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Producing Coleus for Profit: A Commercial Growers Guide
Michigan State University Extension Service
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I. INTRODUCTION
A. *Coleus x hybridus* are members of the mint family, Labiatae.
B. Introduced into cultivation in 1825, they are native to the Eastern hemisphere tropics, particularly Africa and East India.
C. Coleus are favorite garden annuals and house plants primarily due to their ability to grow in sunny or shady locations and perform well in beds, window boxes, tubs and hanging baskets. Valued for their brightly colored foliage rather than for their non-descript flower spikes which are usually pinched off as they form.
D. Coleus retain their brilliant colors throughout the growing season and require very little maintenance.

II. CULTIVARS
A. Generally, coleus are classified by leaf size and shape (see Table 1 for complete descriptions of various cultivars).
   1. Small-leaved cultivars, such as Carefree, are usually self-branching and quite dwarf.
   2. Medium-size leaves are often “rainbow-type” or heart-shaped, and the plants are generally not self-branching.
   3. There are a few large-leaved cultivars, such as Red Monarch.
   4. Fringe leaved coleus are also popular; Magic Lace is 90% fringed and Figi is 100% fringed.
B. Many cultivars are self-branching.
   1. Self-branching cultivars do not require pinching; they are naturally short and bushy. These include Carefree, Saber, Dragon, Seven Dwarfs and Wizard.
   2. Rainbow types, however, are usually not self-branching and need to be pinched and have their flower spikes removed frequently.

III. PROPAGATION
A. Seed
   1. Coleus are grown primarily from seed; there are approximately 90,000 to 110,000 seeds per ounce.
   2. Only use seed from reliable sources and order new seed each year for best results.
   3. Store the seed in a cool, dry place that is safe from rodents and insects.
   4. Seeds germinate in approximately 10 days under greenhouse conditions.
B. Media
   1. Use a fine, porous medium such as peat-lite mix or fine sphagnum with a pH around 6.5.
   2. Media should be treated to be pathogen free.
C. Sowing seeds
   1. Moisten the media thoroughly before sowing. Watering immediately after sowing may bury or wash away the seeds.
   2. Using methyl bromide treated soil may reduce germination.
   3. Sow the seed in rows about 2” apart and ¾-⅞” deep.
   4. A standard size flat (11½ x 22½”) will require about 1,000 seeds.
   5. Cover the seed with a thin layer of fine vermiculite to help keep moisture around the seed, but still allow light to penetrate. The seed need not be covered if a mist system is used.
   6. It is important with coleus to use a fungicide drench treatment when sowing to prevent damping off.
D. Watering
   1. Keep the surface of the media uniformly moist; any moisture fluctuation will result in seedling death.
   2. Water carefully so that seed is not washed away or buried by splashing soil. Use a fine water fog nozzle, an automatic mist system or sub-irrigation.
   3. Use warm water (70°F); cool water (below 60°F) will delay germination.
E. Temperature and humidity
   1. The best air temperature for germination is between 70° and 80°F for the first week after sowing, then lower the temperature to 65°F for the next two weeks.
   2. Keep the soil temperature above 70°F by applying bottom heat; monitor with a soil thermometer.
   3. To keep the humidity high, cover the flats with clear polyethylene or glass.
      a. The temperature will be higher under the polyethylene or glass than it is in the greenhouse.
      b. Remove the covering on very warm or sunny days to prevent excessively high temperatures.
      c. Remove the covering after germination when seedlings are first visible.
F. Fertilization
   1. Apply a liquid feed of 100 ppm of 15-16-17, or equivalent, about 1½-2 weeks after sowing.
IV. TRANSPLANTING/GROWING ON

A. Transplanting
1. Seedlings can be transplanted about 3 weeks after sowing when the first true leaves are present, or when the seedlings can be handled easily.
2. Transplant into thoroughly moistened media, water with warm water, and do not allow the soil to dry out completely.
3. Coleus are usually grown in flats of 24-72 or in 3-4" pots.
4. After transplanting, allow 5-6 weeks until sale.

B. Damping off
1. Coleus are very susceptible to damping off, so do not plant the seedlings any deeper than they were in the seed flat.
2. A post-transplant fungicide drench is recommended. When applying this drench, use a light second watering. However, do not apply when the soil is dry or even moderately dry.

C. Growing Media
1. A typical bedding plant peat-lite mix contains the following ingredients: (Adjust according to your region.)
   - 50% peat/50% perlite or 50% peat/50% vermiculite by volume
   - 11 bushels peat, 11 bushels vermiculite or perlite per cubic yard
   - 5 pounds fine dolomitic lime
   - 2 pounds superphosphate 0-20-0
   - 1 pound potassium nitrate
   - 2 pounds slow release fertilizer (14-14-14)
   - 3 ounces wetting agent
   - 4 tablespoons fritted trace elements or equivalent amount of any microelement mix
   * one cubic yard equals 27 cubic feet or 22 bushels. However, since shrinkage occurs in mixing, add 4 bushels for one full yard of mix. Therefore, 26 bushels before mixing will give one yard or 22 bushels after mixing.

2. A soil based mix contains the following ingredients:
   - ⅓ cubic yard loam soil
   - ⅓ cubic yard sphagnum peat
   - ⅓ cubic yard perlite
   - 2 pounds 0-20-0 superphosphate
   (adjust soil pH to 5.8 to 6.0 by adding dolomitic limestone to increase pH or FeSO₄ to lower pH)

3. Whatever type of mix you choose, it must provide good aeration, drainage, and moisture-holding capacity. A peat-lite mix gives the most consistent results.

D. Fertilization
1. Before fertilizing, know the pH and soluble salt content of the soil. Use a pH meter and solubridge to spot check pH and soluble salts weekly.
2. Send a sample of the initial soil mix to a soils testing lab for complete analysis, then make necessary adjustments prior to planting.
3. A general recommendation for a peat-lite mix is to fertilize lightly with 100 ppm of 15-16-17 or equivalent of N-P₂O₅-K₂O every second or third watering.

E. Temperature
1. After transplanting, grow at 60-65°F. Coleus grown at 70°F will be ready for sale one week earlier than those grown at 60°F.
2. On cloudy days the temperature should be 5°F higher than night temperature and 10-15°F higher on sunny days.
3. Harden plants for the last 7 days before sale by dropping temperatures to 55-60°F and restricting water.

F. Growth regulators
1. A-Rest is effective in reducing coleus height: 100 ppm is usually used.
2. B-Nine is relatively ineffective in reducing coleus height.

G. Spacing
1. Place flat to flat in greenhouse, leaving a 2' wide center aisle. This will utilize 90% of the greenhouse space.
2. Raise the plants off the ground to prevent rooting into the greenhouse floor and to increase air circulation.

H. Light
1. High light as well as cool temperatures (under 80°F) enhance leaf color.

V. SCHEDULING

A. Total time for coleus crop is 8-9 weeks at 65°F for pack sales and 9-10 weeks for 4" pots.
1. Total time will be one week earlier in the South or if plants are grown at 70°F.

B. Schedule for pack sales grown at 65°F, ready for May 1 sales follows:
   - Week 10: Sow seed (70°F)
   - Week 11: Seed germination (lower night temperature to 65°F)
   - Week 13: Transplant (65°F)
   - Week 17: Lower temperature to harden plants (55-60°F)
   - Week 18: Sales

VI. COMMON PROBLEMS

A. Damping Off
1. Damping off is caused by Rhizoctonia and/or Pythium fungi and results in death of seedlings.
2. It often spreads in a circular pattern through the seed flat; sowing the seeds in rows may help curtail spreading.
3. Control by using steam or fungicide soil treatment prior to sowing seed and an additional fungicide treatment after transplanting the seedlings.
4. Be careful not to transplant the seedlings too deeply.

B. Cool Temperatures
1. Temperatures below 60°F can slow or stall growth, especially on young transplants.
2. In the seed flats, cool media temperatures (below 70°F) can severely delay germination and growth.

C. Insects
1. Aphids
   a. Aphids are light-colored, crawling insects that suck plant juices and cause stunted growth or a general decline in plant vigor.
   b. They often appear on growing tips or under leaves.
   c. They secrete a sticky honeydew which supports a black sooty mold growth.

2. White fly
   a. Adults are flying insects with powdery white wings which cluster on the underside of the leaves.
   b. They suck plant juices and cause a general decline in vigor.
   c. Also, they secrete a sticky honeydew which supports a black sooty mold growth.

**LIST OF CURRENT COLEUS CULTIVARS AND THEIR PHYSICAL CHARACTERISTICS.**

<table>
<thead>
<tr>
<th>Cultivar</th>
<th>Colors</th>
<th>Leaf Shape</th>
<th>Habit</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brilliant</td>
<td>golden, pink, red, velvet, mix series</td>
<td>heart-shaped, large to medium</td>
<td>18-20” garden height rainbow type</td>
<td>no pinch</td>
</tr>
<tr>
<td>Carefree</td>
<td>bronze, flame, jade, pastel, pink, velvet, scarlet, golden, red mix series</td>
<td>“oak-leaf”, small, deeply lobed</td>
<td>dwarf, self-branching, bushy, uniform</td>
<td></td>
</tr>
<tr>
<td>Color Magic</td>
<td>young leaves: red edged with green older leaves: cream with red veins, edged green</td>
<td>heart-shaped</td>
<td>rainbow type</td>
<td></td>
</tr>
<tr>
<td>Color Pride</td>
<td>bright rose, edged green</td>
<td>heart-shaped, large</td>
<td>rainbow type</td>
<td></td>
</tr>
<tr>
<td>Dragon</td>
<td>scarlet, pink, series</td>
<td>heart-shaped, large lobed</td>
<td>erect</td>
<td>good in beds</td>
</tr>
<tr>
<td>Dwarf</td>
<td>yellow, red</td>
<td>very narrow, deeply serrated</td>
<td>compact, dwarf, 8” garden height</td>
<td></td>
</tr>
<tr>
<td>Salicifolius</td>
<td>rose, edged green and bronze</td>
<td>heart-shaped</td>
<td>rainbow type</td>
<td>good in beds</td>
</tr>
<tr>
<td>Emerald Pink</td>
<td>orange, edged bronze</td>
<td>serrated</td>
<td>rainbow type</td>
<td>colorful, separate cultivar</td>
</tr>
<tr>
<td>Festive Dance</td>
<td>scarlet, edged yellow-green</td>
<td>heart-shaped, fringed</td>
<td>rainbow type</td>
<td>uniform</td>
</tr>
<tr>
<td>Flamenco</td>
<td>(all colors with green edge) scarlet, pastel, red, blush, lemon lime, rose pink, multicolor, jade, velvet</td>
<td>large, 100% fringed</td>
<td>bushy, erect</td>
<td>12-15” garden height</td>
</tr>
<tr>
<td>Fringed Rainbow</td>
<td>mixed colors</td>
<td>90% fringed, medium size</td>
<td>rainbow type</td>
<td></td>
</tr>
<tr>
<td>Greensleeves</td>
<td>ivory and green</td>
<td>small, tapered, thin leaves</td>
<td>base-branching, similar to Saber</td>
<td></td>
</tr>
<tr>
<td>Highland Fling</td>
<td>amber-red with light green splashes</td>
<td>heart-shaped, large lobed</td>
<td>rainbow type, uniform</td>
<td></td>
</tr>
<tr>
<td>Magic Lace</td>
<td>reds and purples splashed with green and yellow</td>
<td>deeply serrated, broad, 90% fringed</td>
<td>rainbow type, compact, dwarf, basal branching</td>
<td></td>
</tr>
<tr>
<td>Magic Lantern</td>
<td>young leaves: rose red older leaves: cream and red with green edge</td>
<td>heart-shaped, lobed</td>
<td>rainbow type, dwarf, basal branching</td>
<td>similar to Brilliant, 10” garden height</td>
</tr>
<tr>
<td>Midway</td>
<td>golden, pink, red, velvet mix series</td>
<td>heart-shaped</td>
<td>rainbow type, dwarf, 20” garden height</td>
<td></td>
</tr>
<tr>
<td>Othello</td>
<td>black</td>
<td>satiny, crinkled</td>
<td>bushy, mid-dwarf</td>
<td></td>
</tr>
<tr>
<td>Pagoda</td>
<td>red and yellow</td>
<td>heart-shaped, serrated</td>
<td>rainbow type</td>
<td></td>
</tr>
</tbody>
</table>
| Rainbow        | bronze, candidium, rose, red, pastel, scarlet, velvet, golden, multicolor, pink, tyrian, chartreuse, emerald, tri-color, buff, calico, mix series | large to medium size, heart-shaped | 12-15” medium branching     | good for packs, pots, hanging baskets, true to color, pinching helps | cont'd
List of current coleus cultivars and their physical characteristics.

<table>
<thead>
<tr>
<th>Cultivar</th>
<th>Colors</th>
<th>Leaf Shape</th>
<th>Habit</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red Monarch</td>
<td>scarlet red</td>
<td>extra large, rippled</td>
<td>fairly dwarf</td>
<td>slower to flower, hanging baskets, no pinch</td>
</tr>
<tr>
<td>Saber</td>
<td>rose, pastel, red, scarlet, jade, clown, velvet</td>
<td>small, tapered, thin</td>
<td>dwarf, basal branching, 8-12” garden height</td>
<td>makes excellent hanging baskets, window boxes</td>
</tr>
<tr>
<td>Scarlet Poncho</td>
<td>red, edged green</td>
<td>serrated</td>
<td>rainbow type, central stem upright with cascading side branches, 10-12” garden height</td>
<td>makes excellent hanging baskets, window boxes</td>
</tr>
<tr>
<td>Seven Dwarfs</td>
<td>marbled candidum, multi-color, pastel, red, scarlet, sunset, mix series</td>
<td>small, heart-shaped</td>
<td>rainbow type, self-branching</td>
<td>slower to flower than Rainbow, no pinch</td>
</tr>
<tr>
<td>Volcano</td>
<td>scarlet-red</td>
<td>lobed</td>
<td>rainbow type</td>
<td>no pinch</td>
</tr>
<tr>
<td>Wizard</td>
<td>rose, sunset, pastel, velvet, red, golden, jade, pineapple, pink, scarlet, mix series</td>
<td>large, heart-shaped</td>
<td>compact, dwarf basal branching, 10-12” garden height</td>
<td>no pinch, good in baskets, packs, pots, slower to flower than Rainbow</td>
</tr>
</tbody>
</table>

Production Schedule (by week) for Sale of Coleus May 1.

<table>
<thead>
<tr>
<th>Week</th>
<th>Jan</th>
<th>Feb</th>
<th>March</th>
<th>April</th>
<th>May</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
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<tr>
<td></td>
<td>16</td>
<td>17</td>
<td>18</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**WEEK:**

- **sow**
- **germination**
- **transplant**
- **sell**

Fig. 1 Weekly stages in development of coleus

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