CULTURAL TECHNIQUES FOR GROWING HYBRID GERANIUMS[1]

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During 1978, there were over 250 million geraniums sold in the U.S. The fact that 60 million of these hybrid (seed) geraniums points to the increasing economic importance of this method of production (1).

The grower can make more dollars by growing geraniums from seed than he can from cuttings. This is especially true in the midwest or any area where fuel (and other production) costs are high. Many growers have found it difficult to make a profit on the cutting geraniums. Some have done well by buying rooted cuttings and growing and selling them within eight weeks.

There are over 70 different varieties of seed geraniums available, and constant improvements are being made. Plants are being bred for earlier flowering and more compact growth which make them a more saleable commodity. Seed grown varieties tolerate dark conditions and hot summer weather in the garden better than cutting plants. Today, many of these improved varieties are grown and sold in packs.

In seed geraniums, as compared to cutting geraniums, it appears that there is a much greater demand for flower colors other than red. While 50-60% of seed geraniums are red, other colors are grown in greater numbers than the cutting geraniums.

Flowering Habit:

In Minnesota, it takes approximately 120 days from seeding date to flower, depending on variety and climatic conditions. The Sprinter Scarlet, for example, required 110 days to flower in Minnesota in 1977. In 1978, as a result of lower natural light intensities, the same variety required 130 days to flower; in Florida it would flower in 80 days (2).

Recent work has shown that a crop can be produced in Minnesota under sodium high intensity high pressure lamps in approximately 80 days. This reduction in flower time was obtained by exposing plants to sodium light for 12 to 16 hrs during the first three to four weeks after emergence and thereafter only to natural light conditions. Lights were four-feet above the flats and four-feet apart. For economic reasons, plants should be exposed to sodium light while still in flats or closely grouped. Incandescent and fluorescent lights have been less effective in reducing time to flowering. A formula which can be used during winter is, that as a rule one day in Florida equals one and one-third days in Minnesota; this is the result of differing light intensities and duration. Timing depends on the total light energy. Based on our experiments, it is advisable to use HID lights for the first 21-34 days post germination.

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Germination:

The sowing and germinating of seeds is of major importance. Seeds should be sown 3/8-inch deep and 1/4-inch apart in rows, with 1 1/2- to 2-inchs between rows; they should be covered with 1/8-inch of fine perlite. Sowing seeds in rows is important in that the separation usually serves to help control disease through the entire plant production in a flat. The soil must be moist at all times; if it dries out, seeds will not germinate. Germination occurs in three to four days on the average and should be completed in 14 days. The seedlings should be ready to transplant between 21 and 28 days after sown.

Temperature:

To obtain optimum germination, soil temperature should be maintained between 70°F and 75°; it should not go below 70° or above 80°. Maximum germination is usually achieved with the use of bottom heat; a soil thermometer is placed in the soil such that it directly reads soil temperature. Temperature is also important to seedling development. The best growth (short and compact) is usually achieved at a night temperature of 65°; at 75° a taller, more spindly plant will result. However, at a 90° night temperature, very little growth occurs. This latter response is probably the result of a decrease in gibberellic acid activity. If the night temperature is maintained at 65° the plants will not excessively stretch (3).

In general, with a 10° reduction in night temperature, a plant will require a week to ten days longer to flower. Plants can be grown at night temperatures as low as 40°F, but the time to flowering is increased to the point where the process is not economically feasible. Good compact growth is achieved without an unreasonable increase in time to flowering. When good sunlight levels are available, the night temperatures may be increased 3-5°.

Light:

Light intensities as stated are important. It is the cummulative total light exposure which initiates flowering and light also affects the rate of flower development. Therefore, in periods of low light intensities, flowering can be expected to be delayed unless electric light is used to speed the process. The size of the plant has little to do with the time to flower.

Growth Regulators:

Most geraniums are shorter when treated with A-Rest and Cycocel. B-Nine has no apparent affect. Cycocel and A-Rest are not yet cleared by the Environmental Protection Agency, but experimental work can be carried out. For this reason, Cycocel would be the treatment of choice due to its lower cost. Cycocel was applied 35 days after germination or seeding (about two weeks after transplanting) at 1500 ppm. Most geranium varieties that are treated will not only be shorter in height, but also flower about one week to ten days earlier than untreated plants. With cutting geraniums, Cycocel may not hasten flowering, but it will reduce height. When the base of cuttings are dipped in Cycocel, research has shown more roots develop than untreated cuttings.

A-Rest was applied at 100 or 200 ppm in our experiments. We sprayed to the dripping point 35 days after germinating or seeding. A-Rest will not cause leaf yellowing as Cycocel does, and the effects of A-Rest are longer lasting than Cycocel. With Cycocel, several applications at two to three week intervals may be required. In our experiments, up to four applications have been used with no harmful effects. It is however, important to remember that controlled watering is still one of the best growth retardants.

An alternative method of geranium production which has been studied involves producing seedlings in the southern areas (where higher light intensities are available) and shipping them to other areas for finihsing. This method might be used by growers who produce an Easter crop and then find it difficult in the limited time available to produce a geranium crop for Memorial Day. If 2 1/4-inch seedlings are brought in from the south, 35-40 days should be sufficient in the midwest to produce a flowering plant for Memorial Day.

Shipping:

Shipped seedlings have shown a tendency toward yellowing of the lower leaves, but reducing the temperature to 40°F and thoroughly watering the plants before shipment normally eliminates the yellowing. Experimental plants also exhibited yellowing of leaves when kept in the dark for more than 48 hrs at 70°. Ethylene may be a cause of this chlorosis.

Nutrition:

If the pH is below 5.5, plants may not flower, and a brown or rust color may develop on the leaves. At a high pH (6.5 or greater) magnesium deficiency may occur. If rapid growth and flowering is to occur, high levels of nutrition must be maintained. The plants should be fed at 200 ppm of nitrogen with every irrigation.

Spacing:

While our experiments indicate that the best plants are grown four to a square foot, many growers produce plants pot-to-pot, or nine to a square foot. The higher density production, however, yields lower quality plants.

Literature Cited

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