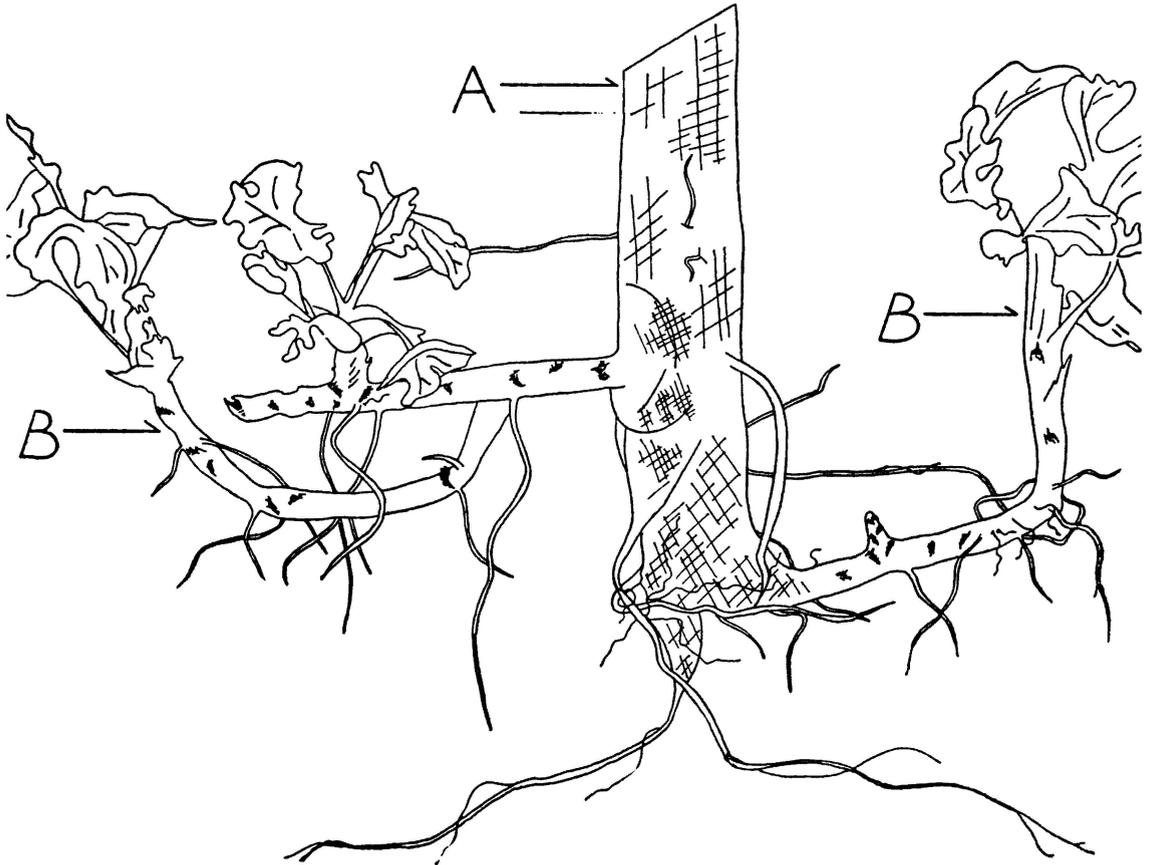


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# GROWING HARDY CHRYSANTHEMUMS

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Parent plant showing A, old stem, and B, new shoots or rhizomes.

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# Growing Hardy Chrysanthemums

Hardy chrysanthemums are gaining in favor among gardeners year by year. This increase in popularity comes mainly from our knowing more about how to grow chrysanthemums and from the use of improved varieties.

Suggestions given in this circular are based on experiments made by the Department of Horticulture at V. P. I., where many named varieties and about 1,500 seedlings have been grown during the last several years. "Horticultural Special Mimeographed Report Number 1," Virginia Agricultural Experiment Station, gives full details of the 1946 tests.

## Varieties

In general it is best to grow varieties that bloom before killing frosts. It often happens, however, that later varieties are not much harmed by early frosts and bloom normally in the warmer weather that nearly always follows.

Since there are far too many varieties to list here, gardeners are urged to study nursery catalogs. The mimeographed report mentioned in the introduction tells of tests on 93 varieties and numerous selected seedlings.

The Experiment Station has no plants for sale or distribution. Any new types developed at the Station will be made available to nurserymen for their propagation and sale.

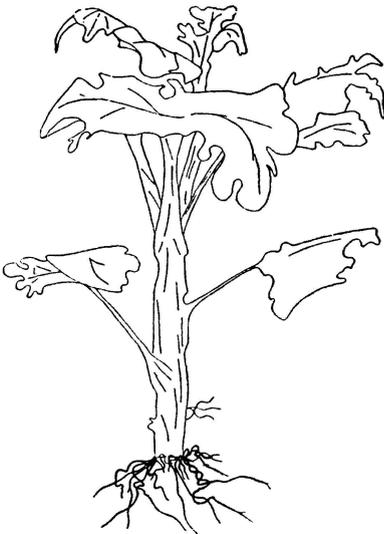


Figure 1. Rooted cutting ready to be potted or set in shallow box.

## Propagation

The average gardener will not find it easy to root his own chrysanthemum cuttings. Quite often cuttings will rot at the base and form roots along the sides of the stem. Plants that root this way are seldom vigorous. Unless you have the necessary equipment and experience, it would be better to use nursery-grown cuttings, or make divisions of your own parent plants.

The illustration on the cover shows how to make divisions. This is usually done in the spring. Discard the central or mother stem and start new plants each year.

A rooted cutting is shown in Figure 1. Such a plant is not strong enough to be planted directly out-of-doors. As soon as you get your rooted cuttings from the nursery, plant them in pots or shallow boxes and allow them to form strong roots. Make sure the plants do not become stunted from insect injury or lack of water.

New shoots from parent plants usually have good roots by late winter. They may be planted in place out-of-doors when the top growth is one to three inches high.

### **Where To Plant**

Hardy chrysanthemums do best in full sunlight. They will do fairly well in partial shade but will grow taller and branch less.

Early frosts sometimes mar the beauty of the flowers, especially those with soft petals, such as the Korean Hybrid type. Plants on high ground where cold air will drain away will be injured less by frost than those in low places. When light frost has touched the flowers, you can lessen the damage to the blooms by protecting them from the early morning sun.

Any garden soil that is well drained, in good tilth, and fairly well supplied with plant food is suitable for chrysanthemums. Humus is, of course, an important item in any garden soil (see Circular 395, Virginia Agricultural Extension Service).

### **Food for the Plants**

It is well to use nitrogen sparingly during the spring and summer months. Heavy applications of nitrate of soda, manure, or other materials high in nitrogen will force the plants into a leggy growth. They will not be strong nor will they have good flowers. If you have provided enough humus, you should get good results from a 3-10-6 fertilizer — 3 percent nitrogen, 10 percent phosphorus, and 6 percent potash. In rich or shaded borders, use a 0-14-7.

Apply the fertilizer about one week *after the plants are set*, at the rate of 2 to 3 pounds to 100 square feet of ground. For example, a border 5 feet wide and 20 feet long would be given 2 to 3 pounds.

More nitrogen may be used after the flower buds have set



**Figure 2. Terminal buds have formed. At this stage plants may be given additional nitrogen. Over-feeding will result in soft flowers.**

(Figure 2), in order to get larger blooms. Use only a moderate amount; otherwise, both stems and flowers will be too soft. Do not add nitrogen after the buds show color.

*Caution:* Never apply fertilizer when the ground is dry. Do not put fertilizer close to the plants. Avoid getting it on the foliage. Work it into the ground, mixing it thoroughly with soil.

Because of the great difference in soils and the large number of fertilizer materials put on flower borders, no advice can safely be given on the use of materials carrying the so-called minor elements. If you follow the suggestions already given as to sunlight, soil, humus, and fertilizer, you should not need to consider these minor elements.

### **Planting**

Hardy chrysanthemums should never be crowded. The cushion types grown at V. P. I., when started from rooted cuttings in May, have reached a diameter of four feet. If given space, this type will be covered with bloom right down to the ground. (Figure 3-A.) Upright varieties (Figure 3-C) need less space.

Plants set in June and July will need about a third of the space needed for early plantings. It is better to have a few plants with plenty of room than to crowd too many into a border. For all varieties measured here at the Experiment Station in 1946, the average width was 21½ inches.

Avoid setting plants when the ground is wet. Roots will form more normally if they are put in moist or dry soil and watered. Divisions of old plants should be placed in the ground as nearly as possible just as they grew on the parent plant.

### Cultivation

The roots of chrysanthemums spread rapidly and grow near the surface. Deep cultivation will cause injury. Stir the surface of the soil just enough to control weeds.

Water may be needed at planting time and possibly when the fertilizer is put on. Unless the plants wilt from lack of moisture, no other watering is recommended.

When the young plants in pots or in the border reach a height of 4 to 5 inches, pinch off the tip of the plant, leaving 4 to 6 leaves (Figure 4). Several new stems will then develop. When these have developed 4 to 5 leaves each, pinch off the tip of each stem. If you get your chrysanthemums out early, you may need to pinch off the tips several times in order to get stocky plants, unless they are early blooming kinds. The cushion type does not need to be pinched at all.

If properly grown, most of the hardy chrysanthemums do not need supports to keep them off the ground. Upright varieties having heavy flower clusters may need support to keep them from being broken by wind or heavy rain. Plants growing in shade or over-fertilized with nitrogen or watered too much, since they will likely grow tall and weak, will need staking and tying.

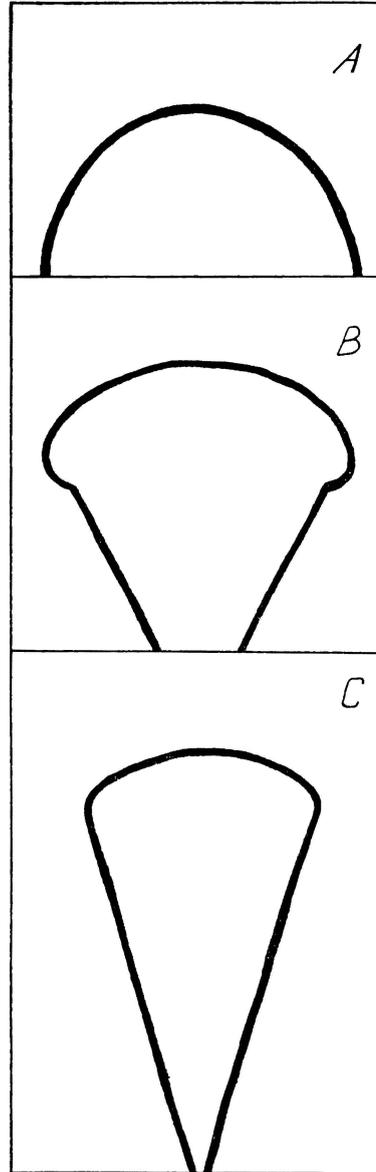
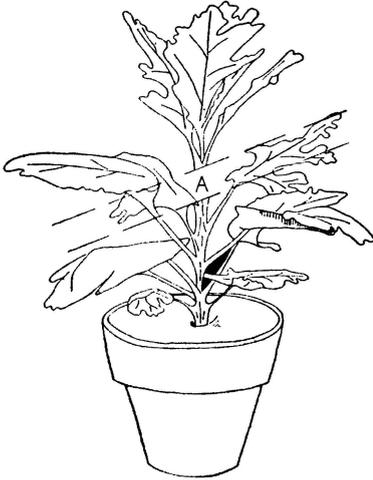
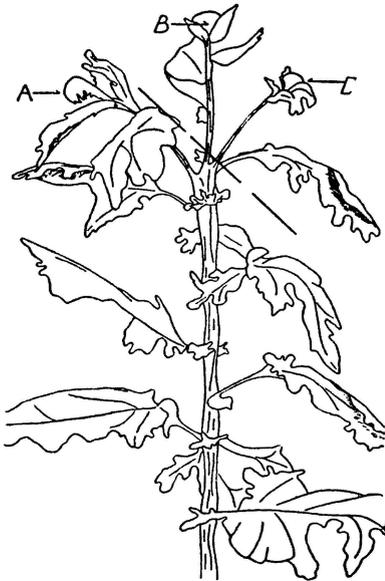


Figure 3. Plant forms. A-cushion: flowers over entire plant. B-intermediate: flowers over upper third. C-cone: flowers near top only.



**Figure 4.** Potted plant ready to be set in border. Pinch at A.



**Figure 5.** B-terminal bud. A and C-crown buds. Leave A.

Hardy chrysanthemums will grow and bloom without any spraying or dusting. But the plants will be healthier and the bloom should have more quality if you dust or spray with bordeaux mixture. Put it under and over the foliage once or twice when the plants are small. If aphids (plant lice) appear, control them with applications of nicotine and soap. This material is most effective on warm, still days.

### Disbudding

Disbudding is not recommended unless you are preparing entries for a flower show. If done properly, disbudding may increase the size of flowers. If done too late or in the wrong manner, the stem may be crooked and rough and there will be little improvement in the bloom (Figure 6).

Size is often confused with quality. Too often disbudding will increase the size of the bloom at the expense of quality.

For those who wish to disbud their hardy chrysanthemums, these suggestions are offered:

1. Do not disbud cushion types.
2. Choose at planting time the plants you are going to disbud. Plant these closer together than normally. Treat with bordeaux mixture.

3. After the first pinching (Figure 4), select several stems

and remove all others. Omit later pinchings. Remove all side shoots.

4. Protect foliage with bordeaux mixture, and with nicotine if aphids appear.

5. When first bud (Figure 6-A) appears, remove it promptly, leaving one side stem. Remove all other side shoots.

6. The second terminal or center bud (Figure 6-B) may produce a good flower on early varieties. Remove this on late varieties and leave one crown bud (Figure 6-C).

7. The second crown bud below the terminal (Figure 5-A) is considered best. Leave this for flower; remove others.

8. The last group of buds are all terminals (Figure 2). All will bloom. Leave the one which appears best in shape and position; remove others.

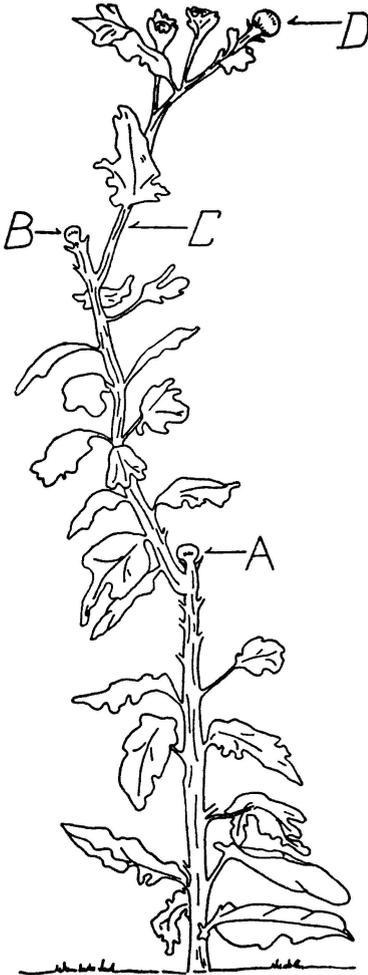


Figure 6. Crooked stem from delayed disbudding, showing position of first bud-A, first terminal bud-B, terminal stem-C, and crown bud-D.

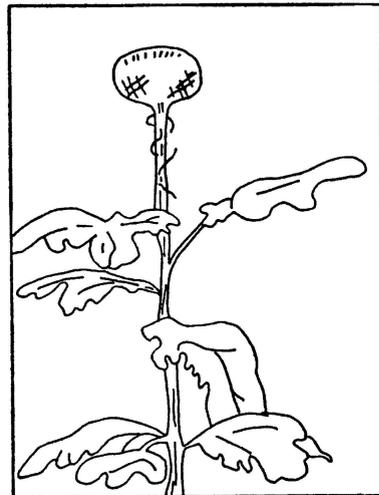


Figure 7. Well-developed bud with straight stem.