



# Producing Petunias For Profit

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While experienced growers usually have detailed information needed to produce a crop of petunias, the beginner may have to read several books, talk to many established growers and work for several years in order to build his own grower's guide. For both new and established growers, this outline will serve as a guide and reference for petunia growing.

## I. HISTORY

- A. *Petunia axillaris* and *Petunia violacea*, native to South America, are thought to be the ancestors of modern petunias.
- B. By 1850, early varieties could be found in private gardens because of the breeding work of French botanist Petun.
- C. In 1880, Mrs. Theodosia Shepherd was breeding *Superbissima* types. These California giant petunias were the leading type until 1930.
- D. In the 1940's, open pollinated multiflora and grandiflora varieties became prominent.
- E. Early in the 1950's, the first  $F_1$  hybrid single petunias were introduced.

## II. CULTIVARS

- A. There are two main types of petunias—diploids and tetraploids.
  1. There are four classes of diploids.
    - a. The first class is *Grandiflora singles*.
      - (1) This type has few large flowers on one stem.
      - (2) These flowers have one sepal each.
      - (3) These are the most popular varieties because of large, showy flowers.
    - b. The second class is *Multiflora singles*.
      - (1) These have few smaller flowers on one stem.
      - (2) These flowers have one sepal each.
      - (3) These are the best varieties for flower beds.
      - (4) This class weathers better than the *Grandiflora* single class.
    - c. The third class is the *Grandiflora doubles*.
      - (1) They have larger flowers on one stem.
      - (2) These flowers have two sepals each.
      - (3) These double flowers are best used in window boxes or planters and not in flower beds.

- (4) These have poorer weatherability than single types.

d. The fourth class is the *Multiflora doubles*.

- (1) This class has many smaller double flowers on one stem.
- (2) The flowers have two sepals each.
- (3) These double flowers are best used in window boxes or planters and not in flower beds.
- (4) These have poorer weatherability than single types.

2. There is one class in the tetraploid type.

a. These are the *Superbissima* or *California Giant* class.

- (1) This class has large flower heads averaging from 5½ to 6¼ inches across.
- (2) This class is of little importance in the present day market.

B. Here are some important cultivar notes.

1. There are approximately 400 to 500 cultivars available.
2. Each seed company has a list of their favorite cultivars.
3. Observe cultivars under your conditions, visit trial grounds, and grow those that perform best in pack, as well as consumer's garden.

## III. PROPAGATION

- A. *Petunias* are propagated by seeds or cuttings.
- B. Seed is most commonly used for production.
  1. Use only hybrid seed from reliable sources.
  2. Here is the procedure to keep seed viable.
    - a. For best results, order new seeds each year.
    - b. Keep the seed in a cool, dry place in insect and rodent free containers for storage from year to year.
    - c. The rule of thumb: keep the humidity (in percent) plus the temperature (in degrees) below 100.
- C. Proper method of sowing seeds is important.
  1. There are roughly 20,000 seeds per ounce but seed count varies by variety.
  2. Sow seed in rows about 1 inch apart.
    - a. The rows in the mix are made from a marking board calibrated to form a V-shape indentation ¼ to ½ inch deep.
    - b. Sow approximately 1000 to 1500 seeds per standard flat (11½ × 22¼ inches)



3. Sow in a thoroughly moistened peat lite mix.
  4. Sow seed on top of indentation.
  5. Do not cover seed.
  6. Seed can be sown by hand.
    - a. Tap edge of the seed packet gently for even seed distribution.
    - b. Hand sowing is slow.
  7. Seed can be sown with mechanical or vacuum seeders.
    - a. This method is more accurate with similar number of seeds per flat.
    - b. Mechanical seeding is faster.
- D. Uniform watering is essential for germination.
1. Moisten seed flat before sowing.
  2. If additional water is needed, water carefully so seed is not buried in soil or washed out of flat.
    - a. Use a fine fogger or mist nozzle if water is needed.
    - b. Use automatic water from mist system for 6 seconds every 10 minutes.
    - c. Sub-irrigation works well also.
  3. Thoroughly moisten mix for good germination.
  4. Water temperature should be warm, 70° is ideal.
  5. Cooler water temperatures, below 60°, will delay germination.
- E. Air temperature for propagation is critical.
1. Best results for germination are at 75° to 80°F while a minimum of 70°F is necessary. Use a soil thermometer.
  2. Use bottom heat to maintain a minimum of 70°F soil temperature.
  3. Soil temperatures above 90°F will reduce germination.
  4. A layer of clear polyethylene over the flats will keep humidity high and help maintain temperature. (Caution: if polyethylene is used to cover flats, make certain temperatures do not become excessive on sunny days.)
  5. With polyethylene, germination should occur without additional watering.
  6. Remove the polyethylene at germination.
  7. Newspaper and translucent polyethylene can also be used.
- B. Transplant from 14 to 21 days after sowing.
1. Transplant when first true leaves form. Do not delay transplanting. The older the seedling, the more shock incurred at transplanting.
- C. One or two light fertilizations with 100 ppm 20-20-20 after germination, but before transplanting, may be needed. This depends on the soil nutrient level.
- D. Thoroughly water the soil immediately after transplanting.
- E. After germination occurs, temperatures can be reduced to 60° at night.

## V. GROWING

- A. Petunias can be grown in soil or soilless media.
1. For rapid growth and root development, the media must provide good aeration, drainage, nutrient and moisture holding capacity.
  2. For most consistent results, use a peat-lite mix.
  3. The ingredients for a typical Bedding Plant Peat lite mix are:
    - a. 50 percent peat/50 percent perlite or 50 percent peat/50 percent vermiculite by volume. 11 bushels peat, 11 bushels vermiculite per cubic yard\*
    - b. 5 pounds fine dolomitic lime.
    - c. 2 pounds superphosphate 0-20-0
    - d. 1 pound potassium nitrate
    - e. 2 pounds osmocote (14-14-14)
    - f. 3 ounces wetting agent

\*one cubic yard=27 cubic feet or 22 bushels. However, 15-20 percent shrinkage occurs in mixing and for one full yard of mix add 4 bushels. Therefore, 26 bushels equal one yard.
- B. Proper fertilization is important for good growth (See MSU Bulletin E-1275, "Chemical Controls for Michigan Commercial Greenhouse and Bedding Plant Production", Price 50 cents).
1. Before fertilizing, know pH and soluble salt content of soil.
  2. Use a pH meter and solubridge.
  3. Spot check pH and soluble salts weekly.
  4. Send sample of initial soil mix to soils lab for complete analyses. Make necessary adjustments to soil before planting.
  5. Usual recommendation is 200 ppm each of nitrogen and potassium at every watering. Many growers use less and feed only

## IV. SEEDLING SCHEDULING AND CULTIVATION

- A. Seedlings are visible in 72 hours under optimum conditions.



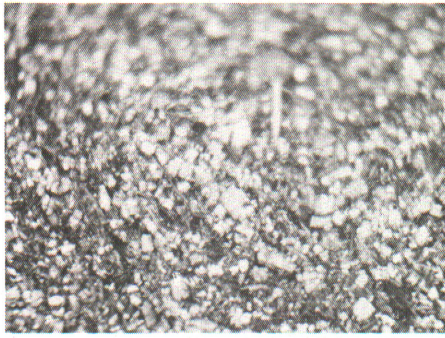
- enough to maintain good green color. Low levels of fertilizer keep plants short.
6. Develop your own fertilizer system.
  7. If you under-fertilize, plants will be short, yellowish in color, and poor in growth.
- C. *Optimum temperatures vary with type of growth desired.*
1. Seed germination requires a minimum of 70-75° constant temperature.
  2. 60-65° night temperature is required for first 3 to 4 weeks of transplant growth.
  3. Night temperature can then be lowered to 50°F for the last 3 to 4 weeks of crop.
  4. Some growers do not lower temperatures at the end of the crop, but maintain 60° night through entire crop growth.
  5. Night temperatures of 70°F after transplanting are too warm for a quality crop.
- D. *Proper light is essential for good growth.*
1. Petunias require direct sunlight for best growth.
  2. Use all light possible at recommended temperatures with adequate water.
  3. Reduced light causes plants to stretch and reduces flowering.
- E. *Proper water is important.*
1. For most uniform crop, it should be done by hand.
  2. Use a fine water breaker to water flats thoroughly.
  3. Automatic systems must be adequately installed with enough light present to allow rapid drying of foliage.
- F. *Spacing is an important consideration.*
1. Place flat to flat with 2 foot center walk. (90 percent of greenhouse space should be utilized.)
  2. Keep flats off the ground to prevent rooting into greenhouse floor.
- G. *The following should be considered in flower initiation and development.*
1. Plant height and flowering is controlled by temperature and photoperiod.
  2. Petunias are long-day sensitive between 63° and 76°F.
  3. Below 63°F, plants are short, well branched and take longer to flower.
  4. From 63-76°F (under short days—8 to 12 hours light), plants are short, well branched and take longer to flower.
  5. From 63-76°F (under long days—12 to 16 hours light), the flower will initiate, plants will be taller, single stemmed and flower faster.
6. Above 76°F (under either long or short days), plants will be single stemmed, fast flowering and tall.
- H. *Growth retardants can be used to keep plants compact. (See MSU Bulletin E-1275)*
1. Use B-Nine Sp at 2500 ppm when plants are the size of half-dollars.
  2. Some varieties require 2 or 3 applications spaced 5 to 7 days apart.
  3. Late applications are less effective and may delay flowering.
  4. A-Rest at 100 ppm as a foliar spray works well but is more expensive.
- I. *Programming is an important consideration.*
1. Cropping time is 10 to 12 weeks with 50°F night temperature for the last 3 to 4 weeks.
  2. Eight to 10 weeks are required if 60°F night temperature is minimum.
  3. Total crop schedule might be 70 to 75°F to germinate, then 60 to 65°F nights for two weeks until transplanting, continue 60 to 65°F nights for four weeks, then finish crop at 50 to 55°F nights.
  4. To delay flowering, provide 40° nights when the buds appear.
  5. In northern climates, December to January sowing takes 90 days, February sowing, 70 days and March sowing, 50 days.

## VI. INSECTS AND DISEASES

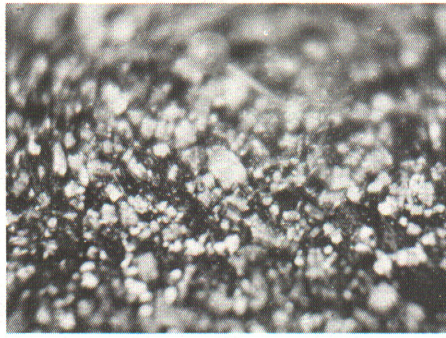
- A. *Insects are not usually a major problem. (See MSU Bulletin E-1276 "Insect Controls for Michigan Commercial Greenhouse and Bedding Plant Production", Price 50 cents).*
1. The following insects can be problems:
    - a. Aphids can infect petunias.
    - b. Caterpillars are sometimes problems on petunias.
    - c. Slugs and snails can be a problem in greenhouses with poor sanitation practices.
- B. *Diseases can be a major petunia problem. (See MSU Bulletin E-1275).*
1. Damping off is the major disease on petunias.
    - a. Usually it is caused by *Rhizoctonia*, *Pythium* or *Phytophthora*.
    - b. Steam or chemical treatment of soil can reduce the problem.
  2. Foliar diseases can also be a problem.
    - a. *Botrytis* is the most frequent foliar disease.
    - b. Avoid free moisture on foliage and implement strict sanitation conditions.



## VII. WEEKLY STAGES OF DEVELOPMENT OF PETUNIAS



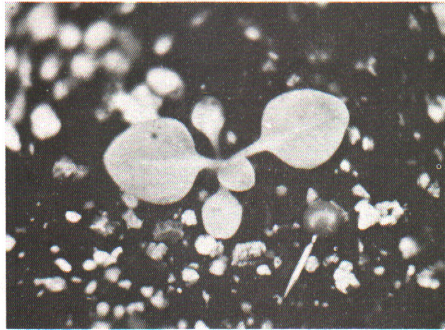
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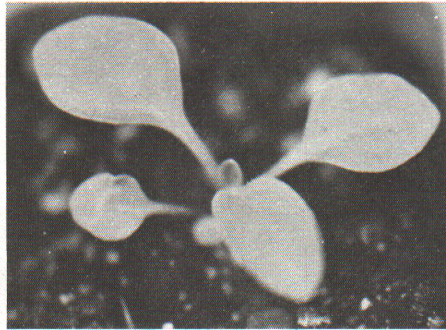
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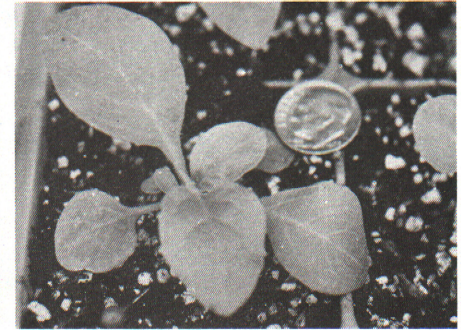
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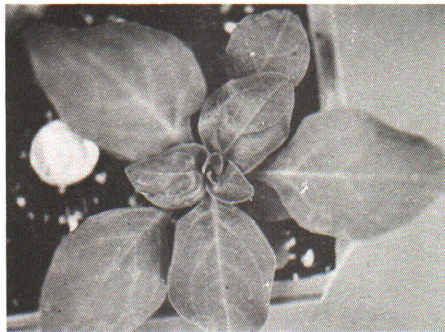
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WEEK 5



WEEK 6



WEEK 7



WEEK 8



WEEK 9



WEEK 10



WEEK 11



WEEK 12

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