

VIOLA WITTROCKIANA

Mammoth™

Minimum Germination Rate: 90%

Seed Product Form: Raw, GoldSmart™ Primed

FLOWERING

Flowering Mechanism: Irradiance (primary); plants initiate on approximately day 15 with HID light for 16-18 hours OR total 15 – 20 mols (4,250 – 5,500 foot candles or 42,500 – 55,000 lux) for 2 – 4 weeks at 67°F (19.5°C). Bud/flower initiation at approximately 3 – 5 leaves, days 12 – 28. An average daily temperature of 67 – 70°F (19.5 – 21°C) will enhance flowering.

PLUG CULTURE

The timing approximations are based on optimal culture recommendations below:

Germination 1 (approximately day 1 – 5): Humidity in the air 100% (humidification) from the time the crop is sown until radicle emergence takes place; root initial has penetrated media; some cotyledon development. Expect radicle emergence in 2 – 5 days; 3 – 5 days for non-primed seed.

Cover: Cover seeds lightly with coarse vermiculite to maintain moisture levels.

Media: Avoid media compaction to allow for root penetration. pH: 5.5 – 5.8; higher pH levels will encourage Thielaviopsis outbreak and boron deficiency which may cause tip abortion and stunted growth. Initial pH of presow medium should be on the low side of pH range because media pH tends to increase under saturated conditions. EC: <0.5

Light: If utilizing a chamber, providing a light source of 10 – 100 foot candles (100 – 1,000 lux) will improve germination.

Moisture: Saturated (5) for days 1 – 5 or until radicle emergence.

Humidity: 100% until radicle emergence.

Temperature: 65° – 68°F (18 – 20°C) until radicle emergence.

Germination 2 (approximately day 6 – 14): Change the humidity in the air (dehumidification) to 40%. The result is better root expansion; cotyledons fully expanded; roots are expanding throughout the growing substrate.

Media: pH: 5.5 – 5.8. EC: 0.5 – 0.75

Light: 2,000 – 2,500 foot candles (20,000 – 25,000 lux); 6 – 8 mols of light.

Moisture: Dry back media to wet (4) and alternate to moist (3) within 18 hours at radicle emergence (approximately day 6).

Dehumidify: Lower relative humidity to 40% (approximately day 6). Provide horizontal airflow to aid in drying down the media through evapotranspiration, allowing better penetration of oxygen to the roots.

Temperature: Once cotyledons are observed, reduce temperature to 64° – 67°F (17.5° – 19.5°C); -2 to -3°F (-1.5 to -2°C) DIF or morning drop.

Fertilizers: 14-4-14 or 17-5-17 at 60 – 75 ppm nitrogen as needed for an EC in the soil of 0.5 – 0.75. Maintain a boron concentration of 0.5 ppm in the soil.

Growth Regulators: B-Nine spray at 2,500 ppm if stem stretch is observed

Plug Bulking/Flower Initiation (approximately day 15 – 21*): Length of vegetative period – time necessary for roots to reach the edge of the plug, for shoots to fill out container, and for plants to become receptive to flower initiation. Before initiation starts, the plants should be a proper size, which includes optimum shoot development, large number of auxiliary shoots and good presentation from pot size to plant size.

*An additional week may be necessary to ensure sufficient shoot growth when the ADT is 80F (26.5C) and irradiance is greater than 18 mols.

Media: pH: 5.5 – 5.8. EC: 0.75 – 1

Light: 3,500 – 5,000 foot candles (35,000 – 50,000 lux); 12 – 18 mols

Temperature: 64° – 67°F (17.5° – 19.5°C); DIF or morning drop of -3 – 5°F (-2 – -3°C) can be used.

Moisture: Alternate between moisture levels wet (4) and medium (2). Allow media to dry back to level (2) within 18 hours before re-saturating to level (4).

Fertilizers: 14-4-14 or 15-5-15 at 75 – 100 ppm nitrogen, 8 – 12 ppm phosphorus. Maintain a boron concentration of 0.5 ppm in the soil.

Growth Regulators: A-Rest (ancymidol) at 5 ppm. Increased concentrations may be necessary when the average daily temperature is greater than 75°F (24°C)

Fungicide: Apply fungicide drench for Thielaviopsis.

Initiated Bulking (approximately day 22 – 35): Plants are receptive to flowering.

Light: Provide 4,250 – 5,500 foot candles (42,500 – 55,000 lux) or 15 – 20 mols of light.

Temperature: 64° – 67°F (17.5° – 19.5°C); -5 to -10°F (-3 to -6°C) DIF or morning drop.

Fertilizer: 14-4-14 or 17-5-17 at 100 – 125 ppm, 8 – 12 ppm phosphorus. Maintain a boron concentration of 0.5 ppm in the soil.

Growth Regulators: B-Nine spray at 2,500 – 7,500 ppm; A-Rest 2 – 3 ppm.

GROWING ON

The timing approximations are based on optimal culture recommendations below:

Transplant to Finish (approximately day 36 – 82)

Media: pH: 5.5 – 5.8. EC: Avoid EC above 1.5

Light: 4,000 – 6,000 foot candles (40,000 – 60,000 lux); 14 – 22 mols

Temperature: 64° – 67°F (17.5° – 19.5°C); -5 to -10°F (-3 – -6°C) DIF or morning drop.

Moisture: Alternate between moisture levels wet (4) and medium (2). Allow media to dry back to level (2) within 18 hours before re-saturating to level (4).

Humidity: 40%

Fertilizers: 14-4-14 or 17-5-17 at 100 – 125 ppm nitrogen, 8 – 12 ppm phosphorus. During cool weather production, ammonium-based feeds may



encourage root rot problems. High nitrogen concentrations may promote stretching.

Nutrition: At an average daily temperature of 80°F (30°C) a calcium spray at 150 ppm per week may be necessary to prevent upward cupped leaves; a boron spray at 1 ppm per week may be necessary to prevent tip abortion.

Growth Regulators: Colossus is genetically more compact, requiring less growth regulators. B-nine (daminozide) at 2,500 – 5,000 ppm. Also responds to negative DIF treatments, A-Rest (ancymidol), or B-Nine/Cycocel (chlormequat chloride) tank mix.

Techniques to Enhance Post Harvest Quality

When to Treat: 1 – 2 weeks prior to finish or shipping

Growth Regulators: Spray B-Nine (daminozide) at 2,500 – 3,500 ppm

Fertilizer: Potassium nitrate at 150 ppm nitrogen

Temperature: A DIF of as much as -15°F may be applied for spring production

Common Diseases: Alternaria Leaf Spot, Downy Mildew, Thielaviopsis Root Rot, Cercospora Leaf Spot

Common Pests: Aphids

PRODUCT USE

Packs, pots, containers, mass plantings

GARDEN SPECIFICATIONS

Light: Full sun

USDA Hardiness Zone: 4

AHS Heat Zone: 9 – 1

Mammoth 6 – 8" (15 – 20 cm) 6 – 8" (15 – 20 cm)

Pansy SCHEDULING in Weeks

Total crop time

11 – 12 for fall market;

13 – 14 for spring market

10 – 12 for fall market;

12 – 14 for spring market

'288' plug crop time

4 – 5 for fall market;

5 – 7 for spring market

4 – 5 for fall market;

5 – 7 for spring market

Transplant to finish crop time

Pack 4 – 5 for fall market;

5 – 7 for spring market

4 – 5 for fall market;

5- 7 for spring market

4" crop 5 – 6 for fall market;

6 – 7 for spring market

5 – 6 for fall market;

6 – 7 for spring market

The shortest crop times may be achieved when following recommended optimal culture. Deviation in environmental conditions will result in longer crop times.

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Note: These suggestions are only guidelines and may have to be altered to meet individual grower's needs. Check all chemical labels to verify registration for use in your region.

