

Cultural Information for:	Danova & Daniella	Annual
Common Name:	Primrose	
Botanical Name:	Primula acaulis	
Seed Count:	33,000 / ounce	1,150 / gram
Optimum Germination Temperature:	64-68°F / 18-20°C	
Optimum Growing Temperature:	50-59°F / 10-15°C	

Plug Culture – 8 weeks (288 12 x 24 tray)

Stage 1 (days 1-14) Select a sterile substrate containing a high amount of organic matter and a pH between 5.5 - 5.8 and EC <0.6 mmhos (2:1 dilution). Primula seed requires light for germination, but a light cover of vermiculite is recommended to maintain enough moisture. Optimum germination temperature is 64-68°F/18-20°C. Temperatures above 68°F/20°C reduce total emergence. Maintain high humidity levels and either place the flats in a germination chamber or shaded greenhouse to provide cool conditions.

Stage 2 (days 15-29) When the cotyledons are fully expanded, reduce humidity levels but do not allow the plants to dry out. Target 60-62°F/16-17°C to prevent stretching. A light mist 2-3 times per day is beneficial. Primula leaves are very sensitive to strong light (>3,000-foot candles/32,000 lux). To avoid leaf burn, shade the plugs from intense sunshine. During periods of high temperatures, the plants grow very slowly. Fertilize with 50-75 ppm Nitrogen to strengthen the plants. Select a well-balanced calcium nitrate-based fertilizer to produce strong and healthy seedlings.

Stage 3 (days 30-48) The first true leaves have formed. For high quality plugs it is necessary to maintain cool temperatures and enough humidity. Fertilize the plants with 100 ppm N as needed to maintain EC between 0.75-1.0 mmhos (2:1 dilution).

Stage 4 (days 49-56) The plants have 3-4 true leaves and are now ready for transplanting. Applying 200 ppm N a week before transplanting helps the plants make the transition from the plug tray to the final container.

Transplant to Flowering – 14-16 Weeks

Pots: Transplant Danova plugs into 4-5 inch/10-12 cm pots using a well-drained sterile media. Optimum pH is between 5.5 - 5.8.

Temperature: Maintain a day/night temperature of 62-65°F/17-18°C to promote vegetative growth and build plant bulk.

Light Level: A maximum light level of 3,000-foot candles / 32,000 lux is recommended for Primula production.

Fertilizer: A well-balanced calcium nitrate-based formulation is recommended. Apply 100-150 ppm N as necessary to maintain an EC between 1.0–1.2 mmhos (2:1 dilution). Increasing potassium promotes higher bud count and more compact plants.

Flower Initiation: Danova is a medium-early and Daniella a medium-late flowering type. When the plants have 6-10 leaves and a well-established root system, the plants are receptive to flower bud initiation. Danova & Daniella require vernalization and optimum initiation temperature is 45-50°F / 7-10°C for seven to nine weeks. Cooler temperatures promote higher uniformity. When flower buds are visible (but not before) increase the temperature to 62°F/17°C to force flowering.

Schedule in Weeks*	Plug: 64-68°F 18-20°C	Vegetative: 62-65°F 17-18°C	Initiation: 45- 50°F 7-10°C	Flowering: 62°F 17°C
Danova	8	4	7	3
Daniella	8	4	9	3

**timing may vary slightly depending on climate and location*

Production Points: In general, Primula is not attractive to insects, but aphids, thrips, white fly and cut worms are the major concerns. Problems with fungus gnats or shore flies are common during the germination and plug stage. Primula requires cool conditions and high humidity to produce high quality plants. However, these conditions favor the development of botrytis. Good sanitation, watering early in the day and good air movement all help to control and prevent this disease.

Growth Regulation: In general, Primula growth is controlled with fertilizer and cool temperatures. If necessary, the following chemical growth regulators are effective. Do not apply below 41°F/5°C. To avoid over-regulation, multiple applications at lower rates is best. Do not apply after flower bud set.

Chemical	Rate
B-Nine (daminozide)	2,500 – 5,000 ppm (0.25 – 0.5%)
Bonzi (paclobutrazol)	5-10 ppm foliar spray 0.5-1.0 ppm drench

“All information given is intended for general guidance only and may have to be adjusted to meet individual needs. Cultural details are based on North American conditions and Sakata cannot be held responsible for any crop damage related to the information given herein. Application of recommended growth regulators and chemicals are subject to local and state regulations. Always follow manufacturer's label instructions. Testing a few plants prior to treating the entire crop is best.”