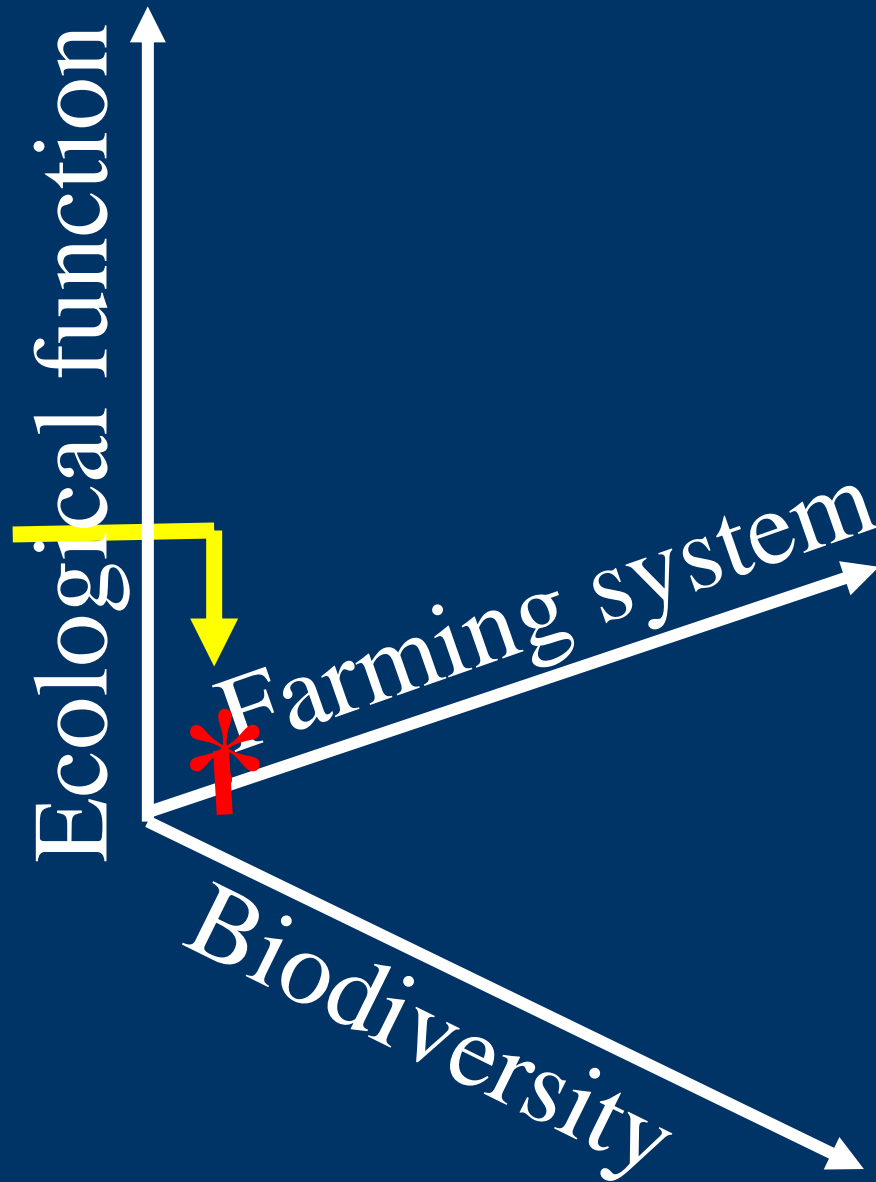


Single tactic  
control of a  
single  
pathogen in a  
mono-cultured  
crop



Multiple  
crops over  
time and  
space to  
foster high  
biodiversity,  
multi-pest  
suppression,  
and  
vigorous  
plant health

# Can we implement a compost-based production system as an alternative to methyl bromide fumigation?



**John Vollmer**

- on farm research
- organic transition

**Michelle Grabowski**  
MS student



# Treatments

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Compost

Methyl Bromide

Telone C35

Unfumigated Control



- Plots (4 beds 40 ft long)
- Data collection inner 20 ft of inner 2 beds
- Latin Sq. design
- Same location for 3 consecutive years (i.e. no crop rotation)
- Fall plant. Harvest=April - June



# Controlled Microbial Compost

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- **Management intensive system**
- **Compost pile monitored and adjusted daily for temperature, moisture and CO<sub>2</sub> content**



**Recipe:** 30 % Dairy manure  
30% Waste Hay  
30% Waste Silage  
5% Finished compost  
5% Clay soil





**Legume-Grass Cover Crop**



**Year 1: 30 yd<sup>3</sup>/acre**

**Year 2: 20 yd<sup>3</sup>/acre**

**Year 3+: 15-20 yd<sup>3</sup>/acre**





**Rotary Spader**

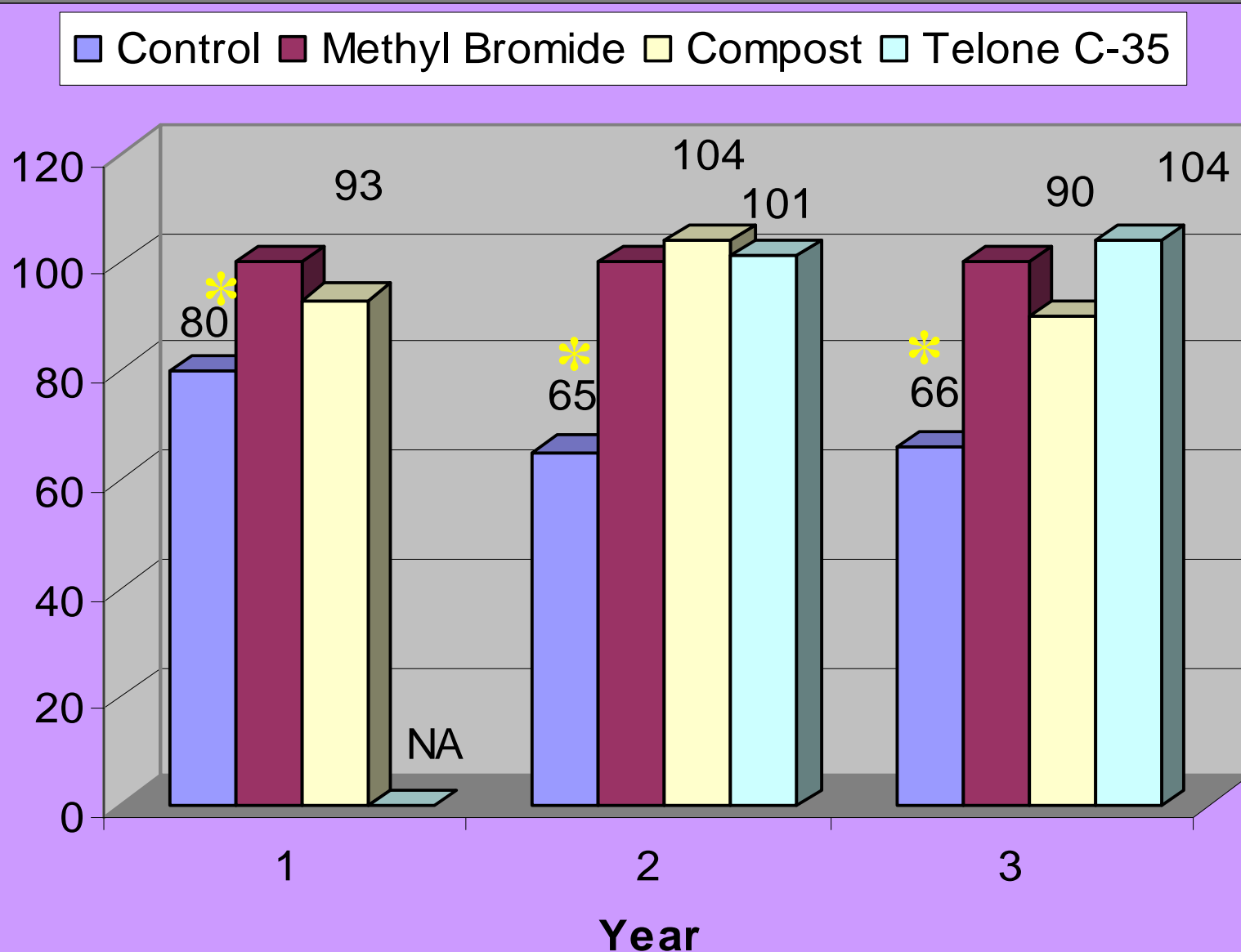


**Raising of the Beds**

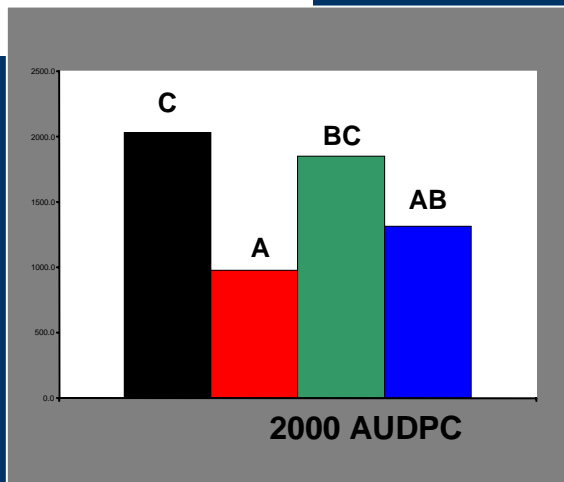
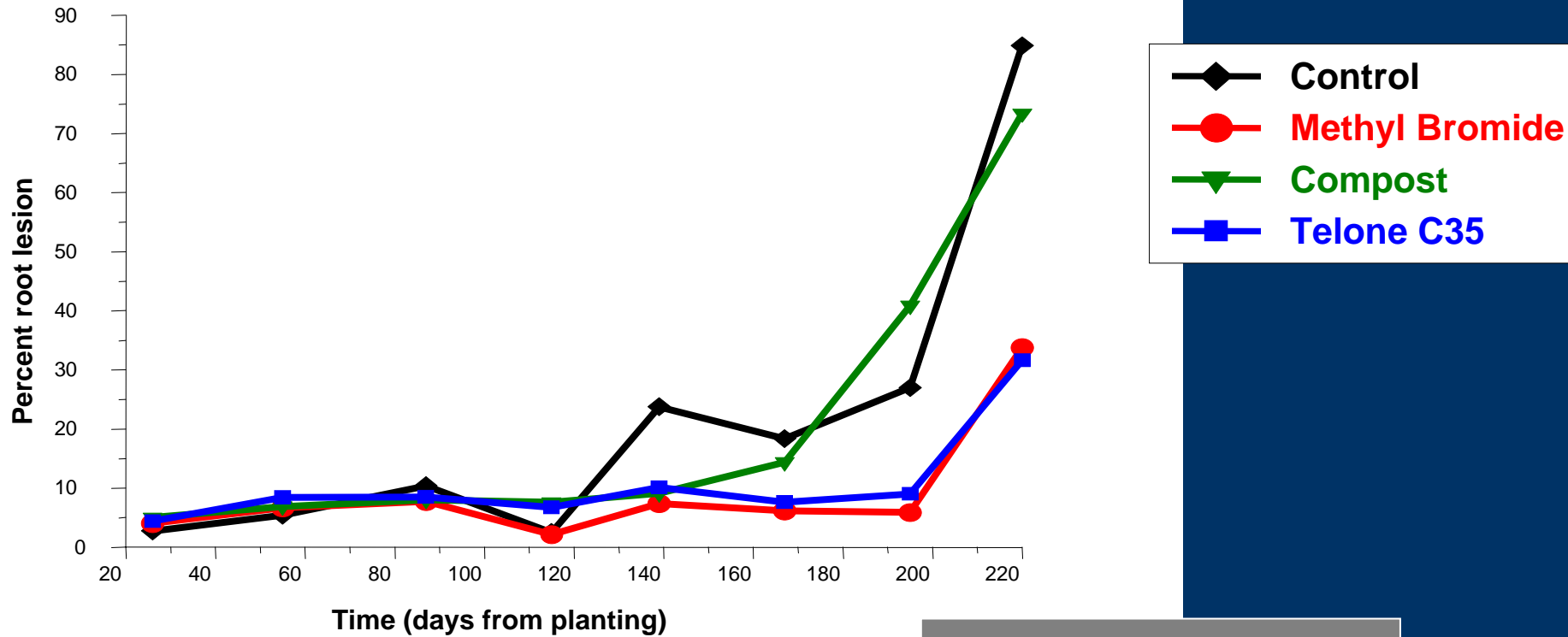


**Crop Establishment**

# Marketable Yield



### Year 3





# Microbial ecology

## Objective:

- To characterize the population dynamics of pathogens and biocontrol agents in roots and soil from both the transplant and field production systems.
- To research biological methods and processes to enhance disease management.

# Pathogens to Control

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- *Isolated and characterized over 1200 fungi*

(G. Abad; F. Louws; L. Ferguson; G. Fernandez)

- *Fungal complex varies with crop production site*
- *Clean plants are difficult to obtain*
- *Rhizoctonia fragariae : AG-G, AG-A, AG-I*
- *Pythium irregulare, Pythium spinosum, Pythium artotrogus, Pythium HS*
- *Fusarium solani and Fusarium oxysporum*
- *Described new Phytophthora species*

# Why do growers fumigate?



**Healthy**



**Black Root Rot Complex**





**Leonor Leandro et al. POSTER 331B**

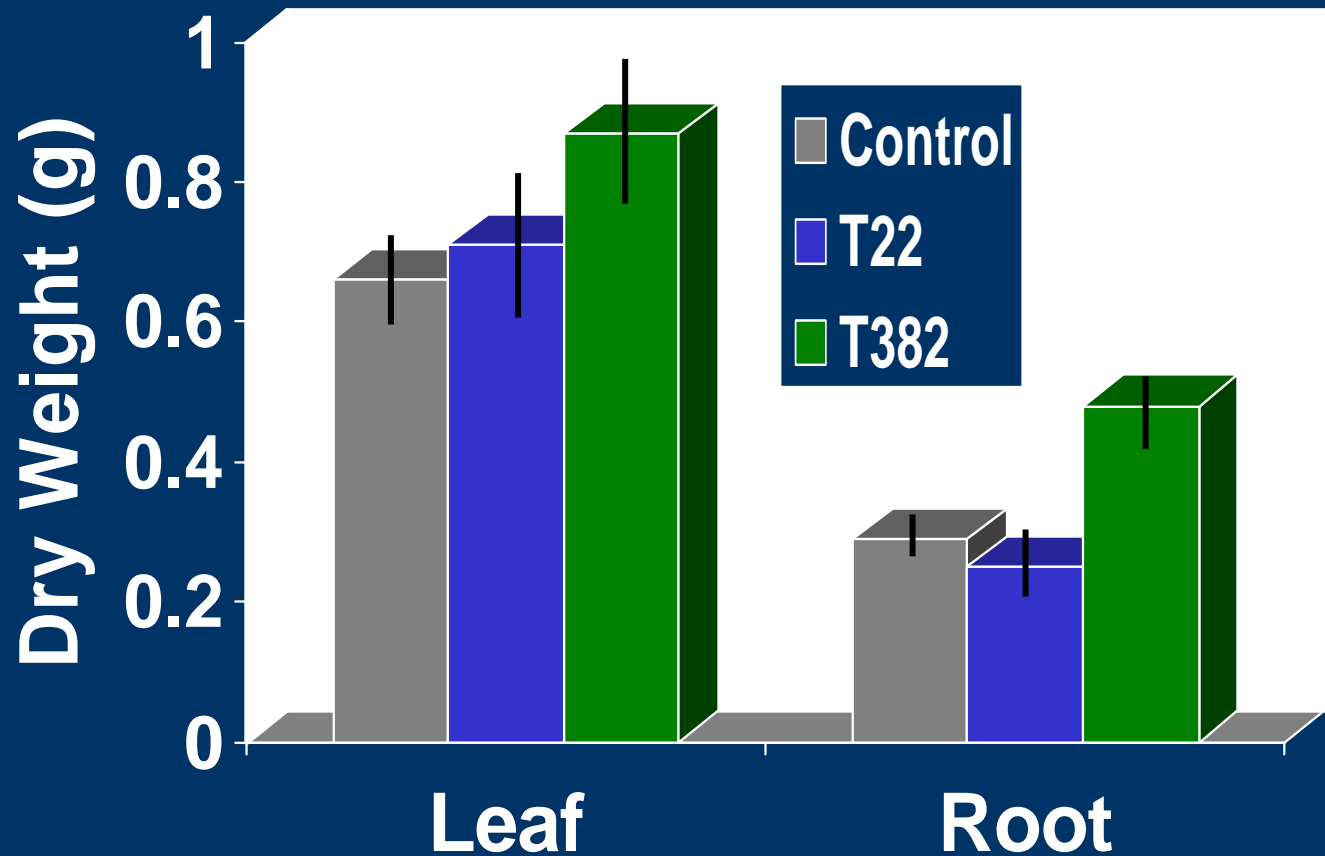
# Can we get specific suppression

Fungal isolation frequency (%) from roots of 4-week-old plug transplants for each treatment.

Fungal genus/ species	Diseased Roots			Healthy Roots		
	Control (n=19)	T22 (n=10)	T382 (n=18)	Control (n=46)	T22 (n=22)	T382 (n=22)
<i>Trichoderma</i>	36.8	70.0	27.8	41.3	81.8	59.1
<i>P. irregulare</i>	21.6	0.0	11.1	15.2	0.0	4.5
<i>Phytoph. cactorum</i>	36.8	30.0	0.0	13.0	4.5	0.0

T22 = *Trichoderma harzianum* ; T382= *T. hamatum*

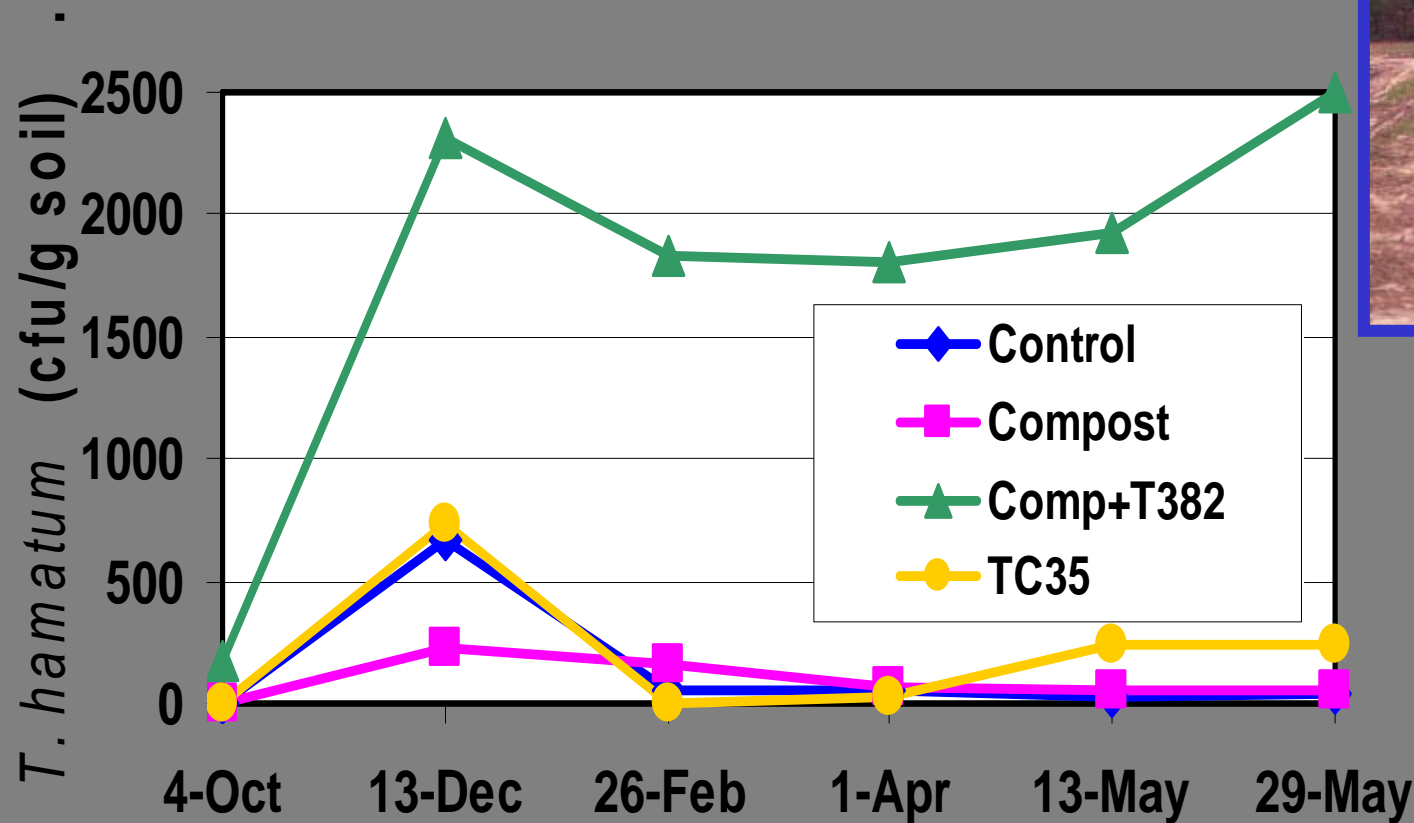
Effects of *Trichoderma* biocontrols on root health and growth of 4-week-old plug transplants.



Preliminary Data



# Can we bias the soil community to favor T382 populations?

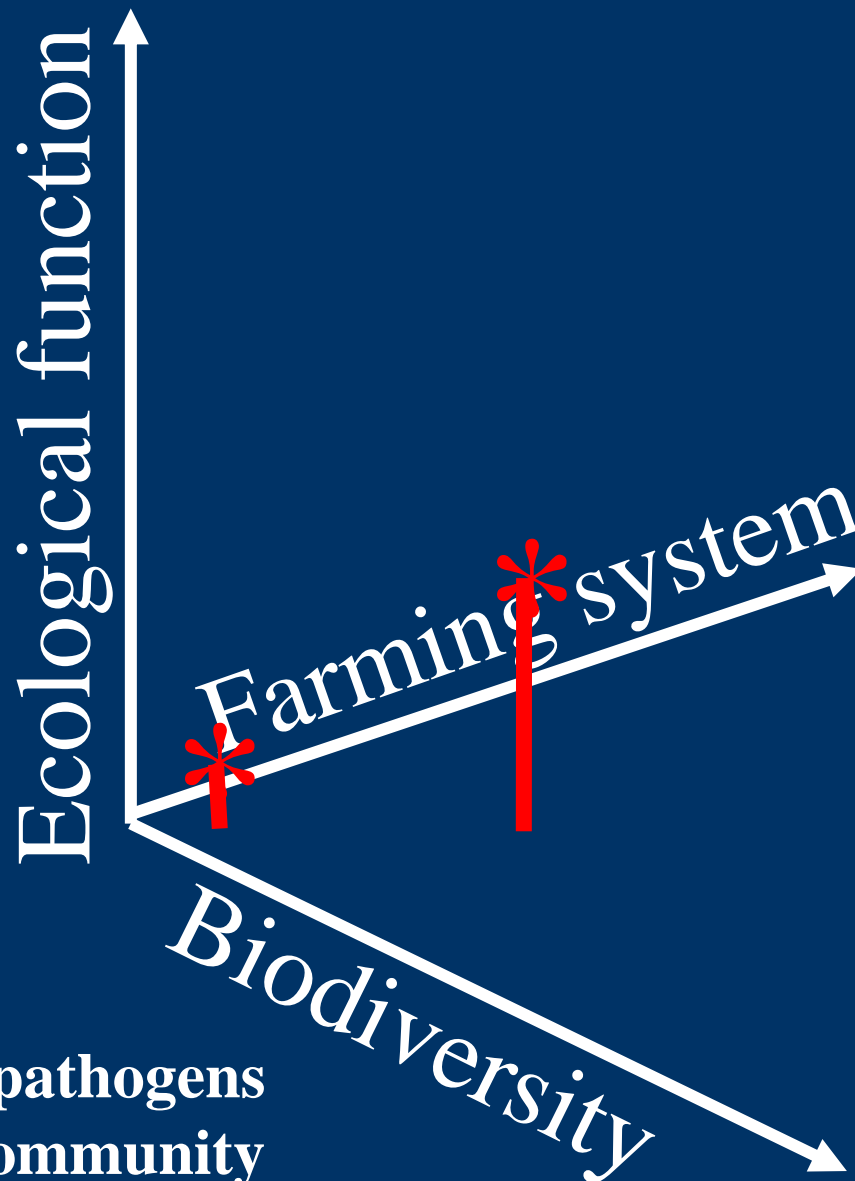


Population of *T. hamatum* in field soil.  
Compost was inoculated with T382 and  
incorporated into field soil after two weeks.

# RESEARCH COMPONENTS

- Disease suppression
- Plant growth promotion
- Good Yields

- Cover crops
- Compost

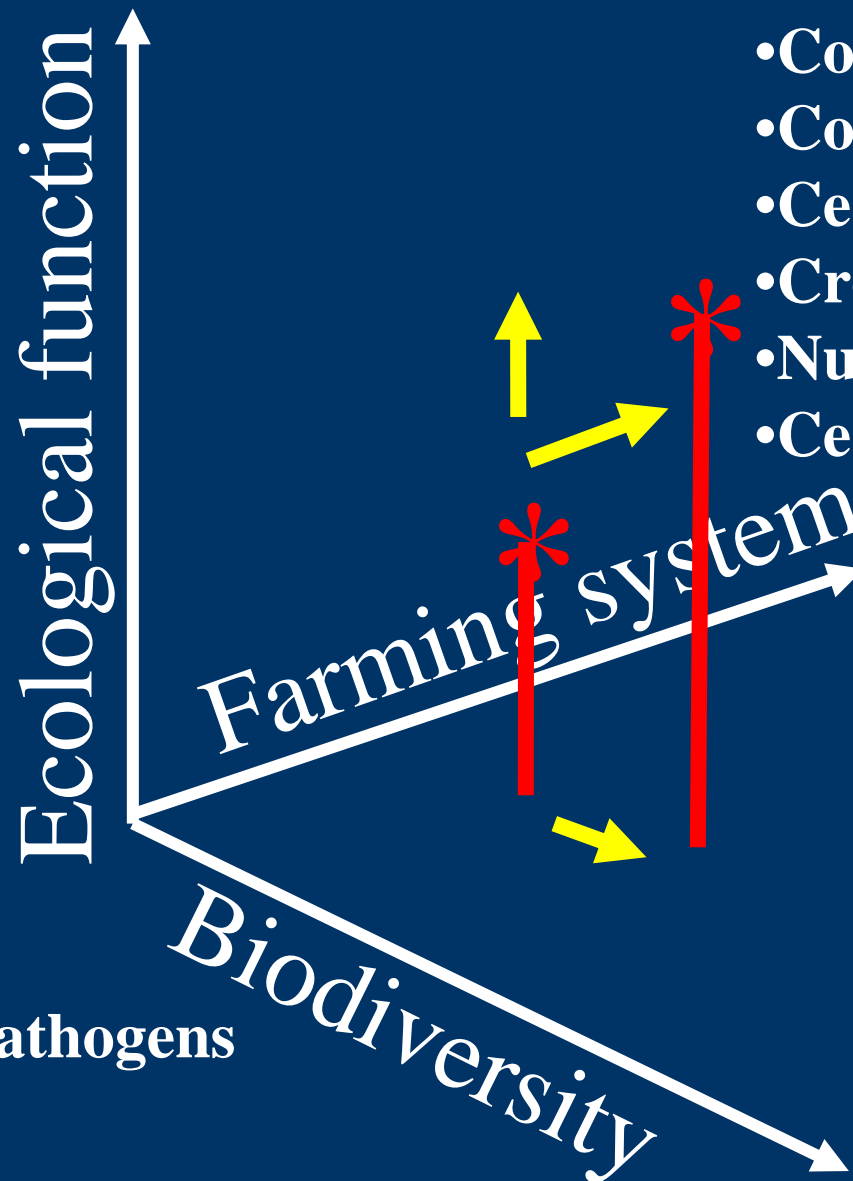


- Biologicals
- Knowledge of pathogens
- (Biased) Soil community

# EXTENSION & IMPLEMENTATION COMPONENTS

- Disease suppression
- Plant growth promotion
- Good Yields
- Weed suppression
- Nutrient cycling/CEC

- Biologicals
- Knowledge of pathogens
- Soil community
- Crop diversity



- Cover crops
- Compost
- Certified plants
- Crop rotation
- Nutrient mgmt
- Certified organic