

MANAGING SOILLESS MEDIA  
UNDER PROTECTED CULTURE  
FOR VEGETABLE AND SMALL  
FRUIT CROP PRODUCTION

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# Structure of the Program

- ⦿ Research, Extension and Education.
- ⦿ Involvement:
  - Research studies and validations.
  - Field demonstrations.
  - Advising and consulting.

## Horticultural Program at the GCREC: Area Served under Protected Agriculture in Florida

Crops	Acreage	
	2009	2011
Strawberry	2.5	15.7
Tomato	0	5.7
Pepper	0	1.8
Blueberry	2.3	40.2
Herbs	0	1.0
<b>Total</b>	<b>4.8</b>	<b>64.4</b>

**More than 200 acres in the state.**

# Areas of Expertise

- Structures and maintenance.
- Soil/soilless media.
- Cultural practices.
- Irrigation and water management.
- Fertilization and plant nutrition.
  
- Pest management: Other scientists at GCREC and UF.

# Main Principles

- ⦿ Protected ag is not only for the rich, but rather for the rich of creativity, ideas and desire!
- ⦿ Keep it simple!
- ⦿ Work as much as possible with materials and resources that the grower already has.

# Soilless Media and Containers



# Soilless Media

- ◎ Replacement for natural soil.
- ◎ It should provide:
  - Root support.
  - Nutrient and water retention.
  - Gas exchange.
  - Pest-free environment.
- ◎ Free is not necessarily best.



# Soilless Media

## ◎ Mineral origin.

- Perlite.
- Vermiculite.
- Sand.
- Rockwool.

## ◎ Organic origin.

- Coconut coir.
- Peat.
- Pine bark.
- Compost.
- Rice hulls.





# Containers

- ◎ Affordable.
- ◎ Long-lasting.
- ◎ Manageable.
- ◎ Types:
  - ◎ Pots.
  - ◎ Bags.
  - ◎ Troughs.
  - ◎ Trenches.
  - ◎ Tables.













# Experiences under Protected Culture



# Experiences under Protected Culture





**Balm, Hillsborough Co. (2007-11)  
Strawberry in soil**



**43°F  
Water use: 0**



**27°F  
Water use: 3 acre-inch/day**

# Balm, Hillsborough Co. (2007-11) Strawberries in high tunnels



Production systems	Early yield ---ton/acre---	Total yield
High tunnels	2.7 a	14.6 a
Open fields	2.1 b	9.4 b
Difference	+28%	+55%

**Balm, Hillsborough Co. (2009-10)  
Melons after strawberry**



**Balm, Hillsborough Co. (2009)  
Strawberry-boxes-pine bark**



**Balm, Hillsborough Co. (2009)**  
**Tomato-boxes-pine bark**



# Balm, Hillsborough Co. (2009-11) Tomato-STS-pine bark

Production system	Marketable yield
	t/ha
<b>STS (tunnels)</b>	<b>100</b>
<b>Open field</b>	<b>40</b>



# Balm, Hillsborough Co. (2009-11) Color peppers-STS-pine bark



# Balm, Hillsborough Co. (2010-11) Strawberry-STS-pine bark





**Balm, Hillsborough Co. (2010-11)  
Pepper and strawberry-pine bark**



# Balm, Hillsborough Co. (2009-11) Strawberry-boxes and vertical systems-medium



# Balm, Hillsborough Co. (2010-11) Strawberry-tables-pine bark



**Balm, Hillsborough Co. (2010-11)**  
**Peppers-boxes, pots, bags**  
**Coconut coir, perlite, potting mix, pine bark**



**Balm, Hillsborough Co. (2010-11)  
Tomato-bags-coconut core, pine bark**



**Balm, Hillsborough Co. (2010-11)**  
**Basil-boxes-pine bark**



# Lake Wales, Polk Co. (2009-11)



**Lake Wales, Polk Co. (2009-11)  
Strawberry-tables, bags, vertical  
Pine bark, coconut coir**





**Lake Wales, Polk Co. (2009-11)  
Strawberry-tables, bags, vertical  
Pine bark, coconut coir**



# Lake Wales, Polk Co. (2010-11)



**Lake Wales, Polk Co. (2010-11)**  
**Pepper-bags, STS**  
**Pine bark, coconut coir**



**Lake Wales, Polk Co. (2010-11)**  
**Pepper-bags, STS**  
**Pine bark, coconut coir**



# Lake Wales, Polk Co. (2010-11) Tomato-bags-coconut coir

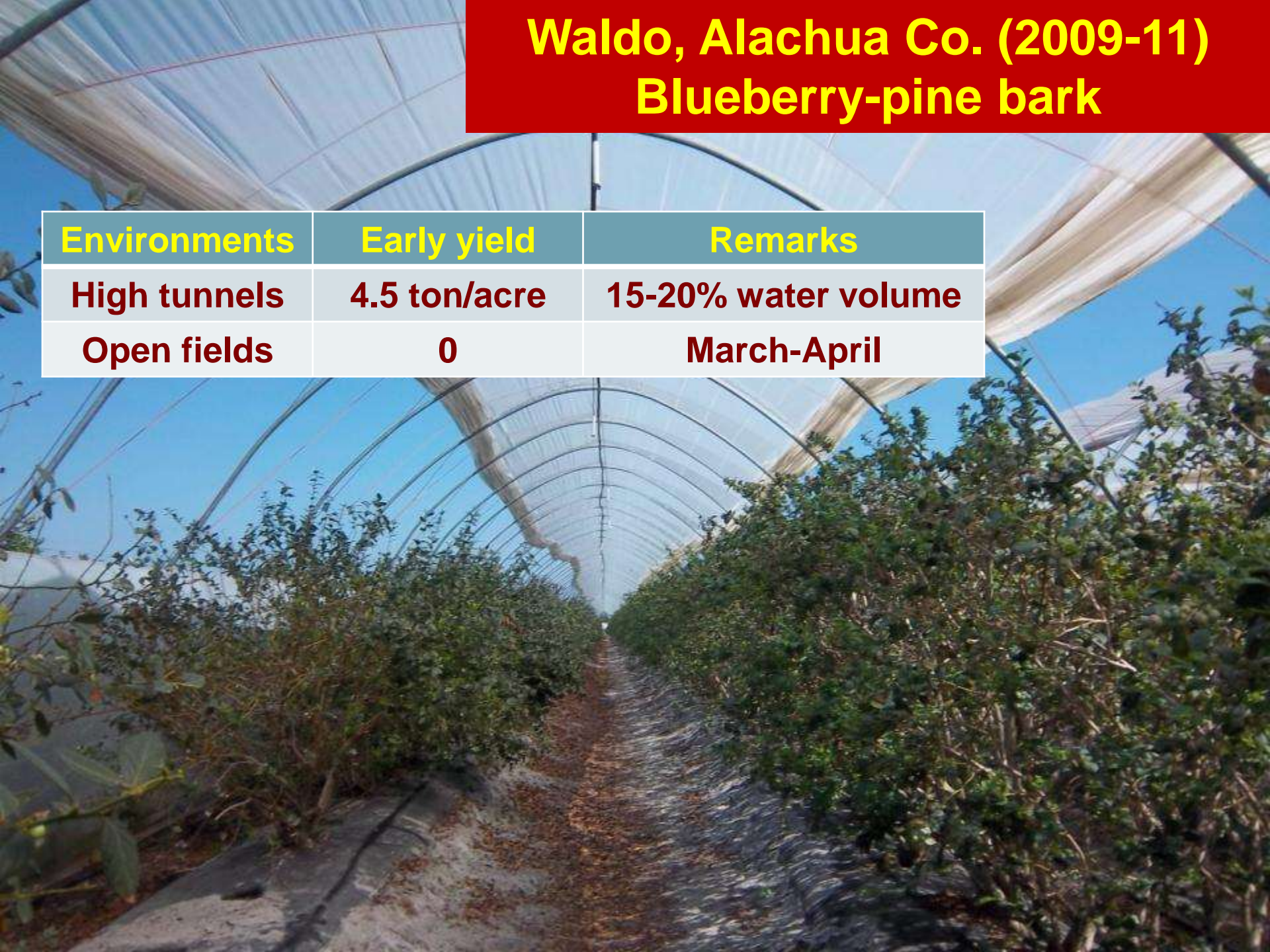


**Waldo, Alachua Co. (2009-11)  
Blueberry-pine bark**



# Waldo, Alachua Co. (2009-11) Blueberry-pine bark

Environments	Early yield	Remarks
High tunnels	4.5 ton/acre	15-20% water volume
Open fields	0	March-April



**Waldo, Alachua Co. (2010-11)  
Pepper, strawberry-STS-pine bark**





**Waldo, Alachua Co. (2010-11)  
Strawberry-tables-pine bark**



# Plant City, Hillsborough Co. (2010-11) Strawberry-soil



# Plant City, Hillsborough Co. (2010-11) Strawberry-soil



# Haines City, Polk Co. (2010-11) Strawberry-bags-coconut coir



# Haines City, Polk Co. (2010-11) Strawberry-bags-coconut coir



# Haines City, Polk Co. (2010-11) Strawberry-bags-pine bark



**Haines City, Polk Co. (2010-11)  
Strawberry-troughs-pine bark**



**Clewiston, Hendry Co. (2010-11)  
Basil-STS-soil, pine bark**





**Crescent City, Putnam Co. (2010-11)  
Pepper-bags-pine bark, potting mix**



# Crescent City, Putnam Co. (2010-11) Blueberry-pots-pine bark



**Ruskin, Hillsborough Co. (2010-11)**  
**Tomato-bags, pots, troughs**  
**Coconut coir, pine bark**



**Ruskin, Hillsborough Co. (2010-11)**  
**Tomato-bags, pots, troughs**  
**Coconut coir, pine bark**



**Plant City, Hillsborough Co. (2010-11)  
Strawberry-soil**



# Plant City, Hillsborough Co. (2010-11) Strawberry-soil



**Brooksville, Hernando Co. (2011)**  
**Tomato-STS-pine bark**



**Brooksville, Hernando Co. (2011)**  
**Tomato-STS-pine bark**





**Thanks!! Questions?**  
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