Kabloom and Crave Calibrachoa

Plug and Finish Culture

PanAmerican Seed®

Outline

1. **Varieties**

2. **Plug culture**
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3. **Finish culture**
    1. Photoperiod
    2. ADT
    3. PGRs
    4. Crop time

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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

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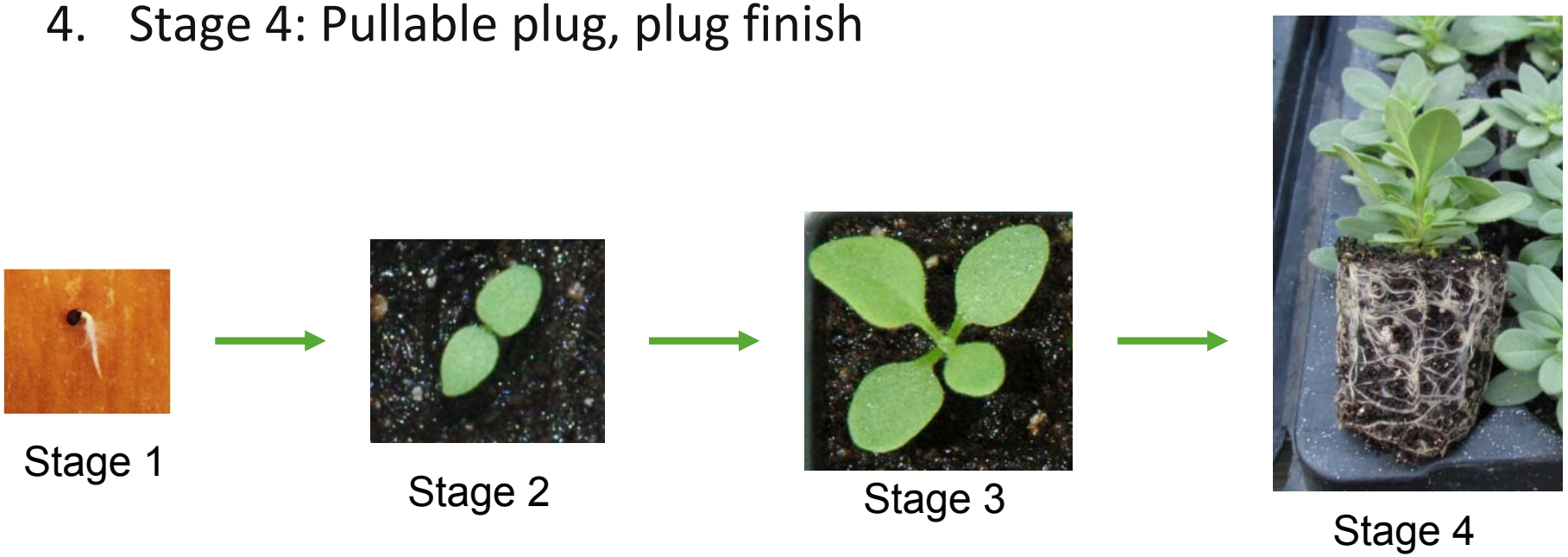
2. Plug Culture: Stages

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



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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)

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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

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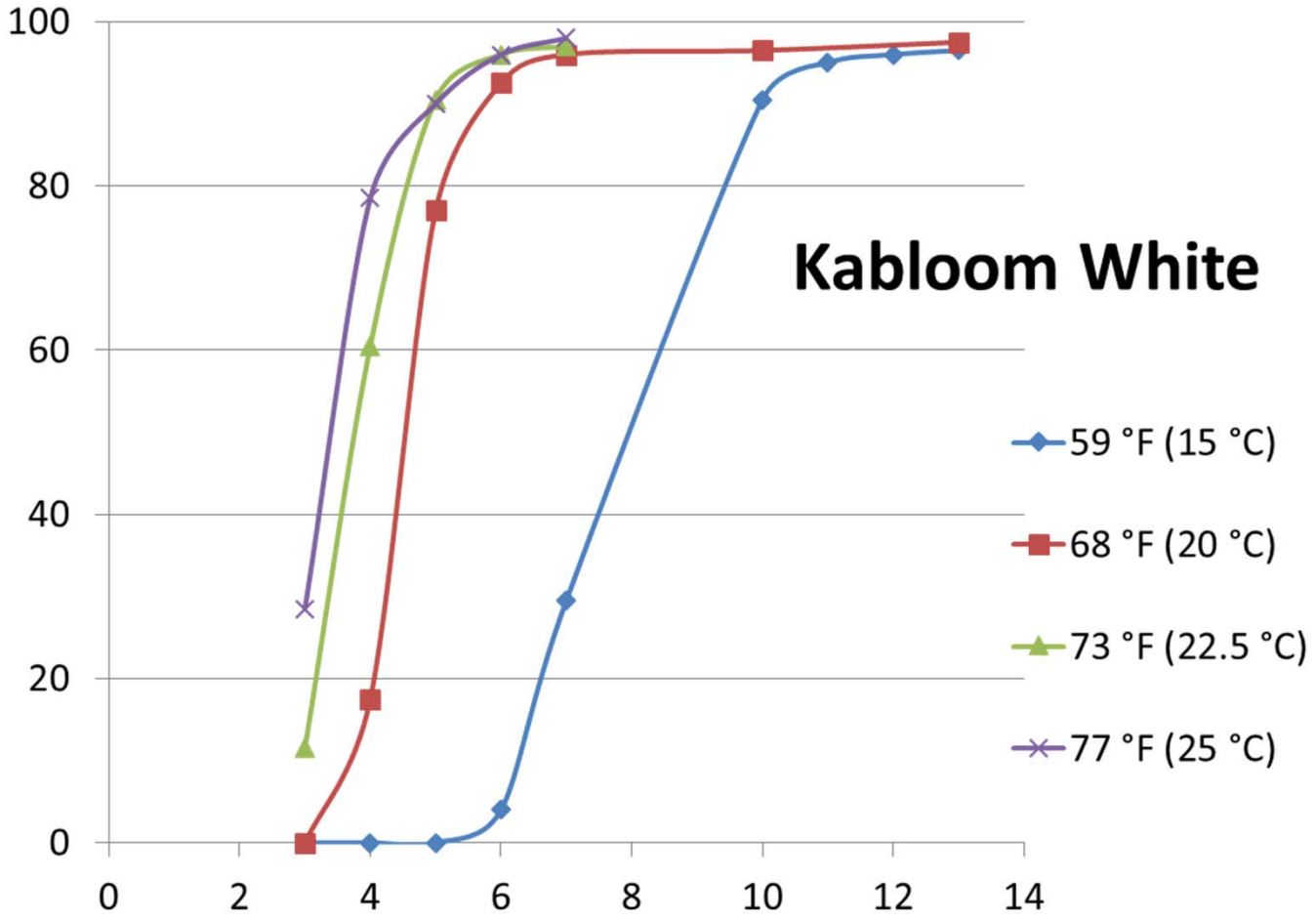
2. Plug Culture: Stage 1



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2. Plug Culture: Stage 1

Fast Germinating Varieties	**Slow Germinating Varieties**
Kabloom White	Kabloom Deep Blue
Kabloom Deep Pink	Kabloom Red
Kabloom Yellow	Crave Sunset
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

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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 ≥10 moles·m^{-2}·d^{-1}

- pH 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*

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2. Plug Culture: Stages 2-4: Trialed PGRs

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

Paclobutrazol at 3 ppm | Daminozide at 2500 ppm | Daminozide at 1250 ppm | Paclobutrazol at 1 ppm | Untreated control

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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

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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

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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

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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

Flurprimidol

Daminozide

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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

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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)

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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

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2. Plug Culture: Crop Time

Plug Tray Size	Crop Time in Weeks from Sow to Pullable
288	5-6
128	7-8
105	7-8
72	7-8

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3. Finish Culture

- Post-transplant crop culture is similar to vegetative calibrachoa

Aloha Kona Midnight Blue

Cabaret Deep Blue

Kabloom Deep Blue

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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

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3. Finish Culture: Photoperiod

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

Minimum Daylength Requirement	Variety
10	Kabloom White and Kabloom Yellow
10.5	Kabloom Red
11	Kabloom Deep Blue and Crave Sunset
12	Kabloom Deep Pink

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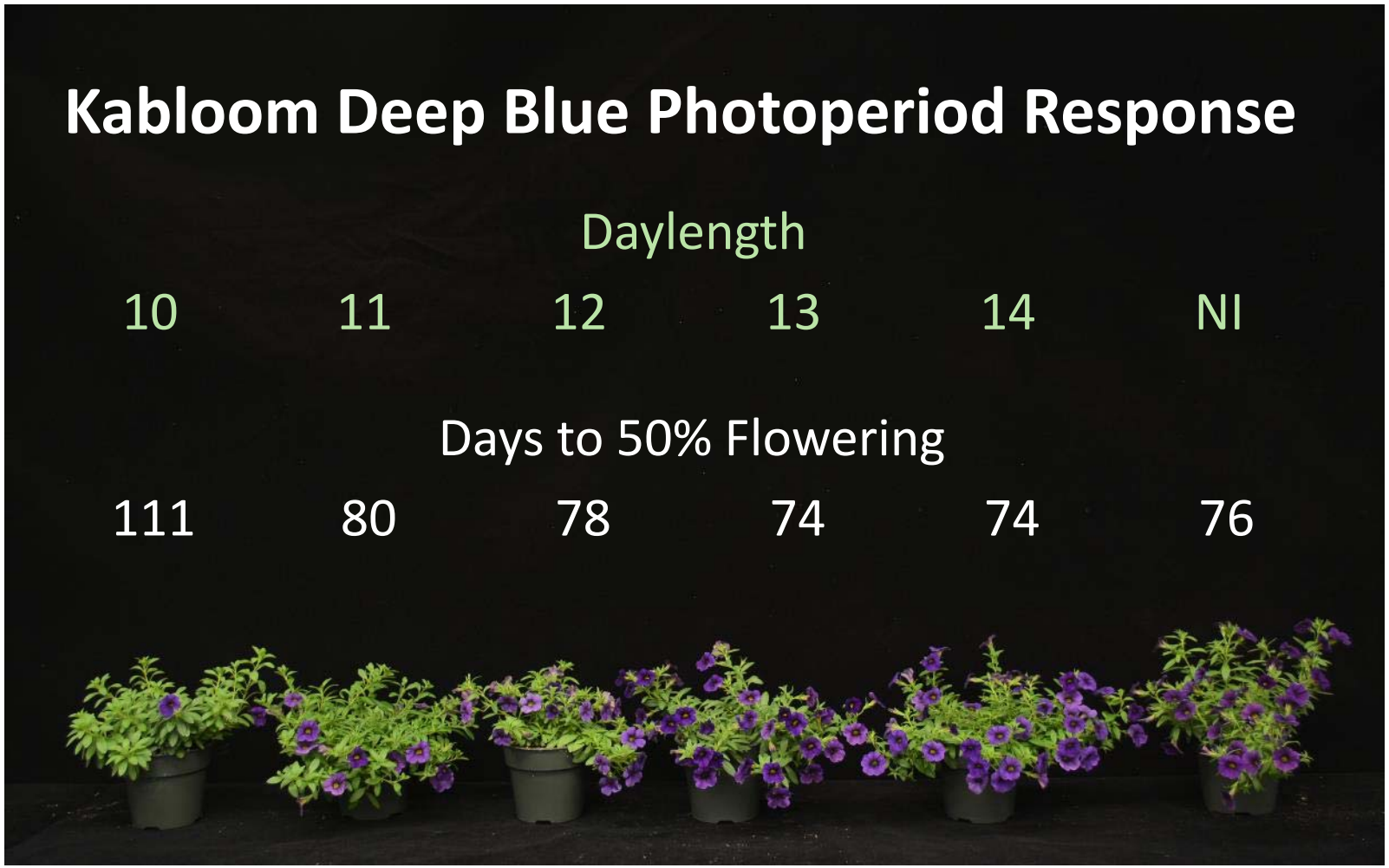
3. Finish Culture: Photoperiod



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3. Finish Culture: ADT

- Can be Cool-grown, similar to vegetative calibrachoa
- Cool-growing will delay flowering than warm growing

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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

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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

Untreated control | Paclobutrazol at 1 ppm | Paclobutrazol at 3 ppm

Photo courtesy of Todd Metevia, Green Circle Growers

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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

Untreated control | Paclobutrazol at 1 ppm | Paclobutrazol at 3 ppm

Photo courtesy of Todd Metevia, Green Circle Growers

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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

Untreated control Paclobutrazol at 1 ppm Paclobutrazol at 3 ppm

Photo courtesy of Todd Metevia, Green Circle Growers

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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

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3. Finish Culture: Crop Time

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

Container Size/PPP	Crop Time in Weeks from 288 Plug to 100% Flowering	Total Crop Time* in Weeks from Sowing to 100% Flowering
4” to 6” (10 to 15 cm) Pots and Quarts/1 PPP	7-8	12-13
10“ (25 cm) Basket/3 PPP	9-11	14-15
12“ (30 cm) Basket/5 PPP	9-11	14-15

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

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