crop culture report:

Primula Danova

This primula series has a new, narrow focus that should benefit growers and retailers alike.

By Kathy Cron and Bob Croft

Top: *Primula Danova series.* ***Middle:*** *'Danova Red'.* ***Bottom:*** *'Danova Rose Bicolor'. (Photos: Sakata Seed America)*

Introduced in 1989, *Primula acaulis* Danova is known for large flowers with bold colors on compact, uniform plants. Intended for early season sales, the Danova series has grown to a broad selection of 30-plus varieties. Sakata Seed America is now taking a new, narrowed focus with this primula series.

The broad selection was narrowed to nine colors designed to have cultural ease, bloom window uniformity and retail color demand. The full bouquet is bred to form on very uniform, tight plants for outstanding color without cabbage-like foliage. The broad Danova series, the balance of which is still available, is now simplified for success at the grower and retailer levels.

Plug Production

Select a sterile substrate with a high amount of organic matter and a pH of 6.0-6.5. Primula seed require light for germination, but a light cover of vermiculite is recommended to maintain sufficient moisture. The optimum germination temperature is 59° F. It is important to maintain high humidity levels. If needed, place the flats in a germination chamber or shaded greenhouse to provide cool conditions. Radicles should emerge 7-10 days after seeding.

When the cotyledons are fully expanded, lower the humidity levels but do not allow plants to dry out. A light mist 2-3 times per day is beneficial. Primula are very sensitive, and the leaves can burn easily in strong light (greater than 3,000 foot-candles). A light shade is recommended to protect plugs from intense sunshine. During periods of high temperatures, the plants grow very slowly. Fertilize with 50- to 75-ppm nitrogen.

When the first true leaves have formed around day 30, fertilize plants with 100-ppm nitrogen to maintain a roughly 1.0 EC. The plants are ready for transplanting when they have 2-3 true leaves. Applying 200-ppm nitrogen a week before transplanting helps plants make the transition from the plug tray to the final container. Plug production usually requires 7-8 weeks.

Growing On

Transplant seedlings into 4-inch pots using a well-drained, sterile media that is high in organic matter. It is important to set the plug even with the medium. Planting too deep results in crown rot and invites other disease problems. Planting too high makes a poorly anchored and floppy plant. The optimum pH is 5.5-6.2. Light levels should range from 1,700 to 2,000 foot-candles with a maximum of 3,000 foot-candles. The plants can initially be grown pot tight and spaced as leaves begin touching each pot's edge.

Primula are sensitive to excess salts, so maintain even moisture and avoid excessive dryness. Using a well-balanced calcium/magnesium feed at 100- to 150-ppm nitrogen works well. Alternate with 20-10-20 as needed to maintain optimum pH. Fertilize as needed to maintain a 1.0-1.2 EC. Phosphorus and iron are the most common nutrient deficiencies in primula. Low phosphorus results in a bronzing of lower foliage accompanied by brown veins and an inward leaf curl on newly developing leaves. Iron deficiency shows as an interveinal chlorosis on both old and new leaves.

Flower Induction

Plants should have 6-10 leaves and a well-established root system 4-5 weeks after potting. At this stage they are receptive to flower induction. To promote bud set, some growers apply a higher fertilizer rate and double the potassium relative to nitrogen starting two weeks prior to temperature drop. There are several factors to consider as temperature and light, both quantitative and qualitative, influence the flower induction rate. The traditional approach is to lower the temperature to 45° F for seven weeks with natural short days and ambient light. This promotes a uniform crop with high bud count.

However, recent studies by Meriam Karlsson at the University of Alaska show that early, fast-growing *Primula acaulis* cultivars like Danova are both facultative long day and irradiant plants. This means that a longer day length (up to 14 hours) combined with higher light intensity (up to 1,700 foot-candles) reduces the time needed to initiate flower buds from 50 to 30 days. Karlsson found the optimum light energy needed is 10 mol of light per day.

Extend the day or use night interruption with either HID or incandescent lights (10 foot-candles), depending on the average amount of light received. To ensure fast and uniform flower development at 55° F, provide a 14-hour photoperiod and 10 mol of light per day. The most important factor for rapid flower induction and development is long day length.

For growers in cold regions with sufficient light, growing at 45° F and extending the photoperiod will save energy and reduce crop time. For growers in warmer areas with sufficient light quality, one can ensure a uniform bud set at a higher night temperature, 55° F, by providing long days. Be careful using incandescent lights with warmer night temperatures as they can promote plant stretch. Also, monitor the temperature if using HID lights as they produce heat energy.

Finishing

After bud formation, maintain 55° F to flower the plants. Long day conditions are no longer necessary, and light levels should be reduced to a maximum of 2,000 foot-candles to prevent flower fading. Plants typically flower in three weeks and are usually sold with 5-6 open flowers.

In general, primula are not attractive to insects, but aphids, thrips, whiteflies and cut worms are concerns. Problems with fungus gnats or shore flies are common during germination and plug stages. Primula require cool conditions and high humidity to produce high quality plants, which favors the development of Botrytis. Good sanitation, watering early in the day and good air movement help control and prevent this disease. GPN

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