THE WINNIPEG FLOWER GARDEN

PRESENTED BY

The Winnipeg Horticultural Society

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THE WINNIPEG HORTICULTURAL SOCIETY

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The Society acknowledges with sincere appreciation the assistance of the following members who contributed to the articles contained herein:

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To our Members:

The Winnipeg Horticultural Society takes pleasure in bringing to you "The Winnipeg Flower Garden".

We, as a society, are very much indebted to the Committee consisting of Dr. Bruce Chown, Mr. F. C. Cave and P. H. Hammond, who have, with an infinite amount of enthusiastic labor, succeeded in producing this little booklet, which I am sure will prove of real value to our members.

At the request of the society, the various subjects have been dealt with in the most elementary manner by successful gardeners, having a special knowledge of the horticultural problems with which they have been dealing.

Our purpose in presenting the subject matter this way is to stimulate interest and to aid the amateur gardener.

If this booklet meets with a kindly reception from our members, we hope to extend the service and publish a second booklet next year containing the experiences of other Winnipeg gardeners.

Our organization desires to serve the citizens of Greater Winnipeg to the best of its ability, and constructive suggestions as to how this may be accomplished will be welcomed.

I wish you a very happy season in your garden, and lots of success.

R. W. BROWN,
President.

The Winnipeg Flower Garden

GARDEN PLANNING

Before Spring work gets under way, all gardeners should sketch a plan of their lot; draw it to scale ⅛" to the foot and put in first the fixed features in their true positions—House, Garage, Driveway and Paths. In planning your garden consider the development of the whole street. If your neighbors have run their lawns from the edge of the flower bed in front of the house down to the sidewalk, a hedge across the front of your lot will spoil the harmony of the street. The front garden should be planned to demonstrate the owner's contribution toward the general beautification of the street and city. The arrangement and display of plants and blooms should be attractive and well balanced, and the approach to the house inviting. Possibly the most important objective is to obtain a sense of spaciousness when space is limited. Usually it is well to avoid flower beds or shrubs in the lawn. Borders along walks are undesirable if the lot is small. A lawn will grow just as well in the rear as in the front of your home. Make the back garden a summer rendezvous for your family. It is generally recognized that the front and back gardens will be separated, although the idea of having them distinct and different in design and content is not so prevalent now as formerly. This change has been well illustrated in prize winning gardens of recent years in the Winnipeg area. The one blends gradually and smoothly into the other without a pronounced or contrasting break or change. The plan of your garden should be designed with a view to economy of time and effort, because the condition in which it is kept is more important than the material you plant in it.

It may be that your family want some special feature such as a Summer House, Lily Pool or a Rock Garden, and if so these are the next features to be entered on your plan. If you want a Summer House for enjoying afternoon tea outside in the summer, it should face east. If it is for the children to sleep out-of-doors on hot nights, it will have to face west so that the sun won't wake them too early in the morning. A Lily Pool is always a source of pleasure. It needs to be in full sunlight if you want waterlilies to bloom. In that case it can be placed so as to be surrounded by lawn and can be made part of a formal design—either square, oblong, or oval; or it can be banked on the north with shrubbery and can then be irregular in shape. Rock Gardening is a hobby by itself. Owing to the flatness of the ordinary city lot it seldom enters into such planning, but it can be a part of your garden pursuit if you become enthusiastic over it. Garden books and maga-

zines should be consulted before determining the type of Rock Garden best suited to your garden, taste and purse.

Next make the following entries on your plan: Foundation plantings, Screen Plantings, Border Lines and Lawn Area. The purpose of Foundation plantings is to break the ground line around the front and sides of the house. I would caution you not to plant shrubs that normally will grow too tall and which would have to be cut down to prevent their growing above the window sills. The purpose of garden planning and planting is to create a picture, and the foundation plantings are a very important feature in setting off the house to advantage. For work around the foundation of your house below the windows, the choicest shrubs are as follows.

Cotoneaster Acutifolia—which grows 4 feet tall.
Cotoneaster Integerrima—4 feet tall.
Caragana Pygmea—3½ feet tall.

Thunberg's Barberry — is a very desirable little shrub, growing up to 30 inches tall. It turns to lovely autumn tints after frost. It is somewhat tender and should be wrapped with burlap for the first winter. At the corners of the house or against the chimney stack you may want some taller shrubs. Remember, your space is limited and each planting must be calculated to add its joy to the garden. Grow only the most beautiful; the cleanest growing and the most reliable shrubs. One of the very best for Winnipeg districts, growing up to 6 feet tall, is the French Hybrid Lilac. There are many varieties of various colors.

Screen Plantings—comprise tall and dense shrubbery to screen any unsightly object such as a garage, the clothes drying yard, or a wooden fence. The following are hardy and reliable: as they are to be permanent fixtures in your ground you would be well advised to see these plants growing in the parks of Winnipeg before making a selection: Caragana Arboresens, Villosa Lilac, Josekaea Lilac, Ginnalian Maple grown as a shrub. If the back garden is dug up for vegetable growing you may want to separate the back from the front at or about in line with the back of the house. You can do this either with shrubs or with a trellis. If you use the latter it should be fronted with a flower bed.

The Border Lines you will now enter on your plan will outline the flower beds. The form these will take will depend somewhat on the development of the adjacent gardens. In some cases they start from the street line and sometimes from a point in line with the front of the house. If the border is narrow it can be run in a straight line or in curves. If you prefer curved lines the bed should become wider towards the

rear. Do not plant any shrubs in these borders until you reach a line behind the front of the house. Shrubs in the borders usually rob the soil of food and moisture, and thereby prevent a good display of flowers. A few specimens of the larger perennials and flowering bulbs like Tulips and Lilies should find a space among the shrubs and towards the back of the larger mixed borders. The medium tall growing kinds should be represented by a group of three; and the dwarf kinds by a greater number. Among the perennials, groups of suitable annuals should be placed to provide blossom when most of the perennials have passed. Beauty and interest sustained over a long period should be your objective.

There is nothing more beautiful surrounding the home than a lovely lawn. It is extremely difficult to maintain throughout an intensely hot summer, but it adds greatly to the appearance of any property. Sodded lawns are never as good as seeded lawns. Moderately good soil and drainage are necessary. Get the best seed obtainable, and once it is sown keep it damp until it is growing—which will likely be from six to twelve days, according to the weather. For your old lawn give a tonic of Ammonium Phosphate at the rate of 1 lb. for 200 square feet, as early in the spring as possible; and on bare or worn patches of lawn sow new seed early in May and cover lightly with a little sifted soil—just sufficient to cover the seed. It appears from experimentation at the University, that the trouble with dandelions can now be eliminated. Write to them for their pamphlet on Dandelion Control. You must know from your own observations, how important the lawn is to home grounds' appearance. It is not the size of the lawn so much as the condition in which it is kept which counts.

The foregoing suggestions have dealt almost exclusively with fixtures, lines and designs. There is another and distinct problem in garden planning for the home gardener, the arrangement and re-arrangement of plant materials to create new garden scenes yearly, and thereby maintain interest.

Colors and color schemes, heights and forms of flowering plants will provide endless variety. Make a practice of recording in detail demonstrations of floral beauty which you see in park beds and boulevards and the gardens of your friends. Try to reproduce them by your own effort. There is joy in accomplishment.

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THE SOIL IN RELATION TO THE PRODUCTION OF GARDEN CROPS

The growth of plants is a normal function, governed by natural laws. If conditions are favorable for growth, it is natural for living plants and seeds to grow and to complete their life cycle. The growth achieved by garden and field crops in any season, is determined by the sum of all the contributing factors. Hence the grower of plants should be familiar with the factors involved, so that he may provide the conditions which will favor the growth of the plants he wishes to produce, and so that he may modify and control as much as may be, any adverse conditions that are under the control of the grower.

Briefly, the primary or essential factors which determine plant growth may be grouped under the headings of: (1) the soil, (2) the climate, and (3) the seeds or plants. If these three factors are favorable, the resulting growth will be favorable, unless the crop is affected adversely by the secondary or modifying factors, namely, (4) weeds, (5) pests, (6) diseases.

In this discussion we can deal only very briefly with one of the three primary factors which affect plant growth, namely, the soil. In the production of plants the soil has three main functions:

(1) The soil is the medium in which seeds germinate, and in which plants develop their roots or intake system. The germination of seeds is affected by the physical condition and the moisture content of the surface soil; but the root development is affected and determined by the fertility, the physical condition, and the moisture of the soil throughout the root depth.

(2) Plants depend on the soil for their water intake, but the water which plants obtain from the soil solution must first enter the soil either as precipitation or as artificially applied water.

(3) Plants are dependent upon the soil and the soil solution for the intake of all the nutrients they require, with the exception of those that are obtained from the air.

Therefore both the physical and the chemical conditions of the soil are involved in the growth of plants.

From the physical standpoint the soil should be moist and well drained; it should be porous, but not loose or open; it should be friable, mellow, and of good structure, not waxy, cloddy or indurated.

From a chemical standpoint, the soil should contain a sufficient supply of available nutrients; it should be free from toxic substances such as excessive amounts of soluble salts; and the soil reaction should be neither too acid nor too alkaline.

In connection with the physical condition of the soil we may note that the amount and type of organic matter, the size of the soil particles, and the structure or arrangement of the particles into aggregates play an important part. One of the elementary facts that should be recognized is that soils are developed from both mineral and organic materials. The mineral portion is derived from inorganic materials deposited on the earth's surface. For example, the mineral particles may have been deposited as fine clays laid down in deep water, as coarser textured materials deposited in shallow water, as clay, silt, sand, gravel and stone deposited by glaciers, or as residual weathered material derived from rock weathering and decomposition. These mineral deposits determine the texture of the soil as "light", "medium", or "heavy". The grower may take soil material of whatever texture he desires for use in flats, pots or greenhouse soil, but the texture of the gardens or fields is out of his control. The texture has to be accepted as it exists, but the soil structure or the aggregation of particles may be modified by tillage and by the addition of organic matter.

The organic deposits in virgin soils are determined by the type of vegetation under which the soils were developed. For example, the organic matter in grassland soils is derived chiefly from the roots of the grasses and native herbaceous plants. It is intimately mixed through the upper portion of the soil, is high in amount, ranging from 10 to 12 per cent in local black earths, and so modifies to a marked degree the physical properties of the mineral materials of that soil. On the other hand the organic matter under woodland or forest vegetation is deposited on the surface of the soil in the form of leaf mat, or forest litter, and as the tree roots are perennial and woody, the woodland soils contain relatively little organic matter. Consequently the properties of the mineral materials in woodland soils are not modified by organic admixtures to the same extent as they are in the grassland soils. As a result of the difference in organic intermixture, the structure or arrangement of the soil particles into aggregates in a clay soil developed under prairie conditions is very different from that in a clay soil developed under woodland. Grassland soils tend to be granular and of good structure, but wooded soils usually have an inferior structure.

When virgin soils are broken and utilized for the production of garden crops a new set of conditions is imposed upon

such soils. The addition of organic matter to the soil by the growth of grass roots ceases, but the destruction of the organic matter by micro-organisms continues; the organic matter in the soil is gradually reduced, and the characteristic properties of the mineral portion of the soil become increasingly dominant. As the organic matter is reduced, the clay soils become more waxy, less friable and more difficult to till. However, the grassland soils with their relatively higher organic matter content will stand up under tillage much better than the wooded soils in which the organic matter is relatively low.

If the above facts are recognized, it is obvious that one of the outstanding problems in the management of the heavy garden-soils in the Winnipeg district is the problem of establishing and maintaining good physical conditions in these soils. To make the heavy clay soils, that were developed under woodland, friable and mellow, and to keep the soils that were developed under prairie in good tilth, the grower should first provide for the periodic addition of organic matter, and second, he should undertake the initial plowing or digging of the soil at a time of the year that will give the most favorable results. Organic matter may be added to the larger gardens as good, partially rotted, barnyard manure; to very small areas, and to pots or flats, as barnyard manure, rotted sods, leaf mat, well decomposed peat, or compost. The organic material added should be thoroughly incorporated with the soil.

In the tillage of the heavy clays of the Winnipeg district the tilth, friability and structure of the soil can be markedly modified by timely digging or plowing. If the clay soils are worked in the spring, when they are generally wet, they become hard and cloddy, and assume a bad structure. On the other hand, if these soils are dug or plowed in the fall, the subsequent action of wetting and drying, and freezing and thawing, will result in these soils becoming mellow, friable and finely granular. In the former case, tillage puts the soil in a bad physical condition which can only be corrected by timely rains and the slow action of climate. In the latter case, the soil will be put in a good physical condition so that a good seed bed, favorable for the germination of seeds, can be made by light surface tillage. These two fundamental facts should be recognized by the grower.

The following rules for the management of the heavy clay garden soils of the Winnipeg district are based on the application of the above facts:

(1) Good, partially rotted barnyard manure should be applied in the fall at the rate of one-half ton per 1,000 square feet. Partially rotted manure is better than fresh manure for open garden use because it contains fewer viable weed seeds. If rotted sod, leaf mold, or compost are used instead of manure they should be applied also in the fall and thoroughly incorporated.

(2) The manure should be dug or plowed-in in the fall as soon as it is applied, and the soil surface left rough to the action of the frost. The soil will dry more rapidly, and excess water will drain more quickly from the surface soil in the early spring if the surface is left loose and rough. Even if manure is not applied, the initial operation of fall digging or fall plowing should always be practiced on heavy clay soils.

(3) Spring digging or plowing should be avoided. The turning over of the wet clay in the spring causes it to run together, to become hard, and to bake when it dries, so that a lumpy, cloddy condition is the result. Digging and tramping in the early spring cause a bad physical condition which cannot be remedied until the clods are slacked by thorough wetting with rain.

(4) Clay soils should not be worked when wet, nor surface worked too early in the spring. The soil may be dry in the upper one-half inch but may be wet and greasy below this depth. Tramping at this stage causes the soil to run together and to develop an amorphous condition below the surface, so that later, root development is restricted and the soil below the surface becomes indurated or cemented.

(5) Under local conditions the land surface is flat. In some places drainage is impeded. If water tends to lie on on the surface of the garden in the spring, a ditch or drain should be dug alongside the garden, to provide the necessary drainage.

The above remarks have dealt chiefly with the soil in relation to garden crops in the Winnipeg district from the standpoint of the soil as a medium for the germination of seeds, and as a medium for root development. The relationship of the soil to plant nutrition will be dealt with in a later paper.

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FERTILIZERS FOR WINNIPEG GARDENS

The ability of garden soils to produce depends upon a favorable physical condition of the soil for the development of the plant roots, upon a sufficient supply of water, and upon the availability of nutrients. If the soil is in good physical condition, and if the moisture conditions are favorable, the question then arises: What are the fertilizer materials which the grower should provide to insure that the plants will have a sufficient supply of available nutrients?

Many amateur gardeners have the idea that each different garden crops requires some special kind of fertilizer, but the fact is that all crops require the same chemical elements, although they require them in different quantities. All plants require ten essential elements for normal development. (A few others are required by some plants in very small amounts only, and it is only in special cases that they need be considered.) The ten essential elements are easily remembered, especially if one writes down

C. HOPK'NS CaFe Mg.	Which may be read that Charlie Hopk'ns kept a CaFe that was M-ighty G-ood.

The letters in this grouping are the chemical symbols of the ten essential elements found in plants. The first three—(C) carbon, (H) hydrogen and (O) oxygen, are obtained from air and water, hence we need not worry about them, so long as the soil is moist. The remainder are obtained by the plants from the soil, and of these (Fe) iron, (Mg) magnesium, and (S) sulphur are generally present in Manitoba soils in plentiful amounts. Calcium (Ca), the oxide of which is referred to as lime, is preesnt in plentiful amounts in all soils which are not acid. This disposes of seven of the ten essential elements required by plants, and leaves only three which are usually considered in fertilizer requirements, i.e. (N) nitrogen, (P) phosphorus, and (K) potassium. One or more of these may be required.

What is the function of these three elements? — There is a little doggerel, attributed to Vivian, which runs as follows:

"There was a man in our town,
And he was wondrous wise,
He knew that if he wanted crops,
He'd have to fertilize.
It's nitrogen that makes things green,
Said this man of active brain,
And potash makes the good strong straw,
And phosphate plumps the grain."

In other words, nitrogen is responsible for leaf and stem development. It gives a dark green color to leaves. An excess of nitrogen causes rankness and softness of growth and late maturity, but on the other hand, a pale yellowish green foliage indicates a deficiency of nitrogen. Phosphorus is responsible for bloom, seed production and heavy fruiting. It hastens maturity and increases root development, general thrift and

vigor. This element is the one most likely to be deficient in local soils. Potassium is responsible for stiffness of stem, for crispness and quality in stalks, roots, tubers and fruits. This element is rarely deficient in the medium to heavy soils of Southern Manitoba.

Complete fertilizers for garden use are made by fertilizer manufacturers to include nitrogen, phosphate and potash. The proportion of these three are varied in the various trade brands to meet varied soil conditions, but in general the principles followed in making mixed fertilizers are: (1) To use a complete mixture high in phosphate where seed production or bloom is required; (2) To increase the nitrogen for crops grown for leaf and stem; and (3) To increase the potash for roots, tubers and fruit. If the latter element is not needed, fertilizer containing only nitrogen and phosphate should be used.

How may the fertilized ingredients required be provided? Fertilizer trials to ascertain which elements, if any, may be deficient in Manitoba soils have been more extensive with field crops than garden crops, but these trials indicate that phosphate gives the most general response locally. Nitrogen is needed to a less extent, except for lawns, and potash is not usually required. Potash may be used in small amounts to insure a balanced condition for crops which are large consumers of potassium, such as potatoes. It is recommended that the general mixed fertilizer for local gardens should have an approximate ratio of one part nitrogen (N), three parts phosphate (P_2O_5) and one part potash (K_2O).

In regard to the ability of soils to supply nutrients, it may be noted that nitrogen, and to a lesser extent some of the phosphate, is contained in the organic matter. A dark color in soils implies high organic matter and good total nitrogen content. The difference between total nitrogen and available nitrogen however should be noted. In the growing of plants it must be recognized, especially in northern latitudes, that the nitrogen of organic matter is not available to plants until that organic matter is decomposed by the micro-organisms in the soil. These organisms are not active as long as the ground is cold or dry. A garden soil therefore may be well supplied with organic matter, and may when the soil is warm and moist, give good growth as far as nitrogen is concerned, and yet in the early part of the season, or after a very dry fall, temporarily deficient in available nitrogen. This is especially so under lawn grass. The addition of soluble nitrogen in the early spring may therefore increase growth on fertile soils.

Phosphorus may be obtained both from the mineral portion of the soil, and also from the decomposition of the organic

matter. Some soils strongly fix phosphorus and tend to keep the available phosphorus low. This appears to be the case in local soils, and explains why a supply of available phosphate should be provided as a routine procedure at planting time. Thus, it is not only necessary to add fertilizer ingredients to soils deficient in total plant nutrients, but it is also good practice to add small quantities of nitrogen and phosphate on good soils, as an insurance against slow elaboration of these nutrients in cool seasons and in the early spring.

Potassium is less likely to be required for the local clay soils and in the drier districts. It is required more on sands in humid regions, and its application does not give, locally, the same general response that is given by phosphate and nitrogen.

Barnyard manure should be used where possible to supply organic matter for the physical improvement of soils. In addition it contains nitrogen, phosphate and potash. For local conditions these three ingredients should be in the proportion of 1-3-1; that is, phosphate should be added in larger amounts than nitrogen and potash. But barnyard manure contains approximately 10 lbs. of nitrogen, 5 pounds of phosphate, and 10 pounds of potash per ton. The relative amount of phosphate is too low, and the use of manure gives an improper balance unless it is reinforced with a phosphatic fertilizer. Another point to note about barnyard manure as a fertilizer is that the quantities of fertilizing ingredients carried are of low percentage, and moreover, the combined organic ingredients are not readily available, especially early in the season. The best practise therefore is to incorporate the manure in the fall, and then at seeding time to apply a small quantity of soluble phosphate to insure a nutritive balance.

The three carriers of soluble phosphate which may be used for this purpose are: (1) Ammonium phosphate, (2) Triple superphosphate, and (3) Superphosphate. Superphosphate contains 16 per cent available phoshate, (P_2O_5) and if used, must be aplied three times as heavily as the triple superphosphate, which contains about 43 to 44 per cent phosphate (P_2O_5). The ammonium phosphate contains 48 per cent available phosphate and 11 per cent of nitrogen (N). For use in the early spring when the ground is cold, the ammonium phosphate is the best fertilizer of these three to use locally, as a supplement to barnyard manure.

Finely ground, steamed bone meal can be used also as a carrier of phosphate to reinforce the manure, but it is slow in action. It may be used to advantage with perennial plants and in pot cultures, but, because of the more available condition of the phosphate in mineral fertilizers, the latter are to be preferred for spring sown annual crops.

It frequently happens that good, well rotted manure is not available, and the home gardener may have to depend upon commercial fertilizers to supply the required nutrients. This raises the question: "If manure has not been applied, what fertilizer should be used in local gardens?"

Our experience locally indicates that, for general garden use, excellent results can be secured with a complete fertilizer which contains nitrogen, phosphate and potash in the ratio of 1-3-1. Such a fertilizer can be made up by mixing 5 pounds of ammonium sulphate, 15 pounds of ammonium phosphate, and 5 pounds of potassium sulphate. This home mixture should be applied at the rate of 4 to 6 ounces to a 50 foot row. The ready mixed complete fertilizer sold as 9-27-9 is practically the same, and its use saves the trouble of home mixing. A 4-12-4 mixture can be used instead if desired. All these contain the desired ratio of 1-3-1, but as the 4-12-4 is a lower grade fertilizer than the 9-27-9, it would have to be applied two and one-quarter times as heavily to give equal amounts of fertilizer ingredients. The figures on the fertilizer container, such as 4-12-4, mean that the fertilizer contains 4 per cent of nitrogen (N), 12 per cent of phosphate (P_2O_5) and 4 per cent of potash (K_2O). The percentage is always expressed in this order.

In applying high grade commercial fertilizer for garden use, a few points must be carefully observed.

1. High grade fertilizer must not be put in contact with seeds. The ideal is to apply the fertilizer as a band or strip alongside the rows about three-quarters to one inch away from the seed, and from one inch below the seed to seed level. This insures that the seed is planted in fertilizer free soil, so that germination is not injured, and that the fertilizer is close enough to the plants for the roots to absorb the ingredients early in growth. Surface applications at seeding time are of little value. The fertilizer can be applied in a second furrow by hand, or it may be drilled in with a Planet junior type of seeder.

2. The quantity used must be small. Too much will be injurious. Four ounces to 50 feet of row is plenty when ammonium phosphate is used, and six to seven ounces to a 50 foot row when a 9-27-9 mixture is used. A better idea of the small amount required is obtained if it is noted that a heaping teaspoon to each 5 foot of row, or five teaspoonfuls to 25 foot of row where rows are one foot apart, applies the fertilizer at the rate of about 150 to 200 pounds per acre. Ten to twelve heaping dessertspoonfuls, or six to seven ounces to 50 feet of

row, when rows are one and a half feet apart, will distribute the fertilizer at the rate of 235 pounds per acre. For potatoes, 250 pounds per acre of 9-27-9 applied to the depth of the sets in strips on either side, and two inches from the sets, can be expected to give good results.

Lawns

Lawns require an initial dressing of phosphate or minerals in the early spring, and then repeated applications of a nitrogen fertilizer during the season. Even in fertile soils the nitrates disappear rapidly under grass, and lawns always respond to dressings of nitrogen if properly applied. In fertilizing lawns the following plan is suggested:—

First. **Initial dressing.** For the initial treatment, one may top dress with either,

(a) Steamed ground bone meal in the fall; or

(b) Ammonium phosphate or a 9-27-9 complete mixture applied the first thing in the spring at the rate of three-quarters to one pound to each 100 square feet.

Second. **Periodic application of nitrogen.**

Every three to five weeks a light dressing of nitrogen should be applied, using ammonium sulphate at the rate of one-quarter to one-half pound to each 100 square feet. Ammonium sulphate contains approximately 20 per cent nitrogen. Care must be taken that this fertilizer is not applied to the grass when it is wet, or burning of the leaves will result. The simplest method is to mix the fertilizer with finely sifted dry soil and to broadcast this mixture when the grass is dry, after which the lawn should be raked. The object of this is to get the fertilizer down to the soil, and to prevent the fertilizer adhering to the leaves.

The methods mentioned, together with the judicious use of water, will insure the plentiful supply of fertilizer ingredients for the vigorous growth of gardens and lawns in the Winnipeg district.

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SHRUBS FOR MANITOBA

He who plants a tree or shrub not only improves the appearance of his own property but gains healthful exercise for himself, sets a good example to his neighbours, and thereby creates a desire in them to improve their surroundings. The severity of our climate makes the choice of planting material rather limited, but there are upwards of fifty varieties which we have found hardy and suitable for Manitoba.

The common Lilac (Syringa vulgaris) is perhaps the most familiar of all shrubs. The most desirable kinds are the French Hybrids: Charles X, with its dark purple flowers, Madame Casimir Perier (creamy white), Madame Lemoine (white), Michael Buchner (light Lilac) Marie Legraye (white), President Grevy (light lilac), Souvenir de Louis Spath (dark purple), Charles Joly (dark red), Condoscet (pale blue); and the late blooming Hungarian Lilac (Syringa Josekaea). The Siberian Crab (Pyrus baccata) is a most attractive lawn specimen with its pinky white apple blossoms in June. It is however, subject to fire blight, but not to such an extent as to eliminate its use. When the disease is noticed the affected part should be cut off and burned immediately. This seems to be the only method of keeping it in check.

The Honeysuckle (Lonicera tatarica) is a very beautiful tall-growing shrub, producing red, pink and yellow flowers, followed in the early fall by bright berries. The Red Maple (Acer rubrum); Ginnalian Maple (Acer ginnalia); Siberian Pea (Caragana arborescens); Russian Olive (Eleagnus augustifolia), with its silvery leaves and small sweet scented flowers; the Buckthorn (Rhamus catharticus and frangula); Buffalo Berry (Sphepherdia argentea) and the Elders (Sambucus racemosa, nigra laciniata, canadensis); the Hawthorn (Crataegus coccinea); Pincherry (Prunus pennsylvanica); and High Bush Cranberry (Viburnum opulus) are equally good where height is required. The Laurel-leaf Willow (Salix latifolia) and the golden variety (vitellina aurea) lend color to the landscape and can be grown in the bush as well as the tree form. In the medium sized shrubs we have the Dogwoods (Cornus stolonifera and siberica); Sea Buckthorn (Hippophae rhamnoides); the Flowering Currants (Ribes aureum and alpinum); Nannyberry (Viburnum lantana); and Spirea (opulifolia). In the smaller size for the front of the border or for foundation planting we have the Barberries (Berberis Thunbergii and its purple leaved variety, atropurpurea); the Dwarf Siberian Pea Tree (Caragana pygmae); Cotoneasters (acutifolia and integerrima); Native Cinquefail ((Potentilla fruticosa); Hydrangeas (paniculata and aborescens); Dyer's Greenwood (Genista tictoria); Spireas (billardii, sorbifolia, pikowiensis, trichocarpa and media); the Russian Almond (Prunus nana) with its early pink blossoms before leaves appear, and Roses (Rosa rubrifolia and rubiginosa). In Winnipeg the Cedars (Thuja pyramidalis, wareana, globosa, and the golden variety, lutea) may be treated as shrubs but require winter protection. When left uncovered they are liable to be scorched on the south side by the bright early spring sun. A very light sacking or canvas is the best covering to use. This will allow the air to circulate

freely and at the same time protect the tree from the hot sun. In general, shrubs require a well drained, friable soil, and to attain this condition the ground should be deeply dug before planting. While spring is the accepted planting season, it is well to do the preparatory digging in the fall.

But do not be discouraged from planting this spring if you did not prepare the ground last fall. You can always find some old fine soil to go close about the roots. When shrubs arrive from the nursery they should be planted as soon as possible. Roots must be kept covered and moist until time of planting. When ready to plant, dig a hole slightly bigger than the root of the shrub, loosen the soil in the bottom of the hole and place the shrub in the hole so that it stands at the same or a slightly lower level than it was in the nursery. Spread the small roots out in a natural direction, intermix fine soil between the roots and tramp firmly. Add more fine soil until the hole is filled to within two inches of the top and tramp again. I would here emphasize the need of firm planting, as the roots cannot grow without the aid of the firmly packed soil. Water thoroughly, then fill in the remainder of the hole. During the summer this surface should be cultivated to conserve moisture and eliminate weeds. All shrubs and trees should be pruned when planted by shortening the long branches and shaping the plant for future development.

Most of our shrubs produce flowers on the previous year's growth and for this reason they should be pruned immediately after the flowering period. A gradual thinning of the older wood is generally all that is necessary. In the thinning process the old wood should be cut at the base, as this will allow the light to penetrate to the centre of the shrub and encourage new growth at the base. Let the lower branches hang over until touching the ground, and leave the shrub just as natural as possible. Avoid trimming and topping, as by this method much grace and beauty is lost, which rightly belong to this class of plant. A few shrubs produce their flowers on the current year's growth and require different treatment. The Hydrangea and Perpetual, and Hybrid Tea Roses are in this class. They should be pruned in the spring when all danger of frost is over. Cut out all weak stems right down to the base, leaving at most six or eight of the strongest stems. Cut the strongest stems back, leaving two healthy buds at the base of each. When buds develop, rub one out leaving one bud on each stem. It is only by this apparently drastic pruning that really good bloom can be obtained.

THE GLADIOLUS

Varieties to Grow, and How to Grow Them

The reason for the popularity of the Gladiolus among flower growers is not hard to discover, for no flower gives greater satisfaction as to duration of bloom and magnificence of appearance either in the garden or in basket or vase. Desirable varieties are those which are strong healthy growers, which produce a generous spike of bloom of good color, substance and form. Such varieties are: Picardy, Rosemarie Pfitzer, Queen Mary, Star of Bethlehem, Minuet, Irene, Mother Machree, Marmora, Golden Goddess, Mr. Cuthbertson, Wasaga, Charles Dickens, Ave Marie, Our Selection, Mrs. Malthouse, Dr. Bennett, Tip Top, Johnkeer Von Tets and many others. The Primulinus varieties with their graceful willowy stems and dainty, small, hooded blooms are especially suitable for table decoration. Some of the nicer sorts are White Butterfly, Zona, Mrs. Calvin Coolidge, Betty Co-Ed, and Orange Butterfly.

The Gladiolus grows from a bulb or corm. During its season of growth a new corm grows on top of the old one, which later shrivels up. Adhering to the new corm grow bulblets or cormels, small pea-like bodies. It is by means of these and by splitting of the new corm that Glads increase. Corms are of various sizes. The full sized are 1½ inches or more in diameter, and are referred to as No. 1's. Those below ½" are called No. 6's; the other sizes ranging in between these two extremes. It should not be expected that the smaller sized bulbs will produce a flowering spike the first year, but they will respond with a blooming sized bulb for the next year. The cormels too will, in time, give bloom identical to the parent bulb. This is the practical way of increasing any particular variety. Glads grown from seed will not come true to type. It is from seed that new varieties originate.

For most varieties the best bloom is not obtained from No. 1 but from No. 2 corm. The very large corms are inclined to split up, giving two or three second quality spikes of bloom rather than one of first quality. This is not true of Picardy or Queen Mary.

For your Glads choose a sunny location in your garden and as soon as you can work the soil, dig it over well at least a foot deep, and break it up fine. While a sandy loam is preferable, any good garden soil will do, the principle feature being that it must be rendered and maitained porous, never allowed to form a crust on the surface and become soggy underneath. If fertilizer has to be incorporated to restore im-

poverished land, well rotted manure is the most desirable, but always keep in mind that no fertilizer should be permitted to come into direct contact with the bulbs.

In the Prairie Provinces the usual time of planting is about May 15th, the essential feature being that the soil should be well worked and as warm as can be.

After preparing the ground, a trench about 8" deep is made to receive the bulbs, then into the bottom 2" of this trench finely broken up clean soil is poured and if it is desired, a good handful of bone meal for every two feet can be mixed in. On top of this about 1" of sand, and we are all ready to set the bulbs. But the bulbs are not ready as yet, they must be rendered insect free, and this is accomplished by a mercury bath. Mercuric Chloride, one of the better known poisons, is mixed in the proportion of one ounce to six gallons of water. The container must not be a metal one, but either wood, glass or earthen-ware. When thoroughly mixed, the bulbs are peeled and immersed in the bath for three hours, then removed and placed in the trench six inches apart and five inches deep, the trench is filled with soil and pressed firmly down. Small sized bulbs are planted closer together and also nearer the surface according to their size, but never closer than two inches apart nor less than three inches from the surface. The space between rows should be wide enough to permit of access for cultivation, or about eighteen inches.

After the bulbs are planted it is largely a question of thorough cultivation for a month to keep the weeds down. Unless the spring has been unusually dry watering should not be necessary, but from the time the plants approach a foot in height, they will require a thorough soaking once a week until the blooming season is over. Watering must be followed by raking the surface to keep an inch of dust mulch, so as to retain the moisture underneath as long as possible. In place of a dust mulch, gardeners are more and more resorting to mulches of peat moss, paper, straw, or manure with gratifying results. They make for more uniform growth, lessen the labor and keep the soil sweeter.

When the flower spikes begin to appear, staking must be started for a heavy spike of bloom falls an easy prey to winds and sun. Stakes should be slender and sturdy, but not unsightly. Small bamboo canes or even ½ inch iron rods, five to six feet long and shoved well into the ground between the plants are good for this purpose. Tie the plants to these stakes with raffia. Stake and tie early, as prevention is much better than cure. In cutting the spike leave at least four leaves on the plant to insure bulb growth.

As soon as the first floret opens, cut the spikes early in the morning and set them deep in cool water. If the stem is cut an inch each day and dead flowers removed, you can enjoy them for a week or even more. Glads open their bloom much better indoors than in the garden; the color is purer; it does not streak or fleck; nor do the reds fade.

The period of growth between the time the spike is cut and the bulb is dug is, from the standpoint of bulb harvest or increase, the most important of all. Cultivation should be persisted in though of a much shallower nature, barely working up more than an inch or so of soil. If fall rains are not sufficient, a good watering may be necessary occasionally.

When the frost has eventually stopped further growth, it is time to dig the bulbs. The bulbs are raised with the digging fork, and the tops at once cut off close to the bulb. These tops should be handled carefully to avoid shaking insects from them onto the bulbs, so have a container ready for the bulbs, together with their increase and carry them out of the garden as soon as may be. They should then be dried off in the air. This takes days, not hours. For this purpose have some place such as the basement, garage or shed ready to receive them, where they will be free from danger of frost, but still have a free circulation of air about them. Successful winter storing depends largely upon proper and thorough drying out. When they are quite firm and dry, the old bulb, which is still adhering to the new one should be broken off and destroyed. The new bulbs are separated, cleaned and together with their bulblets, stored away for the winter in shallow trays or paper bags. They should be stored in a place where the temperature can be kept consistently near to 40 degrees.

Going back to the garden: the old plants or tops should be gathered up and burned on the garden. This destroys all insect life they harbor. The ash makes a good fertilizer. The garden should be spaded, and well rotted manure spread over it to be washed in by the melting snow and spring rains. The garden is then ready for the winter.

Now a word about the Glad growers' arch enemy, against which we are incessantly at war, Gladiolus Thrips. These minute insects are the greatest trial that the grower has to endure. To see beautiful strong plants, which give every promise of enviable bloom, produce shrivelled-up, unsightly, half opened buds is hard to bear. If the garden has become infected with Thrips 90% or more of the spikes may so end in disaster. Fortunately this can, to a great extent, be prevented; but two lines of action are positively necessary:

1st: Plant only disease free bulbs. This is assured if they are soaked, as before described, in the mercury bath.

2nd: Spray the plants every week from the time they are six inches high until the blooming time arrives.

The seed houses advertise many sprays, all of which, if faithfully employed will prove efficacious. If you wish to mix your own, mix a level tablespoon of Paris Green with two pounds of brown sugar, and three gallons of water. This is the mixture recommended by the Entomological branch at Ottawa. While it stains or burns the foliage somewhat, still that is a small cost if it insures good bloom. It is suggested that a small quantity of hydrated lime added to the mixture will control this burning effect, without interfering with the insecticidal property of the spray.

There is one thing the Glad grower can be reasonably sure of: if he will plant good clean bulbs of good varieties, in well prepared soil, give them good cultivation, spray them faithfully, and cut them as directed, he will be able, regardless of lack of experience, to exhibit spikes of bloom as good as any displayed in any show.

The Gladiolus is essentially a cut flower and as such it is unexcelled.

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ROSES

The Rose is supreme amongst flowers. It typifies all that is charming in the flower world, yet this lovely flower is all too rarely seen in Winnipeg gardens. All gardeners in Manitoba can enjoy growing Roses in their own gardens, for, with the experience we have had, we know they can make themselves quite at home in our soils, and give us bloom from June until freeze-up. Of course you cannot grow Roses in Winnipeg, or anywhere else, just anywhere or anyhow, but give them the soil and situation and care that they require, and you will be rewarded by a wealth of beauty that surpasses all other.

Roses delight and do best in a strong, loamy soil, and prefer that this should be rather on the clayey side than on the light. They are heavy feeders and need all the plant food available in your soil. They should, therefore, never be planted near trees or hedges, as the roots from these will rob the Roses of nourishment and moisture. Further it is absolutely necessary that rose bushes be planted in the sunniest spot in your garden, where they can get free circulation of air around them. Give them the best spot in your garden and they will amply repay you. The most successful, and the only way to get the true value of any Rose, is to plant three or more of one

variety together. By so doing, you get the beauty of color and form of this particular variety. Try it and see, and I am sure you will agree with me.

Plant your rose bushes early in May, but never in wet soil. Dig a hole deep enough so that, when the bush is planted, the graft or union will be about 2 inches below the surface of the soil. And remember, when planting Roses, to **use your feet** to firm the soil; it must be packed tightly around the roots or they will not grow. I am safe in saying that more rose bushes die from improper loose planting than any other cause. Roses will not grow unless planted right, so **stamp them in** as firmly as possible.

After the bushes are planted, you must prune severely, and there must be no perhaps or experimentation about this. Thousands have done this before you for your benefit. You must cut the bushes back to not more than three or four eyes from the base of each stem. If you have had no previous experience in Rose growing, you will be hesitant about cutting the bushes back to this extent, particularly if there are nice green shoots coming out on top of the stems, but it must be done if you are to have success. You don't get blooms otherwise. Once a bush has been cut back you will be surprised how quickly it will throw strong, new shoots from its base. It is from these that you are going to get your beautiful blooms, strong, healthy and long stemmed.

Water your rose bushes freely when newly planted, and until they are well established, giving thorough soakings that will go down to the roots.

There are several classes of Roses, but the most beautiful and the most popular are the Hybrid Tea Roses. This term is used to distinguish them from the two classes of Roses from which they were originated, the Hybrid Perpetual and the Tea Rose. The word hybrid means that the Roses in this group are of cross-bred origin. The chief influence in their production came from the Tea Rose, not only the form of flowers, but the perpetual flowering habit.

In my own garden in St. James, the following varieties have been very satisfactory, and have given an abundance of bloom from June until freeze-up.

H. G. Hill & Templar: Deep scarlet, with a wonderful velvety touch, and very beautiful.

Talisman: Glorious combination of orange flushed with yellow and coppery red; a color combination you will never forget and a real gem in its setting of bronze foliage.

Madame Butterfly: A lovely salmon pink with a faint suspicion of apricot in its centre folds.

Briar Cliff: Clear rose pink, very fragrant and a good bloomer.

Premier Supreme: A deep velvety dark red. This is too good to pass by, and should be in every garden.

Johanna Hill: A fine clear yellow that holds its color well.

Ophelia & Rapture: Lovely pinks that will be a delight. Good growers, reliable bloomers.

In the foregoing I have mentioned just a few that have proven worthy in my own garden.

There is another class of Roses, called Hybrid Perpetuals. These are more hardy and vigorous than Teas or Hybrid Teas. The blooms are frequently a little larger in Hybrid Perpetuals, but we don't get the shades of color or color combinations as in the Hybrid Teas. Practically all are self-colored, red, rose pink, or white. Every gardener wishing to grow these hardy roses should use them either as specimen plants or in corners, not in beds. They are much more vigorous and strong growing than the Tybrid Teas, attaining a height of 30 to 36 inches. This class of Rose only blooms in June and July, though in a few instances an occasional bloom may show up in late summer. The best varieties to recommend to you are: Mrs. John Laing (soft pink), Hugh Dickson (deep red), Paul Neyron (rose pink), Karl Druski (white).

The most serious diseases of Roses are Milldew and Black Spot. These diseases can be prevented by beginning spraying as soon as the leaves appear and continuing to spray at least once a week throughout the growing season. Your seedsman will sell you a good fungicide. Use it early and often.

There are many other phases of this subject that I would like to enlarge upon if space were available, such as winter protection, fertilizer, growing for exhibition, all of which will be of interest to you if you become a Rose grower. I should be pleased to answer personally any questions sent to me, at 346 Truro St., St. James, relating to Rose growing.

In conclusion I hope you may start this year and plant a few rose bushes. There is no secret about growing them, and possibly some unknown fear has held you back. Let me assure you that nothing in your garden will be more appreciated than a few Roses during the coming summer.

HERBACEOUS PERENNIALS

The grouping of plants in any border is always a problem. Some have very definite likes or dislikes for soil or sun or moisture. Some grow much faster than others. Coarse varieties overshadow and oust less robust members of a planting. Some by their voracious feeding habits starve their neighbors. Thus, for example, a Heuchera or a Delphinium set alongside a Shasta Daisy will seldom flourish, because the heavily matted root system of the daisy takes up the available moisture and plant foods much more rapidly than do the finer roots of the other plants. Many of the habits, likes and dislikes of plants we can only learn by trial. You must not be afraid to take up and move a plant when it is not doing well, and you must be prepared to trim, train or dig out the more rampant plants. It is only thus that you can attain balanced and attractive plantings.

Certain plants require careful watching. Those with creeping root stems are prone to usurp the finest soil and aspect in the border, killing all in their way. Such plants are Golden Glow, Michaelmas Daisy, even the finer Nova-Angliae and Nova-Belgii varieties, Scarlet Lightning, Blanket Flower, and perennial Mallows, among many. Grow them, for they fill a very important place in the scheme of garden things, but the moment they start invading the surrounding plants and getting out of hand, dig around them, heading them back.

The following sorts too are inclined to be rampant and might be avoided in the smaller garden; Linaria macedonia and dalmatica, which seed and stool badly and any of the Golden Garden Marguerites, which, though pretty, seed and run about to fill all adjourning ground surfaces.

On the other hand, plants which have deep, parsnip-like roots with but few hair feeding roots, such as Baby's Breath and Oriental Poppy, may be set with other finer varieties without starving the smaller plants.

The following are but a few of the lesser known sun-loving perennials worthy of a place in the scheme of garden things. Heleniums, in variety, give the bronzes, golds, and browns which are so desirable in the fall garden. They come into flower in August and continue until freeze-up, the individual blossoms lasting about a month.

Rudbeckias in named varieties are quite different to the Golden Glow of our gardens of today. They extend not only the color range to pinks, mauves, violets and purples, but come into flower in early August. They are of intermediate height.

The Day Lilies have received considerable attention by plant breeders during late years and they are now available in a long range of colors, scents and heights with blooming periods from June until freeze-up.

The perennial Phloxes are without a doubt the most alluring members of the perennial garden. Coming in early in July, and continuing until freeze-up, they provide a display of bloom that the lordly delphinium cannot emulate. They require a deep, well drained, porous soil, sunlight and a plentiful supply of water. Given these they will make of your garden a floral paradise. The varieties, Daily Mail, Daily Sketch, Lord Lambourne, Smiles and Paladin are among the outstandingly beautiful.

The perennial Asters are fast coming into popular favor. They do require an open fall for the development of the blossoms, but some of the early flowering varieties of the Amellus type come into flower in July and continue until freeze-up. They are not absolutely hardy but, given protection, they will come through as they did last winter for the writer. They are distinctly beautiful, of rather short habit, 1½ ft., bearing enormous heads of single aster-like blossoms. The earlier varieties of the Nova-Angliae and Nova-Belgii types come into flower in September. They differ greatly from the perennial asters of a few years ago. The colors are deep and rich and the blossoms large and semi-double with great heads of bloom covering 3 foot plants.

The various campanulas are worthy of greater attention from all who aspire to a beautiful perennial planting. The colors available are limited, white to purple through mauve and blue being the range, but what they lack in color variety they more than make up in beauty of form and freedom of flower production. Scabiosa caucasica is a lovely, sweet-tempered thing of softest blue with a long flowering season.

It is not possible to develop a perennial planting that will prove a source of interest and beauty from early spring to late fall. In large borders certain definite sections may be developed as points of focal interest for the respective seasons, but to have the whole of continuous interest it is necessary to resort to the use of annuals and bulbous materials. Tulips and daffodils may be used to advantage for early bloom. Lilies such as regale, auratum, tigrinum and so on may be used to brighten the planting during the summer months. Gladioli may be similarly used, though they are not essentially decorative garden subjects.

The everlasting problem of the home gardener is to get plants which will grow in the shade. There is shade af various

kinds: shade from a house or fence which leaves all cold at the base, shade of overhanging trees which varies from a pleasant casting of shadows to a wet, moss-grown darkness, and shade from overhanging shrubbery and hedges. The shade of the house or fence may be quite readily taken care of with Lily of the Valley, Ferns, Bleeding Hearts, Sweet Williams, and various other similar plants if it is not too cold.

The light shade of trees is often a delightful location in which to raise such things as Primulas, Columbines, Bleeding Hearts, Lilies, Ferns, certain Campanulas, Daffodils, Trollius, Virginian Blue-Bells, herbaceous Spireas and Deutzias. Incarvillea, a most beautiful subject, will also flourish in partial shade when the soil is deep, cool, moist and porous. It is not absolutely hardy so is best wintered in the cellar.

The wet, moss-grown shade is rather a problem. It is difficult to get other than a ground cover with Lysimachia, Polygonium and the like, although flowering plants may be made to grow by deep digging of the soil and working in supplies of plant foods. The plants may not be long lived. Primulas, Solomon Seal, Ladyslippers, Ferns, etc., will help to brighten these areas.

Alongside a shrubbery or hedge the border is invariably chock-full of feeding roots from the shrubs, with the result that the perennials are starved out. A fence of tin below the ground will prove effective in shutting out the adventitious roots. The varieties of plants which you then may grow are quite extensive.

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ANNUAL FLOWERS

To that group of plants known as annuals, we on the Prairies look for the brilliant colored flowers to brighten our Summer gardens. Within this group can be found kinds and varieties to suit almost every need; sorts suited for the formal flower bed, the ribbon border, window and veranda boxes, and for cut flower purposes. Regardless of the size of the garden, or the scope of our endeavours, we will find material suitable for any purpose.

Some of the kinds need exacting care under greenhouse conditions for their early stages. The tiny seeded kinds like Petunia, Lobelia, Begonia, Ageratum and Nemesia contain such a small reserve of food, that moisture and growing conditions must be under one's control. Others need too long a season to advantageously develop their bloom from outside sowings, so we lengthen the season at our disposal by starting

early indoors. Salvia, Pansy, Verbena and Snapdragon are examples that need this long season. We have a third group of annuals, and within this group are those needing the least exacting care, those whose seed can be sown where they are to grow and bloom. A very well known one is the Zinnia, others are Phlox drummondii, Rose Mallow, Candytuft, Clarkia, California Poppy, Larkspur, Nasturtium and the Scarlet Flax.

It is important when making up the flower seed order that the above facts be fully understood. At the time of writing this, February 25th, most of us already have our Verbena, Pansy and Lobelia seed underway. In ten days or two weeks time those varieties that are the backbone of our annual gardens will need to be started. I refer to the Petunias, Snapdragons and Stocks. Later on the African and French Marigolds, Nemesia, Balsam and Tagetes will be sown. Season of sowing is therefore important.

In selecting our varieties we should consider their use and effect. Very few of those most suitable for cut flower purposes make good bedding annuals. If cut flowers for the house are required we would include Scabiosa, Tall Larkspur, Annual Carnations, Sweet Sultans, Cornflowers or Bachelor Buttons and Salpiglossis. We would need to locate these in our gardens where the wind would not unmercifully whip them to pieces. If the garden effect is our chief concern mass color effects, color blending and contrasts tax our imagination to the 9th degree.

Hours can be spent conjuring in our minds probable effects from the use of various varieties and colors: their reaction to the heat of summer, their moisture needs, the season of bloom, the happy combinations of colors we have seen elsewhere that we would like to see in our own gardens. In view of the near approaching Spring, and the necessity of getting some seeds sown, the home gardener must need make plans. Seeds, if not already purchased, should be obtained quickly, and sown according to their needs. The seed order goes hand in hand with the summer garden plans, hence get both underway and save disappointment. Due to this being Coronation Year, Red, White and Blue, or Purple and Gold, are in the minds of many of us. A flower bed or border, or even window box, gives us an opportunity to take part in the crowning of our King.

In deciding what kinds of flowers to grow we should first consider the location they must occupy. Flower beds that surround the foundation of our homes and face South and West fully open to the sun should be planted with such kinds as Petunia, Verbena, Zinnias or Salvia; kinds that delight in intense heat. Snapdragons and Stocks prefer cooler conditions,

therefore an open Eastern and Northern aspect can be planted with such varieties. If the soil is sandy or of poor fertility Nasturtiums once established make a glorious show of bloom. If our garden is shaded with trees or other buildings Clarkia, Nicotiana, Pansy and Godetia will thrive.

In conclusion, study your garden location and conditions, the varieties of annuals best suited to your conditions, select from these the ones you prefer, acquaint yourself with their culture, and so be prepared when Spring arrives.

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SWEET PEAS

Plans

Early fall is the best time to make your plans for the growing of Sweet Peas the following year. Select a sunny site, sheltered if possible from the prevailing winds.

Preparation of Soil

Rows 25 feet long are recommended, which should be prepared as follows: Place a garden line down the centre; dig out the soil one spade wide and one spade deep on each side of the garden line. This should give you a trench about 18 inches wide and 12 inches deep. Place in this trench a 2-inch layer of good farmyard manure and 5 lbs. of bonemeal, spread evenly. With the fork or spade thoroughly mix this into the next spade-depth or spit of the trench. Tread or firm the bottom spit thoroughly. This is important. It cannot be overemphasized that Sweet Peas **must** have firm ground to grow in. Now replace the top spit of soil, adding a generous dressing of wood ashes. This supplies potash to the soil and makes for finer blooms. A light dressing of a commercial fertilizer may also be added, taking care to mix thoroughly when replacing the top spit of soil. Again tread down or firm the soil. If you are planning to grow more than one row, allow 4 to 5 feet between rows, so that you can with comfort, do the necessary work later on.

Staking

Some people use brush, but I find it more convenient to use 6 foot chicken wire, in the following way: Use 3 pieces of 2′ by 2′, 8 feet in length, one at each end and one in the centre of a 25 foot row. Brace the two end pieces to the outside, and the centre one on both sides. Screw three small hooks into each post, on the corresponding sides, placing one at the top, one in the centre, and one at ground level of each 2 by 2. Place

the 2 by 2 two feet in the ground, leaving 6 feet for the wire. Secure this to the hooks as tightly as possible. This will provide adequate support for the vines of the Sweet Peas.

The Cordon System

Growing Sweet Peas by this system is, briefly, restricting of number of haulms or vines to each plant. This means pinching out side growths at the ground level and in the axils of the leaves, as they appear during the growing season. Some varieties are more robust than others, but from experience, I find two haulms or vines per plant is enough on the Prairies. Most exhibitors grow their Sweet Peas in this manner, and the writer makes a plea to all to give your peas a better chance to do better for you.

Seed

In buying your seed, obtain good sound seed, which is usually graded, from Sweet Peas specialists of national or international repute. Most varieties are dark-seeded, that is they have a dark or black outer skin. It is recommended to chip all such varieties, removing a small piece of the skin with a pen-knife or small file. In doing this, be sure to chip on the side opposite to the eye. The eye can be easily distinguished as it is much lighter in colour than the rest of the skin. The main advantage of chipping is that it gives a higher and more uniform germination.

Seed-Sowing and Transplanting, Etc.

It is fast becoming an accepted practice to transplant Sweet Peas. They transplant readily, just as easily, in fact, as other bedding-out plants we use in our flower-gardens. The following practice I have used with every success. The ordinary dried-fruit boxes are ideal for the purpose, the size being 14 inches long, 8 inches wide, and 6 inches deep. Put in the usual drainage first. Make a compost by mixing 4 parts rotted sod, 2 parts leaf mould and 1 part sand. Put this through the seive, then fill your boxes and firm to about 1 inch from the top. Divide into 6 rows, sow 6 peas in each row, fill with soil and firm. Water and place in a cool place with a temperature about 50 degrees. In a week or ten days the Peas should be through the ground, and in two weeks will have grown 4 inches tall. At this height, or when 2 pair of true leafs have formed, pinch out the top or growing point, so as to encourage strong side growths, two of which will be the haulms or vines for future use. Grow along in a cold frame, well ventilated. Transplant out into their permanent place about May 24th. Allow at least 6 inches between plants, firm and water in. As growth continues keep all side growth pinched out, both at the ground level and in the axils of the leaves.

If it is necessary to water during the growing season, do it well and cultivate with a dutch hoe the following day.

It is not necessary to have a greenhouse to bring Sweet Peas along, according to the foregoing details, as Sweet Peas sown on or about April 1st will commence to bloom about July 1st to 15th. The flower stems are generally about 12 inches to 16 inches long with 4 well-placed blooms on each stem.

Before presenting varieties, may I make a plea to all, to give your Sweet Peas more space. The common fault with many is to crowd them like sardines, which are naturally small.

Varieties Generally Grown

White—Gigantic; White Heather; Model.
Cream—Yellow Tip; Colwood; What Joy.
Pink—Pink Frills; Pinkie; Pink Gem.
Cream Pink—Robustum; Patricia Unwin; Magnet.
Scarlet or Red—Welcome; Startler.
Crimson—Red Boy; Rubicund.
Blue—Blue-Bell; Lady Lilford.
Lavender—Highlander; Powerscourt.
Mauve—Chieftain; Satin Mauve.
Purple—Purple King; Purple Monarch
Picottee—Youth; Gloria; Lady Gay.
Flushes—Silver Jubilee; Superfine; Mrs. H. Wright.
Maroon—Loch Lomond; Warrior.
Stripe or Fancy—Pierrot; Fantasy; Columbine.

Varieties of salmon or orange are not sunproof, and need shading. If, however, you wish to grow them, use one haulm or vine only.

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ROCK GARDENING

The purpose of a Rock Garden is to provide a suitable medium and an attractive setting for beautiful, diminutive plants that would be lost or impossible of cultivation in a general, perennial border. Alpine enthusiasts would limit the flowers of the Rock Garden to those which originate in the mountains, but for myself I am glad to admit on grounds of equality those from the highest peaks and those from the

lowest bogs. Their suitability does not depend upon their geographical origin, but upon a certain fineness of character, a daintiness, a youthfulness of spirit and a gaiety of bloom.

Rock Gardening here in Winnipeg is still in its early infancy. With rare exceptions you cannot see beautifully built or beautifully planted Rock Gardens here. You can see many ugly ones. The usual method for these is to make a slightly raised mound of mud and stick into the top of it anything from ten to a hundred chunks of raw building-stone. The result is a sore thumb, not a Rock Garden. In the well planned Rock Garden the rocks are few, deep laid, and rise gently from the ground. They look like a natural outcropping of an underlying limestone stratum, look as though they had been brought to the surface twenty-five thousand years ago and there had lain, weathering, ever since. I have never built a beautiful Rock Garden, but I have seen them. And a beautiful Rock Garden is beautiful. You don't have to pretend it is, or to confuse the rare and the unusual with the beautiful.

Our greatest difficulty in Winnipeg has been to know what we can grow. I can tell you a few things that I have grown or seen growing here but the great mass of possible plant material that can be grown is still for the future to learn. That is one place you can help. You can try out new things and let the Winnipeg Horticultural Society know of your successes and of your failures. They will make that information available to you and your fellow citizens and slowly new beauties will grow among us. There are three books that will help you with your Rock Gardening. The first is Clarence Elliott's "Rock Garden Plants". Elliott has collected and grown Alpine plants for the past twenty-five years. In his book he writes about the several thousand varieties that have given him pleasure, and omits the several thousand others that have bored him. From his book then you can choose the beautiful. But of course Elliott writes of English gardens, and what will grow in England won't necessarily grow here. So the next book I recommend to you is Henry Correvon's "Rock Garden and Alpine Plants". Correvon is a Swiss. He has developed new ideas in growing Alpine plants which will probably prove more valuable to us in Winnipeg than are the English methods. These he describes in his book and also gives an even longer, but much less critical, list of plant material than does Elliott. The last book is B. H. B Symons-Jeune's "Natural Rock Gardening". There is a copy of this in the Carnegie Library on William Avenue. It deals with the use of rocks in the garden and, if the grandeur of some of his ideas does not frighten you, will lead you to the best and most satisfying way of building, but not growing your garden.

You cannot grow Alpine plants in Red River clay. If you are going to have a Rock Garden you must be prepared to have deep beds of special mixtures. It has been the refusal to accept this fact that has held back Rock Gardening here in Winnipeg. The necessity for special mixtures is true the world over, but for a beginning a single mixture will do. In the one bed which I am going to describe you can grow many lovely Alpines, but when the disease is upon you, and you want to have whole gardens of primulas or gentians or to make happy some gay new immigrant from the Himalayas or the Andes, you will dig great pits lined with concrete, with hidden rivers underneath and artificial mountain mists above. But those are for the future. Let your first Rock Garden, like the plants in it, be diminutive, say about four by five feet. If possible choose a northern slope, even a very gentle one, and a spot where a distant tree casts a light shade at noon. Dig out the ground two feet deep. Slope the bottom towards one end and dig a sump hole here another spade deep. Fill the sump hole with stones, and put six inches of very coarse river gravel in the bottom of the garden. Now set in the rocks that are to show above the surface. Two large ones are enough for this little garden and let those be weathered, flat-topped, grey, limestone. Arrange them so that, when the bed is filled, they will show upon the surface as a long, flat, cloven wedge, slanting away into the ground to the south and west. This will give you some cooler places on the north and east. At least two thirds of these stones should be buried and they should be set on stone so they will be firm. The upper edge of the base of the wedge should be not more than ten inches to a foot above ground level. Next put in six inches of sphagnum moss. I have used the crude, unshredded and untreated moss that is sent into the City for insulating houses. One, or possibly two bales will be enough. Then fill the bed with a mixture of washed crushed limestone, as used for walks, 1 part; leaf mould, 1 part; coarse river sand, 1 part; shredded or granulated peat, 1 part; garden loam, 1 part. Water this thoroughly, especially between the two big rocks, so no air spaces will be left and so the moss below will have a good reservoir of water. Finish off the top with an inch or less of river pebbles and small stone fragments. Once the bed is planted do not water from above but let the hose run gently in at an upper corner and let the water so supplied seep up from below. You now have a bed upon which no water will lie, which is cool and moist and yet cannot become stagnant. In it your Rock Plants will be happy. Now you are in a position to start planting your garden and choosing among the thousand and one treasures that may be grown there. Your choice must be your own.

There is appended a short list for a beginning but I hope that you will go far beyond its bounds.

There are a few other points about Rock Gardens and Rock Gardening that are important but are secondary to the main business of getting that first garden started. The first of these is the idea that lies behind your use of stone. Stone, that is stone protruding above the surface, is not really necessary at all for most Rock Garden plants. The stones are put in to add to the beauty of the garden picture. It is a good general principle that the simpler your use of stone the more effective it will be. The prettiest small rock garden I have seen was right here in Winnipeg. The gardener in this case had gone out to near Stonewall or Stoney Mountain, found a natural small outcropping of limestone, marked the relationship of stone to stone, photographed it, moved it to his garden and set it up again just as it had been in nature. It made a perfect setting for his Alpine flowers. It was a peaceful garden. This is natural rock gardening. In sharp and unhappy contrast to this is what one might call artificial mountain gardening. In this an attempt is made to imitate mountain peaks and valleys, screes and moraines, in miniature. The result is nearly always bad, very bad. The "mountains" know they're just pretending and look silly. The flowers, even the tiniest are out of proportion and snub the "mountains". The result is discord. I beseech you: Don't build imitation mountains. They're as bad as the "sore thumb" gardens.

Another point is about a rock garden's complexion. It is very prone to be pimply, one pink sticking up here, one campanula sticking up there, one this, one that. You must plant in groups sufficiently large to give some body to each kind of plant. And if you're careful in your selection and don't plant rampant growers you will do better to place the groups close together. Some kinds, such as gentians and some anemones, **must** have company for their roots if they are to do well. A very good facial for your Rock Garden is the use of very dwarf spreading plants as a ground cover. This binds your plants together, makes a pleasant background and not only shows the others off but actually helps many of them to grow. Clarence Elliott has developed this idea for use in larger rock gardens, calling it the alpine lawn. It is most effective.

And now you have built your little Rock Garden I must leave you. I hope you see it as I do. It lies in lightly dappled shade. Two old grey rocks, weather worn and deeply pitted rise gently side by side from a thick piled carpet, a carpet of green, from brilliant emerald to soft grey. From between and half covering them grows a little bush, a foot high and half as much again across,—a Daphne. It is covered with bright pink blossoms. It perfumes the whole garden. Minute flowers of mauve and of white are dusted over the green carpet, while up through it thrust diminutive pinks and blue bells, anemones and gentians, and blue eyed grasses. The tiny rose-pink bells of the twin flower creep across the open gravel beneath fairy parasols of alpine poppies. Do you catch the melody? The small rock garden is a garden of the diminutive but gay. It isn't garish. It doesn't try to pretend it's the Rocky Mountains. It is just a group of gay little flowers that have settled down to live forever around an old rock.

Rock Garden Plants

I. HARDY AND WORTH GROWING. Numbers—height in inches; P—pink, R—rose, W—white, B—blue, V—violet, Pu—purple, M—Mauve, C—cerise, Y—yellow.

Androsace Sarmentosa, 2, P; Chamaejasme, 2, W; Villosa, 3, W; Anemone Montana, 6, Pu; Aquilegia Coerulea, 16, B; Glandulosa, 18, B; Arabis Albida, 6, W; Armeria Caespitosa, 2, P;Asperula Suberosa, 4, P; Aster Alpinus, 6, M; Calamintha Alpina, 5, V; Campanula Caespitosa, 3, B; Pulla, 3, B; Raddeana, 9, V; Stevenii, 12, B; Carpatica, 12, B; Dianthus Alpinus, 3, P; Brevicaulis, 4, P; Neglectus, 3, P; Deltoides, 6, C; Dryas Octopetala, 4, W; Gentiana Acaulis, 2, B; Verna, 3, B; Lagodechiana, 3, B; Farreri, 4, B; Macauleyi, 4, B; Geranium Farreri, 3, P; Sanguineum Lancastriense, 6, P; Gypsophila Repens, 4, W; Iris Arenaria, 6, Y; Pumila, 8, Pu; Lewisia Howellii, 8, P; Myosotis Alpestris, 6, B; Rupicola, 6, B; Papaver Alpinu, 5, Y, (Broadcast seed); Phlox Amoena, 6, P; Divarticata, 10, B; Douglasii, 4, M; Subulata, 3, W to P; Primula Cortusoides, 10, C; Farinosa, 4, P; Auricula, 4, Y; Saxifraga Aizöon, 4, W; Burseriana, 6, R; Cochlearis, 4, W; Sedum Ewersii, 6, R; Silene Acaulis, 1, R; Veronica Incana, 12, M; Viola Missouriensis, 6, V.

II. CARPETERS. Arenaria Balearica, 1, W; Antennaria Dioica, 2, P; Mentha Requienii, 1, M; Lotus Corniculatus, 2, Y; Thymus Serpyllum, in variety; Micans.

III. SHRUBLETS, EVERGREEN. Daphne Cneorum, 12, P; Helianthemum Alpestre, 10, Y; Rubens, 10, Apricot.

IV. NATIVES. Dodecatheon Media, 12, P and Y; Hepatica Trilola, 5, V; Houstonia Coerulea, 4, B; Lithospremum Canescens, 10, Y; Linnea Borealis, 2", P; Moneses Uniflora, 4, W; Parnassia Caroliniana, 10, W; Polygala Paucifolia, 3, M; Pyrola Americana, 6, P; Sisrynchium Angustifolium, 8, Pu; Viola Pedatifolia, 5, V.

V. DON'T GROW THESE IN SMALL GARDENS. All Alyssums, Cerastiums, Erigerons, Inulas, Sedums, except, perhaps, Sedum Ewersii.

PEONIES

The Peony takes first place amongst herbaceous perennials for prairie gardens. It is the hardiest of all and it attains its maximum in our soil and climate. It delights in the long winter rest period, and with proper culture the bloom will equal the best grown anywhere. It fills a particular need in our western gardens, because there are only a few shrubs that can be depended on to grow to a height of approximately 30 inches.

Peonies should be planted in the fall, preferably during the month of October, but anytime after September 15th to freeze-up will do.

The ideal root to plant is a division of a root which has been grown one year in the nursery. Large clumps if moved, will only give leaves and will not bloom. They are never satisfactory. The Nurseries sell divisions with three to five eyes. Each eye will produce a leaf stem the following year.

The minimum space required by a peony three years old or older is 3 feet square; 4 feet square is better. It will be two to four years before it produces any quantity of bloom, but once blooming is established it will, with good culture, continue for years. There are peonies growing in and around Winnipeg that have remained 15 years in one place and are still blooming well. You will therefore see that, if you go to some extra trouble in planting a peony, it will pay you in the long run. Once a peony is planted it should be looked upon as a permanency.

The ground should be dug at least 2 feet deep. If at all possible this should be done some time before you are intending to plant in order that the ground may settle before planting. It is well to incorporate in the soil 20% Leaf Mould, approximately 1 lb. of Bone Meal, and, if you have it, 10 to 15% Sand. It is unwise to use barnyard manure in the peony beds. If used at all it must at least 12 inches below the surface. The roots should be set with the eyes 4 inches below the normal level of the soil. Bear this in mind, it is very important indeed. If the plant sinks in the soil much below 4 inches, you will get an abundance of leaves but no bloom. If, when the soil settles, the plant is too near the surface, it will be damaged either by frost in the winter, or by growth starting too early in the spring.

Be sure to plant only strong plants with clean roots. There is a disease called Nematode or Root Gall. On the large roots it looks like a succession of swollen joints, and on the fine roots like little ball-like adhesions. No such roots should be planted. There is another disease which most unfortunately seems to be becoming more prevalent, and that is a form of

Crown Rot. This shows in the stems of the plants as brown patches.

Peonies bloom in Winnipeg district from June 25th to July 10th. When the buds appear there will usually be a centre bud and from two to five smaller buds on the one stem. When they are about the size of peas, pinch out with thumb and finger, all but the centre bud. When you cut your peony remember that you must leave at least two leaves on the stalk, as these will help the plant to develop for the following year. Don't break off the stem, but cut on the slant with a sharp knife. It is better to cut the bloom in the early morning just before the bloom fully opens, when the bud is about 3 to 4 inches in diameter, and it will open perfectly in water in the house in a few hours.

There are hundreds of varieties of peonies, most of which will do well. To the writer's knowledge over 200 varieties have been grown in Winnipeg and district. All of the highly rated varieties have been, and are being grown here. There are many peonies that have a most exquisite perfume, and unless a peony is quite outstanding in form and beauty, it should not be planted if it lacks perfume. Any of the following will grow well and are sure to please.

White

Avalance—8.7, also known under the name of Albatre. A white of fine quality, and fragrant.

Festiva Maxima—9.3. One of the really old varieties, originated in 1851. Enormous blooms, white flecked with red in the centre, and fragrant.

Baroness Schroeder—9.0. White, sometimes tinted blush, not so large, but of fine form, sweetly fragrant, good foliage and stem. A delightful variety.

Madame de Vernville—7.9. White of medium size, strong rose fragrance, very reliable.

Pink

Sarah Bernhardt—9.0. This is the one outstanding pink Peony; slightly fragrant, lovely in form and color.

Mons. Jules Elie—9.2. An enormous incurved variety, but, as it is one of the earliest, the buds are likely to be frozen unless grown in town in a somewhat sheltered position.

Edulis Superba—7.6. An old salmon-pink variety that is

a dependable grower, a sure bloomer, and has strong fragrance. It has not the form or quality of Sarah Bernhardt.

Red

Karl Rosenfeld—8.8. Deep red, good grower and reliable; not of the same quality as the whites or pinks. It is not fragrant.

Mons. Martin Cahuzac—8.8. Very dark blackish red; favoured by some for its color; not fragrant.

Grover Cleveland—8.2. Bright crimson, strong grower, clean and reliable, not fragrant.

I find it necessary to recommend to you another red which has not been fully tested in this country. The name is Philip Rivoire—9.2. It is not large in size, and is rather a flat bloom; a deep purplish red with the delicious fragrance of a dark red rose. Up to the present time it has not appeared to be a robust grower, but the color and the fragrance make it altogether superior to the aforementioned red varieties.

The American Peony Society a number of years ago, undertook the rating of all peonies. The maximum points were 10, and no peony has yet been awarded full marks. After the foregoing peonies you will notice numbers. These indicate the rating awarded these varieties by the Society, and is a fair indication of their value. Many people, in planting peonies, however, want the best, not necessarily by rating. We therefore add a word of caution.

Le Cygne—9.9. It is a very charming, milk-white peony with a delightful fragrance, but is too early for Manitoba. Unless protected the buds will freeze and there will not be any bloom.

Kelway's Glorious—9.9. Beautiful white, delightful fragrance. It is very slow to develop so that our experience is, as yet, insufficient to recommend it. It will probably be satisfactory as it is not too early.

Therese—9.8. Is a perfectly wonderful pink peony; huge in size; beautiful in color, sweetly fragrant. This variety is too early for Manitoba and therefore bloom cannot be depended upon.

Solange—9.7. This is creamy white with Havana brown at the base of the petals lighting up the flower. For form and quality of petal this is the most superb Peony of all. It has been grown extensively in this country but has very seldom given satisfaction because it blooms so late that the intense sun of early July seems to prevent the buds from normal development. If you are a collector of peonies you will, of course, buy this one, and be satisfied with good bloom every third or fourth year. It has no fragrance.

Tourangelle—9.4. For daintiness of flesh colouring, this is exquisite. It, however, is a weak grower.

It will be noted that no mention has been made of the different types of peonies. There are eight types: single, semi-double, Japanese (single), anemone, crown, bomb, semi-rose and rose. The first four don't thrive well in such a dry or intense climate as ours. They are better suited to more moderate climates. The crown and bomb types are all right, but have not the lasting quality that the semi-rose and rose types have. Our best Peonies, without exception, are in the last two classes. Some of the varieties mentioned however, are in the crown and bomb. Edulis Superba is a crown type, having quite large outside or guard petals, and a ring or collar of short petals, with wider petals in the centre. Madame de Vernville and Mons. Jules Elie are bomb types.

If I were planting three peonies this fall they would be Avalanche, Sarah Bernhardt, Philip Rivoire.

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GROWING BULBS FOR WINTER BLOOM

The purpose of this rather brief article is to give those essentials which will ensure success. There are a few points to take special note of, and if these are carefully followed you are bound to succeed. This article is not intended to cover the whole subject, or to recommend a great many varieties. The varieties mentioned herein are comparatively inexpensive, and will, without a question of a doubt, produce very lovely blooms. Once you have gained sufficient experience growing these varieties, you can then indulge your fancy for more extensive growing.

The bulbs must be of high quality. Get the best and largest bulbs even though you have to reduce the number. Large, mature, firm, heavy bulbs are the only ones that an amateur grower should bother with. For greenhouse work smaller sizes would probably be satisfactory. The larger the bulbs the better the blooms.

For your first year be content with the following kinds. They are mentioned in the order in which they will bloom:

Narcissus Polyanthus or Paper White Narcissi: Place bulbs close together in a flower pot. The bulbs can be almost touching. These can be grown in water and stones with good results. Coolness produces sturdy growth.

Hyacinths: White: L'Innocence; Pink: Lady Derby or Moreno; Blue: Grand Maitre or King of the Blues. They can be grown in shallow pots but do better in regular flower pots. Be sure that you put only the same variety in the one pot, as they may differ slightly in their development.

Daffodils: There is nothing better than King Alfred. If you want to try other sorts, grow Van Waveren's Giant, and, for a third, Golden Spur. Double Daffodils, grow only double Von Sion. These should be put in the ordinary flower pots, not shallow pots. The size of the pot will depend on the number of bulbs you want to grow in one container. The bulbs can be put close together.

Poetaz Narcissi: This type is unquestionably going to give you a thrill. They will look like a failure until they come out, because the flower stem comes ahead of the leaves. They throw a cluster of blooms like an enlarged paper white, are much more decorative, and very dependable. Laurens Koster, white with a small yellow eye, must be your first choice. Second, Admiration, pale yellow with the cup edged scarlet.

Double Tulips: These early flowering tulips are the only kind to grow inside. The Darwin tulips grow much too tall for house culture. Tulips will last six to nine days in the house, and as they come last of all, and some are sweetly perfumed, they are sure to please. The best is Mr. Van der Hoef, pure buttercup yellow; second, Tea Rose; third, Couronne d'Or.

Grow Daffodils, Poetaz Narcissi and Hyacinths in ordinary flower pots. Grow the tulips in shallow pots.

These bulbs can be planted any time in the fall — late September, October, or early November.

Now, as to soil. A fibrous soil is needed, and it is a good plan to put some leaf mould in the soil, possibly 25% in measure, also 15% sand. In planting the bulbs see that a quarter of the bulb is left exposed. Do not push the bulbs down into the pot, but place your bulbs and then pack the soil around them, otherwise, when the roots start to come you will find that your bulbs push up out of place because the soil underneath them has been firmed too much.

To water, be sure to stand them in a container and let the water soak up—don't water them from the top. If water gets

in between the leaves it will damage Hyacinth bloom. Keep the soil moist.

Now we come to the one cause of failure, and the essential for success, and that is the necessity of storage after planting, in a cool part of the basement without light. If necessary put a box over the pots to keep out the light. The purpose of the storage is to cause root development before the leaves start to grow. The ideal temperature would be around 40 degrees. Keep as near to that as you can.

Store Paper Whites, if planted in soil, for three to four weeks; Hyacinths, not less than 10 weeks; Daffodils, 12 weeks; Tulips, not less than 16 weeks. These times can all be extended if the plants haven't developed sufficiently. Hyacinths should be 3 inches tall before being brought out; Tulips 3 inches; Daffodils and Narcissi 4 inches or more. From this cold storage and darkness, do not bring the pots upstairs into a 70 degree temperature. Set them out in the basement where they will get light and a temperature of about 55 to 60 degrees. Keep them there for 7 to 14 days; longer, if the leaves are not a good green color. After that time they can be brought up into the house where they will develop properly, and you can look for as fine or finer bloom than can be obtained in the Florist Shops.

Believing that the nurserymen of Manitoba are contributing to the advancement of horticulture and as an aid to our members the Society takes pleasure in listing the following Manitoba growers of trees and shrubs:

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