Pelargonium

Dr. Terri W. Starman
HORT 429
Greenhouse Crop Production

6 Commercial Groups
1) P. X hortorum - zonal or common
2) P. X hortorum - seed
3) P. peltatum - ivy or hanging basket
4) P. X domesticum - Martha Washington
5) Pelargonium - scented, 48 kinds
6) P. floribunda - cascade

In addition to the Pelargonium, the Geranium genus contains many ornamentals used in gardens.

Cultivars
- Shades of red, pink, salmon or white
- Flowers can be single or double
- Petals can be round to serrate and wide to narrow
- Foliage can be variegated

Family and Origin
- Geraniaceae
- Pelargonium genus has 250 species
- South Africa
- Mediterranean climate of Cape Province
- Dry, hot habitats, rocky, sandy
- 15-20% wholesale value of bedding plants
- Cuttings vs. hybrid seed

Uses
- Porch boxes
- Ground beds
- Large pots
- Hanging baskets
- Potted plants
- Standards

Propagation
- Asexually until 1960s
- Hybrid Seed
- ‘Nittany Lion’ from Penn State was the first seed propagated cultivar
- Tissue culture
- Today, growers purchase rooted or unrooted cuttings
Asexual Propagation
- Root in oasis strips, rock wool, peat-pellets or final pots
- Rooting hormone – dust don’t dip
- Bottom heat at 70-75°F
- Mist – keep to a minimum
- Full light
- 12 to 21 days

Sexual Propagation
- 6000 seeds/oz.
- Plug trays are automatically sown
- Mist “as needed”
- Seeds are lightly covered with vermiculite
- Light enhances germination
- Transplant 31 to 50 days after sowing or 23 to 37 days after removal from the germination room

Flowering Control and Dormancy
- Day neutral
- FI and FD rate dependent on total light energy (intensity X duration) at appropriate temperatures
- Juvenility may exist with some cultivars of seed geraniums, minimum of 15 nodes to flower
- Leaf area determines rate of FI in seed geraniums

Temperature
- Optimum for zonal is 68 / 63°F day / night
- Leaf unfolding rate peaks at 76°F
- Temperature drives flower development i.e. from visible bud to opening of first floret
- Optimum for ivy is 68°F day and night for compact growth or 75 / 61°F day / night for stem elongation

Light and Water
- Light drives flower initiation
- Zonals like 3500–5000 fc (700–1000 µmol?s⁻¹m⁻²)
- Ivies like 2500–3000 fc (500–600 µmol?s⁻¹m⁻²)
- Adapted to dry conditions and well-drained soils
- Water stress is sometimes used to control growth and hold plants back

Nutrition Varies with Development Stage

<table>
<thead>
<tr>
<th></th>
<th>Seedling</th>
<th>Well-rooted</th>
<th>Flower in color</th>
<th>Final weeks</th>
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</thead>
<tbody>
<tr>
<td>100-150 ppm</td>
<td>250 ppm</td>
<td>150 ppm</td>
<td>50 ppm</td>
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Nutrition

• High requirement for Ca and Mg
• Low EC
• pH 5.6 – 6.0 for zonals
• pH 5.3 for ivies
• Too low pH causes Fe and Mn toxicity
• Symptoms are stunting, necrotic spots and leaf edges, chlorosis of lower leaves
• To prevent raise media pH above 6.0

Cycocel

• Hastens flowering
• Increases branching
• Decreases stem elongation
• 1500 ppm
• Causes marginal leaf chlorosis i.e. yellowing
• Apply lower concentration more frequently to reduce problem

Spacing

• Pot to pot until leaves overlap
• 4-inch pots on 6 to 7-inch centers
• 6-inch pots on 8 to 9-inch centers
• Disbud to encourage vegetative growth (not in book but it works on cutting geraniums)
• Ivies need 4 to 5 cuttings/10-inch basket

Insects, Diseases and Physiological Disorders

• Relatively insect free
• Susceptible to numerous diseases
• Bacterial leaf spots and blights
• Xanthomonas compestris is very serious and other wilt diseases
• Culture indexed plants are used to provide cuttings
• Ivy geraniums get edema

Postharvest

• Usually sold with at least one flower
• Cuttings and potted plants susceptible to ethylene in shipping
• Seed geranium flowers shatter during shipping
• STS applied 14-21 days prior to shipping reduces shatter but predisposes plant to Pythium
• Unpack ASAP and maintain adequate water and light in retail

Ralstonia solanacearum Race 3 Biovar 2

• Southern Bacterial Wilt (SBW)
• Confirmed by USDA-APHIS
• Spread in water
• Pathogen of potatoes
• Regulated by federal quarantine
• Inspection, quarantine, disposal, clean-up
• Traced to stock in Kenya
• Symptoms are leaf yellowing and wilting from the bottom of the plant up then total collapse
<table>
<thead>
<tr>
<th><em>Ralstonia solanacearum</em></th>
<th><em>Xanthomonas campestris</em></th>
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<tr>
<td>Symptoms start at the bottom of the plant and work their way up</td>
<td>Symptoms are more random throughout the plant</td>
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