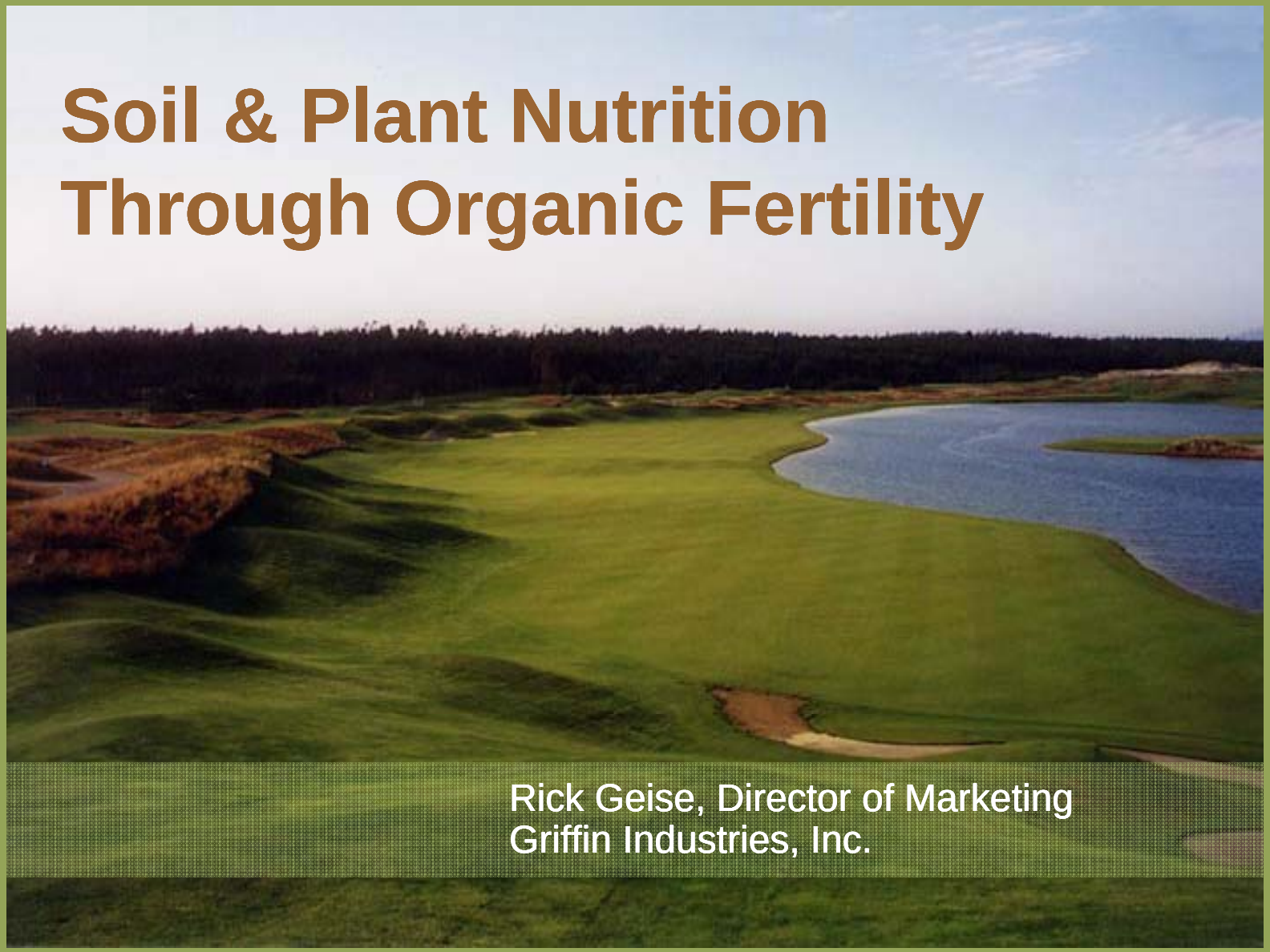
Soil & Plant Nutrition Through Organic Fertility



Rick Geise, Director of Marketing
Griffin Industries, Inc.

Outline

- Introduction – brief company background
- Types of organic fertility
- Specific benefits of organic fertility
- Wrap-up

Griffin Industries, Inc.
Brief Background

- What is rendering?
- GI began in 1943 as Falmouth Fertilizer
- Primary business is animal nutrition
- Developed Nature Safe brand 20 years ago
- Also make products like biodiesel

U.S. Renderers' Impact on Making Animal Proteins Used for Animal Feed and Fertilizer

- Meat and Bone Meal: 2.57 million tons
- Poultry Byproduct Meal: 1.29 million tons
- Feather Meal: 664,000 tons
  - Feed Markets:
    - Poultry
    - Dairy/Beef
    - Swine
    - Aquaculture

Source: Render Magazine, April 2009

Feed to Fertilizer Correlation

- Applied expertise in animal nutrition to soil and plant nutrition
- Principles of how to feed a chicken and how to feed a soil microbe, basically the same

Organic vs. Conventional Fertility Disconnect

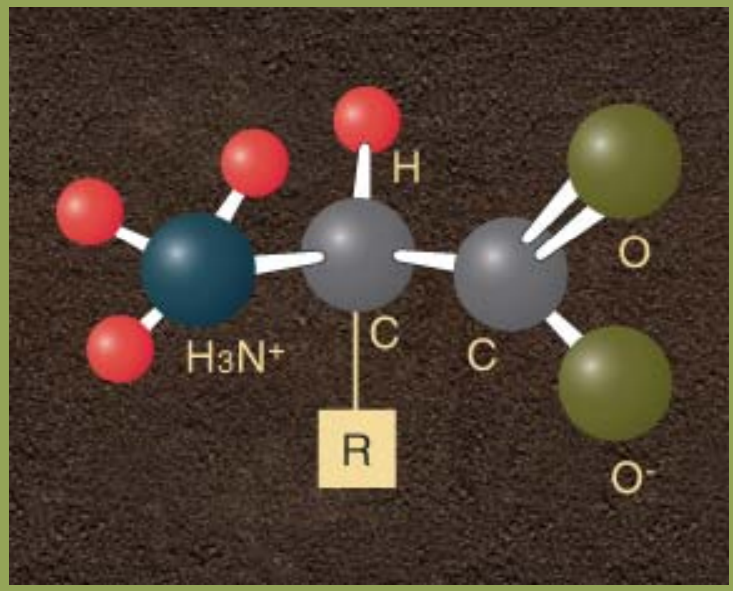
- Many “organic” folks will imply that synthetic fertility is wrong…not ME!
  - Your efforts feed the world
  - Impact on quality of life
  - Organic fertility can also play a vital role by focusing on a healthy soil

Why Focus on Soil Health?

Healthy soil leads to a healthier turf and/or improved crop quality and yields!

Feeding the Soil

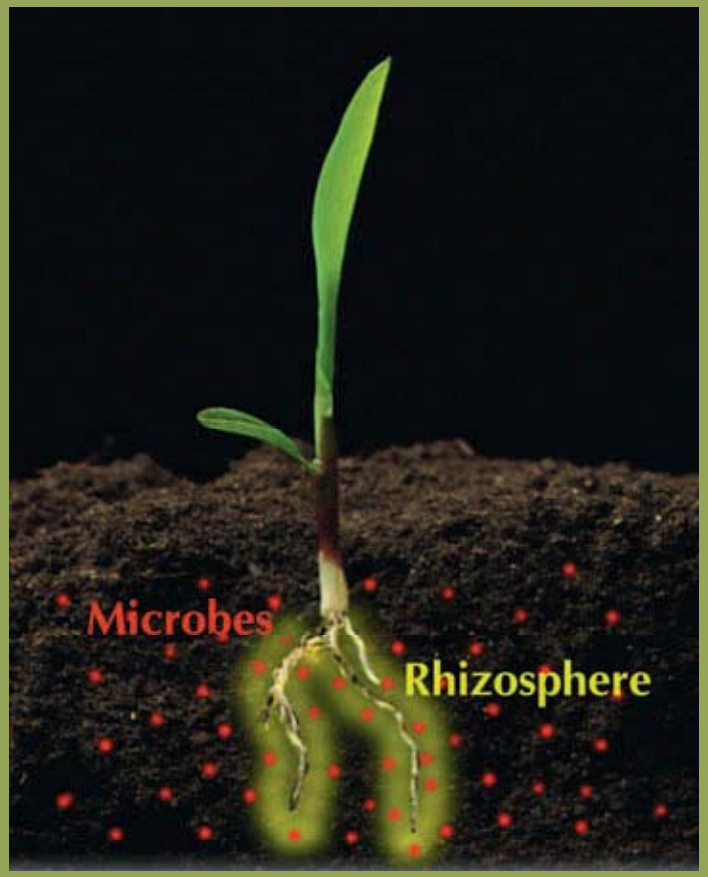
- Discussion will focus on feeding soil microbes to grow their populations
- What's the difference between feeding existing soil microbes vs. adding soil microbes to an ecosystem?



For the Plant, the Value of Microbes is in Their Decomposition

Microbes are short-lived with an average life span of 20 minutes.

Why Use An Organic Fertilizer?



Amino Acid Carbon

- It's the food source for microbes
- Microbes are 50% carbon
- As they die, microbes release 20 - 40 % of their carbon (and chelated minerals) into the soil
- The rest of their carbon is released as CO_2 for plant use

Where Does Carbon Come From?

- Decaying plants and animals
- Decaying microorganisms
- Organic matter

Types of Organics

- Compare the following:
  - How much organic nutrition in the Bag?
  - How available coming out of the Bag?

Types of Organics
Sewage Sludges

- Microbial carcasses
- 3 - 6% N
- 20 - 30% amino acids
- Subject to high heat process for sanitation
- May be challenged with heavy metal content
- Milorganite created the model 80 years ago
- Estimate supply at over 300,000 tons annually
- Not allowable for certified organic crop production

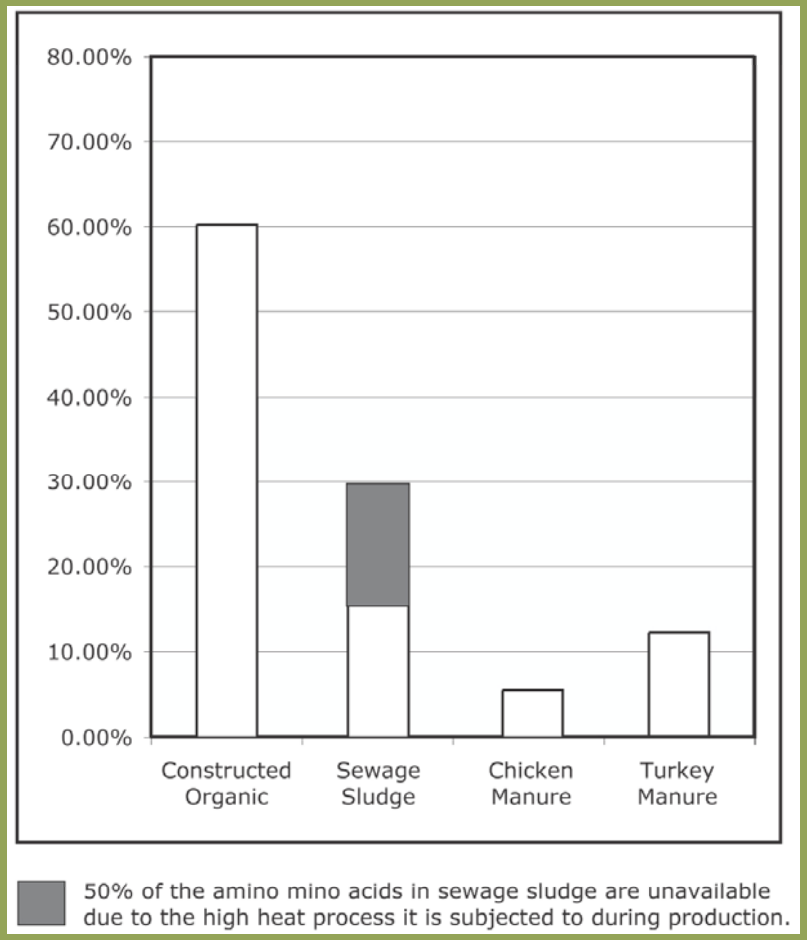
Types of Organics
Manures

- Low N content 1 - 4%
- 6 - 12% amino acids
- May have variable nutrient content
- Composting is not an exact science
- 335 million tons of animal manures produced annually in U.S.

Types of Organics
Constructed Meal-based Fertilizers

- 5 - 13% N
- 30 - 75% amino acids
- Plant and/or animal meals
- Proteins provide slow release N
- Differences in protein qualities
- Improved consistency

Amino Acid Comparisons

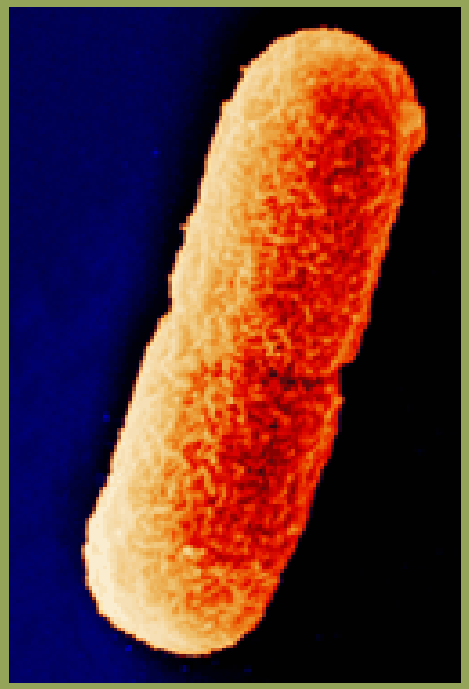


Agronomic Benefits of Organic Fertilizers

- Ultimately, organic fertilizers feed and stimulate soil microbes
- Feed the soil - soil feeds the plant!
- Results in a host of related benefits

Increased Microbial Populations

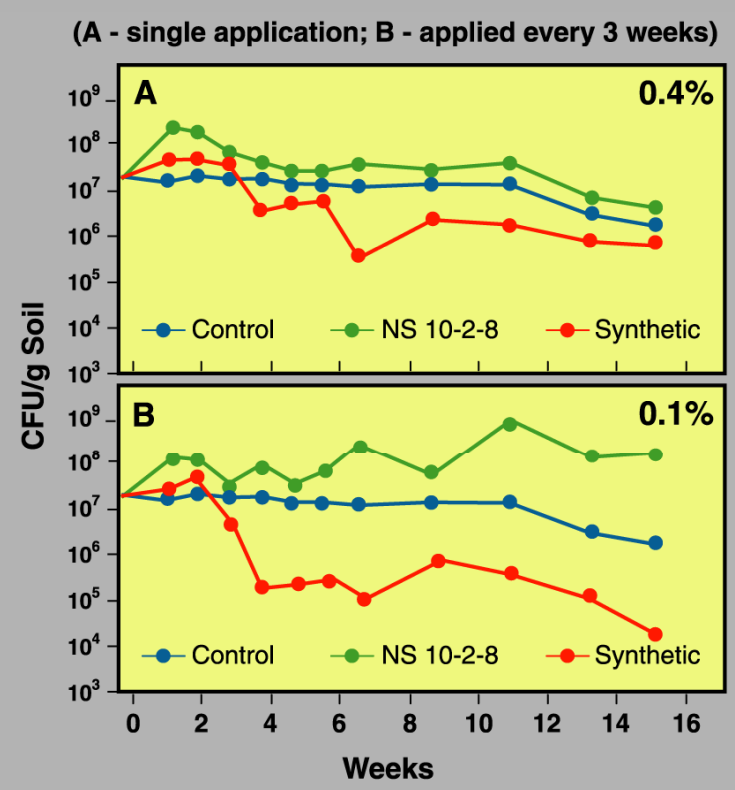
- CO_2 for photosynthesis
- Thatch reduction
- Disease management
- Quicker turf recovery
- Denser rooting/more root hairs
- Improved soil structure and porosity



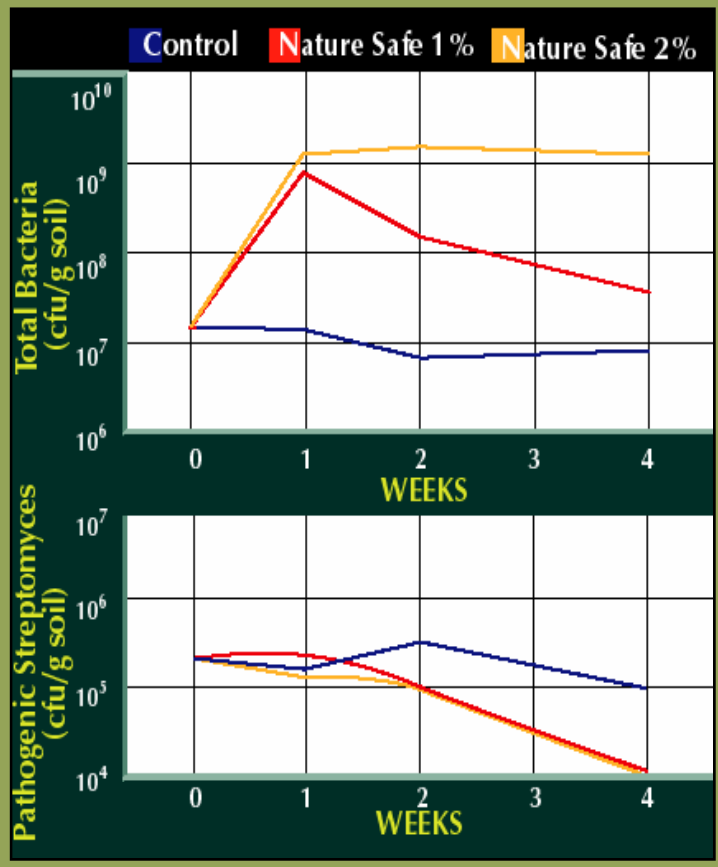
Research shows constructed organic fertilizer improved bacterial pop-ulations while use of a synthetic actually decreased populations.

Dr. George Lazarovits, Agri-Food Agriculture Canada

Effect of constructed organic and synthetic fertilizer on total bacteria populations



Research shows constructed organic fertilizer increased the total bacterial populations in the soil while de-creasing populations of two pathogens.



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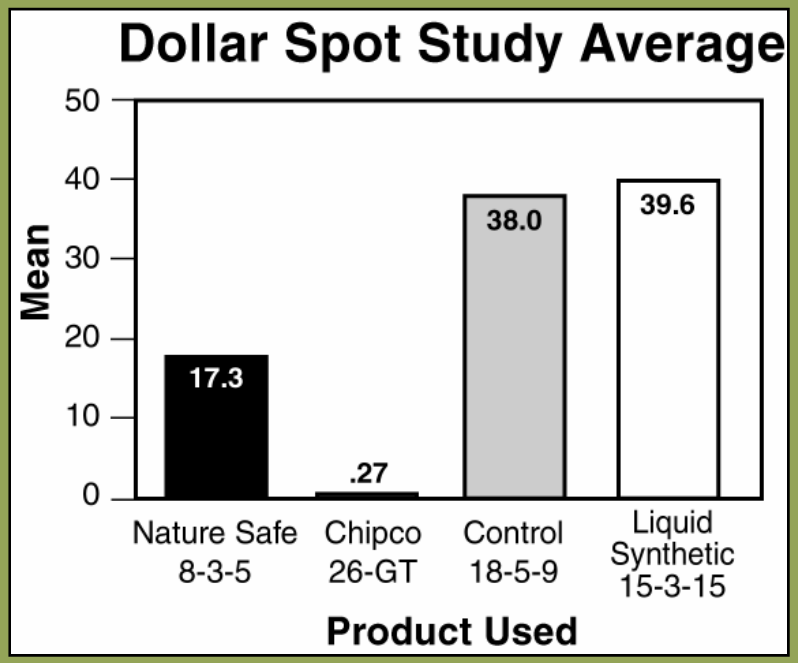
Example: Impact on Dollar Spot

- Research shows constructed organic fertilizer decreased dollar spot versus other fertilizers.



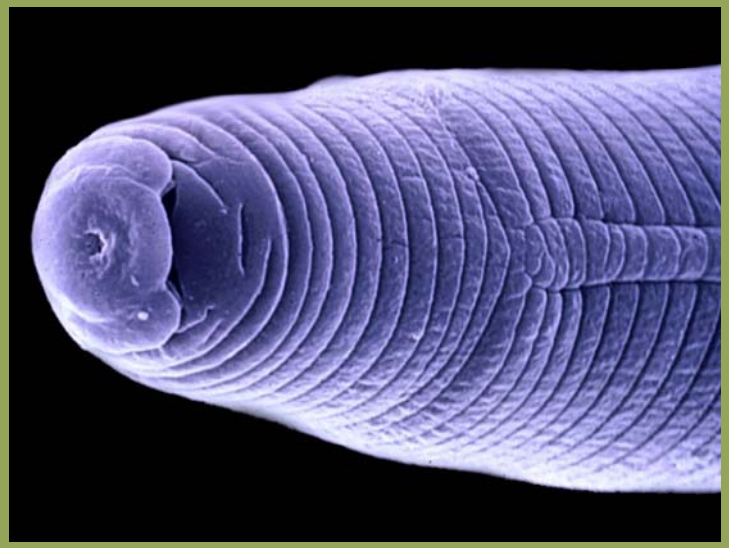
MSU Research, Dr. Joe Vargas, 2000

Used Regularly, Organics Provide Cumulative Benefits

- Increase photosynthesis – higher CO_2
- No flush-starve cycles-reduces thatch
- Soil microbes will also consume thatch
- Improved soil structure
- Enhanced disease management

Enhanced Disease Management

- Pathogens arise during stress periods. A stronger turf and soil = less disease.
- Increased thatch decomposition.
- Efficient fertility improves disease mgt.



(Photo Credit: Rothamsted Research)

Pathogens Are Opportunistic
The Theory of Competitive Exclusion

- Beneficial microbes vs. Pathogens
  - Good guys eat and thrive
  - Their success controls pathogens
  - Pathogens – good survivors; poor competitors

Organic Expectations

- Not a quick fix.
- Cumulative effect of benefits.
- Preventative rather than curative.
- Not cheapest bag of fertility, but, it may offer the lowest total IPM cost.

Organic Fertility Programs

- Promote IPM programs
- Pure organic programs will not control weeds
- There are key niche application opportunities:
  - Aeration (spring/fall)
  - Dormant Feed
  - Grow In Situations
  - Shaded Turf
  - Combat disease or weak turf challenges
  - Environmentally sensitive areas
  - Organic certified crop production

Wrap-Up

- Organics can result in efficient fertility
- Healthier soil
- Improved IPM program effectiveness
- Increased organic crop yields

Thank You!

- Questions?
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