

CINERARIA

Experimental studies with Cineraria (*Senecio cruentus* L'her) referred to in this report were conducted by Dr. Harold Hildrum, Station for Disease-free Stock Plants, Saveherad, Norway.

Cinerarias can be divided into two groups, grandiflora and multiflora. Grandiflora cultivars have larger but fewer flowers and bloom earlier than multiflora cultivars.

Cultivars

In Scandinavia the best early flowering cultivars (January and February bloom) are 'Gemünder Zweig' and 'Master'. 'Early Favorite' and 'Tiolig dverg' are also used in Norway. All are 4-5 weeks earlier than late flowering cultivars. The disadvantage of early cultivars is that they may not produce as many flowers as desired per plant.

Late flowering cultivars include 'KSA' which sometimes grows too vigorously and 'Moll' which is rated excellent.

In Norway the flowering season is January through March. The plants are inexpensive because they require higher temperatures for only a short period.

Production

Propagation is from seed. A standard limed, nutrient-enriched moss peat or moss peat and clay mix medium is used. A temperature of 18°-20°C (65°-68°F) is recommended. Seedlings are grown at 18°C (65°F) and planted in flats at a 3 by 3 inch spacing or in 3-inch pots. When crowded, they are planted in 4- to 5-inch pots for finishing.

Carpenter (1974) reported that seedlings responded significantly to high intensity lighting (5 watts per sq. ft. sodium vapor or 10 watts per sq. ft. fluorescent lamps) for 18- to 24-hour days. This cut production time in half prior to final transplanting. Plants lighted before and after transplanting were ready for low-temperature treatment in 61 days as contrasted to 83 days for unlighted plants. Lighted plants flowered earlier and were of better quality.

Temperature Effect

Post (1942), Hildrum (1966), and others showed that cineraria requires a low temperature treatment (below 15°C or 59°F) for flowering. In controlled studies, plants were treated for 3, 6, and 9 weeks at 9°C (48.2°F), 12°C (53.6°F), 15°C (59°F), and 18°C (64.4°F). Various cultivars had different critical

temperatures for floral initiation. However, the optimum temperature for all cultivars was 9°C (48.2°F) to 12°C (53.6°F). Cultivars Heimdal and KSA required 6 weeks of cooling while 3 - 4 weeks was adequate for Master and Gemünder Zweig. Temperature after cooling is also significant. Heimdal, Master and Gemünder Zweig can be grown at 15°C (59°F) but KSA and Moll require 12°C (53.6°F). Too high temperatures after cooling caused excessive stretch of flower stalks and leaf petioles, thus lowering plant quality.

Plant Age Effect

Research studies with the cultivar Moll showed that number of days from start of cooling to flowering decreased as age of plant increased, and with increases in duration of cooling. Plants 8 and 10 weeks old flowered quickly while 6-week-old plants responded very slowly to cooling at 12°C (53.6°F). Six weeks of cooling were more effective than 1 - 4 weeks.

The question then arose as to whether plant age or plant size was the key factor. Ten-week-old plants were trimmed to retain 4 different levels of leaf area, subjected to cooling for various periods and grown to flowering. Plants with the smallest leaf area were the slowest to bloom, and plants with the greatest leaf area bloomed first. Thus, plant size (leaf area) rather than age determines the rate of plant response to low temperature. In Norway, plants grown for 8-10 weeks from seed sowing at 20°C (68°F) in natural fall light conditions have adequate leaf area for optimal response to low temperature.

Photoperiod

Long-day treatment advanced flowering 2 - 3 weeks for plants of KSA, Gemünder Zweig and Master cultivars. Long days should start when flower buds are first visible and continue until flowering. Lighting plants throughout the dark period with fluorescent tubes (2-2.5 watts per sq. ft.) provided excellent plant quality. Lighting with incandescent lamps produced poor quality plants with long, weak flowering stems. Temperature during long day treatment was also a factor. Gemünder Zweig can be grown 15-18°C (59-64.4°F) while KSA and Moll must be grown at 13-15°C (55.4-59.0°F). Day length had no effect on flower bud initiation.

Growth Regulators

Hildrum was able to substitute a spray of 100 ppm gibberellic acid (GA₃) for 2 weeks of the 6-week low temperature requirement. Flower stems were elongated, however, and plant quality was not good.

Cinerarias did not respond to Cycocel. A spray application of 5,000 to 10,000 ppm B-Nine when flower buds were first visible helped limit plant stretch. B-Nine also delayed flowering if applied during flower bud initiation. (Editor's note: proper culture would seem preferable to application of B-Nine.)

Timing

In the past, cinerarias were scheduled to bloom in late February; now flowering from early January through February is highly desired. To obtain January flowering, sow the seed August 7, or if the long day treatment is used sow August 20. Also grow early flowering cultivars. Late flowering cultivars bloom 5-6 weeks later at this time of year.

Recommendations

1. Sow seed in early August and germinate at 18°-20°C (65°-68°F).
2. Grow the young plants at 18°-20°C (65°-68°F) until the plants are large enough for the low temperature treatment. Provide 18-24 hour days with sodium vapor (5 watts per sq. ft.) or fluorescent lamps (10 watts per sq. ft.).
3. When plants are of adequate size, initiate flower buds with 4 - 6 weeks of 10°C (50°F).
4. Raise the temperature to 15°C (59°F) for early flowering cultivars, and 12°-13°C (53.6°-55.4°F) for late flowering cultivars. Lighting during this period, as soon as flower buds are visible, with fluorescent lamps (2-2.5 watts per sq. ft.) advances flowering 2 - 3 weeks.
5. Fertilize moderately as high nitrogen levels encourage development of excessively large leaves.
6. Avoid excessive watering of the more vigorous cultivars such as KSA and Moll. Too much water encourages wild growth.

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