

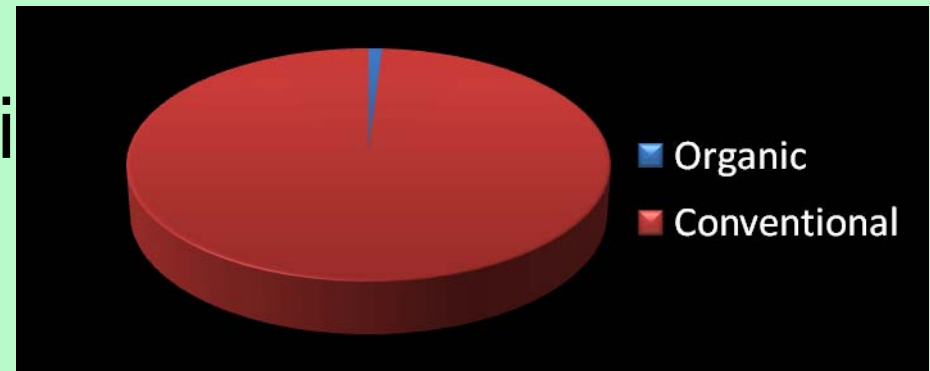
Development of best nutrient and pest management practices for organic blueberry production in Michigan

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Potential for growth

- 53 acres blueberries certified-organic in Michigan, less than 0.3% total Michigan blueberry acreage
- 20% annual growth in demand for organic products
- 20-100% price premiums for wholesale organic blueberries in 2007



Sources:

1. USDA National Agricultural Statistics Service nass.usda.gov/Statistics_by_State/Michigan/Publications/MichiganFactSheets/STHILGTS.pdf
2. Organic certifying agencies registered with Michigan Department of Agriculture (GOA, ICS, MOSA, OEFFA, OCIA, Oregon Tilth, ICO), personal communication, November, of 2007

Challenges in organic production

- Majority of acreage “blow sands”, with lesser but significant acreage on high O.M. peat bogs
- Acidic soils, ideal pH 4.5
- Insect pests, such as Japanese beetle, blueberry maggot (zero-tolerance)
- Diseases, such as mummy berry (zero-tolerance) and anthracnose fruit rot
- Shallow roots, mechanical for weed control difficult



Research objectives

Overall goal: Develop recommendations for production of organic blueberries in Michigan

- 1) Evaluate organic management of blueberry pests (weeds, insects, and diseases)
- 2) Determine effect of mulches, cover crops and organic fertilizers on plant and soil health
- 3) Establish cost of organic production practices

Establishment of organic blueberry research sites

- 1-acre site at HTRC, East Lansing
 - Elliott, Bluecrop; mixed rows of Duke, Draper, and Nelson
 - Sulfur and cover crops 2007, blueberries in 2008
- Trials on farms and experiment stations
- Nutrient sources
 - Commercial organic fertilizer, feather or soybean meal, compost, fish emulsion through drip irrigation
- Mulch
 - Bark chips, straw, white landscape fabric, hand-weeded
- Cover crop treatments
 - Annual crimson clover, perennial alsike clover, cereal

What will we measure?

- Ericoid mycorrhizae
- Beneficial microbes
 - *Bacillus*, *Streptomyces*, *Trichoderma* spp., fluorescent *Pseudomonads*, total bacteria and fungi
- Soil biological and chemical properties
 - Macro- and micronutrients, light fraction O.M., potential N mineralization, microbial biomass, enzyme activity
- Plant health
 - Tissue analysis, growth, yield, disease and insect pressure



Pest management strategies

- Almost 200 OMRI-listed weed, insect and disease control products



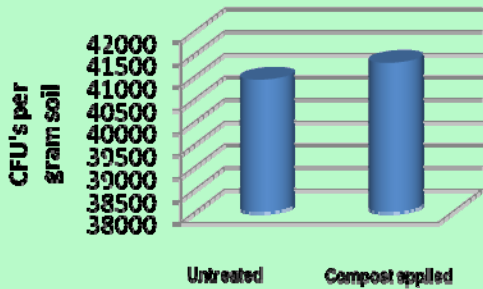
- Which are most effective?

- Spinosad (Entrust™) baits for blueberry maggot
- *Bacillus subtilis* (Serenade™) for fungal diseases
- Acetic acid (AllDown™) and fatty acid (Scythe™)-based herbicides
- Copper and sulfur products
- Compost tea and other foliar spray
- Cultural methods

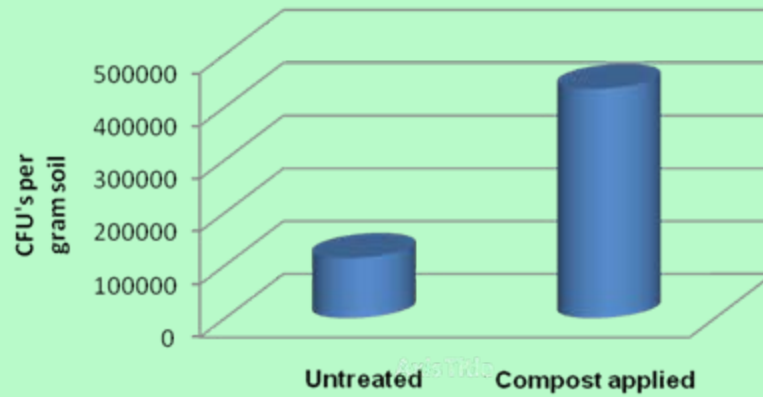


Research Progress

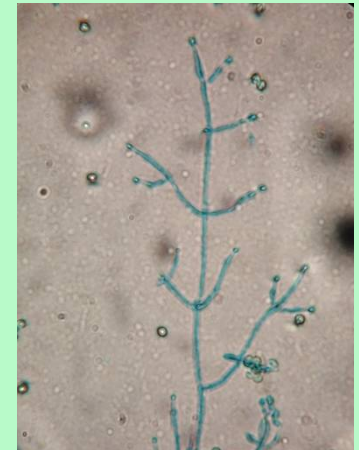
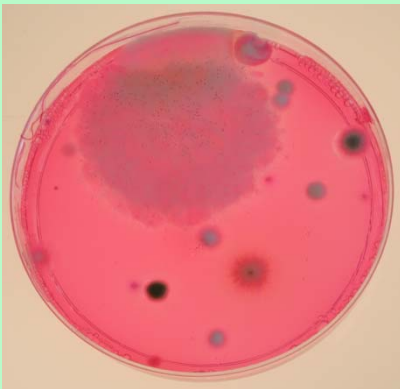
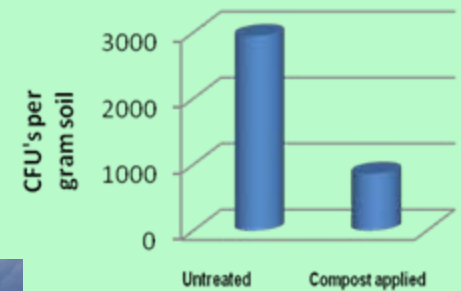
Total Fungi



Fluorescent Pseudomonads



Trichoderma spp.



Conclusion

- Establishment of research sites in 2008
- First year of longer-term project
- Continue to work with growers and consultants to identify priorities
- Questions / Discussion

