

# **Extending the strawberry harvest season from 5 weeks to 5 months in Ohio**

## **Climate Modifications Strategies**

**Great Plains Fruit and Vegetable Growers Conference**

**St. Joseph, Missouri**

**January 13, 2018**

**Brad Bergefurd, Horticulture Specialist & Extension Educator**

**OSU Piketon Research & Extension Center Extension**

# Considerations with Strawberries

- Perennial/Annual
- Soil/fertility
- Site/location
- Varieties
- Pests
- Hardiness
- Planting Size
- Pollination
- Maturity
- Equipment



# Ohio is a Traditional Matted Row Production State

- Been a very good system for generations of farmers & made lots of \$
- ~ Harvest Memorial Day to July 20<sup>th</sup>
- Growers are adopting protected culture, plasticulture strawberry techniques, market extension techniques (floating row covers, low & high tunnels and greenhouses) to extend the marketing season



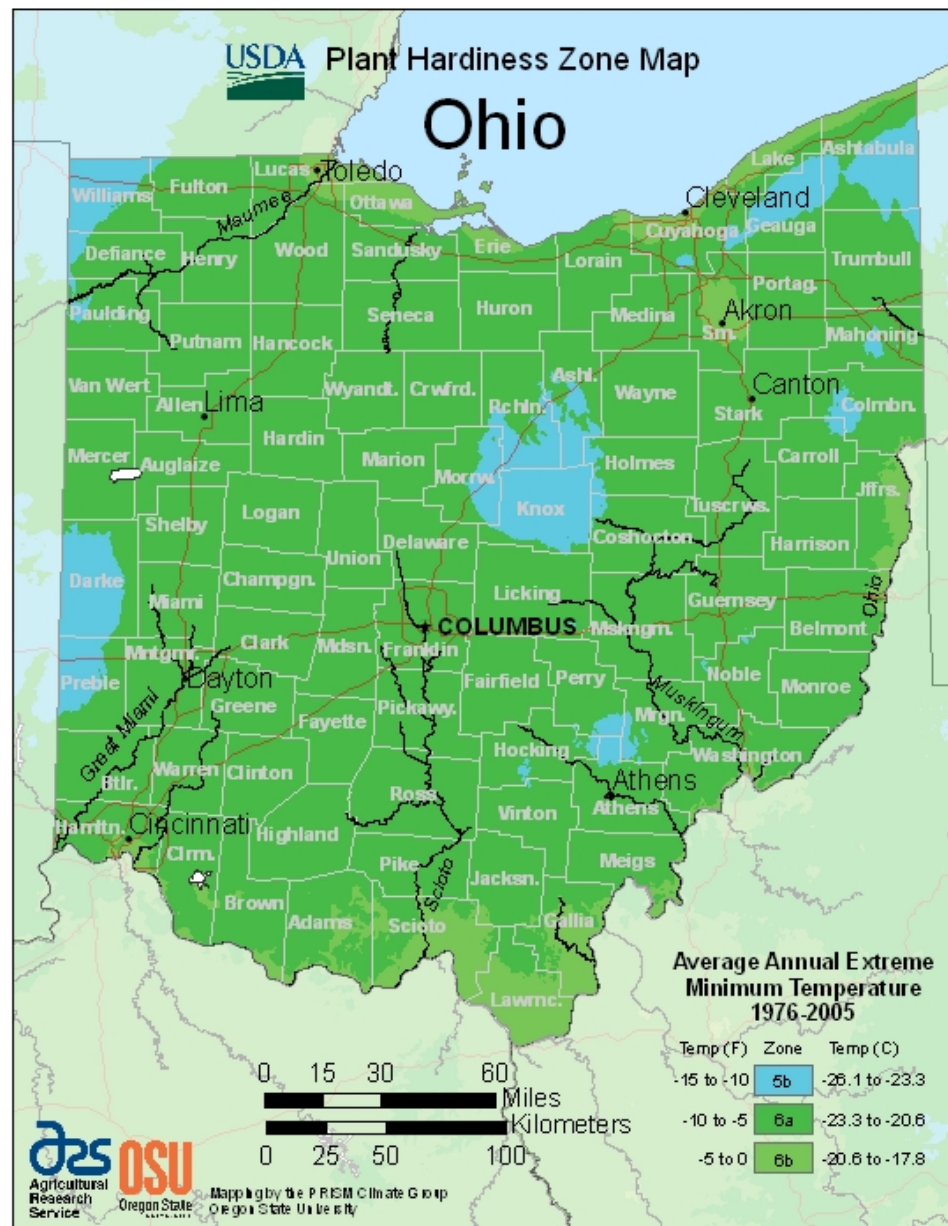
# Ohio Strawberry Production Essentials

- Long period for flower bud initiation in fall, winter and early spring
- Winter protection
- Produce top-quality berries
- Opportunity to get a good price
- Willingness and time to put in extra effort
- \$\$ up front
- Willing to gamble (much risk involved)





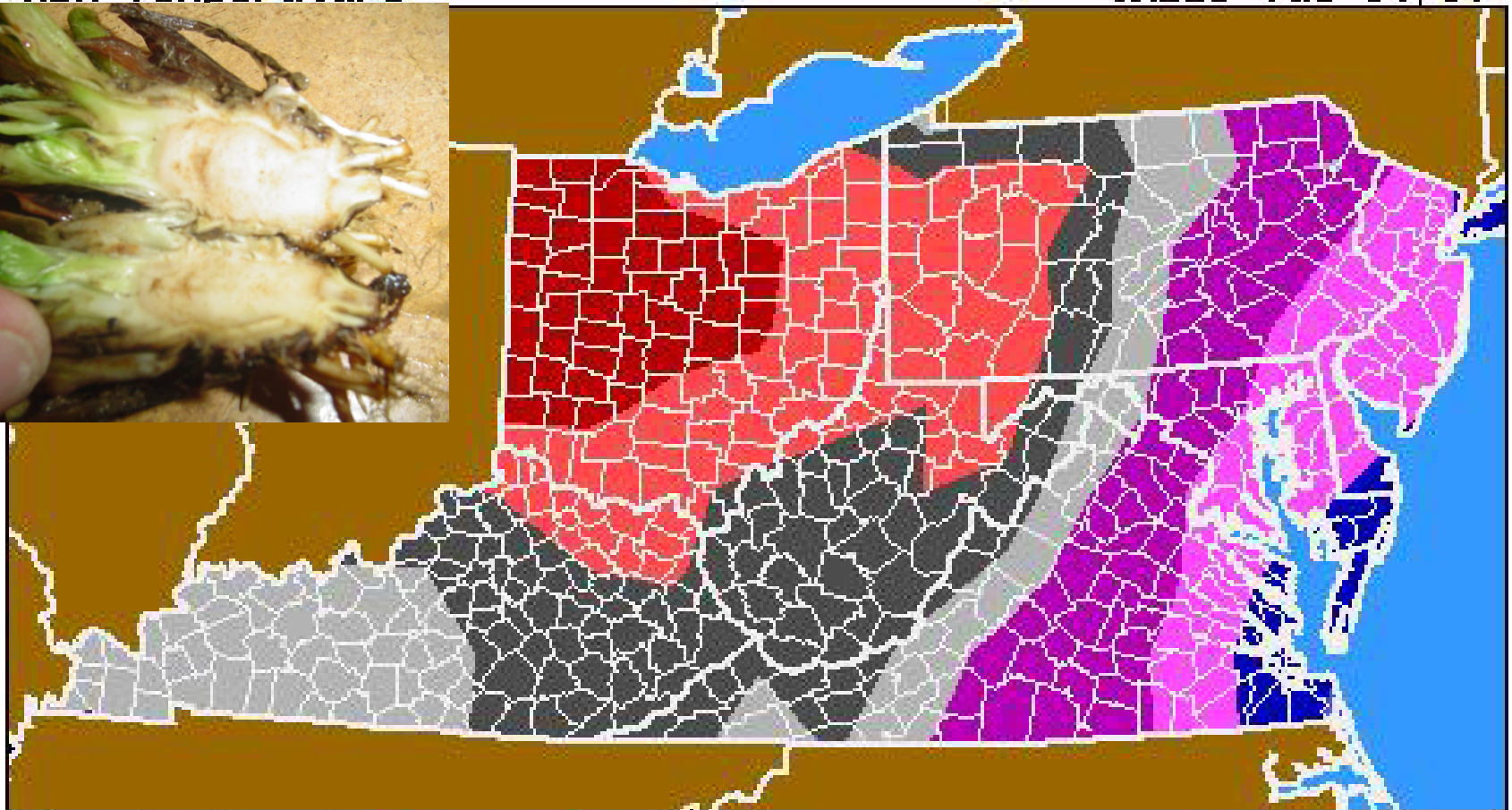
- ZONE 6a
- -10 to -5 F.
- Avg. Min. Temp
- Extreme lows
- 2014 and 2015
- -20 F.



# Be prepared for the worse 1/7/14

MIN Temperature

VALID Tue 01/07



-20 -15 -10 -5.0 0 5.0 10 15 20

AWIS.com

# Freeze and frost protection required



# Strawberry Fruiting Habits

\*June-bearing- initiate flowers under short day conditions in the fall.

\*The flowers open the following spring and produce fruit for about a 4 to 6 week period in Ohio June to July.

\*Everbearing initiate flowers under long day conditions and generally produce a crop in the spring with a more substantial crop in the summer and fall.



# Strawberry Fruiting Habits

- Day-Neutral strawberries produce flowers regardless of day length, as long as temperatures are between 40 and 85° F (Hancock and Handley, 1998).
- In many production systems, Day-Neutral and everbearing strawberries show similar production patterns and these names are sometimes used interchangeably



# Strawberry Fruiting Habits

- \*The easiest way to extend the strawberry harvest season is through variety selection .
- \*In Ohio most of the strawberry cultivars grown are June-bearing
- \*In northern climates, June-bearers form flower buds during the short days of fall, and these buds complete their development and bloom the following spring.



# Strawberry Plasticulture

- Intensive agriculture
- High cost of production ~\$20,000/acre
  - High returns per acre ~\$50,000
- Our approach is to develop research proven methods that extend the marketing season









# Row Covers are a Key Requirement of Plasticulture Strawberry in Ohio

- **Fall: Long flower bud initiation**
  - Enhance growth and development
    - branch crown # and flower #
- **Winter: protection from sub-lethal temps**
  - Timing of application is critical
  - Varies based on physiological state
  - Nov>Dec>Jan>Feb>March
  - April, dormancy breaks and cold sensitivity increases
- **Spring: Frost protection**
  - Marginal events (defined by the stage)
  - Most effective early in the spring
  - Flower and foliage damage in windy conditions
  - Poor pollination during extended periods of use



# Profits Influenced by # viable blossoms







**Spring Season Chandler  
Berries  
(Normal Season is Mid  
May Through June. )**

**\*MART**



# Last Camino Real Harvest 6/20





# Last Camino Real Harvest 6/20



# **Ohio- Traditional Matted Row Production**

Harvest ~ Memorial Day to ~July 20th











# Day Neutral Strawberry

- With the recent release of new day neutral cultivars, we have the potential of providing fresh strawberries for 4 to 6 months instead of 1 month for short day-length varieties.
- Although day neutrals have been considered best for cooler climates, success is being observed from the Carolinas into Canada.
- The best production systems are still a work in progress.





# Strawberry Fruiting Habits

- \*Day-neutral strawberries differ from June-bearing in that they flower and fruit continuously when temperatures are moderate because they are insensitive to day length.
- \*Most day-neutrals grow well in the temperature range 40°F and 85°F. Temperatures lower or higher than these limits will cause the plants to slow or stop flowering and growing.



# Day Neutral Strawberry

- Day-neutrals are sensitive to extreme heat, our hot summers may be a limiting factor.
- Overhead irrigation can be used to cool the plants during high heat periods.
- Harvest should start one to two weeks ahead of short day-length strawberries.



# Day Neutral Strawberry

- \*Day-neutrals prefer the same soil and sites as June bearing cultivars.
- \*Can plant in early spring, at the same time as June-bearing cultivars.
- \*Can be planted in plasticulture system.
- \*Raised beds provide higher spring soil temperatures and better drainage, allowing faster establishment and earlier harvest.



# Day Neutral Strawberry

\*Varieties that do well for Ohio area are: SEASCAPE, ALBION and SAN ANDREAS.

\*Other varieties are PORTOLLA, which is light colored and lacks the flavor of others.

MONTEREY, which hasn't been trialed yet in Ohio.



# In Season Double Cropping of Day Neutrals

- The previous year's fall planting will provide an early spring crop.
- Harvest should start one to two weeks ahead of short day-length strawberries.
- Manage through spring harvest same as plasticulture crop.
- Renovation is required to get a summer and fall crop.



# Summer/Fall Production Mid July through November 1 (cooler summers)

- To renovate, mow, clip or cut off excess plant debris as soon as short day-length crop (matted row) starts to produce.
- Continue to N fertigate according to weekly petiole sap analysis results.
- Note: SEASCAPE does not respond as well as ALBION or SAN ANDREAS to renovation.
- While the short day-length plants are producing, the renovated plants are rejuvenating and will be producing 3 to 4 weeks later after the short day-length and matted row varieties are finished.





# Renovation of San Andreas begins immediately after final harvest 6/20/15





















# Moderate day-neutral San Andreas variety harvest begins 7/15/15



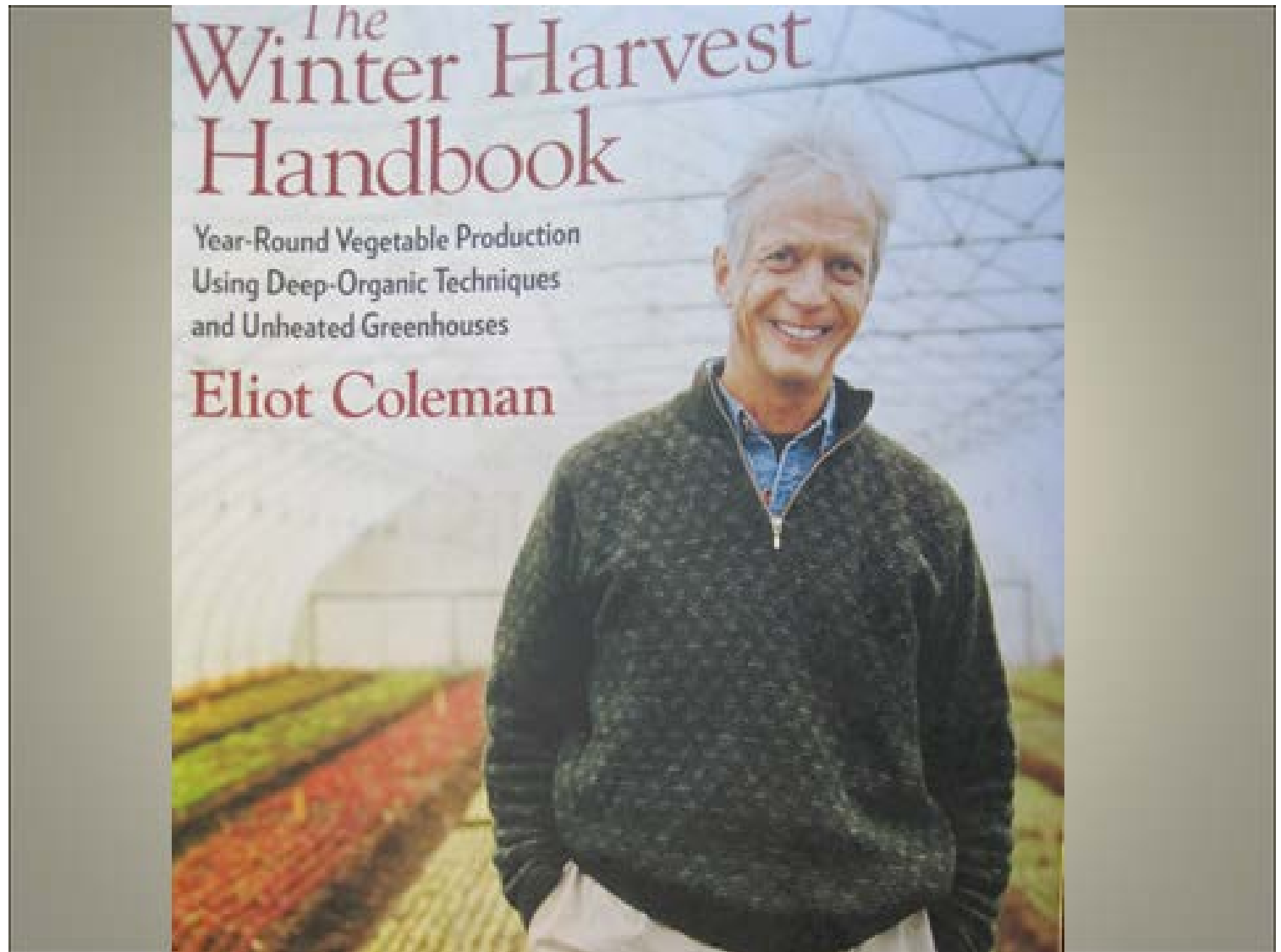
# 7/15 San Andreas Harvest







# Not Tired of Picking Strawberries Yet?



## Quote

- “The differences in markets, climates and grower’s preferences assure endless variations. And that is what makes exploring the winter (off-season) harvest so stimulating to the agricultural imagination.”

- Eliot Coleman, *The Winter Harvest Handbook*



THE OHIO STATE UNIVERSITY

COLLEGE OF FOOD, AGRICULTURAL,  
AND ENVIRONMENTAL SCIENCES

# Our High Tunnel Experience in Ohio

- Strawberry High Tunnel Research began at Piketon in 1994





# Some High Tunnel and Greenhouse Production being Adopted

- Spotted Wing Drosophila an issue July to Fall in OH



# High Tunnels

- Our experiences has been can harvest earlier (March) and later(Dec) in the season.
- Comes down to economics, expensive production system.
- Not enough yield/production on the flat.
- Need to harvest expensive air space (indeterminate tomatoes).



# High Tunnel Structures

## Climates subject to snow and wind

- Make sure your structure is strong enough...



## Tunnels with cross sections

- And more steel for enhanced strength



# How can we make more \$ from high tunnel strawberries?

- Current Ohio research include:
- Troughs?
- Gutters?





# How can we make more \$ from high tunnel strawberries?

- Baskets?





# How can we make more \$ from high tunnel strawberries?

- Stackables?



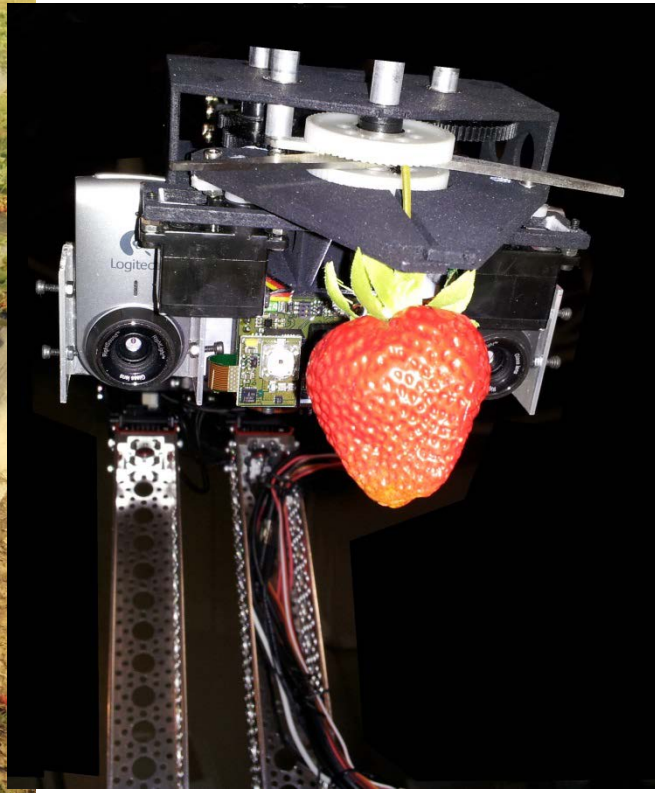
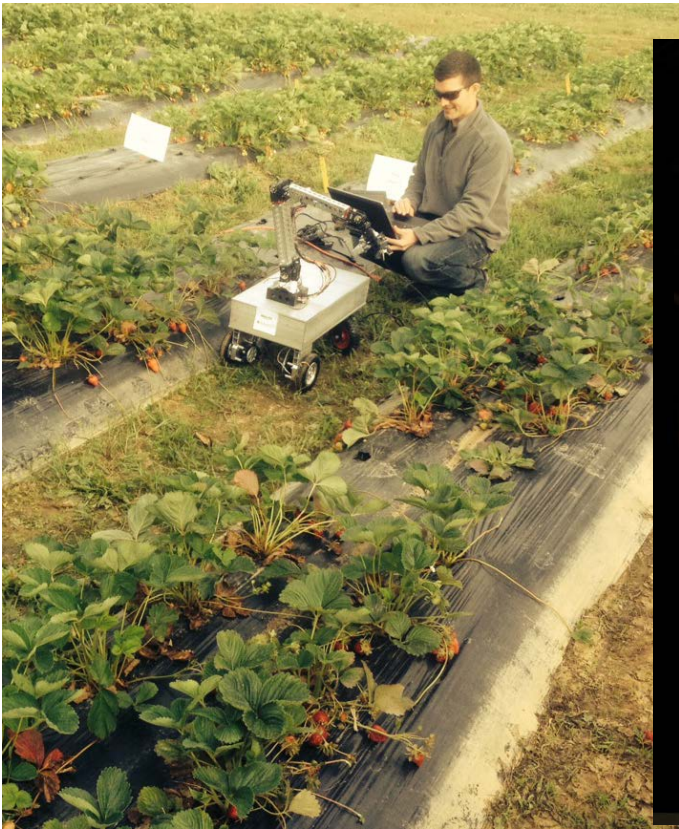
# How can we make more \$ from high tunnel strawberries?

- Low Tunnels?
- Low tunnels are expensive but may be economical because can be reused for ~ four years.



# Labor?

- Robotic harvesting not far away





# Full research reports, assistance and production information

- Brad Bergefurd  
Horticulture Specialist
- Extension Educator  
Piketon Research & Extension Center  
1864 Shyville Road  
Piketon, Ohio 45661
- 1-800-860-7232 ext 136
- OSU Extension Scioto County Portsmouth, Ohio
- 740-354-7879
- Bergefurd.1@osu.edu
- [www.southcenters.osu.edu](http://www.southcenters.osu.edu)



# ANY QUESTIONS?

