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Producing Pansies for Profit: Commercial Growers Guide
Michigan State University Extension Service
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Producing Pansies for Profit

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I. History and Introduction

A. History

1. Pansies belong to the family *Violaceae*.
2. Pansies are thought to have derived from *Viola tricolor*, a native of central Europe.
3. Pansies were first written about and described by Gerard in 1587.
4. In 1629, Parkinson first used pansies as a garden flower.
5. In the early 1870s, pansies were a popular florist's flower.
6. Pansies were then classified as *Viola x wittrockiana*.
7. In 1814-1830, breeding was done in southern England to increase flower size and produce plants that didn't have lengthy stems.
8. In 1841, plants were bred that had blotches on the flower petals.
9. Early breeding done in England and Scotland brought the first big improvements in color and size of flowers and more compact plants.
10. After that, breeders in France and Germany started intense breeding programs.
11. Trimardeau of Paris developed a strain with flower size and color thought impossible to obtain.
12. In 1910, pansies, violas and violets were being used in gardening.
13. In 1933, the first year of the All-America Selection (AAS) Trials, dwarf 'Swiss Giants' won a silver medal.

14. In 1938, 'Carnation Gold' won the silver medal. Both are still used today as the backbone of many breeding programs. Both are open-pollinated types.
15. In the late 1950s and 1960s, the F_2 pansies were developed. Examples of F_2 cultivars are 'King Size', 'Ballerina', 'Early Market', 'St. Tropez' and 'Color Festival'.
16. F_2 breeding gave new flower mixes, larger flowers, increased flower production, better seed germination and better vigor compared with F_1 plants.
17. Several F_1 varieties were developed in the mid-1960s: 'Giant Majestic Mix', 'Majestic white with blotch' and 'Imperial' were thought to be the best cultivars ever produced.
18. 'Orange Prince' in 1979 was the next bronze winner.
19. The 1980s have brought big increases in quality aspects such as vigor, heat tolerance and free flowering.
20. Quality seeds from a reputable company should be used. High quality seeds, however, can be very expensive.
21. Today, the largest breeding programs are in Holland, Japan and the United States. In the U.S., New Jersey, Massachusetts, Pennsylvania and Ohio are the leading breeding locations.

B. Introduction

1. Pansies are among the most popular bedding plants grown, accounting for 3.5 percent of overall sales and ranking seventh in the top 10 bedding plants.

2. Pansies grow exceedingly well in areas with cool summers.
3. New varieties have been bred for warmer climates, but these grow best in partial shade.
4. Pansies are favorite garden perennials in some places but are normally grown as annuals.
5. The word "pansy" originated from the French word "pensee", which means thought.

II. Cultivars

- A. There are currently over 250 cultivars of pansies. Most of the cultivars come in series and each series has several colors. Some of the popular pansy varieties are:

Azure Blue, F_1

Clear Crystals

Color Carnival–Swiss giant type, F_1

Color Festival o.p., F_2 ; wide range of flower colors, Swiss type

Crystal Bowl series, F_1 ; bright, clear colors and no blotches

Engleman's Giants

Golden Champion, F_1 ; large, clear and yellow

Golden Crown

Imperial Giant Blue–yellow eye with light blue

Imperial Giant Orange

Imperial Giant Mix

Majestic Giants, F_1 ; most popular; large flowers, early bloom with blotches

Maple Leaf or Canadian Giants

Paper White–white with yellow eye

Paramount Mix, F_1

Paramount Pure Yellow, F_1

Paramount True Blue, F_1 ; medium blue

Paydirt–large yellow with black lines

Roggli Giant Elite Mix–dwarf habit, original Swiss giant strain, unequaled color richness

Springtime Mix

Stelle's Jumbo Mix–large flowers, early, vigorous, good in the South

Sunny Boy–golden yellow with dark marks

Swiss Giants

Alpenglow–red with orange

Berna–deep purple

Coronation Gold–golden yellow
 Ullswater–medium blue with dark marks
 True Blue–light mid-blue
 Universal Mix, F_1 ; mass of multiflora in extreme temperatures
 Viking Mix, F_1 ; extra large Swiss type

B. Popular violas:

Yellow Perfection

Blue Perfection

Chantreyland

Apricot Orange

White Perfection

Arkwright Ruby

C. Viola or tufted pansies

1. Have smaller flowers than pansies.
2. Are mostly solid colors.
3. Flower heavily.
4. Are more heat resistant than pansies.
5. Last for several years.
6. Seed propagation is the same as for pansy.
7. Can also propagate from summer cuttings (most desirable cultivars are from cuttings).
8. Getting better bred cultivars from seeds.

III. Propagation and Cultivation

- A. There are three common methods of pansy production:

1. Summer-sown in coldframe, then field-grown.
2. Midwinter-sown in the greenhouse.
3. Summer-sown in the greenhouse.

- B. The most historical method still used is the summer-sown coldframe method. General procedures for this method are:

1. Sow the seeds in July and August in coldframes in a well drained medium.
2. Six to eight weeks after sowing (two to three large leaves), plant in a well drained field that is high in organic matter.
3. Apply a complete fertilizer low in nitrogen (5-10-10) at a rate of 2 pounds per 100 square feet.
4. Before planting, weed-treat the soil.
5. Spacing
 - a. Space plants 4 by 6 inches, 6 by 8 inches or 6 by 6 inches.
 - b. Allow enough room between beds for machinery and equipment.
6. Water well after planting.
7. Pansies should be well established before the ground freezes. When ground

is frozen, mulch with straw, marsh hay or evergreen boughs.

8. Remove mulch around March 1 or whenever ground begins to thaw.
 9. Fertilize again in spring when mulch is removed and ground thaws, using the same 5-10-10 at 2 pounds per 100 square feet.
 10. Lift from the field and put into containers as needed.
 11. Advantages of this method are:
 - a. It's less expensive than using greenhouse space.
 - b. Plants are cheaper to produce because planting is done during summer and fall when not much else is going on.
 12. Disadvantages of this method are:
 - a. Plants are mud splattered and dirty when sold.
 - b. Plants tend to be taller than when grown by other methods.
 - c. Roots are disturbed and damaged.
 - d. Digging and lifting are done during the busy spring.
- C. Midwinter sowing for spring sales and greenhouse sowing and growing for fall sales are the two up-and-coming methods. Both methods have similar growing procedures.
1. Seeds are sown in late January or February for spring sales or in mid- to late July for fall sales.
 2. Peat-lite mixes are good for seed germination.
 3. Before sowing, thoroughly moisten soil mix.
 4. Seed plug trays are very good for germinating pansies.
 5. Damping-off fungi can be a problem. Treat with chemicals to control Pythium and Rhizoctonia.
 6. There are approximately 20,000 to 25,000 seeds per ounce. Often pansy seeds have low germination rates.
 7. Lightly cover seed, deep enough so seed isn't visible.
 8. Germination conditions:
 - a. Continuous darkness.
 - b. 70 degrees F until seeds emerge.
 - c. Once seeds emerge, 60 to 65 degrees F.
 - d. Low light and air movement until emergence; then seedlings need light and air movement.
 - e. 80 to 90 percent relative humidity is desired for germination.

- f. Mist germination works well. Allowing seeds and medium to dry out during germination is usually fatal.
 - g. You can cover with plastic to maintain humidity, but this needs to be removed at the first sign of germination.
 - h. Seeds can be hard to germinate at temperatures over 75 to 80 degrees F.
9. Seeds should germinate in 7 to 10 days.
 10. Pansies can be transplanted four weeks after the seeds are sown (when they have two to three true leaves).
 11. After transplanting, you can grow warm at night (70 degrees F) and cooler during the day (60 degrees F). This gives compact plants and allows better control of plant height.
 12. Advantages over field-grown plants include:
 - a. More compact growth.
 - b. Shorter flowering time.
 - c. Shorter production time.
 - d. Cleaner plants.
 - e. Undisturbed roots.
 - f. No need for digging and lifting.

D. General cultural procedures include:

1. Transplant seedlings into trays or flats.
2. Water immediately after transplanting.
3. Do not stress plants, especially during germination.
4. After plants are established, water more sparingly.
5. Water well each time to avoid soluble salt buildup. Depending on water quality and type of fertilizer, allow 10 percent of the applied water to run out of the bottom of the tray.

IV. Environmental Requirements

- A. Peat-lite mixes are usually used to produce the crop.
- B. Check the mix for pH and soluble salts.
1. pH should be 5.0 to 6.5.
 2. A reading between 30 and 80 mmhos/cm is desired on the soluble salt meter.
 3. Do not plant in soil with soluble salt levels over 100 mmhos/cm.
 4. Usually a small amount of fertilizer (calcium nitrate or potassium nitrate) is incorporated into the original soil mix.
- C. Liquid fertilization program
1. Keep a continual check on soluble salt levels.
 2. Feed with a 25-0-25 or similar analysis fertilizer at 200 to 250 ppm at every

watering if you are leaching, or 75 to 100 ppm as needed if you do not leach.

3. Pansies, like most bedding plants, do not require a large amount of fertilizer.

D. Temperature

1. For seedling germination, 65 to 70 degrees F is ideal with bottom heat. Bottom heat is not needed in the summer.
2. Grow the seedlings on at 60 to 65 degrees F.
3. After transplanting, if possible, grow pansies at night temperatures of 50 degrees F.
4. Day temperatures should be 5 degrees higher on cloudy days and 10 degrees higher on sunny days for taller plants.
5. Pansies respond very well to "DIF". A positive "DIF" (when day temperature is higher than night temperature) will result in taller plants. A negative "DIF" (when night temperature is warmer than day temperature) will result in shorter, more compact plants.
6. Pansies are among the hardiest bedding plants and can tolerate cold temperatures.

G. Light

1. Pansies are sun lovers but can tolerate shade more than most of the other sun-loving annuals.
2. Shade is also desired in hot Southern areas.
3. Pansies and violas are somewhat photoperiodic.
 - a. Long days increase flower number.
 - b. Short days produce shorter, stronger stems.

H. Watering

1. Water thoroughly and prevent soluble salt buildup.
2. Cold water on the plants slows growth but has the advantage during the summer season of cooling the soil.
3. Allow to dry to slightly wilted—this toughens the plants and enables them to withstand adverse conditions.

V. Flower Initiation and Timing

A. Pansies and violas will flower under long-day conditions.

1. Eight-hour days will prohibit pansies from initiating flowers.

2. For flower initiation, 12- to 13-hour days are needed.

B. Timing

1. Pansies and violas can be grown in 13 weeks from the date of seed sowing, depending on the growing-on temperature.
2. For greenhouse production, sow seeds in January or early February.
3. Seeds will germinate in 7 to 10 days in darkness at 65 to 70 degrees F.
4. At germination, allow light to reach plants and lower temperatures to 60 to 65 degrees F and grow for 3 weeks in plug or seed flat.
5. For increased vigor of seedlings, feed twice with 100 ppm 20-20-20.
6. Transplant seedlings into flats and lower the temperature to 55 degrees at night, or use the DIF concept to control plant height.
7. The crop will be grown on for 9 weeks until sales.
8. During the later stages of the crop, pansies can be moved outdoors but need protection against adverse weather and heavy freezes.

VI. Marketing, Harvesting and Handling

A. Pansies make saleable plants for early markets (April).

B. Pansies can be sold in flats (greenhouse-grown) or trays (field-grown).

C. Field- or coldframe-grown plants that are dug are usually sold in strawberry quart-like containers and transplanted in flats.

D. Southern fall sales use heat-tolerant hybrids to be planted in the fall. These might need to be cut back in June to 3 inches above the soil; then they will reflower all summer.

E. The North is good for both fall and spring sales.

1. Fall planting is good as long as the plants are established before the ground freezes.

2. Pansies will flower starting in late September or October through snow and also in early spring once the snow melts.

F. Most consumers don't even know that it is possible to overwinter pansies and are

pleasantly surprised to find out that they can be.

- G. Pansies tolerate spring frost and snow. You can plant as soon as soil thaws, in April.

VII. Problems

- A. Insects—pansies are grown cool, which eliminates many insect problems, at least until temperatures warm up.

1. Slugs and snails
 - a. Chew holes in leaves.
 - b. Feed on roots.
 - c. Eat young seedlings.
 - d. Eggs are laid in dark, moist, protected areas (under flats or between flats and inserts).
 - e. Cultural control
 1. Keep elevated from floor.
 2. Keep surroundings dry.
 3. Practice sanitation.
2. Aphids
 - a. Suck juices from plants.
 - b. Create a sticky, saplike substance called honeydew on the leaves.
 - c. Cultural control
 1. Practice sanitation.
 2. Clean weeds or other hosts.
3. Spider mites
 - a. Feeding causes stippling of leaves.
 - b. Leaves eventually yellow.
 - c. In severe cases, webbing is created over the tops of the plants.
 - d. Cultural control
 1. Practice sanitation.
 2. Cooler temperatures slow the spread of mites.
4. Chemical control—see Extension bulletin E-2181.

B. Diseases

1. Damping-off
 - a. Spreads in circular pattern.
 - b. Kills seedlings.
 - c. Cultural control
 1. Plant seeds in rows.
 2. Use seed trays.
 3. Use sterilized media.
2. Root rot
 - a. Pythium
 - b. Phytophthora
 - c. Cultural control
 1. Practice sanitation.
 2. Sow seeds in rows or use seed trays.

3. Anthracnose
 - a. Causes brown areas with black borders.
4. Powdery mildew
 - a. Causes powdery white area on leaf surfaces.
5. Chemical control—see Extension bulletin E-2181.

C. Physiological problems

1. Pansies are resistant to peroxyacetyl nitrate (PAN), a problem related to and caused by smog.
2. Pansies are susceptible to:
 - a. Ozone injury.
 - b. Sulfur dioxide injury.
3. Some pansy cultivars are susceptible to ethylene damage.

VIII. Schedule

A. Three pansy regimes:

REGIME	SOW SEEDS	GERMINATION	TRANSPLANT	SALES
Winter-sown	Jan. 30	Feb. 8	March 1	May 3
Summer-sown (fall sales)	July 20	August 1	August 20	Sept-Oct.
Summer-sown (spring sales)	July 20	August 8 (coldframe)	September 20 (in field)	Early April

- B. From sowing to saleable flats is 13 to 16 weeks.

Many other Extension publications are available on commercial flower production. Call, write or visit the Cooperative Extension Service office in your county for more information. Following is a list of related publications available there or by writing to the MSU Bulletin Office, 10 Agriculture Hall, East Lansing, MI 48824-1039.

E-1275, *Chemical Controls for Michigan Commercial Greenhouse/Bedding Plant Production* (55¢, for sale only)

E-1276, *Insect Controls for Michigan Commercial Greenhouse/Bedding Plant Production* (55¢, for sale only)

E-1375, *Producing Petunias for Profit* (free)

E-1400, *Identifying Major Pests of Greenhouse Bedding Plants* (45¢)

E-1443, *Producing Marigolds for Profit* (free)

E-1493, *Geranium Rust—Symptoms/Disease Development/Control* (free)

E-1579, *Growing Fibrous Begonias for Profit* (free)

E-1580, *Producing Impatiens for Profit* (60¢, for sale only)

E-1663, *Producing Salvia for Profit* (60¢, for sale only)

E-1664, *Producing Coleus for Profit* (free)

E-1861, *Producing Potted Marguerite Daisies for Profit* (free)

E-1996, *Producing Seed Geraniums for Profit* (40¢, for sale only)

E-2069, *Chrysanthemum Pot Plant Production* (50¢, for sale only)

E-2136, *Producing Tuberous Begonias from Seed* (60¢, for sale only)

E-2181, *Chemical Insect Controls for the Michigan Greenhouse Industry* (\$2.75, for sale only)



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