



Integrating High Tunnel Production to Provide Resiliency for Urban and Peri-urban Supply Chains

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Research and Extension

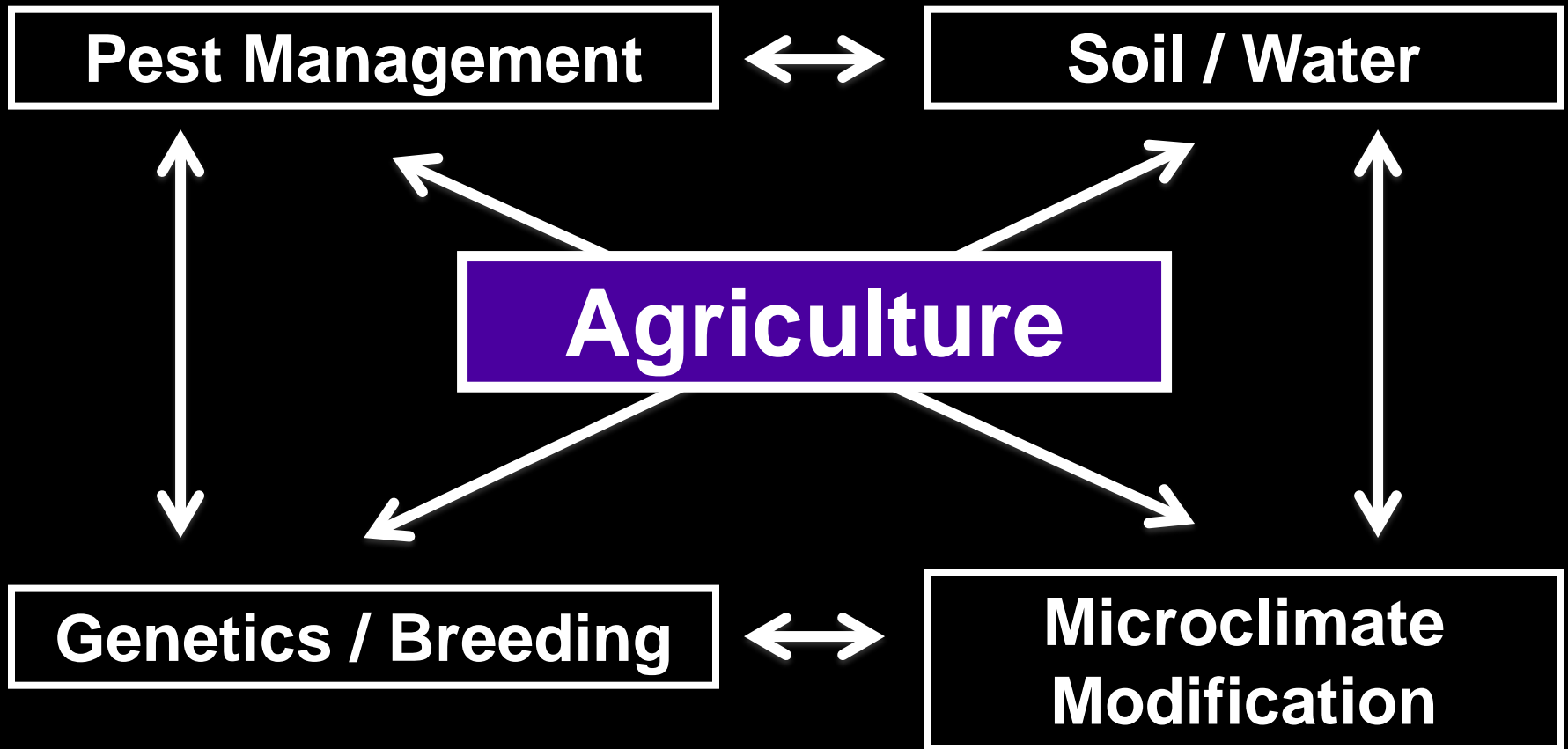
High Tunnels



200' x 96' Multi-Bay Haygrove Tunnel
Three-season | Luminance plastic

Introduction

Role of Microclimate Modification

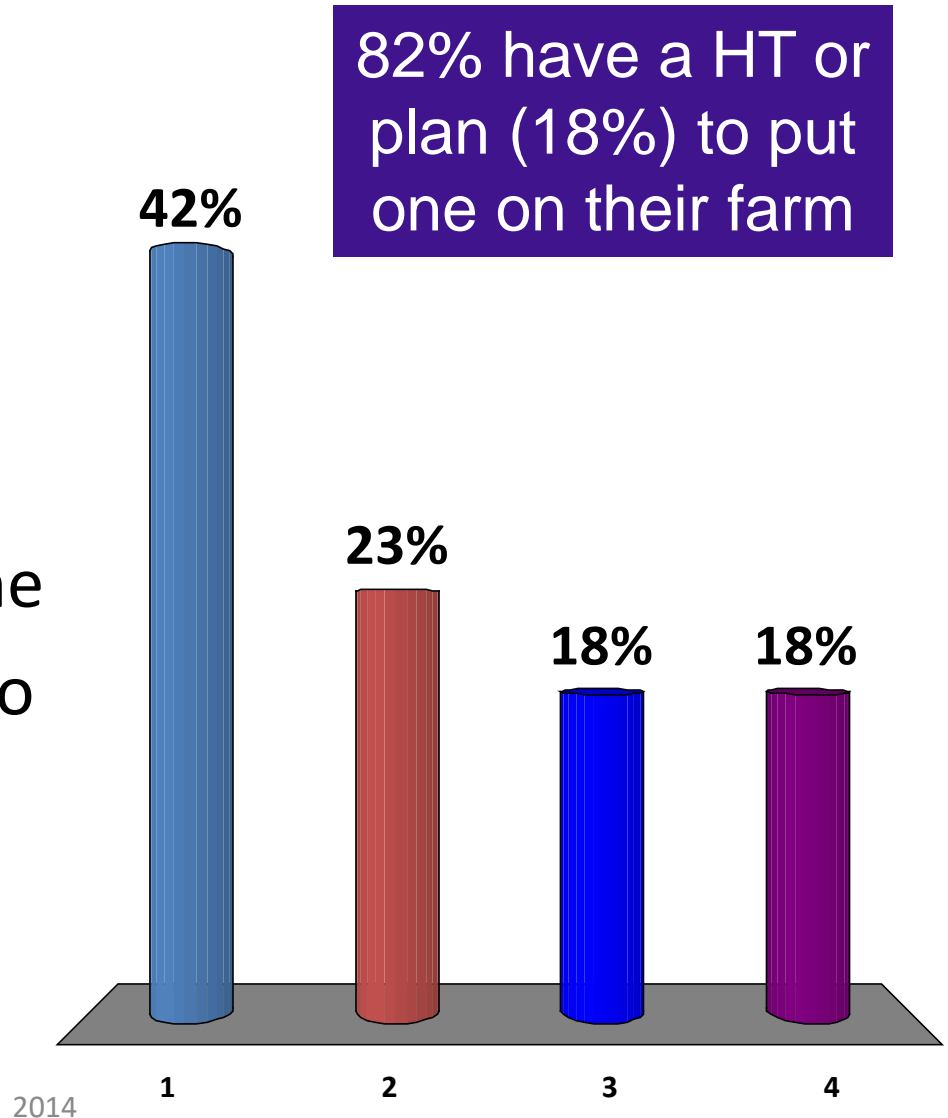




Incredible growth of warm and cool season crops

Do you have high tunnels on your farm?

1. Yes
2. Yes and I plan to put in more
3. No, but I plan to get one
4. No and I don't intend to



*Clicker survey during the 2014 Great Plains Growers Conference (St. Joseph, MO). N=265

Why High Tunnels?

Environmental Protection

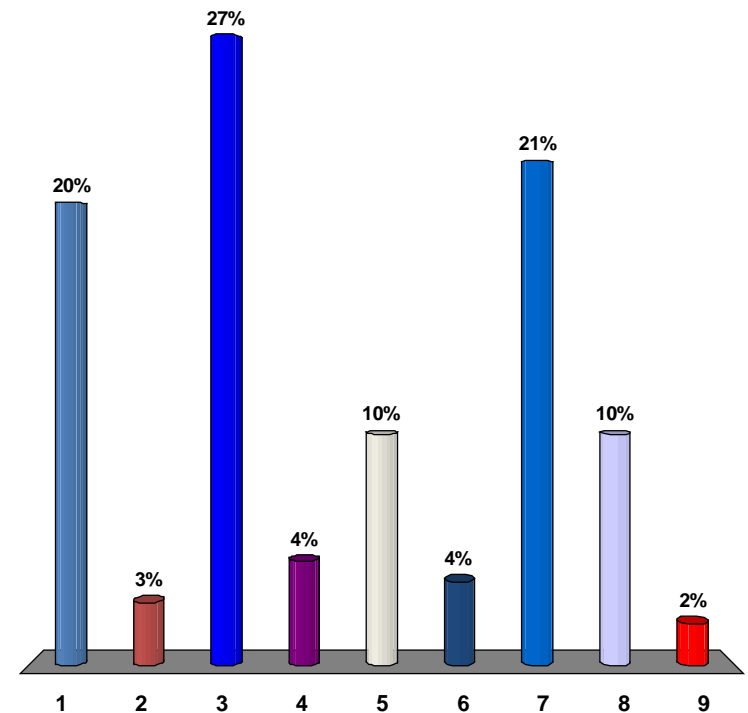


- Early/late frosts
- WIND
- Thermal Stress
- Storms
- Heat ?
- Light ??

Which of the following was the BIGGEST challenge in your business last year?

1. Weather
2. Regulations/policies: pesticide, certification, etc.
3. Available labor
4. Access to farmland
5. Access to markets
6. Financing: loans, etc.
7. Pests: disease, insect, weeds
8. Lack of production skills other than pest control: high tunnel, soil fertility, variety selection, etc.
9. Food Safety

1) Available Labor
2) Pest, weeds, disease
3) WEATHER



**Clicker survey during the 2014 Great Plains Growers Conference (St. Joseph, MO). N=265*

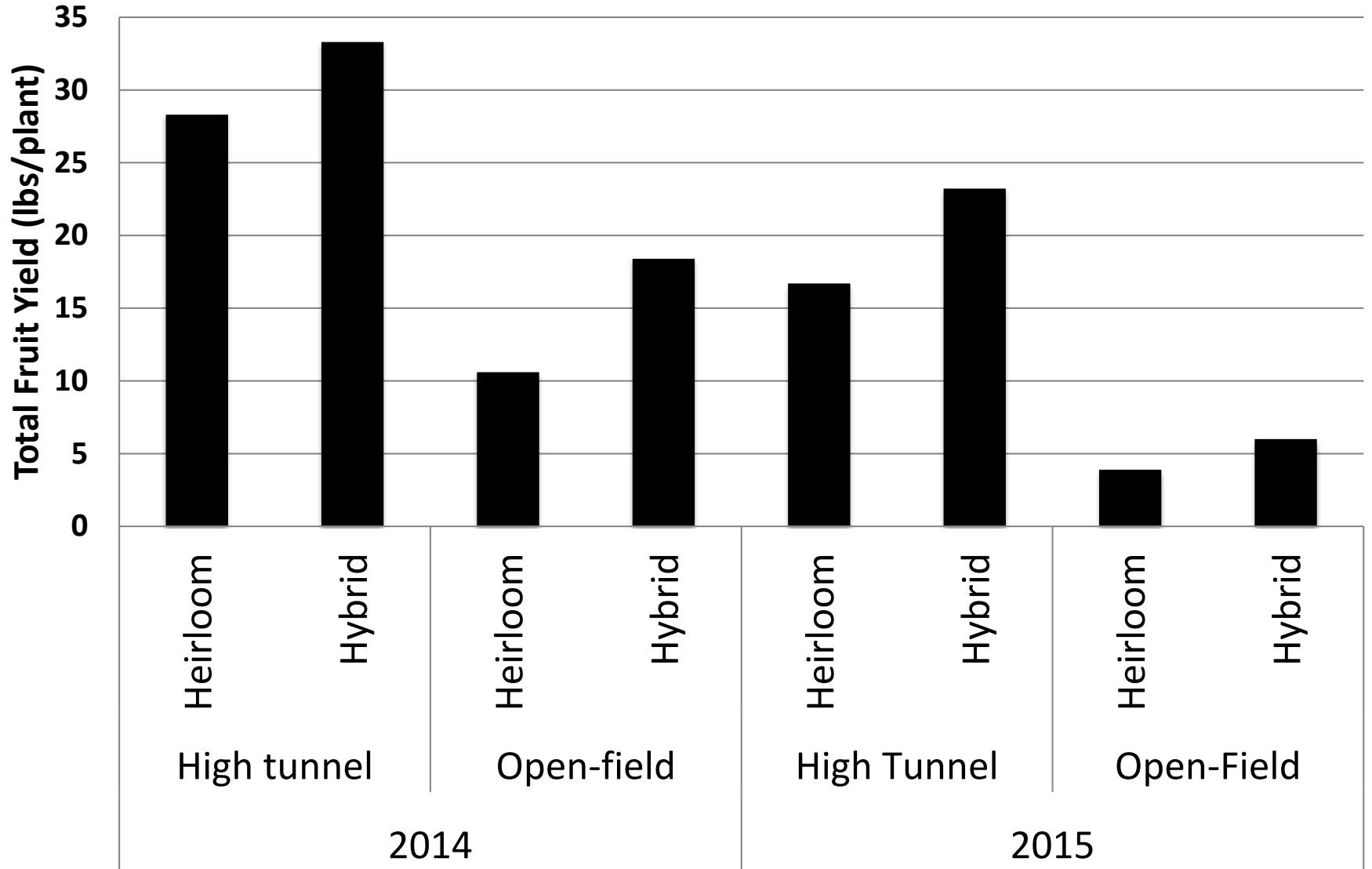
Protection from Heat

High Tunnels = Early Planting Date

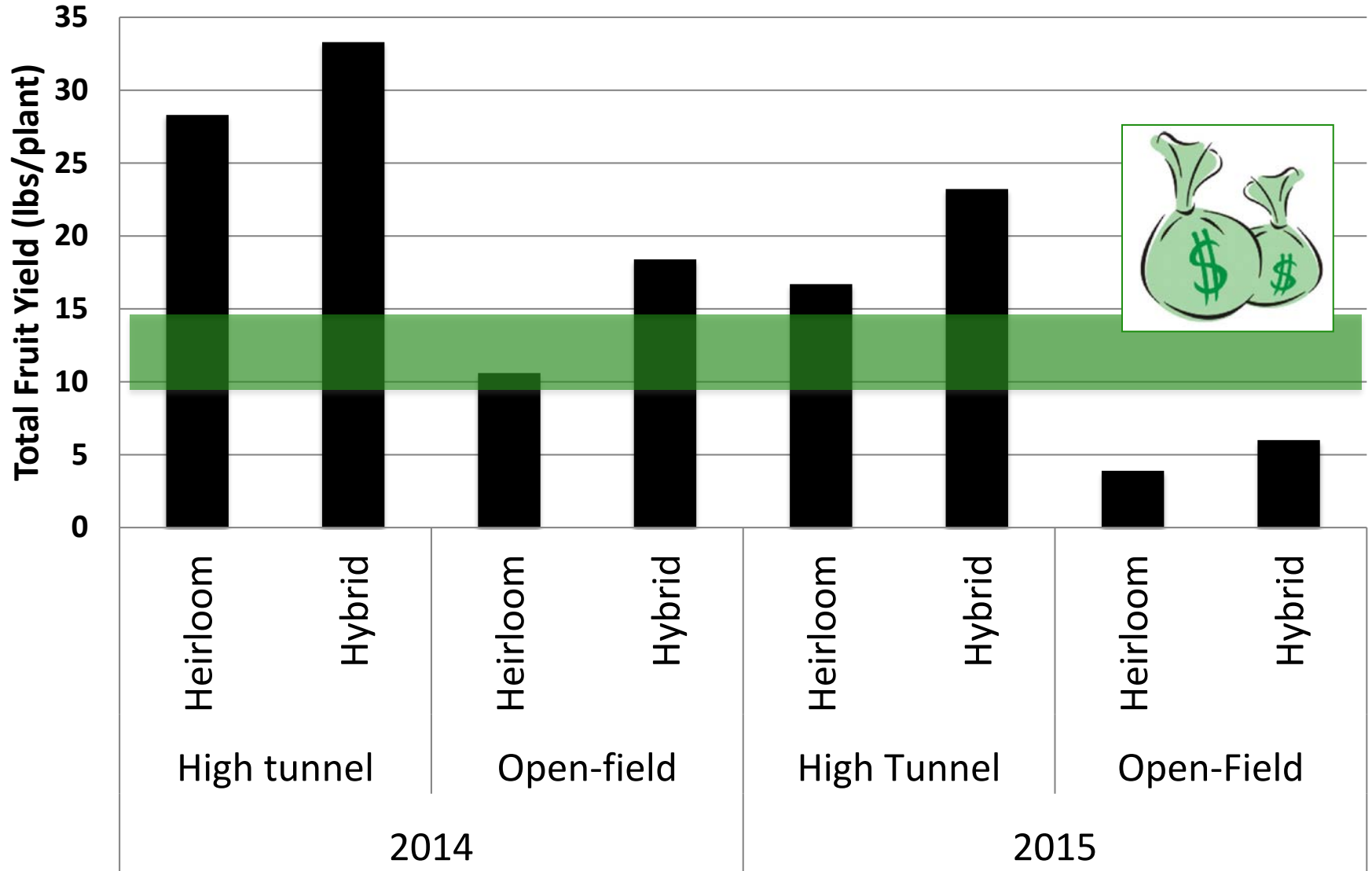
- Fruit set before heat
- Plant is established
 - Root system
 - Foliage – fruit shading
- Planting Preference
 - Scheduling
 - Varieties
 - Transplant quality



2014-15 AFRI Food Security Project



2014-15 AFRI Food Security Project



Summer Spinach Production

- 39% shade
- Sprinkler irrigation



(Carey et al., 2008)

Challenges for HTs

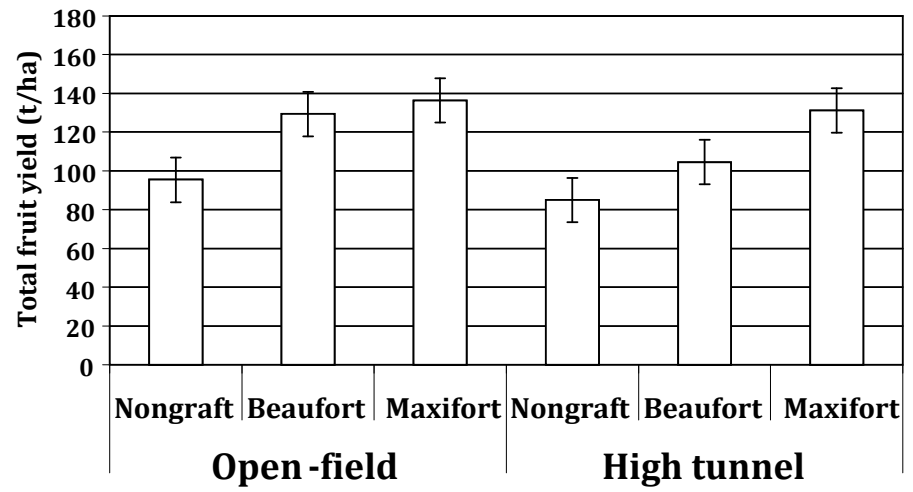
Addressing Challenges for HT Production

- Limited Space
- Soil Management
 - Salinity
 - Crop Rotation
- Intensive production = intensive resource use
 - Balancing risk vs capital and other inputs
- New growing system
 - Techniques
 - Cultivar selection
 - Pest and disease management
- New growers

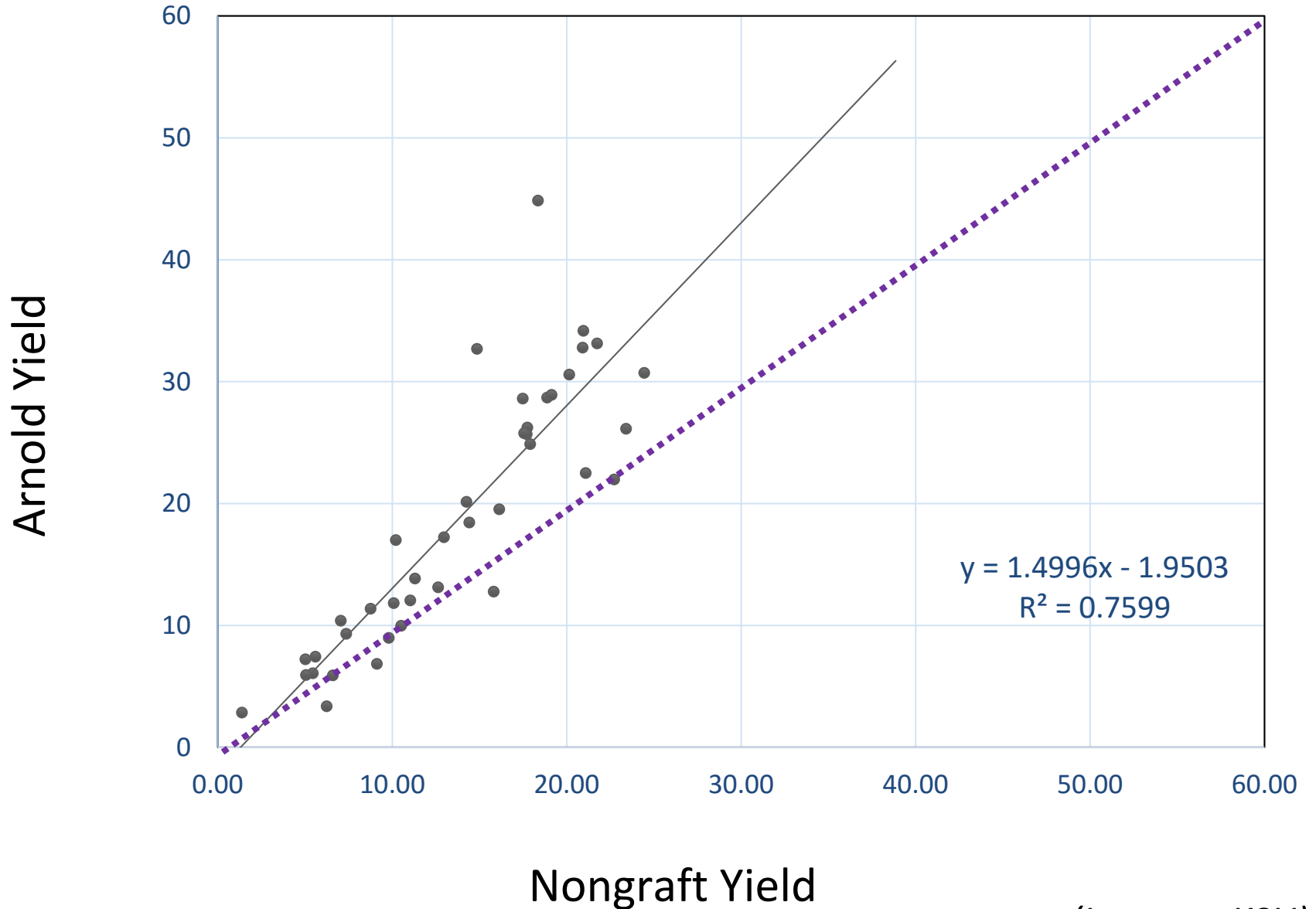
Tomato Grafting

- Inter-specific hybrid rootstocks
 - Soilborne disease management (Louws et al., 2011)
 - Tolerance to abiotic stress (Rivero, 2003)
 - Increased vigor and productivity
- Crop productivity (no disease)
 - High tunnel and open-field
- Root microbial biology
 - Organic systems
- Propagation





Arnold vs Nongraft



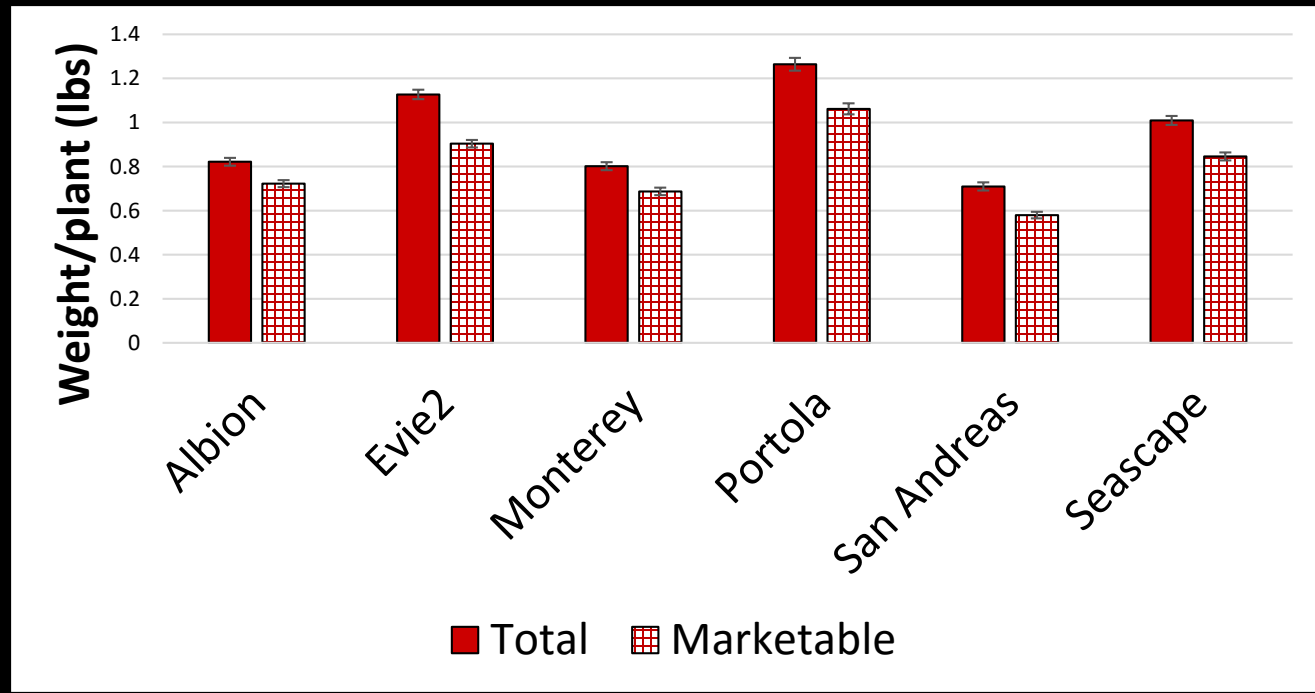
(Loewen, KSU)

Crop Rotation

Spring-planted day-neutral strawberries



- Cultivar
- Evaporative cooling
- Postharvest



Crop Rotation

Sweet Potato Slip Production

- Vegetative propagation of slips in HTs
 - Economics
 - Cultural management (planting density)
 - Follow-thru studies

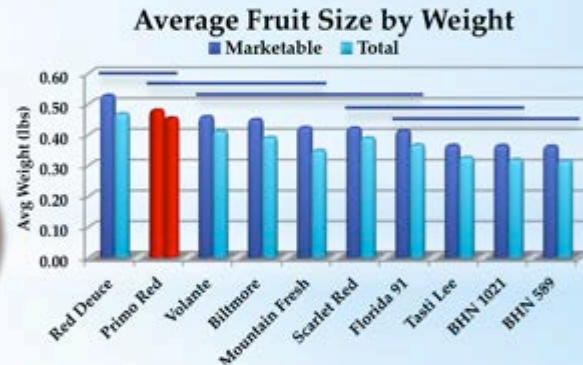
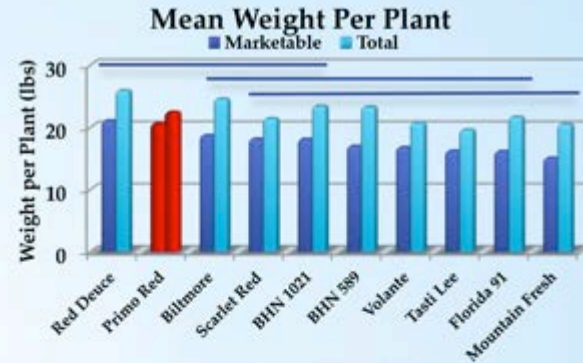


Variety Trials

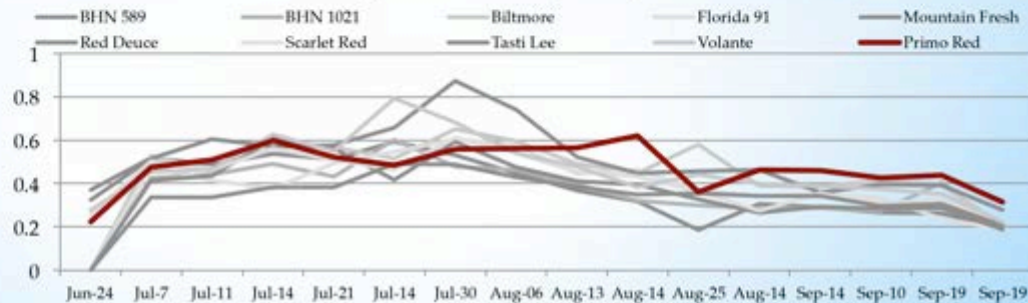
PRIMO RED



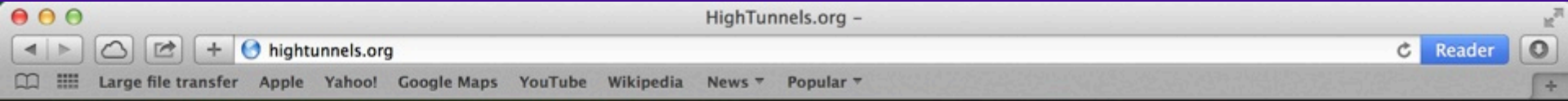
DAYS: 65
FRUIT SIZE: 8.5oz.
PLANT TYPE/HEIGHT:
 Compact
VIGOR: 3 out of 5



Average Fruit Size by Weight: Harvest Date



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- [Tomato Nutrition in High Tunnels Webinar: 03/15/2015, .](#)
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The [hightunnels] listserv comprises over 850 members, most of which are growers using high

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tunnels. The listserv is a great place to learn what growers are doing with high tunnels, what crops and

Summary



- High tunnel production is here to stay.
- They have benefits and challenges.
 - Soil
 - Nutritional quality
- Role of extension/education
- Sustainability

Acknowledgements

- Funding provided by:
 - NCR-SARE
 - USDA-NIFA
 - CERES Trust
- Students and staff
 - Sarah Masterson
 - Lani Meyer
 - David Loewen
 - Kelly Gude
 - Kimberly Oxley
 - Zac Hoppenstedt

