

# Cool Wave™ F<sub>1</sub> Spreading Pansy: Spring Production

*Viola x wittrockiana*

Approximate seed count: 21,200 to 32,600 S/oz.  
(750 to 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 soil wet (level 4) during Stage 1.

**Relative humidity:** Maintain 95 to 97% relative humidity until cotyledons emerge.

### Stage 2

**Temperature:** 65 to 72°F (18 to 22°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 a foliage spray of daminozide (B-Nine/Alar) 2500 ppm (3.0 g/l 85% formulation or 4.0 g/l of 64% formulation) and chlormequat (Cycocel) 300 to 500 ppm (2.5 to 4.2 ml/l 11.8% formulation or 0.4 to 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 (ARest)

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:** 306 packs, 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:** 45 to 55°F (7 to 12°C)

**Day:** 62 to 70°F (16 to 21°C)

For a faster finish and to increase spread which is particularly important for Spring production, grow in a warmer zone for two weeks after transplant at 55 (12 °C) night temperature. This will encourage quicker spread.

### 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 using predominantly nitrate-form fertilizer with low phosphorous. If needed, alternate with a balanced ammonium and nitrate-form



# NORSECO

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**

Since this is a spreading type pansy and mostly grown in larger containers such as hanging baskets, minimal to no plant growth regulators are needed.

If needed, you can use tank mix foliar sprays of daminozide (B-Nine/Alar) at 5,000 ppm (5.9 g/l of 85% formulation or 7.8 g/l of 64% formulation) and chlormequat (Cycocel) at 500 ppm (4.3 ml/l of 11.8% formulation or 0.7 ml/l of 75% formulation) to control plant growth.

**Northwestern Europe:** Temperature control is the best natural growth-controlling factor. Minimal to no plant growth regulators are needed when the crop is being produced at cooler temperatures especially during Spring production.

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

### **Pinching**

Pinching is not recommended.

### **Crop Scheduling**

#### **Sow to transplant:**

Winter/Spring: It takes approximately 5.5 weeks to finish a 128 cell plug. It takes approximately 4 weeks to finish a 288 cell plug.

At 4 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 Spring\*\***

4.5-in. (10.5-cm), Quart 1 6 to 7

6-in. (15-cm), Gallon 1 7 to 8

10-in. (25-cm) basket 3 8 to 9

12-in. (30-cm) basket 4 8 to 10

\*\*Note: Spring crop time varies depending on temperatures used.

If growing frost-free, plan longer crop times.

**Crop Scheduling from 288 plug or similar size  
Weeks from  
transplant to  
finish**

#### **Container Plugs per pot/cell Spring\*\***

306 pack (or equivalent) 1 6 to 7

4.5-in. (10.5-cm), Quart 1 6 to 7

6-in. (15-cm), Gallon 1 8 to 9

6-in. (15-cm), Gallon 3 6 to 7

10-in. (25-cm) basket 4 9 to 10

12-in. (30-cm) basket 5 9 to 11

\*\*Note: Spring crop time varies depending on temperatures used.

If growing frost-free, plan longer crop times.

**Note:** Overcrowding plugs can result in a more mounded basket that will not trail over the 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.**

**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.

630 231-1400

panamseed.com

© 2013 Ball Horticultural Company 13181 REV 04/13

® denotes a registered trademark of Ball Horticultural Company in the U.S.

It may also be registered in other countries.



# NORSECO