Kabloom and Crave Calibrachoa
Plug and Finish Culture

PanAmerican Seed®
Outline

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   2. Stages 2-4
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3. Finish culture
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1. Varieties

1. Kabloom
   1. Deep Blue ‘PAS1020344’ PPAF; EU PBRAF; CA PBRAF; JP PBRAF
   2. Deep Pink
   3. Red ‘PAS1020342’ PPAF; EU PBRAF; CA PBRAF, JP PBRAF
   4. Yellow ‘PAS1020308’ PPAF; EU PBRAF; CA PBRAF; JP PBRAF
   5. White ‘PAS1020307’ PPAF; EU PBRAF; CA PBRAF; JP PBRAF

2. Crave Sunset

PanAmerican Seed
2. Plug Culture: Stages

1. Stage 1: Germination, ends at radicle emergence (RE)
2. Stage 2: From RE to cotyledon expansion
3. Stage 3: From cotyledon expansion to true leaf pair
4. Stage 4: Pullable plug, plug finish
2. Plug Culture: Stage 1

- Product form is single seeded pellet
  - 24,000 pelleted seed/ounce
  - 900 pelleted seed/gram

- Sow 1 seed/cell

- Ensure pellet breakdown

- Light or dark, cover not required

- Media moisture level of 5 (saturated)
2. Plug Culture: Stage 1

- Stage 1 (germination) ends at radicle emergence (RE)

- Optimum media temperature of 73 °F (22.5 °C)
  - RE in 5-7 days at 73 °F

- Can be germinated from 77 °F (25 °C) to 68 °F (20 °C)
  - Faster radicle emergence at 77 °F
2. Plug Culture: Stage 1

Kabloom White

- 59 °F (15 °C)
- 68 °F (20 °C)
- 73 °F (22.5 °C)
- 77 °F (25 °C)
## 2. Plug Culture: Stage 1

<table>
<thead>
<tr>
<th>Fast Germinating Varieties</th>
<th>Slow Germinating Varieties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kabloom White</td>
<td>Kabloom Deep Blue</td>
</tr>
<tr>
<td>Kabloom Deep Pink</td>
<td>Kabloom Red</td>
</tr>
<tr>
<td>Kabloom Yellow</td>
<td>Crave Sunset</td>
</tr>
</tbody>
</table>

- **Stage 1 at 77 °F (25 °C) for 5 days**
- **Stage 1 at 77 °F (25 °C) for 7-10 days**
- **Stage 1 at 68 °F (20 °C) for 5-7 days**
- **Stage 1 at 68 °F (20 °C) for 10+ days**
2. Plug Culture: Stages 2-4

• Reduce moisture level to 4 in stage 2 and cycle between levels 2 and 4 in stages 3-4
  • Do not allow wilting

• Recommended plug ADTs:
  • Stage 2: 68 °F (20 °C)
  • Stage 3: 64 °F (18 °C)
  • Stage 4: 55-64 °F (13-18 °C), no less than 55 °F (13 °C)

• DLI of \( \geq 10 \text{ moles} \cdot \text{m}^{-2} \cdot \text{d}^{-1} \)

• p\( \text{H} \) and EC management: Similar to petunia
• Pest and disease management: Similar to vegetative calibrachoa
2. Plug Culture: Stages 2-4: PGRs

- Spray PGR on day 7-10
  - After completion of stage 1

- Effective plug PGRs:
  - Flurprimidol (Topflor): 2-3 ppm
  - Daminozide* (B-Nine): 2500 ppm
  - Paclobutrazol* (Bonzi): 3 ppm

*See additional information
2. Plug Culture: Stages 2-4: Trialed PGRs

- PGR sprays on day 7 and thereafter, as needed (3 total) on Kabloom White

Photo courtesy of Todd Metevia, Green Circle Growers
2. Plug Culture: Stages 2-4: Trialed PGRs

- Daminozide on Kabloom White:

  Daminozide at 2500 ppm on days 21 and 32

  Untreated control
2. Plug Culture: Stages 2-4: Suggested PGRs

• Daminozide is more effective than Paclobutrazol at tested rates at height control and promoting branching

• Daminozide can cause chlorotic stippling on Kabloom Red
  • Kabloom Yellow and Crave Sunset may show chlorotic stippling to a lesser degree
  • Percentage of affected seedlings varied in trials
  • Plants grow out of stippling in a few weeks

• No stippling with Paclobutrazol or Flurprimidol
2. Plug Culture: Stages 2-4: Suggested PGRs

• PGR sprays on day 14 and on Kabloom Yellow

- Daminozide at 2500 ppm
- Daminozide at 1250 ppm
- Paclobutrazol at 2 ppm
- Untreated Control
2. Plug Culture: Stages 2-4: Suggested PGRs

- Flurprimidol spray at 2-3 ppm was effective in height control as Daminozide spray at 2500 ppm
2. Plug Culture: Stages 2-4: Branching

• Excellent branching at finish without pinch

6-wk non-pinched 288-cell plug

6 wks from transplant to finish under LD in 4.5” container
2. Plug Culture: Stages 2-4: Branching

• Apical Dominance: Results in poor branching

• Causes: Overgrown and spindly plants
  • Low DLI (keep ≥10 moles·m⁻²·d⁻¹)
  • Excessive plug crop time
  • Inadequate plug height control

• Remedies:
  • Pinching
  • Daminozide on plugs (possibility of phyto)
2. Plug Culture: Stages 2-4: Branching

- Overgrown and spindly plants can exhibit apical dominance
- Pinch at transplant: Soft pinch, leaving 4 basal nodes
- Pinch can delay flowering
  - Delay depends on timing and extent of pinch

Pinched Unpinched

Trial courtesy of Armstrong Growers
2. Plug Culture: Crop Time

<table>
<thead>
<tr>
<th>Plug Tray Size</th>
<th>Crop Time in Weeks from Sow to Pullable</th>
</tr>
</thead>
<tbody>
<tr>
<td>288</td>
<td>5-6</td>
</tr>
<tr>
<td>128</td>
<td>7-8</td>
</tr>
<tr>
<td>105</td>
<td>7-8</td>
</tr>
<tr>
<td>72</td>
<td>7-8</td>
</tr>
</tbody>
</table>
3. Finish Culture

- Post-transplant crop culture is similar to vegetative calibrachoa

Aloha Kona Midnight Blue  Cabaret Deep Blue  Kabloom Deep Blue
3. Finish Culture

• Container size and plants per pot (PPP) recommendation:
  • 4” to 6” (10 to 15 cm) Pots and Quarts/1 PPP
  • 10” (25 cm) Basket/3 PPP
  • 12” (30 cm) Basket/5 PPP
3. Finish Culture: Photoperiod

- Based on research conducted at Michigan State University, juvenility ends at 6 leaves (~6 weeks from sowing)

<table>
<thead>
<tr>
<th>Minimum Daylength Requirement</th>
<th>Variety</th>
</tr>
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<tbody>
<tr>
<td>10</td>
<td>Kabloom White and Kabloom Yellow</td>
</tr>
<tr>
<td>10.5</td>
<td>Kabloom Red</td>
</tr>
<tr>
<td>11</td>
<td>Kabloom Deep Blue and Crave Sunset</td>
</tr>
<tr>
<td>12</td>
<td>Kabloom Deep Pink</td>
</tr>
</tbody>
</table>
3. Finish Culture: Photoperiod

## Kabloom Deep Blue Photoperiod Response

<table>
<thead>
<tr>
<th>Daylength</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
<th>NI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Days to 50% Flowering</td>
<td>111</td>
<td>80</td>
<td>78</td>
<td>74</td>
<td>74</td>
<td>76</td>
</tr>
</tbody>
</table>
3. Finish Culture: ADT

- Can be Cool-grown, similar to vegetative calibrachoa
- Cool-growing will delay flowering than warm growing
3. Finish Culture: PGRs

- Paclobutrazol drench at 1-3 ppm 7-10 days after transplant, reapply as needed
  - Daminozide is not recommended due to possibility of stippling on Kabloom Red, Kabloom Yellow, and Crave Sunset

- Kabloom White is more sensitive to Paclobutrazol drench
  - Use lower rates to prevent stunting
3. Finish Culture: PGRs

- Quarts: Kabloom Yellow transplanted in wk 8, Paclobutrazol drench at wks 10, 12, 15, and 17 (4 total), Photo wk 17

Photo courtesy of Todd Metevia, Green Circle Growers
3. Finish Culture: PGRs

- Quarts: Kabloom White transplanted in wk 8, Paclobutrazol drench at wks 10, 12, 15, and 17 (4 total), Photo wk 17
3. Finish Culture: PGRs

- 10” HBs: Kabloom White
  - Transplanted in wk 8 from 128-cell plugs, 3 PPP
  - Paclobutrazol drench at wks 10, 12, 15, and 17 (4 total)
  - Photo wk 17

Photo courtesy of Todd Metevia, Green Circle Growers
3. Finish Culture: PGRs

Varieties grouped by finish vigor (least to most):

- Kabloom White
- Kabloom Red, Kabloom Deep Blue, and Kabloom Deep Pink
- Kabloom Yellow
- Crave Sunset
3. Finish Culture: Crop Time

- Finish crop time for early spring from non-pinched plugs:

<table>
<thead>
<tr>
<th>Container Size/PPP</th>
<th>Crop Time in Weeks from 288 Plug to 100% Flowering</th>
<th>Total Crop Time* in Weeks from Sowing to 100% Flowering</th>
</tr>
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<tbody>
<tr>
<td>4” to 6” (10 to 15 cm) Pots and Quarts/1 PPP</td>
<td>7-8</td>
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<td>14-15</td>
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<tr>
<td>12” (30 cm) Basket/5 PPP</td>
<td>9-11</td>
<td>14-15</td>
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</table>

*Total crop time decreases by 2-3 weeks in the summer