

Petunia Cultural information 26/06/99

Petunia x Hybrida Hort

General

There are three classes of petunia

Grandiflora, Multiflora (sometimes called Florabunda), and milliflora.

The nomenclature refers to the size of flower and number of flowers per plant. The smaller the flower the more flowers per plant.

AFM have carefully selected and tested all our petunia varieties so that they perform under Thai climatic conditions.

Germination time 3-4 days

Germination temp 22-24 deg c

Sowing to transplant-not more than 30-35 days.

Petunia Grandiflora Double -----9,500 seeds per gram

All with large double flowers 7.5-10 cms diameter.

Double Fanfare Mix, Pink, Pink/white, Mauve, White, Red.

Purple Pirouette, purple with white edges. **Rose Pirouette**, rose with white edges.

Cascade Burgundy, **Cascade Pink**, **Cascade Plum**

Sowing to flowering 10-12 weeks

Petunia grandiflora singles 10,000 seeds per gram

Large single flowers 8-12 cms diameter

Titan-King Kong Mix the largest grandiflora petunia flower available at 11-12 cms diameter on plants 30 cms high.

Dreams series, a full range of separate solid color grandiflora petunias, flower size 8-10 cms on plants 25 cms high.

Morn series, three separate colors all with yellow throats, red, peach & pink, plus cherry mix. flower size 8-10 cms on plants 25 cms high.

Vein Types, Daddy Series, six separate colors all with veined flowers, and a veined mix.

Flower size 10 cms on plants 25 cms high.

Rain and overhead irrigation resistant types, The Storm series. Five separate colors and a mix. All with good weather resistance. Flower size 10 cms on plants 25 cms high.

Star selections, Blue star, Red star, Crimson star, Rose star. All flowers have a white star shape.

Frost selection. Fire frost, Velvet frost, Blue frost, Cherry frost, and a Frost mix. All flowers have white edges.

Halo selection petunias are bred in the South of France. They have white throats and come in three separate colors, Rose halo, Salmon halo, Coral halo and a mix.

Wave Petunias (pellets & Plugs only)

The Waves are a class of hanging basket petunia that are the most spectacular type of cascading petunia available. Although seed is available, most AFM customers order plugs as the cost of seed is very expensive. People prefer to leave the risks of germination to us.

Petunia Multiflora 9,000-10,000 seeds per gram & Pellets

Petunia Multifloras are slightly smaller flowered than grandifloras, they have more flowers per plant and are more heat and weather resistant so in hot, humid climates like Thailand they can be grown all year round. We actually recommend our Celebrity Multiflora selection to be grown all year round. It is a cross between a grandiflora and a Multiflora petunia. The flowers are only slightly smaller than a grandiflora and they have all the heat and weather tolerances of normal Multiflora petunias.

Multiflora Double Bonanza Mix. This is an extremely weather tolerant double flowered petunia with 5-6 cm flowers and a height of 25-30 cms. There are many different colors including straight colors, vein & bicolors.

Multiflora Celebrity selections

Our **AFM Celebrity Multiflora** selections have been bred and selected over the past ten years for suitability to Thai climatic conditions. We are continually re selecting and improving these varieties. We call the celebrities a Florabunda type because of their large flowers similar to grandifloras.

The following colors and mixes are available:-

Blue, Sky blue, Burgundy, Scarlet, Lilac, salmon, red, white, Midnight blue, Lavender, Plum, Carmine, Neon rose, Pink, Strawberry sundae, yellow, Lavender sunrise, Halo mix, Sunrise Mix, Sunset mix, Ice vein mix, Star mix, Frost mix, Morn mix, Celebrity mix.

Multiflora Pink Lady is a novelty pink\white color flower on a large plant.

AFM Multiflora bedding selection Pearls mix has been specially chosen for its ability to crepe and cover ground quickly. It is an extremely vigorous growing petunia and is only recommended for bedding, hanging baskets and window boxes. Plants are large spreading up to 40 cms with flowers 5 cms in diameter.

Milliflora Petunias. The third class of petunias we sell are called "Millifloras"

The Fantasy selection have many small flowers and make ideal pot plants. In Thai conditions plants will reach a height of no more than 20 cms with a flower size of 3 cms.

New flowers keep appearing to take the place of old. The plant has a mounding habit and is covered in flowers so much so that they sometimes cover all the foliage

Fantasy can be grown all year round with out using any growth regulators.

Sowing and growing information

Germination

Most Petunia varieties have raw or pelleted seed available.

Pelleted seed takes a little longer time(1-2 days) to germinate compared to raw seed and requires more initial moisture. Pellets are far easier to handle.

Seed should be germinated in a loose sterile well draining media, preferably an imported peat. Peat media with a depth of 5-6 cms.

If sowing seed in a seed tray, seeds should be sown 1 cm apart on the surface of the media and in rows 5 cms apart.

If sowing seed in Plug trays use a 288 plastic tray.

Seed must be sown on the surface of the media and **MUST NOT BE COVERED.**

Drench the peat media after sowing with Prevacure M or Terrachlor to prevent damping off diseases.

Germination STAGE 0

pH:- 5.6-6.2

Germination STAGE 1

Radicle(root) will emerge in 3-4 days

Visual:- At the end of stage 1 the roots of the seedlings should be 0.5-0.75 cms long and the cotyledons will have started to emerge

Moisture:- Sow seeds on wet(saturated media), do not cover seed.

Lighting:-Light is essential for good germination, 10-100 foot candles(100-1000 lux), do not try to germinate petunia seed in the dark. Use artificial light-Neon is fine.

Media Temperature:- 22-24 deg centigrade

Fertilizer:- Do not use fertilizer at this stage.

Media EC(Electro conductivity) 0.75-1.0

Germination STAGE 2

Visual:- At the end of stage 2 the roots should be 1.25-2.0 cms long and the first true leaves should be beginning to emerge.

Moisture:- Reduce moisture levels to encourage roots to penetrate into the media. Media should be moist to the touch but not saturated.

Media Temperature:- 18-20 degrees centigrade.

Fertilizer:- Use a nitrate based fertilizer at about 50 ppm. At The AFM nursery we use the following fertilizer mixed for petunia plugs.

To achieve 50 ppm **calcium nitrate** dissolve the following in 100 liters of irrigation water:-

Calcium Nitrate	15.0.0	16.6 gms/100L water
Mono Potassium Phosphate	0.52.34	10.9 gms/100L water
Potassium Nitrate	13.0.46	11.8 gms/100L water
Magnesium nitrate (Magnasal)	11.0.0.06mg	9.1 gms/100L water
Solute (micro nutrients)		1.25 gms/100L water

Do not use nitrogen fertilizers with ammonium in such as Urea, Ammonium Nitrate, Poly feed.

Media EC(Electro conductivity) 1.2-1.5

Lighting:- Petunias need long days to flower fully. Supplemental light 400 foot candles(4000 lux) giving a total day length of 14 hours will induce early flowering

Germination STAGE 3

Producing a high quality petunia plug is dependent upon careful water management during stage 3 of seedling production.

Visual:- At the end of stage 3 the roots should be over 2.5 cms long and well branched. There should be 2-3 sets of true leaves present.

Moisture:- Allow media to go through wet & dry cycles every 24 hours. Petunia roots require high levels of oxygen once roots have reached 1.5 cms in length.

Media Temperature:- 18-20 degrees centigrade.

Fertilizer:-

Same as for stage 2.

Media EC:- 1.5-2.0

Lighting:- Supplemental lighting 450-700 footcandles(4500-7000 lux) giving an 18 hour day will induce early flowering. Do not exceed a total of 3,500 footcandles(35,000 lux)

Growth Regulators:- 2-3 spray applications of B-9 at 2.8 grams per liter of water or Bonzi at 1.25-2.5 ccs per liter of water. These applications should be made at approximately 10-12 day intervals up to a maximum of three times during seedling stages but and before transplanting. (For further information on B-9 and Cultar\Bonzi use contact AFM)

Germination STAGE 4

This is the stage to start toning your petunia plugs by manipulating temperature, water and fertilizer applications.

Visual:- At the end of stage 4 the petunia plug should have an active root system that binds the media in the plug together so that the whole plug can easily be removed from the plug tray without losing roots or media.

Moisture:- As for stage 3.

Media Temperature:- 16-18 degrees centigrade is ideal, however this is difficult to achieve in Thailand. 20-22 degrees is fine. If temperatures are higher than this growth regulators may have to be applied more often

Fertilizer:- Use a nitrate based fertilizer at about 50 ppm. At The AFM nursery we use the following fertilizer mixed for petunia plugs.

To achieve 50 ppm **calcium nitrate** dissolve the following in 100 liters of irrigation water:-

Calcium Nitrate	15.0.0	16.6 gms/100L water
Mono Potassium Phosphate	0.52.34	10.9 gms/100L water
Potassium Nitrate	13.0.46	11.8 gms/100L water
Magnesium nitrate (Magnasal)	11.0.0.06mg	9.1 gms/100L water
Solute (micro nutrients)		1.25 gms/100L water

Do not use nitrogen fertilizers with ammonium in such as Urea, Ammonium Nitrate, Poly feed.

Media EC:- 1.5-2.0

Lighting:- See stage 3, supplementary light can be applied to give a 14-24 hour day.

Transplanting and growing on.-All Petunias except for Wave Types-See separate growing on Instructions

Media pH:- 5.8-6.2 Yellowing between the leaf veins indicates iron deficiency and is a symptom of too higher media pH. The problem can be temporarily rectified by drenching a solution of iron sulfate into the media of the pot, remembering to wash the solution of the leaves using pure water so that the leaves do not burn and discolor.

The long term remedy is to reduce irrigation water pH so that the media retains a pH of between 5.8 & 6.2

Media:- Petunias prefer a well aerated media. We therefore recommend the following media mix which we have tried and tested at the AFM Farm.

Ground washed coconut fiber	100 liters
Large particle sand	20 liters
Dolomite	750 gms
Multicote slow release fertilizer	250 gms
Organic fertilizer with trichomonas bacteria	10 kgs

Do not use soil unless it has been fumigated or sterilized.

Growers must be careful and continually check the pH of their media components and the final mix.

At AFM we have irrigation water which has a high pH of 8.3 with a high alkalinity of 3.2 meq/l as CaCO₃. We therefore acidify our water using 98% concentrated sulfuric acid, bring the pH down to 5.5

Sometimes some of the media ingredients have a high pH and will counteract the acidifying effect of the irrigation water.

If this happens we stop using dolomite and the organic fertilizer with trichomonas as these two ingredients raise media pH.

Moisture & Irrigation:- Between each irrigation, allow media to dry slightly and then irrigate liberally.

It is exceptionally important to avoid irrigating petunias overhead. Irrigate underneath the leaves.

Irrigate once a day in the early morning. Never irrigate in the late afternoon as this will predispose the plant to disease if the leaves start the evening in a wet condition.

Temperature:- Petunias like full sunshine (high light intensity) and they can usually deal with high heat. Grandiflora petunias grow best during the cooler seasons in the Tropics.

If growing petunias all year round, use 50% shade cloth (saran) during the hottest times of the day 11.00am-3.00pm. However if the temperature during the middle of the day is not as hot as normal due to cloud cover, it is not necessary to use shade cloth on that particular day.

At The AFM Nursery we try to keep petunia temperature around 25 degrees centigrade

Plants with lighter colored flowers grow best in the heat, whites and pinks. Multiflora petunia types are the most heat tolerant and can be grown all year round.

Fertilizer:- Irrigate with a fertilizer solution of 150 ppm in the morning, except once a week flush out fertilizer salts with pure water with a pH 6.0-6.5.

At the AFM nursery we make our own mix (20.10.30) using the following fertilizer and rates in 100 liters of water:-

To achieve 150 ppm **calcium nitrate** dissolve the following in 100 liters of irrigation water:-

Calcium Nitrate	15.0.0	49.8 gms/100L water
Mono Potassium Phosphate	0.52.34	32.7 gms/100L water
Potassium Nitrate	13.0.46	35.4 gms/100L water
Magnesium nitrate (Magnasal)	11.0.0.06mg	27.3 gms/100L water
Solute (micro nutrients)		1.25 gms/100L water

If we require more vegetative growth we will occasionally use an ammonium bases fertilizer such as **Polyfeed** 20-20-20 at 150 ppm nitrogen

Polyfeed	20.20.20	75 gms/100L water
Solute (micro nutrients)		1.25 gms/100L water

EC:- 1.0-1.5

Nutrients:- The most common nutrient deficiencies are, iron deficiency (see above), boron deficiency. This can be alleviated by spraying Borax 3.7-5.0 gms per 100 liters of water. Calcium deficiency-spray calcium nitrate on the leaves (100-150 ppm) at a rate of 0.5-1.0 grams per 1 liter of water.

Lighting:- Petunias need long days to flower. To initiate flower buds under short days, extend day length to 13 hours using florescent lighting.

Even under long days of low light conditions (The Thai rainy season) it may be necessary to give supplemental lighting 450-700 foot-candles (4,500-7,000 lux)

Growth regulators:- Start using growth regulators 10 days after transplanting, and continue using every 10-12 days up to the time when flower buds are just appearing. Do not apply after this time. B-9 should be sprayed at a rate of 5.9 gms per 1 liter of water and Bonzi should be "DRENCHED" at 7.5-15 ccs per liter of water.

DRENCHING, This term required the grower not to spray the foliage of the plants but to apply the growth regulator to the media in each pot similar to irrigating. Try to apply underneath the foliage into the pot. The reason being that larger plants will take up Bonzi far more effectively through the roots.

N.B. Petunia Milliflora Fantasy. This type does not need any growth regulators

Common pests:- Thrips-Spray once a week 3.00pm-5.00pm when thrip populations increase. Alternate the following chemicals:-

Confidor, Ascent, Dicazol, Carmag (Fort), Parzon.

Leaf Miner-Spray every 5-7 days before 9.00am in the morning alternating the following chemicals:- Talstar, Neporex, Confidor, Ascent, Vertimec.

Note: spraying leaf miner at any other time of day will not control these insects.

We suggest yellow sticky card traps are placed around your greenhouse to control and monitor insect populations.

Common diseases:-

Pithium (Damping off)- use Terrachlor or Prevacure M as a drench not as a spray.

Botrytis- Spray Daconil, Dithane, Mancozeb, Rovral-alternate these chemicals to avoid resistance.

Rhizoctonia-Drench Rovral, Top Score M, Fanato, Farnate M, Terrachlor. Prevacure, Metalaxyl.

For rates of use follow manufacturers label recommendations.

Note- Most of the above diseases can be controlled by keeping greenhouse areas clean and disinfecting greenhouse equipment after each crop. Weeds and all dying plant material should be removed and disposed of 3-4 kilometers away from your greenhouse.

Restrict access to your greenhouse to staff only and install a footbath with a disinfectant solution.

Do not give plants too much water, water only at morning time and avoid splashing leaves, Make sure plants are not too crowded together and insure good airflow and ventilation in the greenhouse by venting roofs and installing electric fans.

Special notes

Petunia need light. If light levels are low or there is too much shade the plants will stretch and become "Leggy".

Do not water over the leaves and flowers, water underneath the leaves,

If plants are in pots, pots can be placed in saucers or trays and allowed to soak up water from the saucer or tray by capillary action.

Spacing in beds-15 –30 plants per sq. meter.

Plants per pot, 4"= 1 plant, 5" 1- 2 plants. 6" 2 plants, 8" 2 –3 plants. 12" 5-6 Plants.

Petunia plants if looked after properly will continue to flower for 6 to 6 weeks.

New introductions

2000 Celebrity red frost

2001 Celebrity rose frost

2002 Celebrity burgundy frost and stars