Reconsidering Tree Fruit as Candidate Crops Through the Use of Rapid Cycle Crop Breeding Technologies

Presented by:

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Overview

- Dwarfing work at KSC
- Tree Crop Exclusion
  - Architecture; Juvenility; Dormancy; Harvest Index
- FasTrack™ Crop Breeding System
  - Prunus domestica (plums)
- Tree Crop Inclusion
- Current State of Development
- Q & A
Dwarfing Work at KSC

Control | MS/Thigmo.

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Root Restriction

Blue Light GA Inhibition
Tree Fruit Incompatibility

Architecture

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Tree Fruit Incompatibility

Dormancy

Photo by: Connie Painter

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Tree Fruit Incompatibility

Juvenility
Tree Fruit Incompatibility

Placeholder

Harvest Index

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Candidate crops restricted to herbaceous crops

Tree fruit crops *could* contribute significantly to health crew diet and other ALS objectives...

Tree fruits precluded based on:
- Stature/size
- Long maturation phase
- Dormancy requirements
- Harvest Index

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The challenge is...

Develop tree fruit cultivars that conform to the requirements of spaceflight and planetary exploration life-support systems
FasTrack™ Breeding System

Developed by USDA (Kearneysville, WV)

- Breeding disease resistance
- Breeding better traits
- Stay ahead of disease

Flowering Locus T Gene – *Populus trichocarpa*

*Prunus domestica*
Incompatibilities

- Architecture
- Dormancy
- Juvenility
- Harvest index

Become Compatibilities
Potential Benefits & Outcomes

- Improved crew diet/nutrition (functional foods)
- Bone loss prevention/countermeasure
- Radiation countermeasure
- Water filtration
- ISRU
- System carbon capacitance
- Biomaterials & fibers
The Team

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Questions?

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