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EC1273 Chrysanthemum Culture in Nebraska

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CHRYSANTHEMUM CULTURE IN NEBRASKA

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Chrysanthemum Culture In Nebraska

by Glenn Viehmeyer and
Wayne C. Whitney 1/

The chrysanthemum came to the Great Plains section of the United States with, or soon after, the first settlers, and has been grown in the gardens of the region since that time.

Coming from the lower altitudes and generally milder climate of the East, most of these earlier chrysanthemum varieties proved poorly adapted to the more rigorous climate of the West. The flower, as grown in grandmother's garden, was something of a disappointment, and rarely bloomed without protection from early fall frost. During the past twenty-five years, however, varieties adapted to the more severe climate of the Great Plains States have been developed.

The work of producing varieties adapted to the climatic conditions of the area is only beginning, and much remains to be done. Even so, enough new, suitable varieties are now available to make this flower one of the more important fall-blooming perennials for the region, and one that should be in every garden. It has few faults, requires little care, and reaches its full glory as the flowers of summer fade.

Since these modern chrysanthemums are comparatively new, many growers are poorly informed regarding proper cultural practice. This is evident in the methods of growing practiced in the average garden; methods that fall far short of allowing this excellent flower to show to best advantage.

In chrysanthemums the time of flowering is determined mainly by length of day or "photoperiod". In general they are "short day" plants, incapable of producing flower buds during the long days of summer. As the days become shorter, toward fall, the photoperiod of a given variety is reached and it proceeds to form buds for later bloom. Thus, a variety requiring a very short day to produce flowers is often caught by early fall freezes of the Great Plains region and bloom is lost.

A few varieties, however, are little affected by length of day and will form flower buds during the long summer days. Among these varieties are found those most suitable for Great Plains gardens.

Effect of Cultural Practice and Environmental Conditions on Date of Bloom: Blooming date may be affected by time of planting. This is true of all types of planting material, but is more pronounced where divisions of established clumps are used in the open. The effect is less evident where potted plants are used.

For early bloom, clumps should be divided and reset as soon as active growth starts in the spring, but before much elongation of the new shoot occurs. The stage of shoot growth, not the calendar date, should determine transplanting time. Bloom may be delayed as much as ninety or more days if the new shoots are allowed to become overgrown before dividing and transplanting the clump.

Abnormally early bloom frequently occurs on plants growing in protected sites. In such sites plants may reach blooming size before days become long enough to inhibit flower bud formation. Conversely, the same variety planted in cold sites or in shaded sites may start so slowly that bloom is much delayed.

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Overstimulation of vegetative growth has been known to delay bloom. At the North Platte Experimental Substation forty pounds of nitrogen per acre applied to plants in the early stages of budding resulted in aborted buds and greatly increased vegetative growth. As a result of the treatment, plants became abnormally large and bloom was delayed three or four weeks.

Moving certain varieties from one set of environmental conditions to another may affect time of blooming. A number of selections that regularly bloom in late July and early August at Cheyenne, Wyoming, were brought to North Platte, Nebraska for trial. In the North Platte trials these selections failed to bloom before mid-October during the 1948 and 1949 seasons. Apparently a move of two hundred miles eastward, a drop in elevation of thirty-five hundred feet and a slightly higher mean temperature resulted in delaying bloom for over ninety days.

These results indicate that the value of a variety in a given area can be determined only by actual trial. Although most chrysanthemum varieties appear adapted over rather wide areas, certain kinds may prove very sensitive to minor environmental changes.

TYPES OF HARDY CHRYSANTHEMUMS:*

In a discussion of an ornamental plant that shows the diversity of flower and form found in the chrysanthemum, it becomes desirable that some sort of classification be attempted. Since it is impractical to classify all the many types of bloom in a publication of this sort, hardy chrysanthemums will be classified by growth habit only. They will be listed as Cushion, Border, and Cut-Flower varieties, each of which is described below.

It is recognized that this classification is an arbitary one and that much information of possible value to the grower is omitted. It is felt, however, that it will serve here, and that it will, to some extent, assist the amateur in planning his planting.

It is not possible to set a hard and fast rule in classifying chrysanthemum varieties. Under favorable circumstances a cut flower variety may show up well in the border while many of the border types are excellent for cutting.

Cushion Chrysanthemums: The old variety "Pink Cushion" is representative of this type. The term as used here, refers to a type of plant that is low-growing and symmetrical in form. Cushion 'mums make a low mound of many short branches that terminate in clusters of rather small flowers. Stems should be strong so that the plant does not break apart in storms. The general effect is one of compactness, with no irregularities in placement of flowers, development of branches or plant conformation. Cushion varieties are desirable where low formal plants are needed, i.e., in mass border plantings and as foundation plantings.

Border Chrysanthemums: Into this classification go those other varieties that are attractive in both flavor and plant but lack the formal shape of the cushion 'mums. These might be further classified as low, medium and tall border 'mums, but this is not necessary since nurseries furnish this information in describing the varieties.

Cut-Flower Chrysanthemums: Certain varieties have flowers that are excellent for cutting, but have plants that are coarse and straggling or that have other defects that make them poor subjects for the border. Such kinds are classed as cut flower varieties and are best grown in the cut flower garden.

* The reader is referred to "Hardy Chrysanthemums" by Alex Cummings, Doubleday, Doran & Co. Inc., Garden City, N. Y., for more detailed information about chrysanthemum types and history.

ENVIRONMENTAL REQUIREMENTS

Soil: Chrysanthemums are not particular as to soil type and will do well on any soil that will produce good vegetables. They will grow on the poorer soils but ample plant food is necessary if they are to reach perfection.

Drainage: Perfect drainage is absolutely necessary to both dormant and growing chrysanthemum plants. They will not tolerate "wet feet" and are doomed to failure if planted on a poorly drained site. Dormant plants will winterkill in spots where the soil is waterlogged.

In selecting a site for the chrysanthemum planting the grower should make sure of both surface and subsurface drainage throughout the year. Depressions that might collect water should be leveled and heavy soils lightened and loosened to provide subsurface drainage. The use of tile or the addition of sand, coal ashes or some other soil conditioner will provide an escape for excess water.

Light: Chrysanthemums love the sun. Plant vigor and flower quality is lowered as the amount of light is reduced. They reach their greatest perfection where they receive full sun all day, though they do quite well even though shaded in the morning or evening. Plants shaded for the greater part of the day will be weak and flowers will be small and of low quality.

Spacing: Chrysanthemums are strong growers and must have room. Over-crowding the planting is one of the commonest mistakes the grower makes. They should be spaced 18 to 24 inches apart and an equal distance from other plants if they are to develop properly. Close spacing results in leggy plants and poor bloom. Varieties differ in the amount of room required for full development; tall,narrow kinds require less room than widely branching ones, but in any case, the plant will repay adequate spacing in more and better flowers.

SOIL PREPARATION AND FERTILIZATION

Soil Preparation: A little extra time spent in soil preparation pays dividends. Soil may well be worked to a depth of twelve inches, to provide favorable conditions for plant growth. Fertilizers and soil conditioners may be worked into the soil as the bed is prepared.

Fertilizers: Such organic fertilizers as leaf mold, barnyard manures, compost, etc., are preferable to more concentrated fertilizers. They are, in fact, all that is needed in most cases. This type of fertilizer improves soil structure, increases the rate of water infiltration to lower soil strata, and increases the water-holding capacity of the soil; things which the more concentrated, inorganic fertilizer cannot do.

Raw, fresh animal manures and/or excessive amount of dry vegetable matter should not be applied to the soil immediately before planting time. If they must be used they should be worked into the soil the season before planting, so that they will have time to break down and release plant food.

Such material added to the soil immediately before planting may actually reduce soil fertility for a period and delay or stunt the crop. Plant food may be used by bacteria and other organisms that break down manure and plant residues, leaving little available for the growing crop. This effect may be overcome to some extent by the use of quickly available fertilizers to take the place of elements so tied up. It is, however, better to avoid situations of this kind by applying such coarse organic materials a year in advance of planting time.

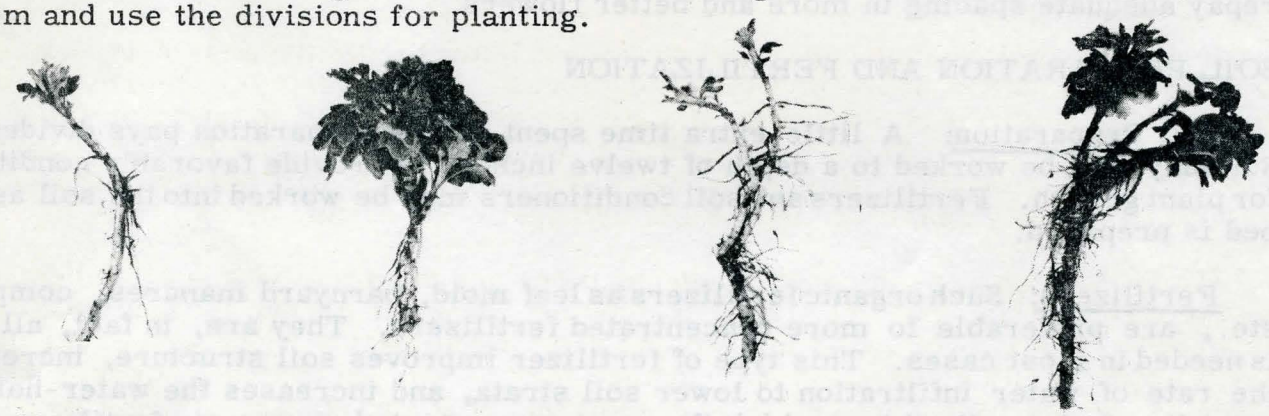
When a particular soil is deficient in some element needed for good plant growth, the use of commercial fertilizers is indicated. Such materials should never replace organic fertilizers but should be used to supplement them. Nitrogen is the element most likely to be deficient, a good many soils respond to phosphorous, while few Nebraska soils are deficient in potassium.

In the Platte River valleys and on any soil high in salts, chlorosis caused by a lack of available iron often occurs. The symptom is a yellowing of the foilage, stunting or, in severe cases, even death of the plant. In most cases, this condition can be corrected by working iron sulphate into the soil at from one to five pounds per square rod. Spraying the growing plant with a one-half per cent solution of iron sulphate is also effective. Solutions containing more than one-half per cent of iron sulphate should not be applied to chrysanthemum foliage because severe burning may result.

PLANTING MATERIALS AND PROPAGATION

Several types of planting material may be used to establish the chrysanthemum planting. These may be purchased from commercial sources or may be produced by the grower. Materials commonly used are field clumps, divisions, potted plants, cuttings and seed. Each of these is discussed below.

Field-Grown Clumps: The field-grown clump is not desirable planting material if used intact. The chrysanthemum increases by means of rhizomes sent out from the mother plant during late summer and fall. By the following spring the original plant is either dead or so weakened as to have little value. Each rhizome is, for all practical purposes, a separate plant. To plant a clump intact would mean that from five to fifty plants were planted in an area of approximately a square foot. It seems obvious that this is not good culture, so, if field-grown clumps are secured, divide them and use the divisions for planting.



Freshly made divisions of old clumps, ready for potting.

Divisions: Divisions are desirable either for planting directly in the field or for production of potted plants. In dividing the field clump, all rhizomes should be separated and each may be used to establish a new plant. If the planting is to be made in the open only the stronger rhizomes should be used since mortality of weak shoots may be high. If the divisions are used to produce potted plants even the smallest division will make a good plant if protected while becoming established.

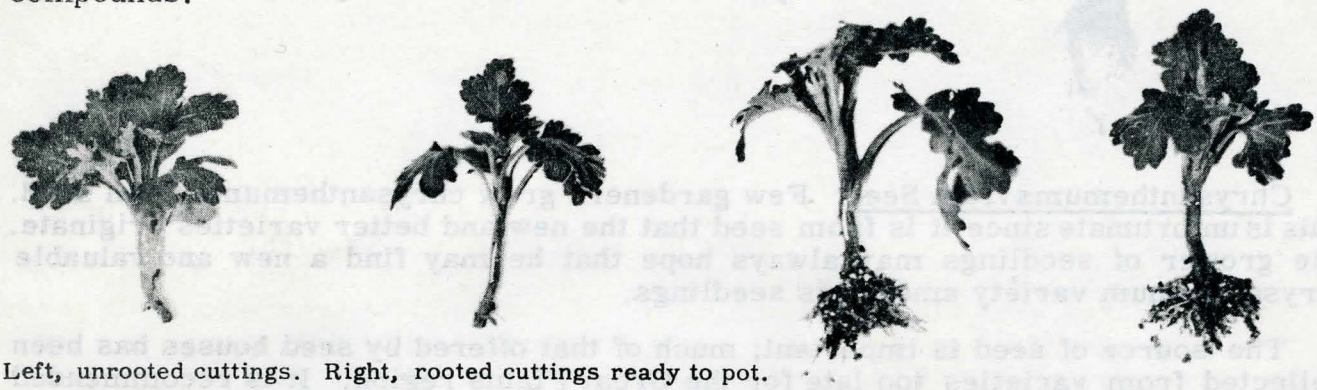
Potted Plants: Potted plants are the nearest "foolproof" of all types of planting material. They may be secured from commercial sources, or the grower may produce them himself in coldframes, hotbeds or even a sunny window. They may be established in plant bands, or in two-inch pots. Either rooted cuttings or divisions may be handled in this manner.

Cuttings: Propagation by means of cuttings is used when large numbers of plants are needed, or when stock is limited. Where large scale propagation is carried on, the clumps are commonly lifted in the fall and carried in a greenhouse at temperatures

high enough to force the shoots and buds about the base of the plant into growth. As these shoots reach a height of three or four inches they are clipped off about one-half inch above ground and used as cuttings. New shoots will start from the stubs and a second crop of cuttings will be produced in a few weeks.

For the home gardener who has no greenhouse, clumps may be planted in pots or flats and carried in a warm, sunny window to produce cutting wood; or the grower may wait until growth starts in the spring and make cuttings at that time. In the latter case, the new plants may not reach blooming size until the second season.

The firm young shoots that arise about the mother plant make the best cuttings. Cuttings of older wood root more slowly and the percentage of cuttings striking root is lower than is the case when young wood is used. Cutting should be two to three inches long. The lower leaves should be removed and the cutting set in the rooting medium to a depth of one inch. Some varieties will strike roots within a few days while others may take much longer. The time required for rooting the cutting can be decreased and the number of roots per cutting increased by use of hormone rooting compounds.



Left, unrooted cuttings. Right, rooted cuttings ready to pot.

In using rooting hormones, the dust form is preferred because it is easier to use and the danger of under or over-dosage less. The lower three-fourths inch of the cutting is dipped in the powder and excess powder is tapped off by striking the cutting against the container. The cutting should be planted in a hole, not pushed into the rooting medium, since forcing it into the medium will remove the rooting compound and may result in mechancial damage to the cutting.

Sharp clean sand, peat moss, spaghnum moss and vermiculite are all acceptable mediums for rooting cuttings. Sand is good but its water carrying capacity is low. This can be corrected by using three parts sand to one part of moss or vermiculite. Vermiculite is rather unstable and cuttings may be washed from the medium while watering unless care is taken. The additions of one part of either peat moss or ground spaghnum moss to three parts of vermiculite is a more satisfactory medium. Peat moss, spaghnum moss and vermiculite can be purchased from most florists or seed stores.

The rooting medium should be placed in a cutting box. Any well constructed box will serve if it has a rim that reaches above the cuttings. This rim is important since the box should be covered with glass while rooting starts. The box should not be so closely covered as to cause excessive moisture to collect on the cuttings or "damping off" may result.

After the cuttings are set, the box should be placed in a greenhouse, hotbed or warm window and protected from full sun until rooting starts. After the cuttings harden and rooting starts the glass may be lifted and the amount of light increased.

Optimum temperatures for rooting chrysanthemum cuttings appear to fall in the range of 45 to 55 degrees F. Rooting will take place above and below that range, but more slowly and mortality will be greater. Extremely high or low temperatures will destroy the cuttings.

As soon as the cuttings are well rooted they should be transplanted to two or three-inch pots or plant bands and carried until well established. They may be planted directly in the open if the grower is prepared to give them considerable attention until established. The amateur, however, can be surer of his results if the cuttings are established in pots before planting in the field.

Root growth from the potted cutting or rhizome is very rapid. This picture illustrates the extent of the root system after five weeks in the pot. The plant is now ready to put in the field.

Chrysanthemums from Seed: Few gardeners grow chrysanthemums from seed. This is unfortunate since it is from seed that the new and better varieties originate. The grower of seedlings may always hope that he may find a new and valuable chrysanthemum variety among his seedlings.

The source of seed is important; much of that offered by seed houses has been collected from varieties too late for the Great Plains region. It is recommended that the prospective grower collect his own seed from varieties that are adapted in his own region. The use of such seed will avoid much of the lateness that appears in progenies of plants from commercial seed.

Chrysanthemum seed should be started in flats during February or March. Seedlings will be large enough for field planting in late April or early May. Well grown seedlings are as easily handled as cabbage or tomato plants and little loss is to be expected during the transplanting operation. Seed can be sown in any good garden soil and should be covered to a depth of one-eighth inch. The flat should be covered with a pane of glass during the germination period.

Seedlings may also be grown in a vermiculite, peat, ground spaghnum moss, sand or mixtures of these materials. These materials contain no plant food and seedlings must be given a nutrient solution. Preparations used for soilless culture of plants should be applied according to the manufacturer's recommendations. The greatest advantage of soilless culture is that the danger of loss of seedlings by disease is eliminated.

Seedlings may be grown in the seed flat until time to plant in the field, provided they are not so crowded as to cause stunting. They are better handled by transplanting to flats of soil as soon as two or three true leaves have developed.

Seedlings handled in this manner will reach full size and give full bloom in the fall of the year the seed is planted. They do not, however, develop the mature flower form the first season. Doubleness of the flower may increase during the second and third season.

GARDEN CARE

Planting: Regardless of the type of planting material the care used in establishing it in the field determines the success of the planting. Packing the soil firmly about the roots is important. The loosely set plant is handicapped from the start and high mortality is to be expected to follow poor planting.

Divisions should be set with the growing tip just above ground level. It is advisable to set them in a rather upright position so that the lower end of the rhizome is far enough below the surface to avoid surface drying.

Potted plants should be set with the ball of earth slightly below ground level. Seedlings may be handled in the same manner as tomato or cabbage plants.

Watering: It is essential that newly set chrysanthemums be well watered until they have become established in their new location. During this period the soil should be kept uniformly moist, not wet. If this is done, even very small divisions or seedlings are readily established in the open field.

Proper watering throughout the growing season is important if one wants to get the most out of the chrysanthemum planting. Infrequent, heavy applications are preferred to frequent light irrigations. The latter often results in shallow rooting while the former will produce both deep and shallow roots. Overwatering is to be avoided. Frequent heavy applications may result in waterlogged soil, which no'mum will tolerate. If the soil forms "mud balls" when squeezed in the hand, it is too wet. Of course, most s oils will ball if tested immediately after water is applied, but a properly watered soil, tested a few hours after irrigation, will not ball but will crumble and appear loose and friable in the hand.

Cultivation: Frequent, shallow cultivation to keep weeds down and prevent soil baking is desirable. As a rule a light cultivation after each irrigation is advisable. Deep cultivation, close to the plants, is not recommended since considerable root damage may occur.

Care of the Established Planting: As far as practical, it is recommended that established clumps be divided each spring. The proper time for this is when danger of hard freezes is past and when early spring growth has started. Single rhizomes having one to three growing points are preferable. Large divisions of many shoots defeat the purpose of division and may result in overcrowded clumps. Remember that chrysanthemums must have room to develop properly.

If for some reason, clumps must be left for a second season, they should be thinned to two or three shoots per clump. Such thinning will result in sturdier plants and more and better flowers

Disease and Insect Control: Grasshoppers, lygus bug, leafhoppers, aphis and other insects may attack the chrysanthemum. These insects are easily controlled with the new organic insecticides. At the North Platte Experimental Substation all these have been controlled with a mixture of chlordane and DDT at the rate of one pound of each chemical per acre applied as a spray.

Heavy dosages of DDT are not advisable because they may deform the plants. No such effect has been observed to follow the use of the chlordane-DDT mixture.

Foliage diseases may be controlled by the use of fungicides such as fermate. Aster yellows, a virus disease, has been known to attack the chrysanthemum but is not serious as a rule. Another virus, "stunt," is becoming serious. This disease stunts the plant and destroys its value as an ornamental. The only control of the virus diseases is the removal of affected plants. Plants suspected of having either aster yellows or stunt should be pulled and burned.

VARIETIES

A list of chrysanthemum varieties that have proved satisfactory in Nebraska is appended. This list cannot be considered complete since many varieties of possible value have not been tested. The list names varieties that have proved hardy for two or more years and should be of assistance to the beginner. It must be understood that height and bloom date (or season) are approximate, and will vary because of variation in climate and cultural conditions.

LIST OF CHRYSANTHEMUM VARIETIES RECOMMENDED FOR NEBRASKA

(S-single, SD-semi-double, D-double, VD-very double)

Variety	Color	Type and Height	Season	Recommended for these areas: Lincoln	North Platte	Scottsbluff
Cushion						
Cody	Orchid	15" SD	Aug.	X	X	X
Golden Carpet	Yellow	10" D	Sept.	X	X	X
Nanook	White	16" D	Sept.	X		
Omaha	Orange	18" D	Oct.	X		
Powder Puff	White	10" D	Sept.	X		
Tecumseh	Red bronze	18" D	Sept. 1	X	X	X
Border muss						
Alabaster	White	30" D	Sept.			X
Avalanche	White	24" D	Sept.			X
Allegro	Shrimp pink	D	Oct. 1	X		
Ann	White			X		
Betty	Pink	tall D	Sept.	X		
Candlelight	White	24" D	Sept.			X
Carnival	Red	20" D	Oct.	X		
Charles Nye	Yellow	28" D		X	X	X
Chippewa	Purple	28" D	Sept.	X	X	X
Chiquita	Yellow	22" D	Sept.	X	X	X
Dainty Lady	Light pink	20" D	Sept.	X		
Defiance	Yellow	D	Sept.	X		
Dawnrose	Pink	D	Oct.	X		
Dr. Longley	Orchid	28" D	Sept.	X		
E. H. Hoppert	Bronze-yellow	27" D	Aug.	X	X	X
Eugene A. Wander	Yellow	24" D	Sept.	X	X	X
Ermine	White	D	Oct.	X		
Glacier	White	24" D	Aug.	X	X	X
Santee	Yellow	26" SD	Aug.	X	X	X
September Cheer	Purple	D	Sept.	X		
Terry	Yellow	24" SD	Sept.	X		
W. P. Synder	Apricot bronze	24" D	Aug.	X	X	X
Waku	White	24" D	Aug.	X	X	X
Wendy	Yellow	24" D	Sept.	X		
White Cloud	White	30" D	Aug.	X	X	X
White Wonder	White	tall D	Sept.	X		

Variety list continued

Variety	Color	Type and Height	Season	Recommended for these areas		
				Lincoln	North Platte	Scottsbluff
Yellow Avalanche	Yellow	24" D	Sept.	X		
Golden Hours	Yellow	26" D	Sept.	X		
Golden Sunset	Red & Yellow	30" D	Sept.	X		
Governor Duff	Orange	24" VD	Sept.	X	X	X
Huntsman	Red	24" D	Oct.	X		
Illuminator	Ruby Red	tall D	Sept.	X		
Ivory Glow	White		Oct.	X		
Inspiration	Yellow	D	Sept.	X		
Jean Treadway	Pink	24" D	Sept.			X
Lt. Beckner	Red bronze	30" D	Aug.	X	X	X
Madam Chiang Kai Shek	Yellow	20" D	Sept.	X	X	X
Martin's White	White	18" D	Sept.	X		
Maroon 'n gold	Red & Gold	20" D	Aug.	X	X	X
Mentor	Pink	18" D	Oct.	X		
Mrs. du Pontq	Peach	D	Oct.	X		
Nokomis	Red	tall D	Sept.	X		
Meditation	Yellow & bronze	VD	Sept.	X		
Olive Longland	Apricot	24" D	Sept.	X	X	X
Osceola	Copper yellow	26" D	Aug.	X	X	X
Pearle Parkinson	Red & Yellow	22" SD	Aug.	X	X	X
Pepita	White	24" D	Sept.		X	X
Polar Ice	White	24" D	Sept.	X		
Ponca	Wine	30" D	Sept.	X	X	X
Primula	Yellow	36" S	Sept.			X
Red Gold	Red	22" SD	Sept.			X
Red Ridinghood	Orange Red		Oct.	X		
Rheingold	Burnt Orange	22" S	Sept.			X
Rosita	Pink	26" D	Sept.	X	X	X