of those successfully grown here under Prairie conditions. You may be tempted in this age of specialization, to attempt a collection of as many species as possible within this genus, and in so doing, advance our knowledge in this particular field. Much work remains to be done. Approximately 70 named species of varieties are presently being grown in our trials, but there may be up to ten times that number in existence.

It is therefore most likely that many of those not yet tried will eventually find a welcome place in our Prairie gardens.

* Species marked thus are offered in the trade as BULBS, (others as seed only).

* Please note that a listing does not necessarily imply a recommendation.

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Wintering Perennials

C. W. CARLBERG

Many perennials are fully hardy and need no protection to survive for many seasons. Some of the hardiest kinds are babysbreath, columbine, daylily, delphinium, goldenglow, iris, peony and oriental poppy. Bleeding-heart, blanketflower, chrysanthemum, coralbell, gasplant, globeflower, pentstemon and phlox are kinds which often benefit from some form of winter protection. Also those kinds which must maintain green foliage over winter should be protected; examples are sweet william and candytuft. Most perennials will benefit greatly if protected the first winter after planting.

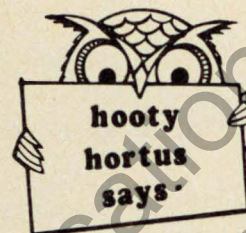
Alternate freezing and thawing and the effect of drying winter winds are important factors in the winter survival of perennial plants and, therefore, anything done to prevent winter thaws and drying out of the plant will be beneficial. Many gardens are allowed to become very dry in late summer and fall. Although a soggy wet soil is not desirable, adequate moisture should be available for the benefit of late blooming sorts and for the winter comfort of all perennials.

A foot or two of snow is the ideal mulch but cannot be depended on to arrive early and remain throughout the winter and early spring. A covering of evergreen branches, other brush or flax straw is useful to hold snow and prevent winter thawing. Where none of these are available, coarse, dry peat

moss, the grade used as chicken litter, may be used if some method can be devised to keep it from blowing away. Leaving dead stems standing will help hold snow and keep the soil from melting too soon, but this is not advised for kinds such as peonies, which carry disease over in stems and leaves. Mulches of fallen leaves and grass clippings are to be avoided because they become compacted and may smother the plants. Protection should be applied after the ground freezes; if applied too soon, soft growth may develop in the warmth of the protection and mice may quickly move into the sheltered accommodation. When to remove the mulch in the spring is more difficult to suggest. Very early removal often results in rapid growth followed by a damaging hard frost. Best advice is to watch so that no amount of soft, spindly growth is allowed to develop under a heavy mulch. If practical, a gradual removal according to season and kind of plant is best.

Perennial plants which have survived the coldest winter sometimes fail to make it through spring. Standing water from melting snow will damage most kinds. Hot, dry weather in May may harm shallow rooted plants when we least suspect that drought is a problem. Hardy chrysanthemums in particular need special care in spring because the centre of the plant often dies leaving only side shoots with very little root

system to carry on. Best results are had by lifting, dividing and replanting the mums, but, failing this, it is helpful to rake a little soil about the plant but not cover the crown and provide ample moisture.



Let it snow, let it snow — we often read about the need of a snow coverage in protecting our garden plants over winter. But did you know that under a six inch snow blanket the soil below remains relatively static at just below the freezing mark?

I have a government bulletin that makes this statement. It explains this as follows, and I quote in part — “What is snow but a loose emulsion of lots of air and a little bit of ice? The air confined as it is between the snow crystals provides a highly efficient insulation over the ground”. But beware, and I quote further — “The insulating quality of snow cover goes down as its density goes up. A high density is simply an emulsion of more ice and less air. Severe compression destroys it”.

Let me now make my own observations. It isn't necessarily the 30 below zero weather in mid-winter that is the hardest on our plants. The real villains are the thaw and freeze conditions which start in March when the snow starts to melt, compact, and in a few short weeks disappears. These are the conditions that make it highly advisable to cover at least our more tender plants in the autumn with soil, leaves or other protective material and not depend entirely on snow coverage for winter protection.



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Perennial Flower Arrangements

MRS. JEAN LYONS

The ideal perennial flower arrangement is, in my opinion, a large mass Victorian or basket arrangement filled to abundance with beautiful old fashioned perennial flowers.

With today's smaller gardens we often have to rely on modern line arrangements, using fewer flowers. We must also be a little more selective when it comes to choosing the types of perennials we wish to grow.

Having just moved onto a city lot with a much smaller garden than our original one and a half acres, it was difficult to decide which perennials to grow. I finally settled on delphiniums, shasta daisy, pyrethrum daisy, gypsophila, statice, Oriental poppy, Iceland poppy, veronica, aquilegia, forget-me-not, powder puff hollyhocks and sweet William (biennial). These are among my favourite perennials, both as garden flowers and for arranging.

These perennials were started from seed outside during June and early July. They were then given a liberal watering with a fine spray and, the seed bed was covered with green plastic sheeting. This was left in place for six to eight days, until germination was completed. The plastic was then removed and the bed covered with old bamboo window shades to protect the young plants from direct sunlight. The soil was kept moist at all times during this period and the shades were

removed only after the plants were well established.

The seedlings were transplanted directly into the garden when they were in their fourth set of leaves and large enough to handle. Germination was excellent, exceeding by far anything I had previously attempted when we had ample space to grow them! If anyone has any ideas about where to grow two hundred or so Oriental poppy plants on a sixty by sixty foot back garden, please let me know!

To the perennials started from seed, we added a few others, which I consider essential in the flower arranger's garden, lilies, lythrum, peonies, bleeding heart, phlox and chrysanthemums.

One of the most striking perennials for line arrangements is the Oriental poppy which should last several days if cut when just coming into bloom and properly conditioned. Singe the stems and plunge them into cool water for several hours, singe stems again when they are recut to required length for arrangement. Use with exotic foliage such as peony leaves (submerge in water overnight). Bergenia or geranium leaves are also very effective. Remember to condition all foliage as well as flowers for several hours before arranging them.

Other suggestions for perennial combinations in arrangements are peonies used with clustered bellflower or veronica using their own foliage,

delphiniums with shasta daisies or clematis as a focal point; iris, lupins and lilies of every variety; again using their rich exotic foliages. Remember to fill all hollow stemmed flowers, such as delphiniums and lupins, with water. This can be done with an eye-dropper. Try using local weeds and grasses for accent in line arrangements. Bulrushes, both green and ripe, are excellent. If you have space in your garden, grow some of the ornamental grasses such as ribbon, quaking, Job's tears, hare's tail, etc.

A very dainty arrangement can be achieved by using a combination of bleeding heart and lily of the valley, use finer foliage for these and other dainty flowers. Pyrethrum daisies, both single and double, are a 'must' in any flower arranger's garden. They are suitable in either line or mass arrangements and are long lasting. They are particularly attractive in dining table arrangements, and are almost a 'must' for mass arrangements, as are daisies of every variety.

While we are unable to grow foxglove as a perennial on the prairies, the new variety, foxy, will produce flowers the first year. Sweet William a biennial and will often survive over winter, or will usually produce seedlings. They are long lasting and again equally effective used in line or mass arrangements.

If you are fortunate enough to have a large garden, there are many other varieties you can grow which are suitable for all types of arrangements. Those listed below are some that I have grown successfully on the prairies.

Perennial aster	Gaillardia
Aquilegia	Goldenrod
Achillea	Gypsophila
Allium	Iris
Anemone	Iceland poppy

Astilbe	Lupin
Bergenia	Larkspur
Canterbury bell	Lythrum
Centaurea	Lychnis
Cheiranthus	Lilies
Clematis	Mertensia
Coral bells	Nepeta
Chrysanthemum	Oriental poppy
Daisy shasta	Physostegia
Daisy pyrethrum	Peony
Daisy erigeron	Phlox
Dianthus	Ranunculus
Delphiniums	Statice
Forget-me-not	Salvia
	Trollius
	Veronica

Rock Garden Varieties are most useful in miniature arrangements, sedium of all varieties, campanula, dianthus (deltoides), creeping phlox such as temiscaming, gypsophila epens, prostrate veronica and lychnis viscaria can be used.

Most of my experience in growing perennials on the prairies has been in Manitoba. We are now living in Edmonton, and I was amazed and gratified to see additional types of perennials thriving. Primulas, which are not considered hardy in Manitoba, are grown extensively in rock gardens here. This suggests that growing conditions across the prairies vary sufficiently to warrant continued experimenting with varieties not common in our own particular area.

To any of you visiting Edmonton I would suggest you include a tour of the eighty acre University of Alberta Botanic Gardens situated near Devon. These gardens are open to the public every Saturday, May through September, as well as the first Sunday of each month.

In closing, may I wish everyone the continued satisfaction and pleasure derived from growing and arranging your perennials.

Insects

A. M. HARPER

Insects were present on the earth 250 million years ago but man has been on earth for only about one and a half million years. Insects are found in a greater variety of places and surroundings than any other class of animals in the world.

Insects affect our lives more than most of us realize. Nearly all our food and most of our clothing comes from plants and animals, and practically no plants or animals are completely free of insects.

Insects are air-breathing animals. Each has a body composed of various segments joined together, and has a distinct head, thorax, and abdomen. Each adult has one pair of antennae, three pairs of legs, and usually one or two pair of wings.

It is important that scientists, farmers, and gardeners know as much as possible about insects so that they can control the harmful ones, permit the beneficial ones to increase, and predict what insect problems may arise if horticultural practices are modified or pesticides are used.

NUMBER

About three-quarters of a million species of insects are now known and every year more are discovered. It is estimated that there may be as many as two million kinds of insects in the world.

In the struggle for existence the

insects are the most successful terrestrial animals. They outnumber in species and individuals all other animals together.

About 200 million insects and mites may live in one acre of rich pasture soil.

A single pair of house flies starting in April theoretically can produce enough flies by August to cover the earth to a depth of 47 feet.

In western Canada there are many thousands of species of insects but surprisingly few are serious pests.

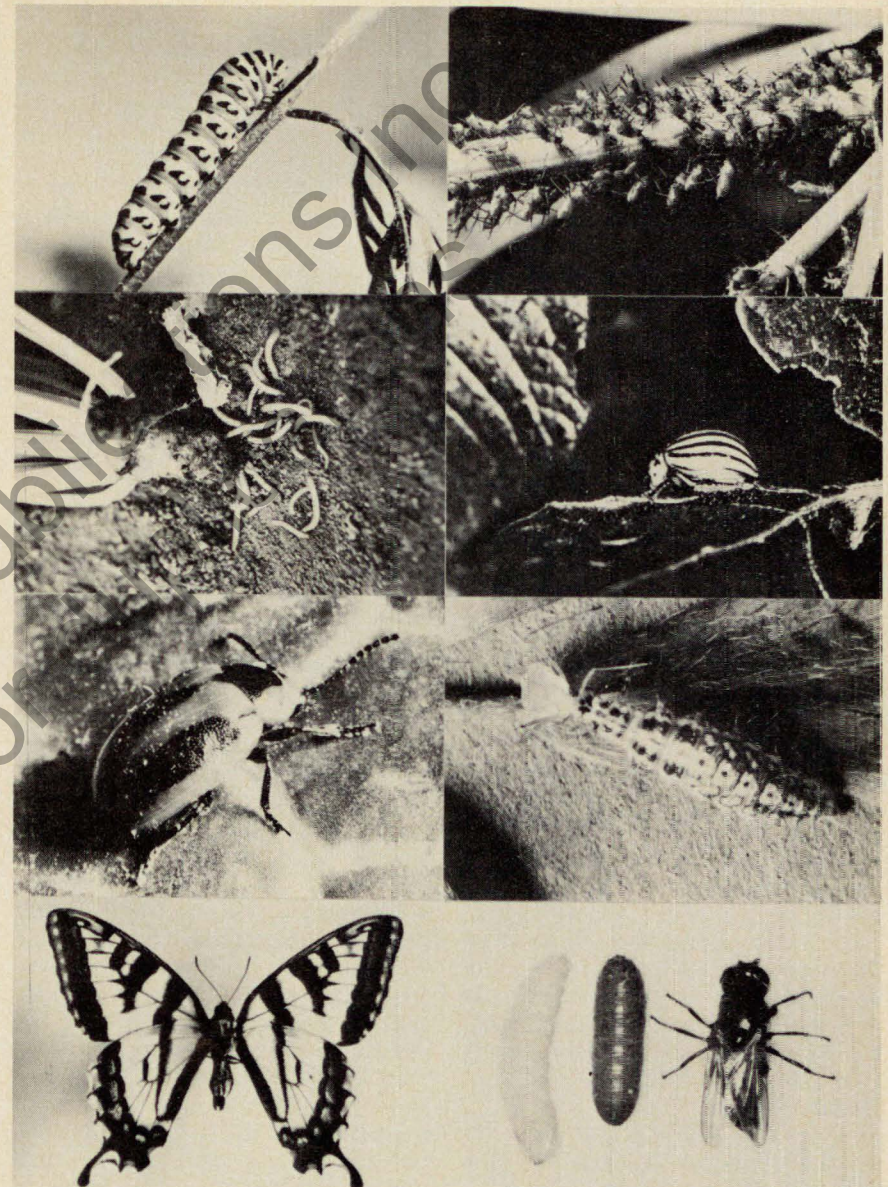
SIZE

Insects vary greatly in size. Some of the parasites of aphids or insect eggs are less than 1/16 of an inch in length. In Venezuela there is a beetle that attains the length of 6 inches and a grasshopper that measures 6½ inches long. Some moths of the genus *Attacus* have a wing span of 9½ to 10 inches and a Brazilian moth has a wing span of 11 inches.

DAMAGE BY INSECTS

Insects take a heavy toll of crops, livestock, stored foods, and clothing. The most obvious losses are those caused by feeding of insects, but animal and plant diseases transmitted by insects may cause an even greater loss.

Yellow fever and malaria, which are transmitted by insects, have caused



Zebra caterpillar
Wireworms
Turnip beetle
Swallow tail

Golden glow aphid
Colorado potato beetle
Aphid lion
Beet root maggot

millions of deaths and tremendous suffering. The control of the insect vectors with DDT and other insecticides has resulted in rapid increases in human population and the consequent need for increased food production.

More trees are lost to insects each year than are lost by forest fires.

In the Canadian Prairies we have stored grain damaged by the rusty grain beetle, rape by the Bertha armyworm; garden crops by cutworms, wireworms, grasshoppers, flea beetles, and aphids; animals are affected by warble flies, horn flies, black flies, and blow flies; and man is annoyed by mosquitoes and ants, and occasionally disabled by the mosquito-born disease, *equine encephalitis* or by severe allergy reactions from bee or wasp venom.

BENEFITS FROM INSECTS

When the economic importance of insects is being considered the benefits to man are frequently overlooked.

Such beneficial insects as lady bird beetles, syrphid flies, lace wings, and *hymenopterous* parasites that attack injurious species are an extremely important group.

Other valuable insects are those that pollinate flowers while visiting them for nectar and pollen. Plants such as alfalfa, clovers, melons, and most of the common fruits require insect visits before seeds or fruits can be formed.

Still other insects are responsible for a number of commercial products such as silk, honey, beeswax, and shellac.

The carrion beetles and some fly larvae break down organic wastes such as dead leaves and manure.

Birds, fish, and other animals feed on insects on land or in the water.

In some parts of Australia, Africa, and Asia, grasshoppers and caterpillars

are eaten by the natives.

Many people find pleasure in observing insects as part of the intensely interesting world of nature; others enjoy collecting them for scientific study or as a hobby.

Some kinds of insects are used as test animals in genetics, physiology, tumor growth, pollution monitoring, aging, and space research.

Man seeks knowledge about insects and searches for facts about them to discover basic patterns of their lives that may lead to a better understanding of life in general.

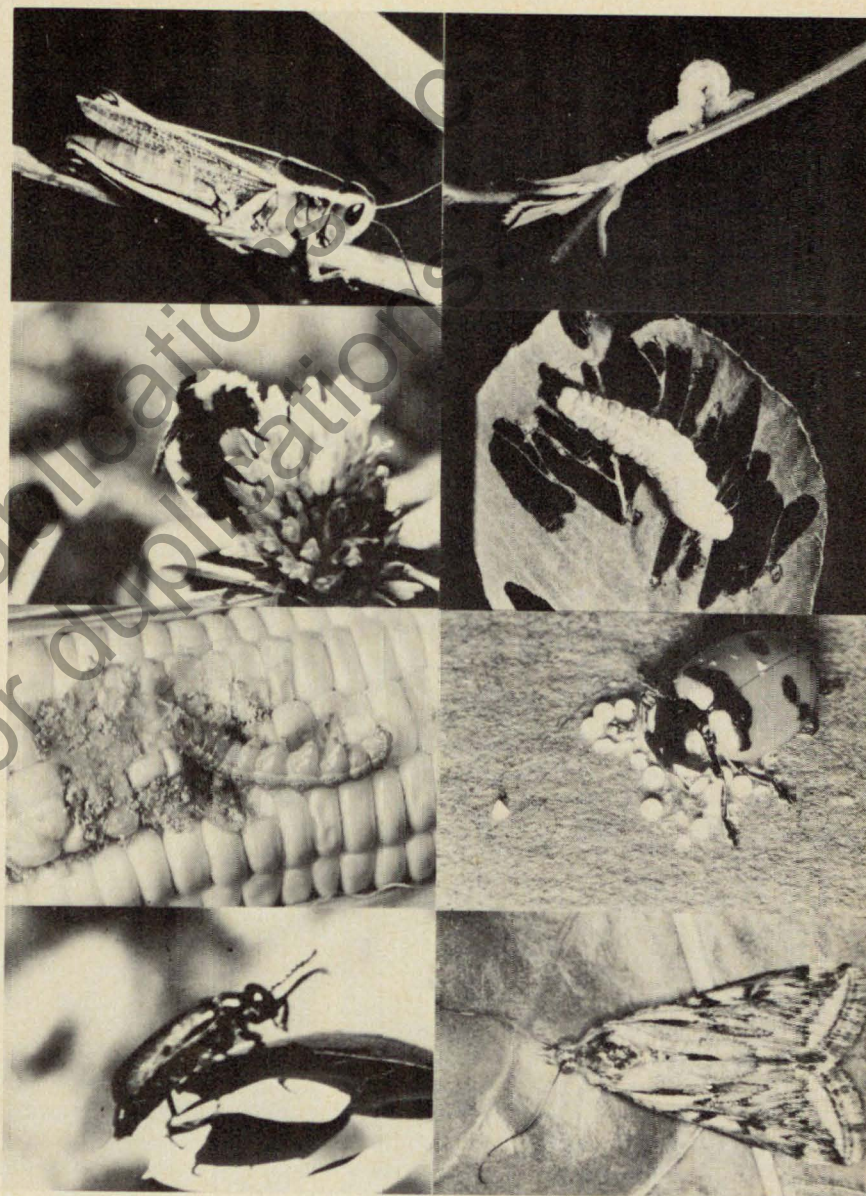
HOW INSECTS FEED

Biting and chewing insects. —

These insects are equipped with toothed jaws that move sideways rather than up and down as do our own. Insects of this type can be controlled by applying certain poisons to the leaves on which they feed or directly to their bodies. Among the common biting insects are grasshoppers, caterpillars, and the larvae and adults of beetles.

Insects with piercing and sucking mouths. —

These insects have mouthparts that resemble a hypodermic needle. With them they pierce small holes in the surface of leaves or the skin of animals and suck the sap or blood. They are able to feed on the inner parts of plants that have been sprayed with some poisons and so escape death. However, fumigants enter the breathing pores and will kill these insects. Contact poisons can also be used successfully against them. Systemic poisons from another group of chemicals that are especially useful against insects with piercing and sucking mouths. They are absorbed by the



Grasshopper

Bumblebee

Corn earworm

Blister beetle

Alfalfa looper

Alfalfa weevil

Ladybird beetle and armyworm eggs

Sugar beet webworm

plant and move in the sap stream. The common sucking insects include aphids, leafhoppers, fleas, mosquitoes, and scale insects.

CONTROL OF INSECTS

Insect control refers to those factors that prevent the spread and reduce the abundance of insect pests. Natural control refers to those factors that do not depend on man for its success, while artificial control depends on man.

Natural control. —

Insect populations are affected by many factors, including (1) weather, such as temperature, humidity, air movement, (2) topography, such as land and water barriers, soil texture, and composition, (3) parasites and predators, that is, insects or other animals that feed on insects, and (4) diseases caused by viruses, fungi, and bacteria. When no disturbing influences are introduced by man or other agencies, the insect population tends to remain in balance.

Artificial control. —

When insects seriously damage crops

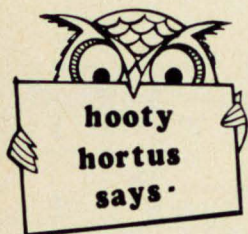
man must take action to control them. He may do this by summerfallowing, crop rotation, changing tillage methods, altering time of planting, destroying crop residues and weeds, growing resistant varieties, stimulating vigorous growth, controlling irrigation or watering, introducing parasites, predators, and insect diseases, and applying insecticides. Often he may need to use two or more of these methods in combination.

PRESENT RESEARCH

Entomological research underway in Canada includes taxonomy, physiology, morphology, biology, and ecology of insects.

Studies are also continuing on the control of pest species by insecticides, predators, parasites, diseases, resistant varieties, atomic radiation, chemosterilants, attractants, repellants, and insect hormones.

Insects are one of the greatest competitors of man in his struggle to live. The battle against harmful insects is a continuing one but entomologists hope to do more than hold their own against them.



Buying nursery plants in cans may be a bit more expensive but it has many advantages such as; They may be planted at any time during the growing season —; There is no need to trim or prune back; —

you may set out your plants, still in their containers, and rearrange them until completely satisfied they are in the best positions before planting them —; instant landscaping is possible. Homes bare in the morning may have the look of an established planting in full leaf by afternoon; — you can plant immediately without the need of previously soaking the plants in water —; there is practically no setback in growth because the roots are not disturbed.

The Perennial Border

J. VAN OTTERLOO

Alberta Horticultural Research Center,
Brooks, Alberta

This Center has been carrying on a series of horticultural plantings for over 15 years. In 1956 two parallel hedges were planted South-west to North-east to divide the ornamental block from the picnic field. These were planted with Red Osier Dogwood, Chokecherry, Honeysuckle, Tartarian Maple, Elderberry, Pincherry, Japanese Lilac and Russian Olive, Thuja, Red leaved rose, Russian Olive, European Highbush Cranberry, Double Flowering Plum, Highbush Cranberry, and Carleton Honeysuckle.

In 1958 the picnic field was seeded to lawn and a perennial border planted on the north side of the hedges. This border was 10 feet wide and 450 feet long and with the help of annuals brought color to the area. During 1961 and 1962 the Picnic shelter was built and the whole area renovated, enabling visitors easy access to the border.

In 1969, the north hedge was taken out and an extra 10 feet added to the perennial border. At this time some ninety conifers were planted for background and new varieties of shrubs and trees added including 'Kelsey' the double flowering rosybloom, Golden European Elder, Caragana, Potentilla and species of Broom, Mountain-ash, Viburnum and Euronymus.

Groups of tulips and other bulbs have been added for early spring color. Annual flowers are still planted in the border; this allows for future acquisitions to be added when available.

Among the perennial flowers that have proved suitable are:

Achillea 'Parks' var.	Geum
Achillea 'The Pearl'	Gypsophyla
Aconitum napellus	Heliopsis
Allium sp.	Hermercallis
Anthemis tinctoria	Iris
Kelway	Liatris
Aquilegia in colors	Lilies trumpet
Campanula incurva	Limonium
Campanula pessivolia	Lupinus
Campanula thyssoides	Lychnis
Campanula glomerata	Lythrum var.
Chrysanthemum	Monarda fistulosa
maximum	
Coreopsis	Ornamental grasses
Delphinium in color	Phlox in color
Dianthus	Pyrethrum in color
Doronicum	Peonies in color
Erigeron	Ranunculus
Eryngium	Rudbeckia
Fall Asters in color	Rudbeckia
Filipendula hexepetala	'Gloriosa Daisy'
Gaillardia	Scabosia caucasica
Geranium ibericum	Tradescantia
	Trollius
	Veronica

*April, April,
Laugh thy golden laughter,
But, the moment after,
Weep thy golden tears!*—WILLIAM

WATSON

Pests of Perennials

BRIAN J. PORTER

Prairie gardeners may not often think of our dry, windy summers and frigid winters as good friends, for most of us never realize their beneficial nature. While it is true that winter calls a halt to our gardening activities outdoors, it also calls a halt to the population explosion in the insect world. The dry, summer winds may not always be conducive to the best plant growth, but the low humidity makes it difficult for disease-causing bacteria and fungi to thrive. Nevertheless, insects and diseases do get out of hand from time to time and the avid gardener is constantly on the watch for them.

DISEASES

Powdery Mildew: This is a white, dusty fungus growth which may quickly spread over much of the foliage of a plant, making it very unsightly and eventually killing the leaves. Yarrow, monkshood, hollyhocks, columbine, delphinium, heliopsis, monarda, phlox and goldenglow are among those most susceptible. As a control measure, a fungicide recommended for mildew such as sulfur, Karathane, Acti-Dione PM or Phaltan should be used. Not all fungicides are effective. Powdery Mildew is more prevalent during cool moist weather and where air circulation is poor.

Botrytis Blight (Gray Mold): This

fungus disease is the most common disease to affect peonies. Young peony shoots may die and flower buds may turn brown and fail to open. Sometimes flowers also are affected. A grayish mold often covers the infected parts. Prevention is the best control method. In the fall, plants should be cut down and all old leaves and stalks removed and burned. Regular dusting or spraying with Captan in the spring is recommended until blooming begins. Any infected parts should be removed and burned during the season.

Lilies are also attacked by one or more species of Botrytis. The disease starts as a spotting of the leaves, and in humid weather rapidly progresses to destroy the leaves and sometimes stems and flowers. Diseased parts should be removed and burned. Bulbs are normally not affected.

Leaf Spots: Many perennials are subject to leaf spots, but usually the disease is not serious enough to require control measures. There are many different types of leaf spots that only a plant pathologist can identify. Where practical, diseased leaves may be removed. Sprays of Bordeaux, zineb, maneb, or Phaltan, if available, may be used.

Yellows: This is a virus disease spread by aphids and leafhoppers. Most commonly it is found on delphinium, dianthus and chrysanthemums, as well

as annual flowers. Typically, the flowers become light green or yellowish, and may be malformed. In delphinium the flowers are shaped normally, but are green and the flowers are bunched together. Once plants are affected they should be destroyed, as prevention is the only control method. A regular spraying program for insects will minimize the incidence of this disease.

Iris Soft Rot: This bacterial disease attacks the rhizomes, causing a foul smelling rot. The disease is found in association with the iris borer, gaining entrance through wounds made by the borer. First symptoms are the collapse of healthy leaves caused by rotting at the base. Old leaves and debris should be destroyed and dying leaves should be cut off using disinfected shears.

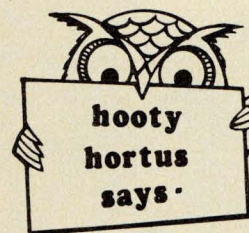
Root and Crown Rots: Usually difficult to identify precisely, they are often caused by soil-borne organisms. Control outdoors is difficult. Fungicides specifically developed for treating soil may be helpful, but they are not always available to the home gardener.

Rusts: Yellow, orange or brown pustules may appear from time to time on the leaves of perennials, but generally they do not cause serious damage. Fungicides specifically recommended for rusts must be used if spraying is to be effective. Often removal of diseased leaves may be sufficient.

INSECTS

Ants: Commonly seen on peonies in the spring, they feed on the sweet secretions of the flower buds. They

You don't lose your shirt by rolling up your sleeves.



Seed annuals outdoors. Don't get the idea that all annuals must be first seeded indoors and put into the garden as bedding plants. In fact there are a few that will do much better seeded outdoors than when

set out as bedding plants.

Calendula is one of my first choices, particularly now that seeds of the new outstanding varieties of this plant are available. They will produce an abundance of flowers all summer. They are also excellent for cutting. I also like Larkspur. They have much charm although they are maybe not as regal looking as their perennial cousin the Delphinium. I have had good success in planting the seeds of these two annuals right out in the flower border in the late fall as well as in the early spring.

Other annual seed that can be planted directly into the ground in early spring are Clarkia, Everlasting Strawflower, Batchelor's Button, Clarkia, Candytuft, Nigella, Cosmos, Sweet Alyssum, Balsam, Portulaca, Amaranthus, annual Hollyhock, Marigold and Zinnia, and of course Sweet Peas.

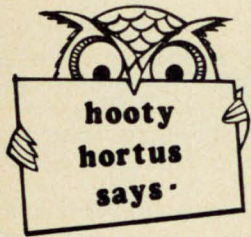
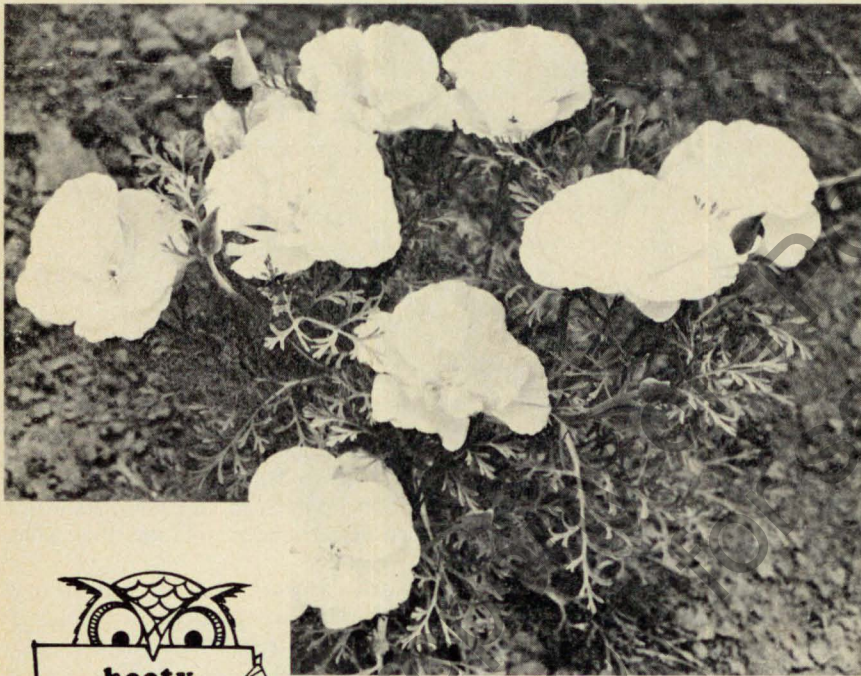
do no harm to the plants, but as they may be considered a nuisance and sometimes associate with aphids, the gardener may wish to control them. Chlordane dust or carbaryl (Sevin) is effective.

Aphids: Small, soft bodied insects of various colors are commonly found in clusters on the undersides of leaves, flower buds and young shoots. They injure the plants by sucking the sap from the plant, causing discoloration and leaf curl; they may also spread virus diseases. Aphids are susceptible

to malathion, diazinon and the common garden pressurized sprays.

Leafhoppers: These small, slender, sucking insects cause tiny yellow spotting and drying of foliage. Winged adults jump and fly around freely on the plants when disturbed. As carriers of virus diseases, they should be controlled. Malathion or dimethoate (Cygon 2E) may be used.

Mites: Although not true insects, they are treated as such. Almost too tiny to be seen with the naked eye, their



All annual poppy seeds should be sown directly outdoors in the early spring. Seedlings do not transplant readily. They like full sun and will do well even in dry areas. The California poppy is a lovely satiny flower with a brilliant color range. The Shirley poppy also has a wide range of delightful shades.

presence is usually noticed after considerable damage has been done. Mites are found on the undersides of leaves, sucking the juice from the plant and causing a yellowish speckling or blotching. They appear as tiny white or grey specks, and in severe cases fine webbing can be seen. Mites thrive in a dry atmosphere and are thus more noticeable in dry weather. Malathion, Kelthane or other miticides can be used to control them.

Tarnished Plant Bug: This sucking insect is brownish in color and about ¼ inch long. The insect is not readily noticed, but it is responsible for causing deformation of flowers and buds. Regular spraying with a common insecticide such as malathion is helpful.

Blister Beetles: These long, slender, dark black or metallic colored beetles occasionally feed on perennials such as delphinium, iris and phlox. They can be controlled with malathion or diazinon.

Thrips: These are tiny brownish black insects which rasp the plants and suck the juice from the wounds. The damaged areas on the leaves often have a silvery appearance, but flowers may also be affected. Carnations, daylilies, delphinium, gaillardia, iris, lilies and peonies are among those affected. Malathion, diazinon or dimethoate may be used.

Columbine Leaf Miner: This insect tunnels between the leaf surfaces, leaving conspicuous white, winding trails. Destroy plant debris in the fall and use malathion or a systemic insecticide in the spring.

Columbine Borer: Larvae of this insect enter the leaf-stalks in the spring and bore downwards in the stems, eventually attacking the roots. Early spring raking of the soil will kill May eggs; later malathion may be used.

Delphinium Worm: Pale green worms about ¾ inch long feed on the flower buds in late May; later they tie the upper leaves together as they begin to pupate. Dusting four times with chlordane at weekly intervals, starting about May 7 will prevent serious damage from occurring.

Isis Borer: This insect can be controlled in early spring with malathion, or a systemic insecticide such as dimethoate.

The use of chemical trade names in this article is solely for the benefit of the reader, and is in no way intended to promote or endorse the products of any particular manufacturer.

Remember that when using any chemical, the precautions and directions on the container label should be followed closely.

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Fungicides for the Gardener

G. PLATFORD

1. Bordeaux Mixture

This is one of the oldest and still one of the most useful fungicides. It is prepared by mixing powdered copper sulphate and hydrated lime in various proportions. A standard mixture is 4-4-50 which means; 4 lbs. copper sulphate + 4 lbs. hydrated lime used with 50 gallons of water. Bordeaux is available in commercial formulations. Bordeaux mixture controls certain fungus leaf diseases and blights of fruits and ornamentals. This fungicide is not generally used now as there are newer fungicides available. It is useful as an early spring pre-bud break spray for control of plum pocket. It may cause some leaf burning and fruit rusting, particularly if it is used during cool, wet weather. It is useful as a general disinfectant for storage cellars, work surfaces, and other areas. Do not use Bordeaux mixture in combination with other fungicides and insecticides. Bordeaux mixture will control some bacterial diseases.

2. Captan

Available as 50% wettable powder. Captan is an excellent safe fungicide to control leaf spots, blights, and fruit rots, etc. on fruits, ornamentals, vegetables, and turf. It is used as a seed protectant for vegetables, flowers, and grasses and is a post harvest dip for fruits and vegetables. It does not

control powdery mildews and rust. It is both a protectant and an eradicant.

3. Dexon and PCNB (Terrachlor)

These fungicides are used separately or in combination for control of various root, stem, and crown rots of vegetables and ornamentals.

4. Dinocap (Karathane)

This fungicide is specific for control of powdery mildews on all plants. Do not use in hot weather (above 85°F) and apply when foliage will dry rapidly. It also has some miticide action.

5. Formaldehyde

It is sold as formalin 40%. It can be used as a soil fumigant for damping-off and other soil-borne diseases. Small batches of soil may be treated for control of damping-off by mixing 3 tablespoons Formalin with 1 cup of water. Sprinkle this solution over 1 bushel of soil. Mix well and fill flats. The seed should be planted 24 hrs. later and then the flat of soil watered. It can be used as a soil drench on fallow soil at the rate of 1 part Formalin to 50 parts water. Apply ½ to 1 gallon to each square foot of soil. It should not be used near living plants. Treated soil should not be used for crops until one year after application.

6. Lime Sulphur

Lime Sulphur is used as a dormant spray for fruits, roses, and some other plants at the 1 to 9 dilution and sometimes in summer sprays at a 1 to 50 dilution for powdery mildew control. As a dormant spray it will also destroy over wintering stages of aphids, mites, and scale insects on broadleaved trees and shrubs. It should not be used in combination with other fungicides and insecticides. Do not use at temperatures above 85°F. Lime Sulphur should not be used near buildings, walls, trellises, etc. because it will stain such objects.

7. Maneb

Available as a 50% wettable powder. Maneb is an excellent general fungicide for control of foliage and fruit diseases of vegetables, trees, turf, flowers, and some fruits. Zineb is a related fungicide to Maneb and can be used for the same purpose. It is preferred over Captan for use on tomato, potato, and vine crops. It is commonly used in multi-purpose sprays. Maneb controls rust but not powdery mildews. Its action is mostly protective.

8. Mercuric Chloride

Mercuric Chloride is very poisonous. It was formerly used in many seed treatments, especially for cereal seeds. Mercuric Chloride is still used for control of snow mold on lawns.

9. Sulphur

Sulphur is used in a dust form for control of powdery mildews, rust, and leaf diseases of fruits and ornamentals. Over application of sulphur may burn plant leaves.

10. Thiram

Thiram is used as a seed and bulb treatment for vegetables, flowers, and grasses. It will control rust. It is used as a soil drench for crown rot and damping-off. It is also a good rabbit and mouse repellent when sprayed or painted on fruit trees for winter protection against rodent damage.

11. Benlate

Benlate is a new systemic fungicide recommended for control of diseases on turf grass, ornamentals, strawberries and fruit trees. It is available as a 50% wettable powder. It can be applied as a foliar spray or soil drench. It is both a protectant and an eradicant fungicide.

Before using a fungicide, find out what is the cause of the disease affecting your plants. Your local Provincial Department of Agriculture, or University Department of Agriculture, will assist you in finding out the cause of your plants disease and will recommend control measures.

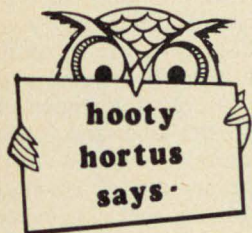
The above listing of fungicides are some of the more commonly used. Many of the all-purpose garden sprays and dusts will contain a mixture of several of the above. It is important to read the product label and follow all safety precautions outlined on it. Apply only the amount of chemical recommended on the label as an excess may cause injury to the plant.

—
*Now fades the last long streak of snow,
Now burgeons every maze of quick
About the flowering squares, and thick
By ashen roots the violets blow.—TENNYSON*

Insecticides for Flowers

A. J. KOLACH

The insecticide DDT was very useful in the past for control of many insect pests on flowers. Not only was it very effective, it was readily available in formulations handy for the homeowner to use. DDT is no longer registered for use on flowers, and we must look to alternatives. The following insecticides listed alphabetically are considered to be effective and safe if used in a proper manner, and should be readily available in suitable formulations. Many of these are formulated in all purpose type sprays and dusts. With the exception of chlordane which is long lasting, these insecticides may have to be applied more than once, if necessary, due to their short persistence.



Plant tulips for early spring color in your garden. They are definitely the most rewarding and dependable spring bulb for prairie plantings.

Tulips do best in a sunny location, but will hold their bloom a little longer if some shade is provided from the hot midday sun. Prepare your soil by digging deeply. They thrive best in a well drained fertile open soil. They should be planted on the prairies in late September or early October so that they can develop some root growth before freeze-up. Plant about six inches deep or a little less if the soil is heavy. Space about six inches apart, in clumps of the same variety. For continuation of bloom select both early and May flowering varieties. Firm the soil, and water well after planting to make sure the bulbs have a chance to start root growth. Some covering, to be removed in the spring as soon as the shoots appear is advantageous.

1. **Chlordane** — A long-lasting soil insecticide ideal for control of cutworms in the flower bed or garden. Should be applied to the soil surface.
2. **Diazinon** — A broad spectrum insecticide ideal for control of aphids and various caterpillars feeding on flowering plants.
3. **Dimethoate** (common trade name **Cygon 2E**) — A short-lived systemic insecticide ideal for control of aphids, plant bugs, mites and others.
4. **Kelthane** — A miticide ideal for control of spider mites and other mites on flowering plants.

5. **Malathion** — A short-lived broad spectrum insecticide ideal for control of aphids and various other insect pests. Some plants are sensitive to malathion sprays, including greenhouse flowers, petunias, certain ferns and others.
6. **Metaldehyde** — A molluscicide ideal for control of slugs. Can be applied in bait form or applied as sprays.
7. **Methoxychlor** — A somewhat longer lasting insecticide ideal for control of various caterpillars associated with flowers.
8. **Pyrethrum** — A short-lived but extremely fast acting insecticide for control of many insect pests and generally available in handy ready-to-use aerosols.
9. **Rotenone** — A very-short lived but safe insecticide available in powder form and suitable for use on flowering plants.
10. **Sevin** (common trade name **Carbaryl**) — An insecticide in dust form which will control a variety of insect pests in flowers.

There are other insecticides that can be used in the flower garden and will provide good results. The insecticides listed above are only some of the ones proven over the years and which the novice and professional can use with confidence. Look to the label for the insects and plants that the product you have in mind, is registered for, and use the rates recommended while at the same time observing precautions and limitations given.

*When the dew is on the grass
Rain will never come to pass.*

Horticultural Horizons

Frank L. Skinner — \$5.00

This amazing book is an absorbing biography of the life and work of a man who, on a pioneer farm in Manitoba, dedicated his life to making things grow in the north; and lived to become a leading horticulturist, taxonomist, and plant breeder of the western world.

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Vegetable Disease Control

JAMES R. LETAL

The home gardener is constantly faced with the problem of plant diseases. From the moment he considers planting a vegetable garden he must consider controlling plant diseases.

The following description of ways of controlling diseases of vegetables is to be used as a guide and not as an answer to all disease problems. If recommendations are followed, especially those on cultural practices, diseases in the home garden can be kept to a minimum.

SELECTION OF SEED

The first step in controlling diseases is the selection of hardy, disease-free seed and seedlings. Resistance to disease is a very important factor to consider.

Diseases carried on or in the seed or seedling can be very troublesome. Therefore, it is very important to pay special attention to the source of seed and seedlings. If it is suspected that the source of seed is contaminated with any diseases, then it would be best to find another source of seed.

Plants which are not hardy for a particular area are usually more susceptible to diseases. Therefore only grow vegetables which are recommended for your particular area.

Growing vegetables which are resistant to a disease which may be prevalent in your area is a very cheap and sure way of controlling diseases.

SEED TREATMENT

Once a certified disease-free seed is selected, it must be treated before planting. Many packaged seeds are already treated. This should be checked before planting.

The seed treatment serves to protect the seed from decay. Also, some diseases present on the seed can be partially or totally controlled by seed treatment.

The following can be used to treat seed:

Thiram 75% W.P. ($\frac{1}{2}$ to $\frac{3}{4}$ teaspoon per pound)

or

Captan 50% W.P. ($\frac{1}{2}$ to $\frac{3}{4}$ teaspoon per pound)

For potato seed-pieces use the following:

Dip the seed-pieces into a solution of Captan 50 or 75 W.P. (mixed at the rate of $\frac{1}{2}$ ounce per gallon water), or dust with Captan 7D, Dithane M-45, Manzate 200 or 8D, or Polyram 7D at the rate of $\frac{1}{6}$ ounce per pound of cut potatoes.

The potatoes should be treated as soon as possible after cutting the seed pieces and they should be planted immediately.

DAMPING-OFF

Most plants which are grown from

seed are susceptible to damping-off. This disease can cause considerable losses to young seedlings. The plants usually wilt quite quickly and die.

Damping-off can be controlled by:

1. Sowing crack-free seed into well-drained soil.
2. Shallow sowing.
3. Sowing at recommended rates.
4. Fertilizing at recommended rates.
5. Controlling weeds.
6. Watering only when necessary and preferably in the morning.
7. Amending heavy soils with sand or peat.

If damping-off appears, water 2 to 3 times, at 4-day intervals with solutions of captan, ferbam, fixed copper, ziram, or thiram (5 table-spoons in 4 gallons of water) at the rate of 1 gallon per square yard.

LEAF-SPOTS AND BLIGHTS

Leaf-spots and blights are caused by a number of different organisms. Most of these diseases begin as spots on the leaves or stems. The spots can increase in size and coalesce resulting in larger diseased areas. Blights cause a more general type of infection.

Control:

1. Collect and burn all plant remains in the fall.
2. Plow deeply in the fall because leaf-spot organisms will not live overwinter if buried deeply in the soil.
3. Crop rotation should be practiced. This may be very difficult in a small garden.
4. Avoid overcrowding.
5. Keep plants growing vigorously

by fertilizing and watering.

6. Plant resistant varieties.
7. Control weeds.
8. Do not grow vegetables in shady places.
9. Plant in well-drained fertile soils.
10. Avoid working in the garden when wet.
11. Avoid planting in cool weather.
12. Maintain uniform soil moisture during the growing season.
13. Spray with a fungicide when first signs of the disease are noticed.

The following fungicides are recommended for potato and tomato leaf-spots and blights:

Difoltan 4.8F, 2-4 teaspoons ($\frac{1}{2}$ - $\frac{3}{4}$ ounce) per gallon water per 400 square feet.

Dithane 4-45 (Mancozeb), $\frac{1}{3}$ - $\frac{2}{3}$ ounces per gallon water per 460 square feet.

Dithane M-22 (maneb), same rate as for Dithane M-45

Polyram 80 W.P., same rate as for Dithane M-45

Dithane Z-78 (zineb), same rate as for Dithane M-45

For bacterial blights fixed copper or Bordeaux mixture should be used.

POWDERY MILDEWS

Powdery mildews affect many of the garden vegetables. These diseases occur as white spots or layers covering the surface of the leaves and stems. Later in the season black fruiting bodies appear throughout these white areas. The leaves of the plants may turn yellow and die.

Control:

Follow the control recommendations given for leaf-spots and blights.

The following fungicides are recommended for controlling powdery mildews:

Sulfur, $\frac{1}{4}$ ounce per gallon water per 460 square feet (up to 7 days before harvest). A few drops of mild detergent should be added to act as a spreader on the surface of the leaves.

Note: at high temperatures (above 80°F.) sulfur may cause injury to plants.

Morocide 50 W.P. at 1/12 - 1/8 ounce per gallon water per 460 square feet (up to 1 day before harvest).

Morestan 25 W.P. at 1/6 to 1/4 ounces per gallon water per 460 square feet (up to one day before harvest).

Karathane at 1/12 ounce per 460 square feet (up to 2 weeks before harvest).

ROOT ROT AND STEM DISEASES

Plants with root rot and/or stem diseases appear weak, yellow and stunted. They may eventually wilt and die. Many different types of organisms can cause root rots and stem diseases. These diseases are usually more serious in cool wet weather.

Control:

Follow the control recommendations given for leaf-spots and blights.

If root rot does occur, it can be reduced by drenching the soil with 4/5 ounce each of terraclor 75 W.P. and captan 50% W.P. in 10 gallons water at the rate of 5 gallons per 100 square feet of garden.

Stem diseases can be controlled by

spraying the plants with one of the following:

Dithane Z-78 at the rate of $\frac{1}{2}$ ounce per 460 square feet (up to 7 days before harvest)

Botran 75% at the rate of $\frac{1}{2}$ ounce per 460 square feet every 7 days during wet weather or when the diseases first occur (up to 2 days before harvest).

VEGETABLE AND FRUIT ROTS

Vegetable and fruit rots usually begin as small water-soaked areas which rapidly increase in size resulting in a rot. Tissues are soft and mushy and usually give off an offensive odor.

Control:

Follow the control recommendations given for leaf-spots and blights.

Also, when cutting seed potato pieces disinfect the cutting knife after cutting each potato tuber. If planting tools are contaminated they should be disinfected.

During cool weather spray the plants every 14 days with a captan solution at a rate of 1/3 ounce of captan per 460 square feet. For those vegetables with below ground edible parts follow the recommendations given for root and stem diseases.

VIRUS AND MYCOPLASMA DISEASES

Viruses and mycoplasma can cause a variety of different symptoms on plants. Some cause stunting of plants, some cause leaf rolling, some cause abnormalities such as irregular shapes and colors, and some cause a variety of other symptoms.

Control:

1. Use disease-free seed and seed stock.

2. Use sanitation methods such as removal of plant debris, removal of diseased plants when first noticed, avoiding excessive handling of plants, and washing of hands in soapy water before and after touching plants.

3. Control weeds.

4. Control insects.

5. Grow resistant varieties.

PHYSIOLOGICAL DISEASES

These diseases are caused by abnormal environmental factors which can affect the plants in one way or another. Examples are nutrient deficiencies, low or high temperatures, improper soil moisture levels, damage by air impurities, and excessive acidity or alkalinity.

Control:

The problem must be diagnosed before attempting a control. In general, provide the plant with adequate moisture and fertilizer without using excessive amounts. Also, make sure the environment is conducive to good plant growth.

HERBICIDE INJURY

Symptoms of 2,4-D damage and damage by similar herbicides:

The leaves become distorted. New leaves growing after injury to the plants are considerably narrowed and irregularly wrinkled and distorted along the margins. Some can be strap-like. Younger leaves may be chlorotic (yellowed) and may show a hollow green mottled coloration. Stems and petioles become twisted and tend to bend down. In very susceptible plants such as tomato and potato the herbicide injury can reduce the young leaves to nothing more than thickened

main veins with little or no lamina. Blossoms of tomatoes may drop and heart shaped fruit and cracked fruit may develop.

Prevention of damage:

1. Use separate sprayers for fungicides, insecticides and herbicides. It is impossible to wash out traces of herbicides or insecticides from sprayers.
2. Use non-volatile herbicides.
3. Never spray on a windy day.
4. Do not use herbicides near any horticultural plants (this includes vegetables) even on calm days.
5. Follow manufacturers instructions very carefully.

STORAGE ROTS

Storage rots reduce the quality of vegetables and usually they make the vegetables totally unedible.

Control:

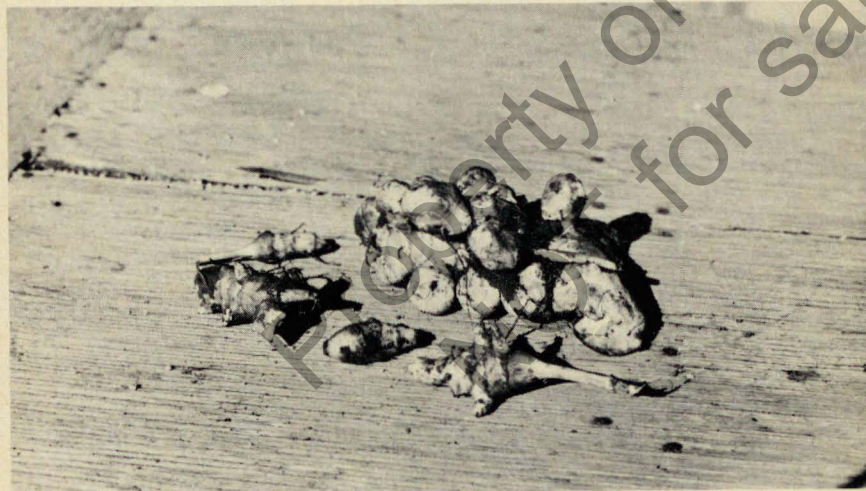
1. Do not plant diseased seed, seed pieces or seedlings.
2. Crop rotate.
3. Harvest during cool weather and promptly cool to storage temperatures.
4. Prevent injury to the vegetables.
5. Clean and spray storage walls and floors with commercial formalin ($\frac{3}{4}$ pint per 10 gallons water) or with a copper sulfate solution (1 pound per 10 gallons water).
6. Store at recommended temperatures and humidity.
7. Keep storage areas dry.

Different Salad Vegetables

CHARLES WALKOF

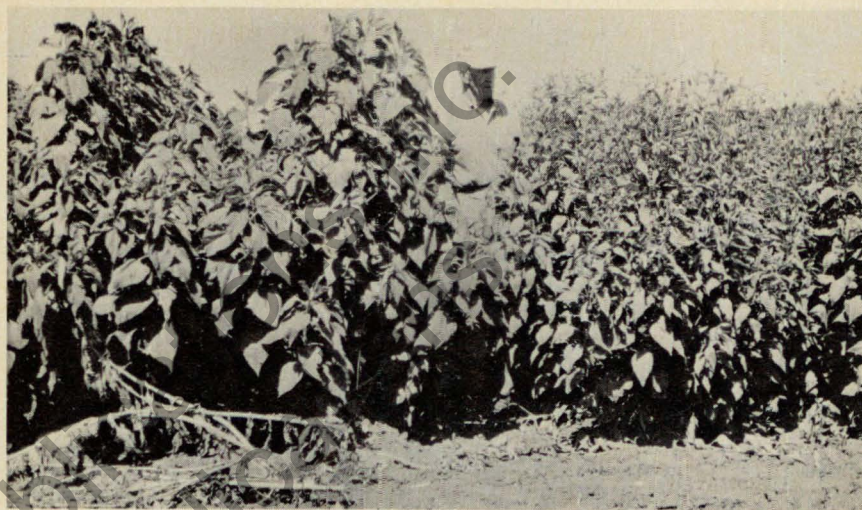
It can be exciting to grow and eat products from plants that are new and different from the usual array of vegetables. Jerusalem Artichokes are different. Another name for them is girasole and also perennial sunflower. They grow wild anywhere in the Prairie Provinces and cultivated strains are also available. They produce potato-like and torpedo-shaped tubers $\frac{1}{2}$ inch thick and 2 to 3 inches long, which are located 2 inches below the soil surface up to 20 inches from the main root of the mother plant. The

Tubers of Jerusalem Artichoke. — The wild strain in front and the cultivated strain in back.



tubers are hardy and will persist from year to year in the soil to start new plants each spring. They do not keep well in storage and therefore should be harvested as needed in late summer and fall. New tubers begin to develop in the soil after the middle of August and can be eaten any time. As a rule, the plants grow 5 to 6 feet tall and, although the stems may be coarse and rough, they can be quite attractive when in flower.

Tubers of Jerusalem Artichoke have a delicate and distinctive flavor like cauliflower when it is steamed and served with cream sauce. They are never mealy. Pickled artichokes are reported to be delicious.



Full grown plants of Jerusalem Artichoke. They yield more than 35 tons of tubers per acre.

Our interest in Jerusalem Artichoke at the Morden Research Station is in its potential as a new farm crop to produce fructose. This is fruit sugar similar to that in honey. It is $2\frac{1}{2}$ times sweeter and is more easily digested than sucrose from sugar beets and sugar cane. According to one report, little insulin is necessary when fructose is consumed by diabetics. A large market potential for fructose may exist in the \$500 million world diet food industry.

Another vegetable, chicory, has long been popular in Europe as the poor man's coffee substitute. It has assumed greater affluence in America where it may be a main constituent of present day instant coffee. Chicory roots are used to make coffee by first cleaning, drying, roasting and grinding

them. As a vegetable, chicory roots are harvested in fall and planted in sand or moss on the floor of a cool basement. The roots will produce white sprouts or new growth about Christmas time and these are most delicious for salads. In Holland, chicory sprouts, known as Witlof, command a high price on the vegetable market.

Chicory roots are grown from seed sown in the open ground early in May. The seed of chicory roots like that of lettuce but is smaller and therefore must be sown shallowly, $\frac{1}{2}$ to $\frac{3}{4}$ inch deep. It is necessary to thin out the seedlings to 4 or 5 inches apart to grow good roots. The plant thinnings are usually

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A plant of Mung Bean with ripe pods.

tender and useful in salads.

Bean sprouts produced from mung beans are another excellent constituent of salads. They are nutritious and health-wise they are rated highly as a cholesterol-free food. Mung beans can be grown in the home garden, preferably with good shelter from prevailing winds. They are frost tender and should be sown about the first of June. In fall, when the pods turn black naturally, the beans are harvested carefully, because they shatter easily when they are dry. The seed of mung beans is dark green and glossy. To obtain sprouts, the seed is placed 1 or 1½ inches deep in an open crock or stainless steel container. It is important that the container has drainage holes which provide for a slow release of the

water. Water, at a temperature of 70°F, is added every 4 or 5 hours and several layers of cheesecloth should be kept over the container to restrict evaporation. Also, the container must be kept in the dark at 70°F. The seed should germinate and produce white sprouts 1 to 1¼ inches long within 5 days. There are a number of recipes for using bean sprouts. They are good — try them.

Mung bean research at the Morden Research Station helps farmers to understand the growing of a new crop which might serve as an alternate for other less productive farm crops. Over 80 tons of mung beans are used in Western Canada each year to produce bean sprouts for Chinese foods such as chow mein. Also, there is a large market in Japan for mung beans. They are milled into flour to produce a

*Therefore all seasons shall be sweet to thee,
Whether the summer clothe the general earth
With greenness, or the redbreast sit and sing
Betwixt the tufts of snow on the bare branch
Of mossy apple tree.—COLERIDGE*

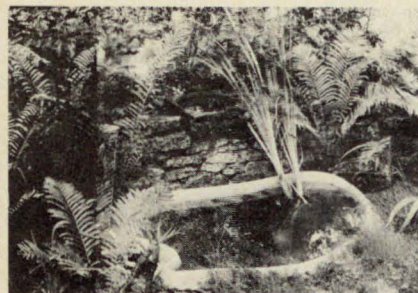


A field of chicory plants to produce fructose sugar from the roots.

translucent type of noodle which the Japanese people enjoy.

The native Indians in the Western prairies enjoyed eating Jerusalem Artichoke for decades. People in Central Europe used chicory for many years and in periods of war or general economic stress it was a most important food because it could be

grown locally. The oriental people have long known the great value of the protein food constituent of mung beans. It seems timely for Canadians to explore the healthfulness of these vegetables and to use them to vary the diet.



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A Try at Apple Orcharding

P. J. PETERS

About half-way between Portage la Prairie and Brandon is the little town of Sidney, Manitoba. This is rolling, hilly terrain. About six miles North and West of Sidney is the home of R. D. Nicholson. A second home on this farm belongs to Bev Nicholson and his wife. Young Bev and his wife bought the farm from his parents in 1962. The parents, Ron and his cheerful wife, continue to live in their lovely little home. They are retired but both of them are busy chasing a life long dream.

The dream is apple orcharding. Ron had a long-cherished interest in apple growing, likely inherited from his father in Ontario. When he sold his land to his son he retained his home and a two-acre orchard site next to it. It just so happened that, at that time the Manitoba Department of Agriculture was looking for co-operators to test the feasibility of apple growing in Manitoba. Ron and the Department got together. This was the beginning of a 10 year courtship.

Mr. Nicholson's dowry appeared to be adequate. The soil was light and sandy, underlain by clay. It appeared that there would be good internal drainage, as well as good top drainage. Soil tests indicated that orcharding might well be quite successful. The two acre site was well sheltered by both deciduous and evergreen trees. Well water for irrigation was available. As far as site was concerned — all systems

were "go". Ron agreed to summerfallow and to work in a heavy application of good manure. The Department was pleased with Ron's site and also Ron's attitude. The dowry was right.

The government's contribution was to be in supplying the apple trees and in giving guidance to the project. The trees were supplied by the Canada Research Station at Morden. The guidance was to come from the Provincial Fruit Specialist.

The approach was to plant apple varieties presently recommended in Manitoba using standard trees. A standard tree is a tree having a hardy root (in our case Columbia or Bedford) and having the rest of the tree stem and branches of the named or tender variety. The following were the varieties planted in the Ron Nicholson Orchard: Goodland, Carroll, Garland, Godfrey, Luke, Collet, Breakey and Kerr. Most of these varieties had been bred or tested at Morden.

The orchard was planted in May of 1964. A 20' by 20' spacing was used, and a total of 130 trees were planted. They wintered well in 1964-1965, 1965-1966 had a cold spell in January but again the orchard seemed to escape major injury. Some fruit developed. Everything looked hopeful.

Then came the winter of 1966-67. A mild March was followed by a miserably cold April. Cold snow, bright sun, strong winds prevailed. In spite of

painting the trees with white latex to reduce sunscald, winter injury soon became apparent. All trees were hurt. One third of the trees were dead. Godfrey, Garland and Luke were almost complete failures.

This was a time for reappraisal. Should the dead trees be replaced with other standard trees? What about trying out stembuilder trees? * Most of the test orchards were failing. Ron Nicholson and the Fruit specialist decided to interplant with stembuilders. The next two years 125 stembuilders were interplanted in the orchard. In 1969 Ron got his introduction to the art of budding. He learned it well. Out of 370 buds, he put on his stembuilders that year, 276 buds took and developed. Not bad for a novice.

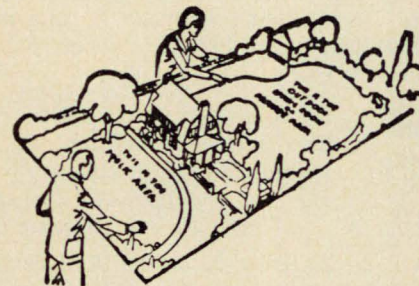
Ron will always remember 1970, Manitoba's Centennial. Everything appeared to be going right. There was a fair crop on the remaining standard trees. He had high hopes for getting

good entries for the Provincial Fruit Show. That's when the storm struck. Torrential rain, winds up to 50 miles an hour and hail pelted the orchard. The crop was completely ruined. Many of the older trees were broken down. Many of the promising stembuilders were badly hurt.

Now, in 1972 much of the damage is overgrown. The first few apples were harvested from the stembuilders. Of the original standard trees only Goodland really survived. A fair crop of Goodland was harvested in the fall of 1972. Barring catastrophies of storm and hail, the future again looks promising. We hope for Ron Nicholson's sake that there will be more progress and less frustration in the future.

* See article on stembuilders in 1969 edition of the Prairie Garden.

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Cultural Hints

Indoor Plants

M.J. TSUJITA

Indoor ornamental plants have graced our homes for centuries. Current concern for the total environment now stimulates this hobby. Today, plants are recognized as an integral part of interior decor. This unique environment presents problems and challenges — especially in respect to the cultural aspects of ornamental plants.

Your success in the growing and maintenance of plants in homes and buildings may be influenced by growing media, water and fertilizer.

Growing media will affect watering and fertilizing practices. If fertile soil of good structure is used at potting or planting time, most indoor plants may not require fertilizer for the first 2 to 3 months. Ideal soil mixtures provide a good drainage and aeration. If the soil mixture is not free-draining, waterlogged condition often results and roots die due to poor aeration. Furthermore, the addition of fertilizer to poorly draining media may result in the accumulation of salts because watering will be done less frequently and excess fertilizer is not leached out of the container.

Most flowering plants will do well in a mixture of 3 parts loamy soil, 2 parts organic matter and 1 part sand or perlite. Organic matter may consist of well rotted manure, compost, or peat moss. To one bushel (18 six-inch pots) of this mixture add ½ - 1 cup of superphosphate or bonemeal. If the

soil tends to be high in clay content, a mixture consisting of 1 part soil, 1 part peat moss and 1 part perlite is satisfactory. Foliage plants should be grown in mixtures containing at least 50% organic matter. It is best to use sphagnum peat moss to make up the bulk of this organic matter. Increase the proportion of sand for cacti and succulents. Acidic sphagnum peat moss should be used in higher proportion in growing acid-loving plants such as azaleas, camellias, gardenias, etc.

The use of soil-less media is becoming a popular practice in growing house plants. The most popular of these is the peat-like mixture consisting of a 50-50 by volume mixture of sphagnum peat moss and perlite or peat and vermiculite. The following is a procedure to make up one bushel (approximately 18 six-inch pots) of mixture:

9 six-inch pots coarse perlite
 9 six-inch pots sphagnum peat moss
 1/8 pound superphosphate
 1/2 - 1 pound dolomitic limestone
 or finely ground limestone

Watering should be done in such a manner so that the soil is completely saturated and excess water is allowed to drain out of the container. This draining out of the water will leach out salts which may have accumulated. Allow the soil surface to become relatively dry before further watering.

The best practice is to thoroughly water plants when necessary. Avoid frequent light applications of water which only wet the upper portion of the soil.

Your fertilizing program will be influenced by light conditions in the room which greatly limit the nutrient uptake by plants. Generally, most house plants do not require heavy fertilizing. Probably the most convenient method to apply fertilizer is in a dilute liquid form. A readily available completely soluble fertilizer such as 20-20-20 will supply bulk of the necessary nutrients.

Soil-less media can be fertilized with every watering by adding ½ - 1 teaspoon of this high analysis soluble fertilizer per imperial gallon of water. This dilute fertilizer solution is used in conjunction with the regular watering program. Flowering plants such as pot mums, poinsettias, Reiger Begonia, etc., grown under good light conditions may be fertilized with every watering by dissolving 1 teaspoon of this diluted fertilizer per imperial gallon of water. Foliage plants grown under low light intensity should be fertilized with every watering using ¼ - ½ teaspoon of this solution per imperial gallon of water.

Flowering plants grown in a mixture containing over 1/3 soil need fertilizer every 3-4 weeks. Use 1½ teaspoons of this solution per imperial gallon of water. Foliage plants can be fertilized every 4 - 6 weeks with a diluted solution containing 1¼ teaspoons of the same soluble fertilizer per imperial gallon water. Make sure that the soil or media is moist when fertilizer is added — root injury may result if the soil is dry.

Slow-release fertilizers are relatively new on the market. These are long lasting forms of fertilizers which slow-

ly release nutrients into the soil over a period of 3 - 4 months. Use these fertilizers according to directions on the container. For indoor plants, it is safer to use these fertilizers at one third the rate recommended for greenhouse conditions.

Indoor plants require only limited specialized attention. Supply the ingredients with thought and care and reap the rewards of enjoyment, satisfaction, and vigorous healthy plants.

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Hobbying with Plastics

RUBY BRYAN

Years ago I listened to a little old Scotswoman say to a group of neighbours, "Every one should have an absorbing hobby". I agreed then and I still do. This is even more necessary now-a-days. When the stresses of our daily pace catch up with us, nothing recharges us faster than an hour spent on a hobby. These take many forms; one of mine has always been the love and growing of flowers.

In Northern Ontario, with its short summer season, we have to resort to all manner of means to lengthen this span. Some of us have always been content to buy a few plants in the spring, often surveying ruefully the small numbers our hobby money bought. Others have planted seeds in window pans, tending them with loving care until the time to set them out, only to find that, very often, the plants had not sufficient stamina to make a good start.

Hot beds and cold frames proved to be a partial solution, however, there were disadvantages to these garden set-ups, as the grower soon found. The glass frames were heavy to handle; loss from breakage was apt to be high; shading was necessary. Changes of temperature, while watering, was a hazard on chilly, windy days. Out of door clothing and shoes had to be worn, and often the whole bit took on the aspect of another chore instead of a few minutes spent on a relaxing

hobby.

Then the day of PLASTICS arrived. Many of the plastics on the market today are a boon to the greenhouse hobbyist, either as a cover for a small Spring greenhouse, or as a protective cover when plants are set out. To me however, the big break-through was corrugated P.V.C. We have found that this material can virtually take the small greenhouse out of the hands of the professional carpenter. It has made it possible for the hobbyist to connect a light shelter to the house at very low cost. A plant space can be easily built outside a window and can be removed and stored for another season. Later on, when the weather is milder, very light-weight sashes can be made of P.V.C. which can be used for many years' service at no further cost.

We buy good quality P.V.C. and always ask for the clear bluish shade, as this does not seem to whiten as the first P.V.C. tended to. It comes in corrugated and flat, to cover 2 feet wide. We use the 20 feet lengths, as it will arch to 12 feet for greenhouse use and will cut into three pieces for the cold frames.

We do not know how long it will last, but we have had no breakage or maintenance for four years and it has withstood wind and hail. We think that the quonset type roof is much more satisfactory than a peak roof. It is easier to construct, is stronger, and

seems to withstand weather well. In a hail storm a neighbour's roof was riddled and a great deal of glass was also smashed, but ours had no damage.

When we decided to build a P.V.C. house for year-round operation, we sent to the distributor for instructions and followed them carefully. We had a mason do the foundation, and a carpenter friend helped with the construction. We used curved pipes to form the roof span, giving ribs every 4 feet. These are supported sideways by 1 inch by 2 inch slats fastened to the pipes by screws set into drilled holes. The P.V.C. is nailed to the slats using the special nails provided. It is joined to the house at one end and is heated by the house furnace. It has cross ventilation at the sides and a screened door at the far end, with a ventilator above it.

When the cold weather came we found that the condensation of moisture on the cold surface melted when the sun shone, and dripped down. We could have controlled this by lining it with light plastic stapled to the slats but since we wanted a permanent job we decided to use the P.V.C. as a liner. This was simply cut

to measure, and pushed into place, it did not require nails.

We found that this not only controlled the drip, but made it much easier to provide an even heat. Now that the surface is cold, the snow just blows off the round roof. The second layer cut the light a little but does not seem to harm the plants. The corrugation defuses the light so that we never have sun burn on any plants, and by placing those that need more light in the brightest spots and the ferns and other shade lovers on the north side, everything seems to thrive.

Geraniums, fibrous begonias, echeverias, impatiens and *Primula obconica* are blooming happily together. A red orchid has favoured us with six large trusses made up of dozens of tiny blooms and keeps company with a hanging basket of a trailing vine with a shower of white flowers. In the warmest end a dendrobium orchid has two lovely sprays of purple. The cattlys orchids are thriving, but it is not yet their season. A pink, and a white camelia are just showing their colours and should be out in a week's time.

The scarlet hibiscus is never without

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bloom and the gerberas are budding up. The lipstick plant still has a few blossoms left and today the blue *Streptocarpus* (Cape primrose) has just opened its first spray.

Under the bench we have a fluorescent light to increase the growing space. This is a nice warm corner and the saintpaulia are just starting to bud up again after their rest and replotting. The hoyo and the stephanotis have made splendid growth lately and their bud heads are just waiting for a few bright days to start their show. Four pots of paperwhites are spreading fragrance through the air, while the nearby hyacinths are taking their own slow time although they are showing spikes.

Several amarillys have finished blooming but one beautiful red is opening in full glory with four huge bells to a stalk, and some are just forming bud stalks. We separate this from the Christmas poinsettia by green foliage plants as the two reds clash horribly. We grow a number of leafy plants which, by their texture, shape or colour, add interest to spots that have no bloom at the moment. Coleus, irisine and variegated ivies are spaced here and there. Ferns are always with us and dark green ivy and other trailers are left to root at will in the side bed to provide us with cuttings for friends at any time. Bulbs of calla and Amazon lilies seem to like their situation very well, and always have beautiful foliage as well as lovely bloom in season. Many more plants find a corner somewhere but, as time goes on our 12 feet by 24 feet greenhouse seems much smaller than it did at first. As the plants come to the peek of bloom we groom them and take them onto the plant stands through the house; this provides conversational interest all the time. Potted herbs are also found to be

very useful.

As you can see our winter season is very full. With the advent of spring ahead we are always faced with the problem of lack of space. Some plants are cut back drastically to take less room, some are given to friends. The spent bulbs are put in flats in the root cellar, until they can be planted out in the garden. One way or another, we manage to clear space for the precious seedlings. The catalogues arrive and the orders are placed. Soon the seeds arrive and we fill the seed flats with the sterilized mixture and start to sow. Fortunately, at this time, they take up little room. As the seeds germinate and have their first transplanting they need more and more space. Gradually the plant stands in the house get fuller as we crowd the pots to make more room in the greenhouse. Soon every spare inch is used.

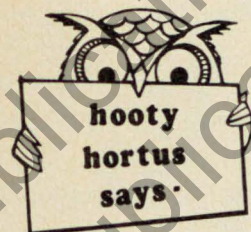
About this time P.V.C. again comes to our rescue. We have a 12 feet by 10 feet extension which my husband built on the end of the greenhouse. This is a very simple construction, a 2 inch by 6 inch frame rests on posts sunk level with the ground. All framing rests on this so that if it should heave with frost it will all go up and, hopefully come down again with no damage to the structure. We made no attempt to winterize this, we use a small electric heater with a fan. From here the plants go to the P.V.C. frames until it is time to plant them in the permanent beds.

A group of us get together in the spring-time to grow the plants which are donated to plant the gardens in the parks, library, hospital, cemetery etc. We have a busy and happy time together while raising several thousand plants for our projects, and the plants for our own garden.

In the autumn we make use again

of our small annex to shelter the plants we bring in from the garden for winter bloom. We find that the plants get used to the new conditions much better when potted here and left for some time before being taken into the heated greenhouse. Some we just pot up and leave until it is too cold for them. We use these for flower arranging and they are then disposed of, but

they do lengthen our cutting season. Last spring we used black plastic to protect the cold frames at night, later the same sheets were cut and used between the rows of gladioli. We neither weeded or watered and harvested our best crop to date. Plastic and planning have made it possible for us to have our garden hobby and still live our business lives.



For fragrance seed Mignonette where it is to grow, preferably in the proximity of an entrance way or outdoor living area. It will grow in full sun or semi-shade in ordinary garden soil made firm before sowing.

The seeds are very small. Seed sparingly, give only the slightest soil cover and thin plants to about five inches apart. Its spikes of red, whitish or yellow flowers aren't showy but make up for this with their fragrance.

For more color make a small seeding or Sweet Sultan, a close relative of the cornflower, in the same area. It also bears fragrant flowers in a variety of pleasing colors. For further fragrance and a nice background for these seedlings, set out a few bedding plants of white Nicotine in June.

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Plastic Covered Tunnels

J. D. CAMPBELL

When I visited Japan and Israel, I saw for the first time the widespread use of plastic covered tunnels. These countries have hundreds of acres of crops growing under these relatively cheap structures, especially during the winter.

Work was begun at the University in 1970 and is still continuing with this method of plant protection. With the use of tunnels that year, tomato yields were increased by 28 percent as compared with uncovered check plants. However, the check plots received benefits from wind reduction. In 1971, when the check plots were not adjacent to the tunnels, yield increases of peppers were as follows:

	Percent increase
Tunnel with heating cable	248
Tunnel only	212
Wind protection only	42

The reason for the dramatic increase was due primarily to a longer growing season.

Horticulturists of the Prairie Provinces are continuously plagued with late spring and early fall frosts which greatly limit the kinds of vegetables they can grow. The type of tunnel developed here has become commercially available at about \$15.00 per twenty foot tunnel.

Growers who wish to make their own tunnels can do so. Requirements

for a 20 foot tunnel are as follows:

1. Six sections of heavy gauge wire 5 ft. long.
2. Five rubber bands, five feet long.
3. Twelve tent pegs.
4. 4 mil polyethylene, 5 ft. x 25 ft.

The method of construction is described as follows:

1. Bend the wire into hoops according to the heights of plants you are growing in the tunnel. The average hoop would measure about 18 inches across where they enter the soil and they are about the same height.
2. Place the wire hoops in the soil to a depth of at least 6 inches and space about every four feet.
3. Lay the plastic over the hoops. On the windward side bury the plastic in the soil. Leave the other side free so that the tunnel can be opened when the temperature exceeds 75°F and closed again if required.
4. Between each two hoops, place tent pegs along side of the plastic so that a rubber band can be stretched against the plastic to keep it snug.
5. Bring the plastic ends of the tunnel together and fasten to tent pegs. This is necessary otherwise the end hoops will tend to bend. The space



required for a 20 foot tunnel is about 23 feet to allow for the end pegs.

When the sun is bright, heat build up can be quite high inside the tunnels and it then becomes necessary to open them up.

To safeguard the plastic it might be advisable to remove it once the frost damage is over. When polyethylene is exposed to sunlight, it becomes brittle unless it is especially manufactured to resist the ultra violet light in natural sunlight.

When the growing season is over, the wire hoops, pegs and plastic should be removed, cleaned and stored.

When properly cared for, the tunnels should last for more than one season. Polyethylene film can be replaced; the cost is relatively low.

Tunnels can be used as a mini-greenhouse for starting plants. It might be necessary to supply some heat. Heating tapes have been used successfully; we are presently trying a car heater which looks satisfactory.

Heat-loving crops such as sweet corn, beans, vine crops, peppers, egg plant and tomatoes all do well under tunnels. We believe growers will enjoy constructing and using these economical structures for enlarging the range of crops that it is possible to grow.

Gardening in Flin Flon

MRS. MARGARET VOLDEN

First, one has to remember that we live north of 54! It's a hard rock mining area, not an agricultural one. Although a few people do make a living from agriculture, mining is the real livelihood. Gardening in Flin Flon is a real challenge. It has many disappointments and surprises — such as unpredictable weather, a short growing season, quick frosts, smelter smoke, and, of course, rocks and rocks and rocks.

We manage to put the rocks to good use — we build rock gardens or rock walls, and these help to prevent our precious soil from eroding away.

There is about every type of soil here that can be found anywhere else. Two of our soils, though, aren't found too often in other areas — muskeg and the grey clay. We have a lot in this northern area. When it is wet, the stuff sticks like blazes and when it's dry, it's as hard as cement.

My mother, Mrs. Machan, has had many years of experience in gardening and has a wealth of knowledge on how to mix up the local soils to keep the clay broken up successfully. The secret of her success is that we were fortunate to live close to the freight haul barns, and able to obtain a generous supply of manure — free. By mixing together the muskeg clay, leaf mold and sand along with the manure, she made her own soil. That clay can never be allowed to harden into deadpan. It is

a good rich soil if kept loose, wet and well mixed. In Flin Flon there is no lack of moisture, lots of rain, and also many lakes.

While our prairie neighbours to the south had plagues or drought, we had a problem with us all the time — it's the gardener's greatest worry — smelter smoke. Those giant smoke stacks belched out their fumes, and we kept watch. If the winds suddenly blew in our direction and if a light rain was falling, it meant disaster for the flowers. We worked like greased lightning and at the same time fervently wished that each of us was an octopus with several dozen hands so that we could cover our flowers up fast.

My childhood home was surrounded with a wide variety of flowers, which were much admired, but it took a lot of hard work. This north country is very different from the prairies, it is very rugged, and impossible to plow.

To make a garden up here the first step is to remove the rocks. This can be done by using a pick, grub hoe, and dynamite. We got out the very large rocks and managed to get all those umpteen million smaller rocks out too with the help of a wheelbarrow. Then we back-filled all the holes left.

There isn't very much soil here in this area. The rocks outnumber the patches of soil far beyond anyone's wildest imagination. We scrounged for

days to get enough soil to complete our garden.

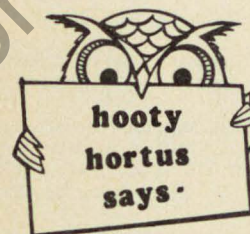
A few years ago I had gardening problems of my own and solved them by growing my garden on an island where my summer home is located. There are several reasons why the island is better. It is just far enough away from the town to escape the smelter smoke, kids, cats and dogs. The island is also heavy with timber which gives shelter from the wind, and lots of leaf mold. I also discovered that the island is warmer because it is surrounded by water and does not get the heavy frosts. It has a two week longer growing period as well. I have successfully grown peanuts, watermelon and many other vegetables there

without any transplanting.

I send my soil out for sampling, so that I know what will grow and where. I can also ward off over-fertilizing or tired soil. I use any rough fish that is caught for fertilizer for the garden. Another feature is that there are not as many black flies or mosquitoes on the island as on the mainland.

Slowly, over the years, the town of Flin Flon has acquired parks, lawns and beautiful gardens — thanks to the tireless efforts of the people up here. With the help of better roads, dirt digging and hauling equipment, Flin Flon is fast becoming a very well landscaped town.

—
The difference between gossip and news depends on whether you hear it or tell it.
—



Grow plants in water, its easy. A number of normally pot grown house plants will also grow in water alone. I suggest the following. An attractive combination is one of the smaller variety Chinese evergreens growing to twelve inches in height with six inch long three inch wide variegated leaves surrounded by a mass of the two to four inch green leaves of the heart-shaped philodendron. Devils' ivy can also be grown dramatically in a shallow dish over which it will quickly spread to form a handsome blanket of foliage. Silver Pothos, a close relative to Devils' ivy, with its regular shaped silver blotched leaves, the many varieties of English ivy, as well as the familiar wandering Jew will all do well in plain water.

I suggest that you use opaque containers or at least dark colored glass ones as clear vases admit so much light that they encourage the growth of green algae in the water. Change the water every month or so, occasionally adding a small amount of liquid plant food for nourishment, and a little charcoal to keep the water sweet. A pin-point flower holder or a ball of crumpled chicken wire will help anchor the roots in the container.

Contributing Authors

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H.E. HARP is retired Head Gardener and Technical Officer Ornamental Horticulture, Canada Department of Agriculture Research Station, Morden, Manitoba. He is writer and commentator on the well known Sunday morning CBC Radio program The Prairie Garden. He is also author of a very informative garden book under the same name. He is now retired, living in Victoria, British Columbia.

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Mrs. JEAN LYONS was President of the Winnipeg Horticultural Society and Director of the Manitoba Horticultural Association for a number of years. She is a proficient and enthusiastic gardener. She excels in Flower Arranging and has judged floral display in Winnipeg's horticultural shows on numerous occasions. She now resides in Edmonton, Alta.

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P.J. PETERS is Specialist in Fruit Crops, Horticultural Division, Soils and Crops Branch, Manitoba Department of Agriculture, Winnipeg, Manitoba. He is Secretary of the Manitoba Horticultural Association. His book of poems "This Land of Ours" is just off the press. GARY PLATFORD has a BSA degree in Plant Pathology from the University of Manitoba and is well advanced toward his doctorate in this field. He has recently been appointed Plant Pathologist with the Manitoba Department of Agriculture, Agriculture Services Complex, University of Manitoba, Winnipeg, Manitoba.

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JOHN WALKER formerly a Professor of Horticulture at the University of Manitoba, and Superintendent of the Forest Nursery Station at Indian Head, Saskatchewan. Latterly he was a Research Associate at the University of Manitoba. Now retired.

Dr. CHARLES WALKOF recently retired, was formerly Assistant Director of the Research Branch, Canada Department of Agriculture at Morden, Manitoba. He was also Head of the Biochemistry and Vegetable Section. He and his staff, over the years, have made significant contributions to Horticulture on the Great Plains in breeding of varieties of tomatoes, sweet corn, cucumbers, peas, as well as cultural studies on most vegetable crops.

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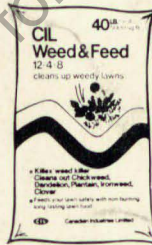
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