GrowerFacts

Cool Wave® F1 Spreading Pansy: Fall Production

Viola x wittrockiana
Approximate Seed Count: 21,200-32,600 S/oz. (750-1,150 S/g)

Plug Production

Media
Use a well-drained, disease-free media. A pH range of 5.4 to 5.8 and EC less than 0.75 mmhos/cm (2:1 extraction) is recommended. Keep the phosphorus level as low as possible to avoid initial stretch.

Sowing
Plug Tray Size
Can be produced in a 288-cell or 128-cell size tray (105, 128, 144 or equivalent) with 1 seed per cell. The larger size of 128-cell will promote stronger lateral growth and quicker finish, with more flowers. Smaller plug sizes restrict the plant growth and increase the crop time; we do not recommend plug sizes smaller than 288.

A medium covering of coarse-grade vermiculite is recommended at sowing to help maintain humidity around the germinating seed for better germination performance.

Stage 1 – Germination takes approximately 2 to 3 days.
Germination temperature: 65 to 70°F (18 to 21°C)
Light: Light is not required for germination.
Moisture: Keep the soil wet (level 4) during Stage 1.
Relative humidity: Maintain 95 to 97% relative humidity until cotyledons emerge.

Stage 2
Temperature: 70 to 75°F (21 to 24°C) days; 60°F (16°C) nights
Light: Can be up to 2,500 f.c. (26,900 Lux).
Media moisture: Keep the media medium (level 3) to medium wet (level 4).
Fertilizer: Apply fertilizer at rate 1 (less than 100 ppm N/less than 0.7 mS/cm EC) with a nitrate-form fertilizer with low phosphorous.

Stage 3
Temperature: 65 to 70°F (18 to 21°C) days; 60°F (16°C) nights
Light: Can be up to 2,500 f.c. (26,900 Lux).
Media moisture: Keep the media medium wet (level 3) during Stages 3 and 4.
Fertilizer: Increase the fertilizer rate to 2 (100 to 175 ppm N/0.7 to 1.2 mS/cm EC). Maintain a media pH of 5.4 to 5.8 and EC at 0.7 to 1.0 mS/cm (1:2 extraction). A higher pH (greater than 6.2) can induce Boron deficiency.

Stage 4
Temperature: 62 to 67°F (16 to 19°C) days; 55°F (12°C) nights
Light: Light levels can be up to 5,000 f.c. (53,800 Lux) if temperatures can be maintained.
Fertilizer: Same as Stage 3.

Plant Growth Regulators
When compared to standard pansies, Cool Wave pansies require fewer PGRs, or under ideal conditions they require no PGRs, in the plug stage. This is to ensure that the spreading habit isn't delayed or stunted.

If needed, treat with foliage spray of daminozide (B-Nine) 2,500 ppm (3.0 g/l 85% formulation or 4.0 g/l of 64% formulation) and Chlormequat (Cycocel) 500 ppm (4.2 ml/l 11.8% formulation or 0.7 ml/l 75% formulation), applied once when the first set of true leaves is fully open.

Note: Some varieties are more sensitive than others to ancymidol (A-Rest); you may notice less uniformity between varieties if using ancymidol (A-Rest) in plug production.

Northwestern Europe: If needed, treat with a foliar spray of daminozide (B-Nine/Alar) at 1,280 ppm (1.5 g/l of 85% formulation or 2 g/l of 64% formulation) applied once when the first set of true leaves is fully open.

Transplant the plugs "on time" to avoid flower bud initiation in the plug stage.

Growing On to Finish

Container Size: 4.5-in. (10.5-cm) pots, quarts, 6-in. (15-cm), and 10 to 12-in. (25 to 30-cm) or similar size hanging baskets.

Media
Use a well-drained, disease-free media with a pH of 5.4 to 5.8 and a medium initial nutrient charge.

Temperature
Night: 55 to 60°F (12 to 15°C)
Day: 62 to 70°F (16 to 21°C)

Light
Keep light levels as high as possible while maintaining appropriate temperatures.

Fertilizer
Starting a week after transplant, apply nitrate-form with low phosphorus fertilizer once a week at rate 3 (175 to 225 ppm N/1.2 to 1.5 mS/cm EC).

For constant feed programs, apply fertilizer at 125 ppm N/1.0 mS/cm EC using predominantly nitrate-form fertilizer with low phosphorus. If needed, alternate with a balanced ammonium and nitrate-form fertilizer to encourage growth and balance the media pH. Maintain the media EC at 1.25 to 1.5 mS/cm and pH at 5.4 to 5.8. If the media pH is greater than 6.2, take corrective measures.

Because Cool Wave pansies are vigorous and spreading, they require more fertilizer to maintain good flowering in the landscape and for consumers. It is recommended to use slow release fertilizer such as Osmocote 15-9-12 at low to medium rate as a top dressing before shipping.

Irrigation
Maintain optimal media moisture; i.e., not too wet or not too dry.

Plant Growth Regulators
Plant growth regulator use may be dependent on light, temperature, variety and container size. Refer to Pansy Cool Wave PGR recommendation based on ADT (average daily temperature) by variety chart.

Northwestern Europe: Temperature control is the best natural growth-controlling factor.

If needed, apply a tank mix foliar spray of daminozide (B-Nine/Alar) and chlormequat (Cycocel) once after transplant. Apply daminozide (B-Nine/Alar) at 1,280 ppm (1.5 g/l of 85% formulation or 2 g/l of 64% formulation) and chlormequat (Cycocel) at 750 ppm (6.4 ml/l of 11.8% formulation or 1 ml/l of 75% formulation) as a tank mix.

Photoperiod
Cool Wave Frost, White, Golden Yellow, and Red Wing are almost day neutral. Purple, Blue Skies, Lemon Surprise, Violet Wing, and Blueberry Swirl flower slightly later under short day conditions.

Pinching
Pinching is not recommended.

Crop Scheduling

Sow to transplant:
Summer/Autumn: It takes approximately 4.5 to 5 weeks to finish a 128-cell or similar size plug and approximately 3.5 weeks to finish a 288-cell plug. At 3.5 weeks, you may not get fully rooted plugs, but this younger plug will finish substantially faster for the finished grower. At 5 or more weeks, Cool Wave may become rootbound and check the growth in a 288 plug.

Transplant to finish:

Crop scheduling from a larger cell plug 105, 128, 144, etc.		Weeks from transplant to finish
Container	Plugs per Pot	Autumn
4½-in. (10.5 cm), Quart	1	4 to 5
6-in. (15 cm), Gallon	1	4 to 5
10-in. (25-cm) basket	3	6 to 8
12-in. (30-cm) basket	4	6 to 8

Crop scheduling from 288 plug or similar size		Weeks from transplant to finish
Container	Plugs per Pot/Cell	Autumn
4½-in. (10.5 cm), Quart	1	5 to 6
6-in. (15 cm), Gallon	1	6 to 7
6-in. (15 cm), Gallon	3	5 to 6
10-in. (25-cm) basket	4	7 to 8
12-in. (30-cm) basket	5	7 to 9

Note: Overcrowding plugs can result in a more mounded basket that will not trail over sides as much.

Northwestern Europe: Total crop time to finish in 4.5-in. (10.5-cm) pots for Autumn production can be approximately 14 weeks from sowing. With Autumn sowings for Spring production when growing frost free, plan 21 to 22 weeks from sow for Spring production. If producing in bigger containers such as hanging baskets, then it may take approximately 3 weeks additional crop time to finish.

Common Problems

Insects: Check/monitor for fungus gnats and shore flies during plug production and for aphids after transplant.
Diseases: Damping-off & black root rot.
Regular scouting for powdery mildew and preventative measures are recommended.

Other Key Tips:
When temperatures are too high in late summer/early fall, Cool Wave pansies will have smaller flowers and diminished shelf life at retail. For this reason we recommend mid to late season fall programs; retail weeks prior to Week 38 are usually not recommended.

Note: Growers should use the information presented here as a starting point. Crop times will vary depending on the climate, location, time of year, and greenhouse environmental conditions. Chemical and PGR recommendations are only guidelines. It is the responsibility of the applicator to read and follow all the current label directions for the specific chemical being used in accordance with all regulations.

Pansy Cool Wave PGR recommendation for finish stage based on ADT by variety

	Below 55°F/13°C	55-60°F/ 13-16°C	60-70°F/16-21°C		Above 70°F/21°C		
Variety	**PGR**	**Tank mix of B9 5,000 ppm/CCC 500 ppm[Z] sp**	**Weekly[w] tank mix of B9 5,000 ppm/CCC 500 ppm[Z] sp**	**Start with tank mix of B9 5,000 ppm/CCC 500 ppm[Z] sp, then Bonzi 3-5 ppm[Y] sp when soil is 90% covered and repeat as needed.**	**Weekly[w] tank mix of B9 5,000 ppm/CCC 500 ppm[Z] sp**	**Start with tank mix of B9 5,000 ppm/CCC 500 ppm[Z] sp, then Bonzi 5 ppm sp when soil is 90% covered and repeat as needed.**	**Start with tank mix of B9 5,000ppm/CCC 500 ppm[Z] sp, then Bonzi 0.125 ppm[x] dr[V] when soil is 90% covered.**
Blue Skies	No PGR necessary	Adequate control	Insufficient control	Adequate control	Insufficient control	Adequate control	Adequate control
Golden Yellow	No PGR necessary	Adequate control	Insufficient control	Adequate control	Insufficient control	Adequate control	Adequate control
White	No PGR necessary	Adequate control	Insufficient control	Adequate control	Insufficient control	Adequate control	Adequate control
Purple	No PGR necessary	Adequate control	Insufficient control	Adequate control	Insufficient control	Adequate control	Adequate control
Violet Wing	No PGR necessary	Adequate control	Insufficient control	Adequate control	Insufficient control	Adequate control	Adequate control
Lemon Surprise	No PGR necessary	Adequate control	Insufficient control	Adequate control	Insufficient control	Adequate control	Adequate control
Frost	No PGR necessary	Adequate control	Adequate control	Adequate control	Adequate control	Adequate control	Adequate control
Red Wing	No PGR necessary	Adequate control	Adequate control	Adequate control	Adequate control	Adequate control	Variety reacts strongly to Paclobutrazol drench. Reduced rates/ frequency recommended.
Blueberry Swirl	No PGR necessary	Adequate control	Adequate control	Variety reacts strongly to Paclobutrazol. Reduced rates/frequency recommended.	Adequate control	Variety reacts strongly to Paclobutrazol. Reduced rates/frequency recommended.	Variety reacts strongly to Paclobutrazol. Reduced rates/frequency recommended.

[Z]B9 5,000 ppm = 5.9 g/l of 85% formulation or 7.8 g/l of 64% formulation and CCC (Cycocel) 500 ppm = 4.3 ml/l of 11.8% formulation or 0.7 ml/l of 75% formulation
[Y]Bonzi 3 ppm = 0.75ml/l of 0.4% formulation , Bonzi 5 ppm = 1.25ml/l of 0.4% formulation
[X]Bonzi 0.125 ppm = 0.03 ml/l of 0.4% formulation
[w]You will likely be able to skip a few applications in larger containers.
[v]Drench volume depending on container size: use 2.5 ounces for 4.5-in./10.5-cm pots and quarts, 4 ounces for 6-in./15-cm pots, 10 ounces for gallons, and 12 ounces for 10-in./25-cm baskets

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