MPRU Mission:
To provide clean planting stock for sweetpotatoes, berry crops and muscadine grapes
Sweetpotato
Clean Plant Program in NC
Release of Clean Stock

1st Virus Testing

Breeder Stock

2nd Virus Testing

Tissue Culture Plant

3rd Virus Testing

(-) Greenhouse establishment

4th Virus Testing

(+/-) Grafting into I. setosa

(+/-) Discard

(+/-) Discard

(+/-) Discard

(-/+) Release as 'virus-tested'

Timeline: 12 months
Viral diseases found in NC

Kinston, NC (Summer 2014)

- Sweetpotato feathery mottle virus (SPFMV)
- Sweetpotato virus G (SPVG)
- Sweetpotato virus C (SPVC)
- Sweetpotato virus 2 (SPV2)
- Sweetpotato leaf curl virus (SPLCV)
- Sweetpotato chlorotic stunt virus (SPCSV)
Trueness-to-type Field Test - Replicated & Observational Tests -
1. Media, containers and nutrient mix used for greenhouse operations

Media

www.sungro.com/professional-product/fafard-4p-mix/

Fafard® 4P Mix
Peat moss, bark, perlite and vermiculite
1. Media, containers and nutrient mix used for greenhouse operations

**Containers**
- Hummert International (www.hummert.com)
  - Panterra Pots
    - Clay look - 8”
  - Pot TO Square Vacuum Deep (SVD)
    - Black - 4”
  - Propagation tray – 72 cells
    - 21” x 11” x 3”

**Nutrients**
- www.dosatronusa.com
  - Fertilizer applied by fertigation (Dosatron injector) to release 200ppm
  - Fertilizer: Jack’s general purpose 20-10-20 (High nitrate nitrogen levels provide for green foliage)
2. Irrigation/Fertigation Practice

Watering
- Hand watering – daily
- Production – Fertilize twice a week
- Water needs may vary based on:
  plant age, variety, ratooning schedule, season

3. Temperature and humidity management

Temperature
- Goal: 75-90°F (24-32°C)
- Day: 85-90°F
  Night: 75-80°F

Humidity
- High: 80-90% due to evapotranspiration

Warm months: May-Sep
- Cooling System
  Cool cell pump – 80°F
  Exhaust fan – 85°F
  Curt motor – 90°F
- Shading cloth

Cold months: Oct-Mar
- Heating: Double layer plastic is well insulated
- Two 200,000 BTU ventilated heaters at opposite ends of the house
- Winterized greenhouse
4. Ratooning Practice

Cuttings

• Critical in dense plantings to avoid shading
• Tip cuttings vs sub-terminals
• 2-node vs 1-node (with leaves and without leaves)
• **Preferred:** 2-node, sub-terminal, with leaves
5. Quality assurance practices (internal & external) – NCPN QMS

Internal & External (Lab & Greenhouse)

Four pillars:
- Say what you do
- Do what you say
- Prove it
- Improve it

Goal: To obtain accreditation
(Document control system, management review system, internal and external audit system)
5. Quality assurance practices (internal & external)

**Sweetpotato Seed Certification Process in NC**

The North Carolina Crop Improvement Association Leads Quality Control and Seed Certification Function for NC Sweetpotatoes

**External (Greenhouse)**

MPRU has to comply with NCCIA standards and has to pass inspection before releasing any order – zero tolerance
6. Other measures to reduce unit cost of production

**Lighting Systems**
- 14-16 h day length
- Supplemental light:
  - 1000W metal halide HID lights
  - 1000W High Pressure Sodium Lights HPS
- LED: Expensive. Work in progress.

**Aeroponics**
- One grower uses LSU system for faster increase in his greenhouse – elite plants

**Pest Control**
- Koppert Biological Systems. Weekly.
  - www.koppertus.com
6. Output measure e.g. multiplication rate, unit cost of production, revenue

**2019-2020 Production**

- **Greenhouse**
  - TC Propagation Block: May - July
  - TC Cuttings (2-node)
  - Potted Nuclear Plants: 2-3 feet long, 6-8 weeks old, 4” square pots
  - September - March
  - Rooted Cuttings in Trays: 3-4 inches tall, 2-4 weeks old, 72-cell trays

- **12,000 Nuclear Plants**
- **120,000 Rooted Cuttings**
- **300 TC Mother Plants**

**Plant Multiplication Rate**

- 1:40 Rate for pots
- 1:400 Rate for rooted cuttings (trays)
- Direct cost of production per pot: US$3.5
- Overhead not included (greenhouse, TC, VT, NCCIA inspection)
- Sales Revenue: comprises 50% of MPRU budget annually (sells + research fees)
- **2020-2021 Cycle**: Expected 1,000 TC for 12,000 pots or 120,000 rooted cuttings (~ 2,000 trays)

**MPRU Plants distributed and Research Fees**

<table>
<thead>
<tr>
<th>Year</th>
<th># of Certified GH Growers</th>
<th># of Plants Distributed from MPRU</th>
<th># of GH Cuttings Reported</th>
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<td>2019/2020</td>
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<td>8,255 pots + 800 trays</td>
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7. Varietal turnover including number of varieties per season

**Major Cultivars for seed**

- Covington (90%)
- Beauregard (5%)
- Murasaki
- Bayou Belle
- NC 04-531
- White Bonita
- Averre
- Bellevue
- Burgundy
- Evangeline
- Hernandez
- Mahon
- O’Henry
- Orleans

**Repository material, Breeding lines**

Bonita
Carolina Ruby
Hatteras
Japanese
Jewel
Norton
Porto Rico

NC State Breeding lines
USDA Breeding lines
LSU Breeding lines
Thanks!
Questions?

Clean Seed is the Future of our Industry

PANEL PRESENTATION
Ken Pecota, Bill Foote & Christie Almeyda
Billy Little - Moderator