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Commercial Greenhouse Geranium Production

Prepared by RAY A. MCNEILAN, *Multnomah County Extension Agent*
Oregon State University

Greenhouse geranium production in Oregon is increasing to the point that recommendations for better production principles and cultural practices are needed for this crop. The following information is the best available at this time, and it has been obtained from a number of greenhouse geranium-producing areas.

Propagation

Coarse, sterile sand is one of the better propagation media for greenhouse geraniums. Clean cutting stock or cultured virus- and disease-free rooted or calloused cuttings from reliable sources should be used. Bottom heat of not over 63° F. supplied for ten days at the beginning of the rooting process is suggested. Cuttings properly handled should be rooted in fourteen days. When making cuttings, take softwood cuttings three to four inches long, each having at least three healthy leaves. Rooting hormones can be used, but they are not essential for successful root production.

Potting

Some growers have had success by rooting directly in 2¼-inch pots in a sterilized medium, while others have had more success by rooting in propagation beds and potting directly to 4-inch pots, thus by-passing the labor cost of potting into 2¼-inch pots, and thence to 4-inch pots. When potting, leave one-half inch for a water reservoir in 4-inch pots.

Soil

Almost any good soil mixture is adequate provided it supplies good drainage, excellent aeration, and has good moisture and nutrient retention qualities. Of the better ones, a mixture of one-third garden loam, one-third sphagnum peat moss, and one-third sand or perlite is suggested. The pH should be adjusted to 6.0-7.0. The pH can be adjusted by using dolomitic lime or ground limestone. Phosphorus should be added at the time the mixture is being prepared at the rate of 5 pounds of superphosphate per cubic yard of soil. The soil mix should be sterilized before use. This can be done with steam or dry heat (heat the soil mix to 180° F. and maintain this temperature for 30 minutes) or chemically with methyl-bromide, Vapam, Mylone, or similar chemicals. After the plants have been placed in the pots, a feeding schedule such as the one listed below can be used to keep them in good vigor.

Fertilizing schedules

Geraniums are easily over-fertilized, and for some of the Martha varieties it is best to withhold fertilizers until flower buds have developed. Using a fertilizer injection system, a weekly application of 3 pounds of 20-20-20 fertilizer per 100 gallons *or* 6 ounces of 25-10-10 per 100 gallons at each watering will maintain vigorous growth. If you are fertilizing without an injector system, plan to use a complete fertilizer in the soil mix. The following is an example of a fertilizer mixture which could be mixed with the soil:

Magnesium ammonium phosphate—12½ lbs./cu. yd.
Potassium sulfate—1 lb./cu. yd.
Dolomite or calcium limestone—10 lbs./cu. yd.
Trace elements mixture—2 oz./cu. yd.

It may be best to fertilize on a regular schedule and thereby maintain the type of geranium growth desired. A red color in the older leaves usually indicates the need for added nitrogen or added potassium, especially when temperatures are below 55° in the greenhouse. Watch also for soft growth and adjust the feeding schedule accordingly.

Temperatures

Geraniums will grow almost twice as fast at 60° night temperature as at 50°. The general recommendation is 55° at night and 60° to 65° during the day. Also, supply full sunlight until around Mother's Day (second Sunday in May); then shade lightly to prevent petal burning. Buds should be above the leaves before the shade is applied. Shading too early may cause legginess of the plant or bud blasting.

Spacing

You can place about 650 4-inch pots in 100 square feet, but this will result in poor plant quality and could cause a disease problem. Spacing of 6 inches by 6 inches will accomodate 400 4-inch pots per 100 square feet profitably. A spacing of 6 inches by 8 inches equals 300 4-inch pots per 100 square feet and is the usual minimum spacing used for normal geranium production. Wider spacing gives a better quality plant, but this may become unprofitable unless premium prices are obtained.

(*Continued—over*)

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Timing

Some authorities suggest potting calloused cuttings in January for Memorial Day (May 30) bloom and from February 1 to March 1 for early June sales. After an early Easter, plants grown in 2¼-inch pots can be potted into 4-inch pots and finished for Memorial Day without pinching. Generally, it takes six to eight weeks from a well-established 2¼-inch pot to a finished 4-inch pot. Since buds should be visible four to five weeks before flowers are wanted, adjust the pinching schedule to make the last pinch at least four weeks ahead of the desired blooming date.

General care

Greenhouse crops are seldom successfully watered "on schedule." Instead, the grower must learn to tell when the plant needs water by feeling the soil. When the soil surface feels dry to the touch, the plant usually needs water. To prevent the accumulation of soluble salts in the soil, supply enough water at each watering to run some out the drainage hole in the pot. Withholding water reduces vegetative growth and hardens the plant. Over-watering can cause large leaves, soft shoots, and long internodes. Soft growth can also be caused by too much nitrogen, too high night temperatures, or too much shade. Avoid applying water to the foliage. Ventilate as much as possible to prevent or cut down on disease incidence. Keep plants of equal vigor and size together for easier handling. Place smaller, less vigorous plants in warmer parts of the greenhouse.

Disease and insect control

Diseases of geraniums are best controlled by adequate spacing, ventilation, and air circulation and early application of chemical control measures to prevent the onset of problems. One of the worst problems is Botrytis blight. This disease attacks soft growth and is prevalent in old flower heads and dead tissues. Spray materials include Captan, Parzate, and Botran. Verticillium wilt and bacterial stem rot are sometimes mistaken for each other. Controls for these problems involve the use of sterilized soil and disease-free stock.

Many virus diseases attack geraniums. These are usually transmitted from one plant to another by piercing or sucking insects such as aphids and leafhoppers. Control is largely a matter of destroying the infected plant and spraying regularly to control insect pests.

The main insects feeding on geraniums are aphids, plume moth, red spider mites, and white fly. Regular applications of recommended pesticides are necessary for the control of insect pests.