

## Spreading Petunia Wave®

(*Petunia x hybrida*)

### Germination

#### Media

Use a well-drained, disease-free seedling medium with a pH of 5.5 to 6.0 and EC about 0.75 mS/cm (1:2 extraction).

#### Sowing

Water thoroughly after sowing to make sure the pellet cracks before the tray is moved to chamber or bench. Do not cover with vermiculite due to physical barriers caused by vermiculite.

**Germination takes approximately 4 days.**

**Soil temperature:** 72 to 76°F (22 to 24°C)

**Light:** Lighting is beneficial. See below for detail.

**Moisture:** Keep soil very wet (level 5) during Stage 1 for optimal germination.

**Humidity:** Maintain 100% relative humidity (RH) until radicles emerge.

**NOTE:** Saturated moisture (level 5) and constant environmental conditions are the key issues for Wave germination. The best germination conditions are in a lighted chamber where the light level is about 10 f.c. (100 Lux) or higher, with 72 to 76°F (22 to 24°C).

If a light chamber is not available, either of the following conditions can be substituted for successful germination:

1. Dark chamber for the first 24 to 48 hours at 72 to 76°F (22 to 24°C). Once the trays are moved out of chamber, maintain saturated moisture (level 5) for the rest of Stage 1 at the same temperature.
2. If germinating on the bench, provide high media temperature from 72 to 76°F (22 to 24°C) and saturated moisture (level 5) by covering with Remy or plastic (Vermiculite is not recommended) until radicles emerge. If not covered, pay close attention to media moisture and maintain saturated condition (level 5) until the end of Stage 1.

### Plug Production

**NOTE:** Because their spreading habit begins after transplanting, Wave plugs can be produced like other petunia plugs.

#### Stage 2

**Soil temperature:** 68 to 75°F (20 to 24°C)

**Light:** Up to 2,500 f.c. (26,900 Lux)

**Moisture:** Start to slightly reduce soil moisture (level 4) to allow root to penetrate into the media.

**Fertilizer:** Apply fertilizer at rate 1 (less than 100 ppm N/less than 0.7 mS/cm EC) from nitrate-form fertilizers with low phosphorous.

#### Stage 3

**Soil temperature:** 65 to 70°F (18 to 21°C)

**Light:** Up to 2,500 f.c. (26,900 Lux)

**Moisture:** Allow media to further dry until the surface becomes light brown (level 2) before watering. Keep the moisture to wet-dry cycle (moisture level 4 to 2).

**Fertilizer:** Increase fertilizer to rate 2 (100 to 175 ppm N/0.7 to 1.2 mS/cm EC). If growth is slow, apply a balanced ammonium and nitrate-form fertilizer with every other fertilization. Maintain medium pH of 5.8 to 6.2 and EC between 1.0 and 1.5 mS/cm (1:2 extraction).

#### Growth Regulators

Control Wave plug growth first by environment, nutrition and irrigation management, then with chemical plant growth regulators if needed. Minimize ammonium-form nitrogen fertilizer to avoid seedling elongation. Temperature differential (DIF) can also be used to minimize height. Test all chemical plant regulators first.

**In North American conditions:** Apply B-Nine/Alar (daminozide) 1 to 2 applications at 5,000 ppm (6.0 g/l 85% formulation or 7.8 g/l 64% formulation) as a spray. The first application should be made when plugs have 2 to 3 true leaves. A second application can be made 7 days later. This treatment can improve basal branching of mature plants.

**In Northern European conditions:** 1 to 3 applications of B-Nine/Alar (daminozide) at 1,250 ppm (1.5 g/l 85% formulation or 2.0 g/l 64% formulation) spray has been tested and shown effective if needed.

#### Stage 4

**Soil temperature:** 60 to 65°F (16 to 18°C)

**Light:** Up to 5,000 f.c. (53,800 Lux) if temperature can be controlled.

**Moisture:** Same as Stage 3.

**Fertilizer:** Same as Stage 3.

#### Large Liner Production

For finished plant growers who do not have supplemental lighting and wish to finish Wave spreading petunias with the same PGRs as regular petunias, the best choice is to use larger, pre-lit liners. The following program produces Wave liners which have flower buds induced and all the heavy PGR applications already taken care of.

#### Liner Size

72-cell or larger. Wave Purple Classic and Wave Pink require 50-cell for uniform flowering.

#### Sowing

Direct sow into liner or transplant from 512 or 406-plug into liner. Note: If direct sowing, follow all germination requirements.

#### Photoperiod

Start long-day conditions (daylength extension to 14 hours or 4-hour night interruption) at 5-leaf count or earlier. Continue long days until plant leaf number reaches 12 (about 6 to 7 weeks from sowing depending on soil temperature, or up to 9 weeks if transplanted from small plugs).

Be aware that if plant material is moved from a 14-hour environment to less than 12 hours of light, there is a possibility of bud abortion occurring.

#### Growth Regulators

To achieve May flowering with a liner production time of 6 weeks, use the following schedule:

**Week 3:** B-Nine/Alar (daminozide) at 5,000 ppm (6.0 g/l 85% formulation or 7.8 g/l 64% formulation)

**Week 4:** Repeat B-Nine/Alar spray

**Week 5:** Bonzi (paclobutrazol) spray at 15 ppm (3.8 ml/l, 0.4% formulation) to 60 ppm (15.0 ml/l, 0.4% formulation) spray

**Week 6:** Repeat Bonzi spray, if necessary

If liner production is taking place during periods of cool temperatures and low light, the liner production period is about 1 week longer (about 7 weeks). Therefore, all PGR applications can be postponed 1 week (postpone 2 weeks if transplanted).

All other environmental conditions follow normal plug production regimes.

**Note:** Do not overgrow Wave plugs. If plugs become rootbound, the plant slows/stops growing. Rootbound plugs are more susceptible to disease. It takes about 1 to 2 weeks for plants to recover after transplanting from rootbound plugs. Make sure roots have optimum room for fastest crop timing.

## Growing On to Finish

### Important Notes for Producing Top-Quality Wave Plants

- Wave® petunias are long-day plants. See Growing On to Finish – Photoperiod/Light for specific details.
- Wave Purple has less daylength sensitivity and flowers about one week earlier than Wave Purple Classic.
- Because of their very vigorous growth, Wave petunias require a higher rate of plant growth regulators than standard petunias. See Growing On to Finish – Growth Regulators for specific details.
- Tips for finishing larger liners. See below.

### Growing On to Finish from Plugs

#### Container Size

Containers should be 4.5-SVD (11-cm) or larger.

**4.5 to 6-in. (11 to 15-cm) pots:** 1 plant per pot.

**10-in. (25-cm) baskets:** 3 plants of Wave Purple, Wave Pink or Wave Misty Lilac, or 4 plants of Wave Blue, Wave Rose or Wave Lavender per basket.

#### Media

Use a well-drained, disease-free, soilless medium with a pH of 5.5 to 6.3 and a medium initial nutrient charge.

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## Temperature

**Nights:** 57 to 65°F (14 to 18°C)

**Days:** 61 to 75°F (16 to 24°C)

Wave petunias can tolerate temperatures as low as 35°F (2°C); however, keep in mind that crop timing (time to flower) is related to daily average temperature when grown under proper daylength. Wave plants will take longer to flower when grown in cooler conditions.

## Photoperiod/Light

Wave petunia lighting requirements vary by location, variety and production week. Refer to the Photoperiodic Lighting Chart.

Start long-day or night-interruption conditions at 5-leaf count or earlier. Continue long-days until plants have a minimum of 12 leaves or until proper natural daylength is reached. When producing Wave petunias early in the year when days are short, decrease crop times by continuing to use Photoperiodic lighting. Day extension or night break (providing a 4-hour night interruption from 10:00 p.m. to 2:00 a.m.) are acceptable.

Both HID and incandescent lights are equally effective for flower induction. For initiation, light levels of 10 f.c. (100 Lux) at 10 ft. (3 m) above plant canopy is recommended. However plants grown under incandescent lights will stretch more and need more PGRs to control plant size. Incandescent lights will also affect plant habit by causing shoots to be more upright than under short days, particularly for Wave Rose and Wave Misty Lilac. Plants will resume their normal spreading habit under natural light conditions in the garden. Keep light levels as high as possible while maintaining moderate temperatures. High light levels or PGR applications may cause white “splashes” or star patterns to appear on the blooms of Wave Misty Lilac.

## Fertilizer

Wave petunias require more fertilizer than is usually recommended for petunias. For best results, apply a balanced fertilizer with every second or third irrigation of 300 ppm for all genetics. For light feeders, skip first application. To assure consumer satisfaction, an optional top dressing with slow-release fertilizer can be applied 10 days before shipping.

## Growth Regulators

The following growth regulator schedule is used for growing on Wave petunias at the PanAmerican Seed Co. Elburn, Illinois (Midwest) research facility. This “recipe” results in 6-in. (15-cm) pots of heavily branched Wave plants with a spread of approximately 10 to 12 in. (25 to 30 cm) when flowering begins – the perfect look for point of sale. For Wave Rose and

Wave Misty Lilac, the pots will be covered with blooms. For Wave Blue, Wave Pink, Wave Purple and Wave Lavender, the first flowers will appear closer to the center of the pot.

## 6-In. (15-Cm) Pots

Apply a B-Nine spray at 2,500 to 5,000 ppm 7 to 10 days after transplanting. Repeat 7 days later. Use a Bonzi drench one time (8-10 ppm for Wave Purple, 5 ppm for Wave Purple Classic, Wave Misty Lilac and Wave Pink; 2 ppm for Wave Lavender, Wave Rose and Wave Blue), 3 to 4 weeks after transplanting or when shoots have reached the edge of the pot. Follow with a Bonzi spray one time at 15 to 30 ppm one week later for additional control.

Somewhat dry conditions during the finishing stage will also keep Wave petunias more compact; allow plants to wilt slightly between waterings. If plants are grown pot-tight, PGR applications must be done more often or at higher rates than plants that are spaced over time. High temperatures or a moist growing regime may also necessitate greater PGR application rates to produce the best product.

## Hanging Baskets

**Option 1:** Apply a B-Nine spray at 3,000 to 5,000 ppm 7 to 10 days after transplanting. Repeat 7 days later. Use a Bonzi spray one time at 30 ppm, 3 to 4 weeks after transplanting. If necessary, a second Bonzi spray can be done.

**Option 2:** Apply a B-Nine spray at 3,000 to 5,000 ppm 7 to 10 days after transplanting. Repeat 7 days later. Follow with a Bonzi drench at 3 to 5 ppm at week 3. Repeat Bonzi drench if holding plants longer than desired.

B-Nine improves branching, but may delay flowering about 1 week. Bonzi does not appear to affect flower timing. Plants grow out of either plant growth regulator almost immediately after transplant to the landscape.

**NOTE:** Be sure to check local regulations regarding the use of plant growth regulators.

**NOTE:** Topflor can be used in place of Bonzi at 2/3 the rate of Bonzi.

## Common Problems

No major problems will occur if using good cultural and IPM practices.

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## Crop Scheduling

**Sow to transplant (288-cell plug):** 5 to 6 weeks

Transplant to flower:

**Spring:** 7 to 10 weeks under long days

**Summer:** 5 to 7 weeks under long days with high light and minimum night temp. of 65°F (18°C).

## Total Crop Time:

**Spring:** 12 to 16 weeks

4.5-SVD (11-cm) pot - 1 plant per pot - 12-14 weeks

6-in. (15-cm) pot - 1-3 plants per pot - 12-14 weeks

10-in. (25-cm) basket - 3-4 plants per basket - 13-16 weeks

**Summer:** 9 to 13 weeks

4-in. (10-cm) pot - 1 plant per pot - 9-11 weeks

6-in. (15-cm) pot - 1-3 plants per pot - 9-11 weeks

10-in. (25-cm) basket - 3-4 plants per basket - 10-13 weeks

Wave Lavender, Wave Blue, Wave Misty Lilac, Wave Rose and Wave Purple flower up to one week earlier than Wave Purple Classic and Wave Pink.

## Growing On to Finish from Large Liners

### Photoperiod

Natural day during Spring when daylength is longer than 11 hours.

### Growth Regulators

One or more (if grown pot to pot) Bonzi 30 to 60 ppm spray based on temperature, weather conditions and cultural practice. All other environmental conditions follow the normal production.

## Crop Scheduling

**Sowing to transplant:** 6 to 7 weeks for direct sowing; 7 to 9 weeks for transplant from small plug.

**Transplant to flower:** 5 to 6 weeks from 50-cell liner (add 1 more week for Wave Purple Classic and Wave Pink); 5 to 7 weeks from 72-cell liner (add 1 more week for Wave Purple Classic and Wave Pink).

## Hanging Basket Tips

At the end of production, maintain fertilization and utilize PGRs. Do not eliminate fertilization to control growth just prior to shipping. Apply fertilizer at half rate and, to hold plant habit, utilize PGRs. Provide good air

circulation at the plant level. This reduces potential for disease and die-off.

Do not allow plants to wilt. Maintain moderate moisture levels. This will provide better plant performance and color in the center of the basket.

## Handy Tips For Retailers

Be sure to ask your grower for Wave petunias in the easy-to-find Wave™ Pink Pots!

Keep Wave plants fresh and healthy at point-of-sale:

- Display Wave petunias in filtered sunlight – in direct sun, the plants dry out quickly and require more frequent watering.
- Keep Wave petunias watered. The soil should never dry out completely.
- In the display, space Wave petunias with the leaves just touching between the plants.
- Feed the plants with a liquid fertilizer once a week at the ratio recommended on the label.
- Remind home gardeners that Wave petunias grow rapidly. These annuals can quickly fill in a square yard of garden space in just a few weeks.

## Green Thumb Tips

### Important Notes for Growing & Using Wave and Tidal Wave Petunias in the Landscape

- Pick the right Wave petunia for your needs. Wave and Tidal Wave have distinct habits. Wave offers a thick, ground-hugging ocean of color. Tidal Wave grows outward, then up for a big, shrublike shape. Tidal Wave looks great growing alongside a fence – plants will grow up and over the fence!
- Start with “fresh” plugs. Avoid starting from rootbound plugs. Plants grown from rootbound plugs may not be able to generate enough roots to adequately sustain themselves when planted outside. Wave and Tidal Wave plugs that have been scheduled and transplanted promptly will root out better in the container and perform better when planted in the landscape. Allowing the containers to dry out slightly between watering encourages better root development. Do not let plants wilt.
- Plant well-rooted plants. Avoid planting poorly rooted plants into the landscape. Poorly rooted plants may wilt quickly if the temperatures become very warm soon after planting.
- Acclimate plants before planting. As a general rule, greenhouse or nursery-grown plants will adapt better in the landscape if they are hardened off prior to planting. Exposing plants to the outside temperatures and light allows the soil to dry between watering and helps reduce transplant shock.

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- Follow good soil preparation practices. Wave and Tidal Wave petunias tolerate a wide range of soil conditions. However, tilling the soil for good aeration, adding amendments, raising the beds to provide good drainage, maintaining the proper pH (6.5 to 7.0 is optimum), and using a broad spectrum fungicidal drench all contribute to successful landscape plantings. Plants will take off more quickly if a liquid feed is used before planting. See “Provide Adequate Nutrition” for more details.
- Petunias prefer sun. Wave and Tidal Wave petunias thrive in bright, sunny locations with at least 6 hours of direct sunlight. Sun is a MUST to keep these plants covered with blooms and looking terrific all season long.
- Space adequately. For fast fill, space Wave petunias 12 to 18 in. (30 to 45 cm) apart in the landscape. Wave petunias spread 3 to 4 ft. (90 cm to 1.2 m), so they can be spaced as far as 24 in. (60 cm) apart. Spacing plants closer than 12 in. (30 cm) can lead to overcrowding and contribute to disease.
- Space Tidal Wave a minimum of 12 to 15 in. (30 to 38 cm) apart. At this spacing they will form dense mounds of 18 to 24 in. (45 to 60 cm) in height. When spaced at 18 to 24 in. (45 to 60 cm), Tidal Wave will spread more like a ground cover from 2.5 to 4 ft. (75 cm to 1.2 m).
- Irrigation. Wave and Tidal Wave petunias are excellent landscape performers. However, like any other plant, they need adequate water after planting in order to get established in the landscape. During the season, do not overwater. Night watering is not recommended. Morning watering is preferred.
- Water Management. Do not let Wave or Tidal Wave petunias dry out to a wilt between waterings as too severe of wilt may lead to increased susceptibility and may limit nutrient uptake. Do not over-water or allow the plants to continually have wet roots. This can lead to disease. Mulching plants can help through conserving moisture.
- Provide adequate nutrition. Wave and Tidal Wave petunias are vigorous growers and benefit from heavier feeding than standard petunias, therefore give plenty of feed throughout the life of the planting. Before Planting: A good way to get the plants off to a fast start is to water the plants with a liquid fertilizer, such as Nature’s Source, prior to planting.  
At Planting: A slow-release fertilizer (such as NutriCoat or Osmocote), which is released by temperature, is recommended. For best season-long growth we suggest the following: incorporate slow release at half rate at installation. Too much fertilizer too soon will cause plants to put on leaves, but not flowers. At approximately the half-way point in the life of the landscape, apply another half rate of the slow release formula. In regions where temperatures are elevated, utilize

### Additional Tips for Using Wave and Tidal Wave Petunias in Containers

- Wave and Tidal Wave petunias are multi-purpose! In addition to making a wonderful color impact in gardens, they’re spectacular in large containers, street planters and large window boxes. For fantastic showings in hanging baskets, choose Easy Wave petunias.
- Containers dry out more quickly than ground plantings. Since containers need to be watered more frequently, nutrients are likely to be leached from the containers more quickly. As a result they may also require more frequent feeding.
- Keep your Wave and Tidal Wave petunias well-fed and don’t let them dry out between waterings. Apply a liquid fertilizer once a week or use a combination of liquid and slow-release fertilizers, following the rates recommended on the labels.

For more information on all Wave spreading petunias, visit **Wave-Rave.com** or **BallLandscape.com**.

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