



Patiola®

VIOLA CORNUTA

Minimum Germination Rate: 90%

Seed Product Form: Raw

FLOWERING

Time frame when plants are receptive to flower initiation: Days 16 – 24; 2 – 3 sets of true leaves.

Flowering Type: Patiola is a facultative long-day plant – long days enhance flowering.

Specific Flowering Mechanism: Daylength and irradiance triggers flowering. Cool night temperatures enhance flowering.

PLUG CULTURE

The timing approximations are based on optimal culture recommendations below:

Germination 1 (approximately day 1 – 4): From the time a seed is sown until radicle emergence takes place; usually with the root penetrating the media and some cotyledon development. Humidity in the air is 95 – 98% (humidification); media moisture 4+ – 5. Expect radicle emergence in 3 – 4 days.

Cover: Seeds may be covered with a thin layer of coarse vermiculite to maintain moisture levels.

Media: pH: 5.5 – 5.8; this recommended range will reduce the incidence of Thielaviopsis outbreaks and boron deficiencies which may cause tip abortion and stunted growth. EC: <0.75. Avoid media compaction to allow for root penetration.

Light: Light is not necessary for germination. If utilizing a chamber, providing a light source of 10 – 100 foot candles (100 – 1,000 lux) will improve germination dramatically compared to seed germinated in the dark.

Moisture: Saturated (5) on day 1. On days 2 – 3 reduce moisture to wet (4) until radicle emergence. On day 7, reduce further to moist (3). Non-uniform germination may result if media conditions are too dry.

Humidity: 100% from day 1 – 4 or until seed coats are shed then reduce to 40%.

Dehumidify: Provide horizontal airflow to aid in drying down the media through evapotranspiration, allowing better penetration of oxygen to the roots.

Temperature: 65° – 68°F (18 – 20°C) until radicle emergence. Then reduce gradually to 62° – 65°F (17° – 18°C) as seedlings mature.

Fertilizers: Maintain EC of <0.75. Fertigation water should not be greater than an EC of 0.5.

Germination 2 (approximately day 5 – 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 5). 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

Fungicides: Preventative fungicide may be applied for Thielaviopsis and Rhizoctonia between day 7 and 10.

Plug Bulking/Flower Initiation (approximately day 15 – 21): The time it takes for the shoots to proportionately fill the plug cell and for roots to develop throughout the media. Induction and initiation may occur; if buds are present, they should be few in number and small in size.

Media: pH: 5.5 – 5.8. EC: 0.5 – 1.

Light: 2,500 – 3,500 foot candles (25,000 – 35,000 lux); 8 – 12 mols of light.

Temperature: 65°F (18°C) nights; 65° – 68°F (18° – 20°C) days. Cool nights will prevent seedling stretch. After several sets of true leaves have appeared, drop night temperatures to 59°F (15°C) to initiate flowering.

Moisture: Alternate between moisture levels wet (4) and medium (2). Allow media to approach level (2) before re-saturating to level (4).

Humidity: 40 – 60%

Dehumidify: Provide horizontal airflow to aid in drying down the media through evapotranspiration under cool, low light conditions.

Fertilizers: Feed established seedlings with a calcium-based fertilizer (14-4-14) at 50 – 150 ppm nitrogen. Use the lower rates on younger seedlings. An ammonium concentration >5 ppm nitrogen will cause seedling stretch.

Growth Regulators: Violas can be treated when the first true leaves are fully developed. Apply B-Nine (daminozide) at 2,500 – 5,000 ppm. A-Rest (ancymidol) can also be used. Violas also respond to negative DIF treatments, -5 to -10°F (-3 to -6°C) DIF or morning drop.

Fungicides: May be applied for the prevention of Thielaviopsis.

Initiated Bulking (approximately day 22 – 34): Seedlings develop from juvenile to mature, usually determined by the number of leaves present (cultivar specific). Seedlings are receptive to initiation and flower bud development.

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)

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.

Fungicides: Fungicides may be applied for the prevention of Thielaviopsis.

GROWING ON

The timing approximations are based on optimal culture recommendations below:

Transplant Ready: 4 – 5 weeks from sow in a '288' tray.

Finish Bulking/Flower Initiation: Optimum conditions during the vegetative period, beginning at transplant, needed for the root to reach the edge of the container AND to make the plant receptive to flower initiation.

Media: pH: 5.5 – 5.8 At pH levels >6.5, Thielaviopsis may develop as black lesions on the roots. Symptoms also include yellowing of lower leaves and die back of the plant. Stressed plants under high temperatures are most likely to be affected. EC: 1.0 Viola roots are sensitive to high salts.

Light: Provide full sun.

Temperature: During the cool season, a night temperature of 59°F (15°C) will promote earlier flowering. Temperatures below 59°F (15°C) will promote a more cold-hardy plant, but will increase crop time and delay flowering. Keep days below 68°F (20°C) or as cool as possible during warm weather conditions.

Average Daily Temperature (ADT): 67°F (19°C)

Moisture: Alternate between moisture levels wet (4) and medium (2). Allow media to approach level (2) before re-saturating to level (4). Saturated media for extended periods will induce stretching. When growing under warm temperatures and high light conditions, do not allow the plants to wilt.

Humidity: 40 – 70%

Dehumidify: Provide horizontal airflow to aid in drying down the media through evapotranspiration, allowing better penetration of oxygen to the roots.

Fertilizers: Feed every 2 – 3 watering at 100 – 150 ppm nitrogen with a calcium-based fertilizer (13-2-13). If desired, an application of ammonium nitrate (17-5-17) will help expand leaves. During cool weather production, ammonium-based feeds may encourage root rot problems. High nitrogen concentrations may promote stretching.

Nutrition: Malformed, puckered and upward cupped leaves indicate calcium deficiencies. To prevent this, fertilize with calcium nitrate or add calcium sulfate to the growing media before transplant. Boron deficiencies can be distinguished by tip abortion, upper leaf stunting, puckering and thickening of leaves, along with shortened internodes and/or a gnarled mass of lateral shoots. Violas tend to be more sensitive to boron deficiencies than pansies. Boron deficiency is more prevalent during warm weather with frequent watering. pH levels <6 will ensure boron is more readily available to the plant. A one-time application of Solubor will help overcome these problems. NOTE: An overdose of Bonzi (paclobutrazol) may also produce symptoms similar to boron or calcium deficiencies.

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Growth Regulators: Violas respond to DIF treatments, B-Nine (daminozide) and A-Rest (ancymidol). NOTE: Malformed leaves and leathery growth may occur if B-Nine is applied at 5,000+ ppm when temperatures exceed 90°F (32°C).

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

Common Pests: Aphids

PRODUCT USE	GARDEN SPECIFICATIONS
Packs, pots, containers, mass plantings	Light: Full sun USDA Hardiness Zone: 8 AHS Heat Zone: 9 – 1

	Garden Height	Garden Width
Patiola	4 – 6" (10 – 15 cm)	4 – 6" (10 – 15 cm)

VIOLA SCHEDULING IN WEEKS

	Patiola
Total crop time	9 – 10 fall sales; 11 – 13 spring sales
'288' plug crop time	4 – 5
Transplant to finish crop time	Timing will vary for production depending on whether the crop is grown under warm or cool conditions. Crop time for spring sales is longer due to cooler temperatures during the winter months in which it is grown.
Packs	4 – 5
4" crop	5 – 6
6" crop	6 – 7

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.