



# BRIDGING THE GAP TO GAIN EFFICIENCIES

Tim Eyrich  
Brock Waggoner

# AGENDA

The logo for HELM, consisting of the word "HELM" in a bold, red, sans-serif font, enclosed within a white oval with a red border.

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Introductions

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Shaping the Soil

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Full Season Weed Control

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Conclusion

# INTRODUCTION

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## Tim Eyrich

### Product Development Leader, Plant Advantage

37 years of agricultural experience – focused on:

- Crop Nutrition
- PGR and biostimulants
- Education and training
- Research
- Product development
- Regulatory projects
- Commercialization

# INTRODUCTION

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**Brock Waggoner**

**Northern Sales Agronomist**

Focuses on technical training, education and field trials that support product development

Previous experience with UPL, NewLeaf Symbiotics and Monsanto

# WHO IS HELM? LEGACY OF FAMILY LEADERSHIP



Founded in 1900

Headquarters in Hamburg

1,600 employees

100 global subsidiaries

Operations in 30 countries

Family-owned company



**Third generation** family leadership.

**Strong commitment** to US and global agriculture.

**Corporate equity re-investment** into agriculture business units.

**\$8B** in global sales

## CROP SOLUTIONS

## INDUSTRIAL CHEMICALS

## PHARMA

Provides growers with forward-thinking solutions with over \$2B in sales across our Crop Protection and Crop Nutrition product lines.

Supplies the manufacturing industry with quality feedstocks and products.

Develops generic prescription drugs for distribution through retail pharmacies and hospitals.

**1950**  
Hermann Schnabel

**1984**  
Dieter Schnabel

**2020**  
Stephan Schnabel

# CONTROLLING THE CONTROLLABLES

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Focusing thought on factors outside of your control will not serve your operation.

**Rigorously addressing and researching** those management factors you are able to address will help you in the long term.



# AGGREGATION OF MARGINAL GAINS

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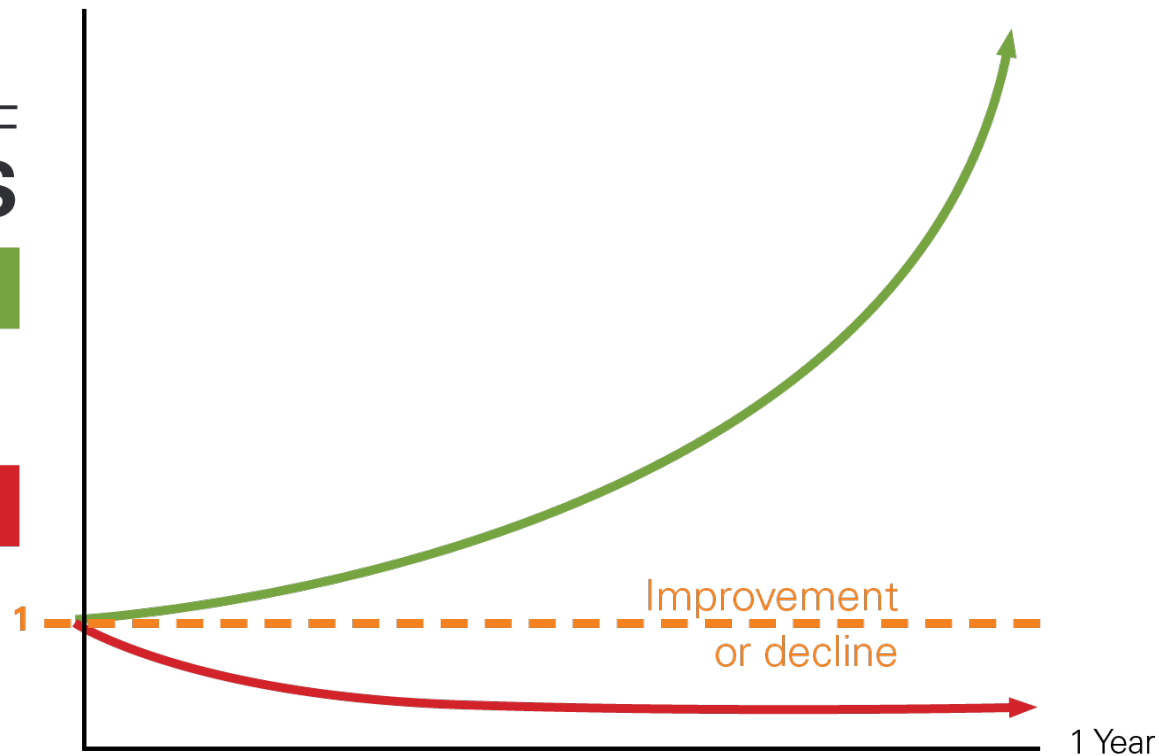
## THE POWER OF TINY GAINS

1% Better Every Day:

$$1.01^{365} = 37.78$$

1% Worse Every Day:

$$0.99^{365} = 0.03$$



- It is easy to overestimate the importance of one defining moment and underestimate the value of making small improvements on a daily basis.
- How can we use these concepts of controlling the controllables and marginal gains to set ourselves up for success this spring?
- In the US, the majority of growers are getting the big things right. We are now operating in the details, in the incremental gains.

# BRIDGING THE GAP



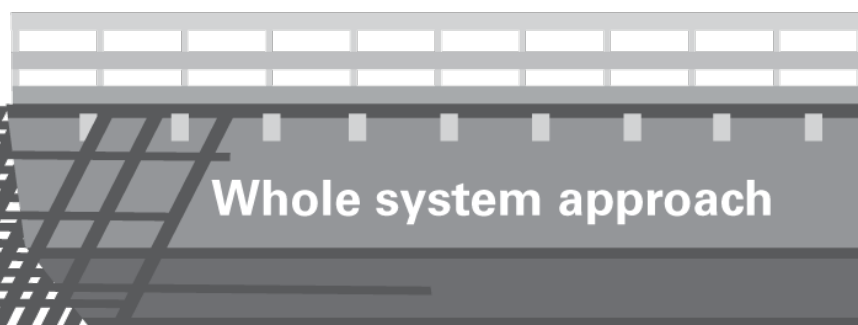
## SYNTHETIC SOLUTIONS



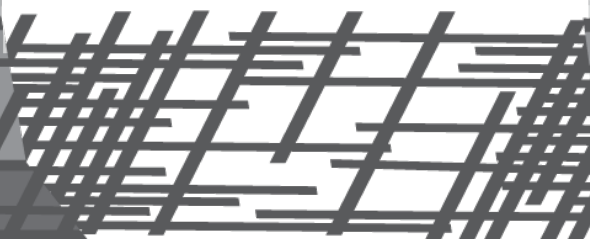
Specific targets



## BIOLOGICAL SOLUTIONS



Whole system approach







# SHAPING THE SOIL

SETTING A FOUNDATION FOR A SUCCESSFUL SEASON

# IMPORTANCE OF SOIL HEALTH

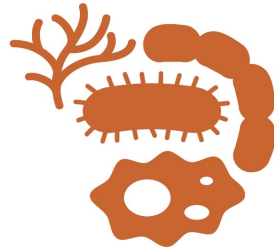
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**High organic matter content**



**Good water holding capacity**



**Plentiful biodiversity**  
including earthworms,  
insects, fungi,  
microorganisms and  
more



**Healthy, high-yielding crop**

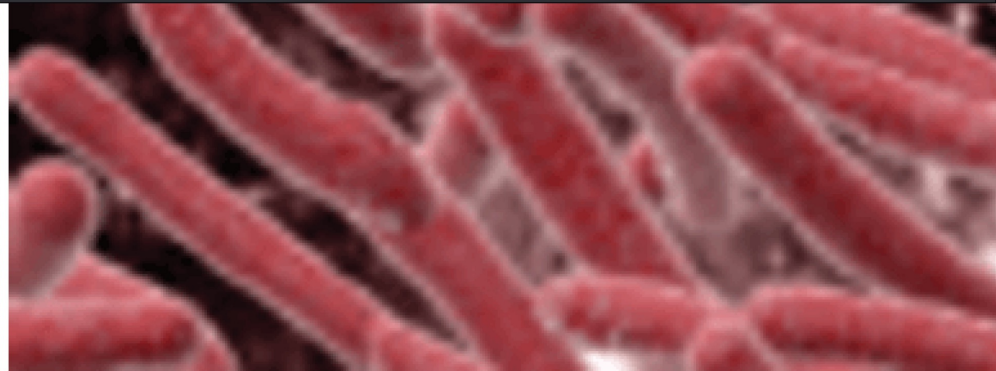


**Reduced runoff and soil erosion**

# BIOLOGICAL COMPONENTS OF THE SOIL



Soil is composed of macro and microorganisms, which spur all biological interactions.



## Macroorganisms

Earthworms

Spiders

Centipedes, millipedes

Beetles, ants, larva

## Microorganisms

Bacteria

Fungi

Algae

Nematodes

Viruses

# SHAPING THE SOIL | MICROBES

The logo for HELM, consisting of the word "HELM" in a bold, red, sans-serif font inside a white oval with a red border.

- **Some microbes are more beneficial than others.**
- **Pathogens** are microbes and other parasites associated with crop stressors, especially disease.
- **Beneficial microbes** are essential to plant health and productivity. They:
  - Speed up nutrient release to the crop
  - Help soil particles stick together for a stronger structure
  - Improve water holding capacity of the soil
  - Provide greater breakdown of residues
  - Promote plant growth

Beneficial microbes can **suppress pathogens through competition** - The beneficial microbe population out-competes the pathogen population, starving it of resources.

# SHAPING THE SOIL

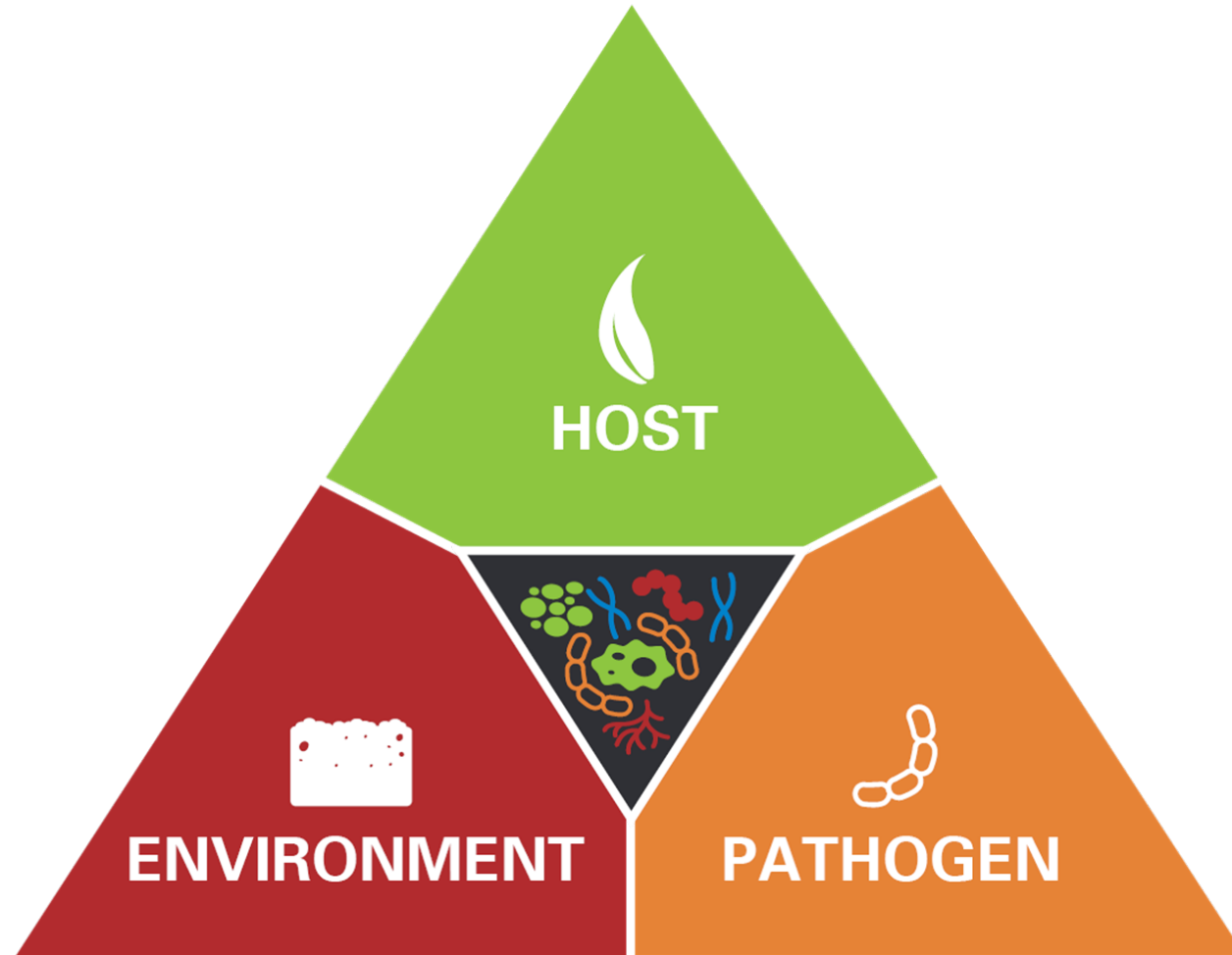
The logo for HELM, featuring the word "HELM" in red capital letters inside a white oval with a red border.

What does **“Shaping the Soil”** mean?

- Preparing the soil to make it an environment for vigorous and healthy root and plant growth
- What does it take to make a healthy microbiome?

# DISEASE TRIANGLE

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# SHAPING THE SOIL



**HEALTHY  
SOIL**



**HEALTHY  
MICROBIOME**



**HEALTHY  
PLANT**



# CREATING A HEALTHY PLANT

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## **Crying out for help with root exudates:**

adaptive mechanisms by  
which stressed plants  
assemble health-promoting  
soil microbiomes

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**Stephen A Rolfe  
Joseph Griffiths  
Jurriaan Ton**

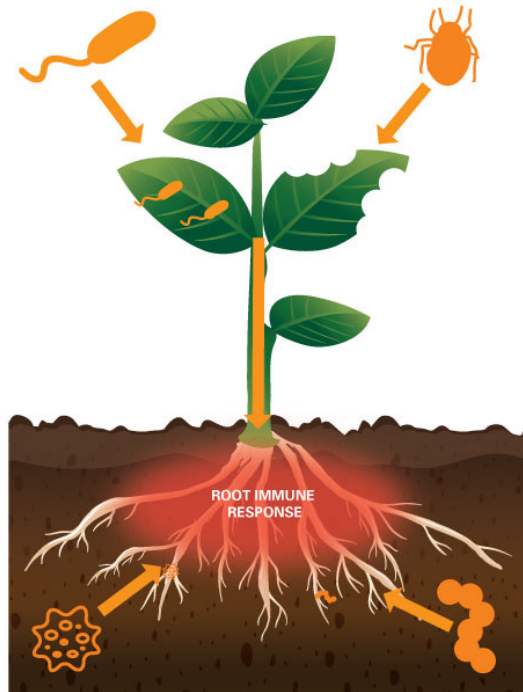
## **Findings**

- Root exudation changed in response to attack
- This change increased beneficial microbes that have activity on soil pathogens.



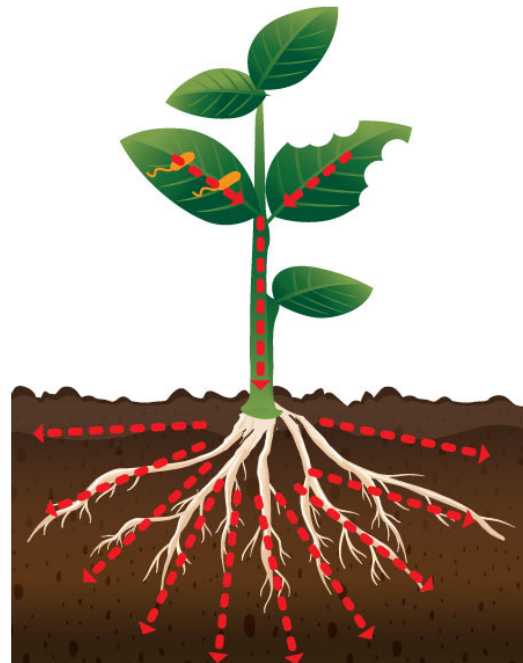
# CRY FOR HELP

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STAGE I

Attack by pathogens (left) or herbivores (right) trigger local and systemic signals that activate root immunity.



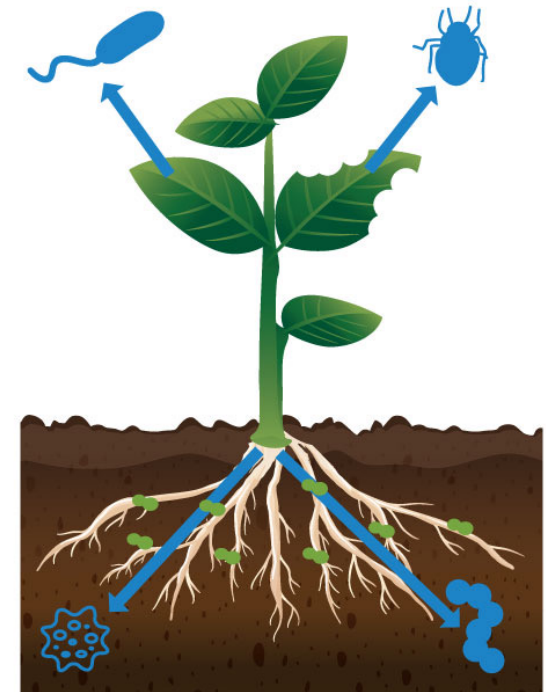
STAGE II

Changes in root exudation profiles of primary and secondary metabolites.



STAGE III

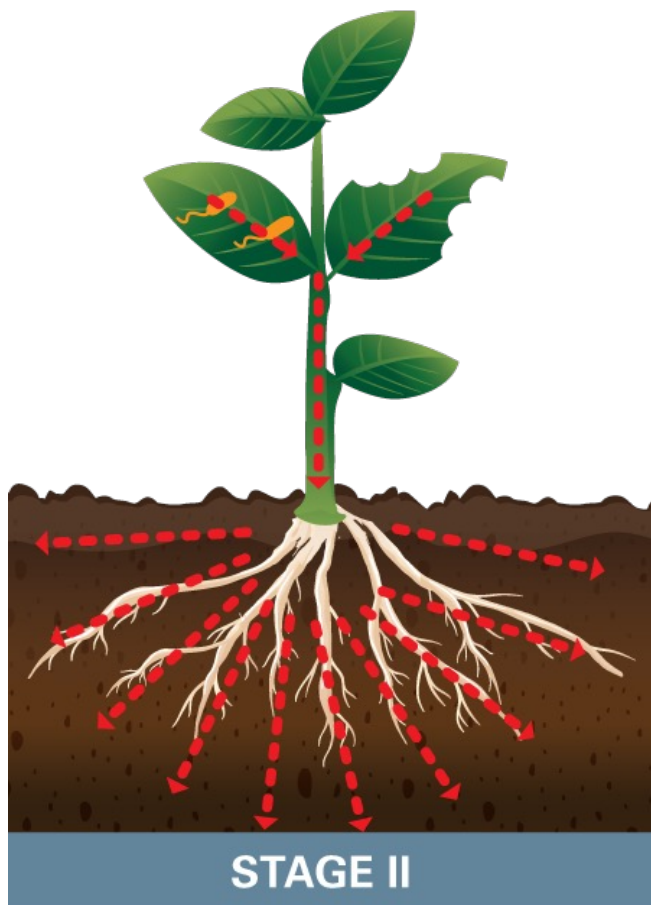
Selection and/or recruitment of beneficial root microbes, resulting in altered root microbiome activities.



STAGE IV

Altered microbiome antagonizes pathogens and herbivores via ISR, direct antagonism, parasitism, or nutrient competition.

# THE IMPORTANCE OF A HEALTHY PLANT



## Root exudates:

- Polypeptides
- Organic acids
- Amino acids
- Simple and complex sugars
- **Phenolics**
- Proteins
- Sterols

## What do they provide:

- Food
- Signaling
- Activity against pathogens

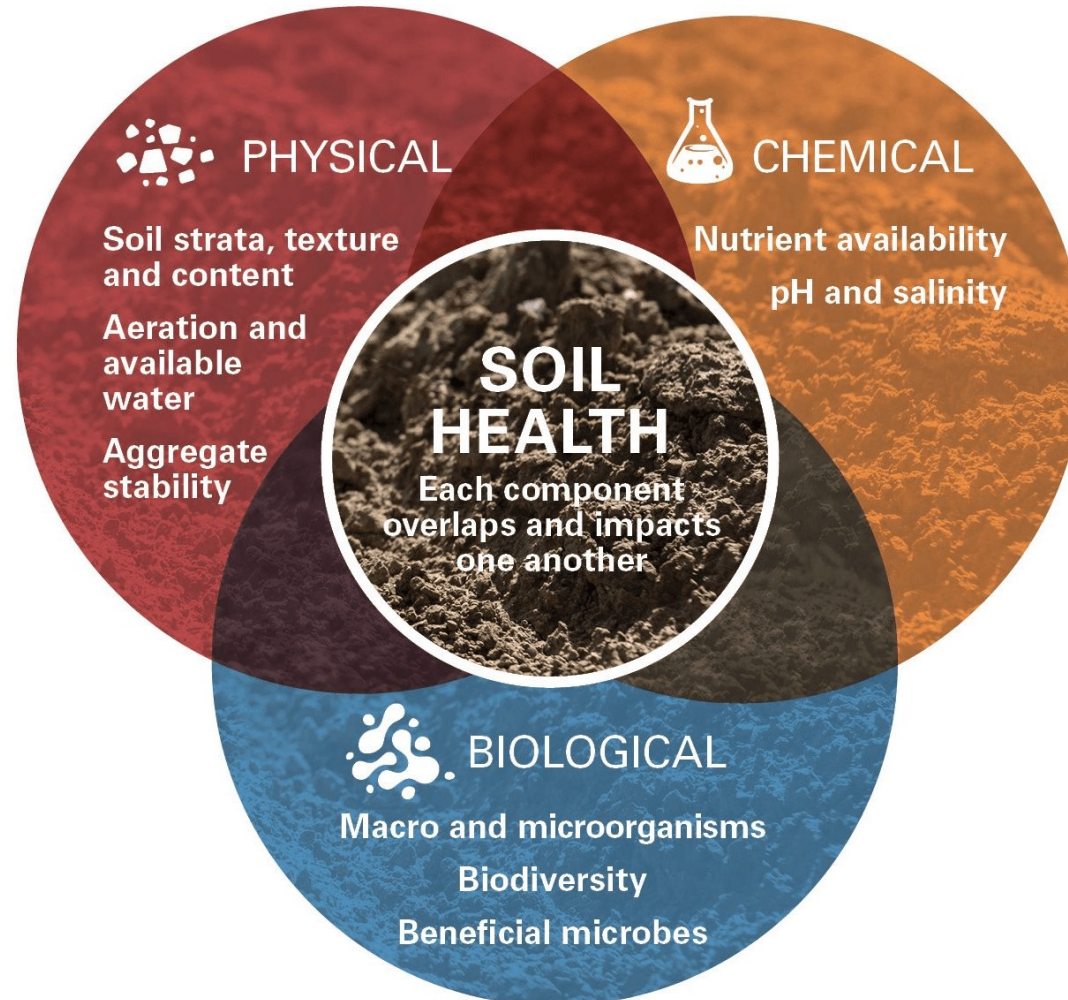
## How do you optimize:

- Balanced and complete nutrition
- Micronutrients
- Biostimulants

Changes in root exudation profiles of primary and secondary metabolites.

# SHAPING THE SOIL

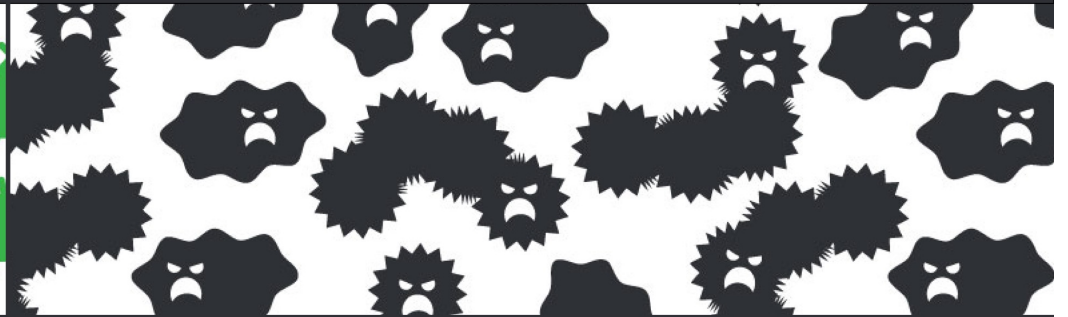
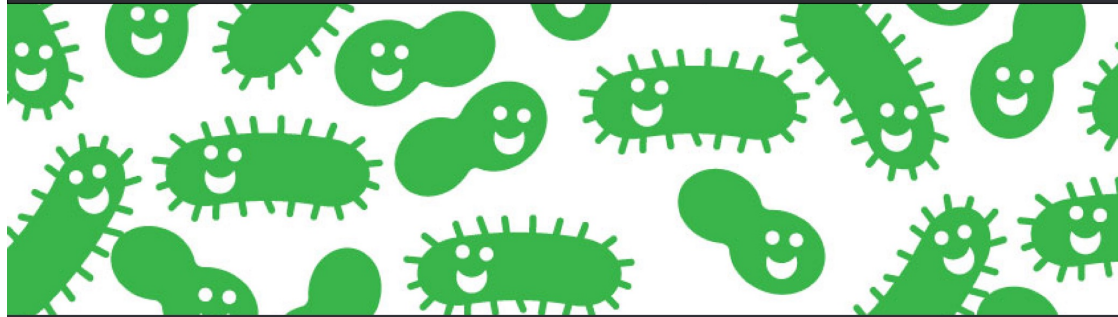
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# BIOLOGICAL COMPONENTS OF THE SOIL

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Soil is composed of macro and microorganisms, which spur all biological interactions.



## Beneficial Microbes

Bacillus species

Mycorrhizae

Azotobacter species

Rhizobia

Pseudomonas

Many others

## Pathogenic Microbes

Rhizoctonia

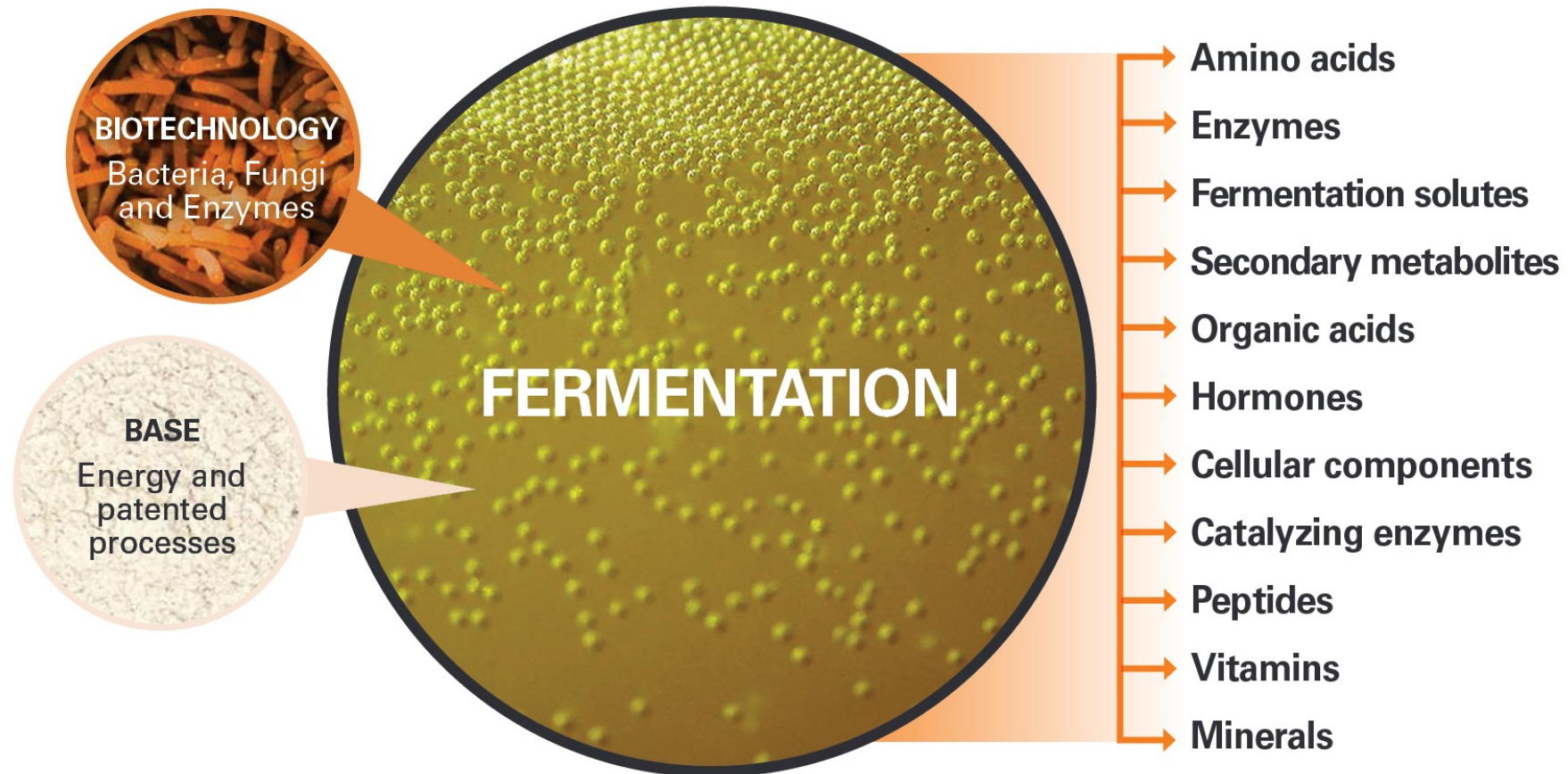
Pythium

Scleractinia

Many more

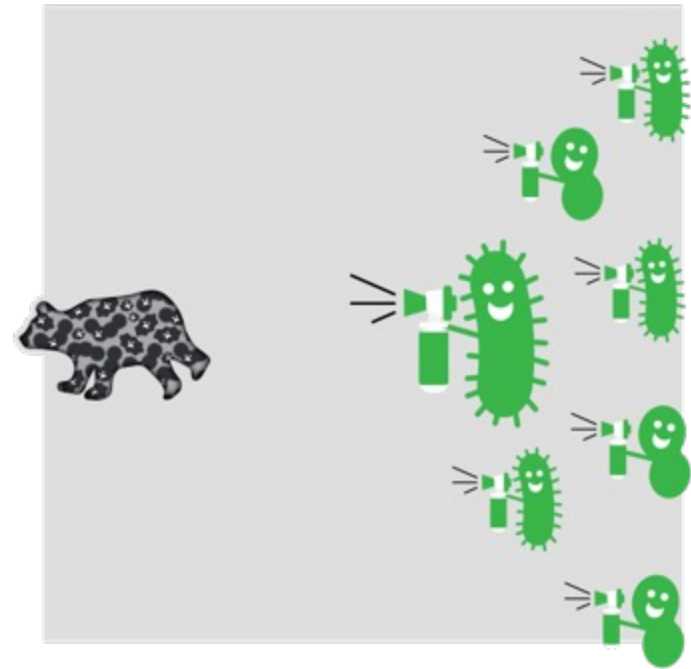
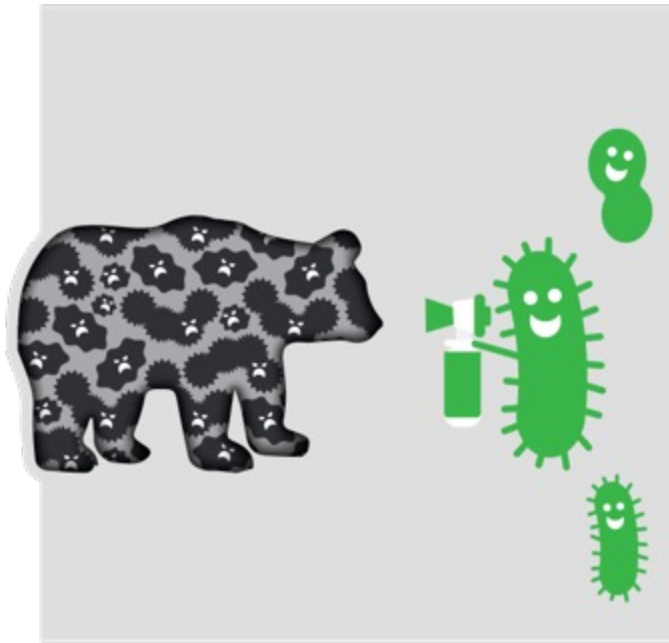
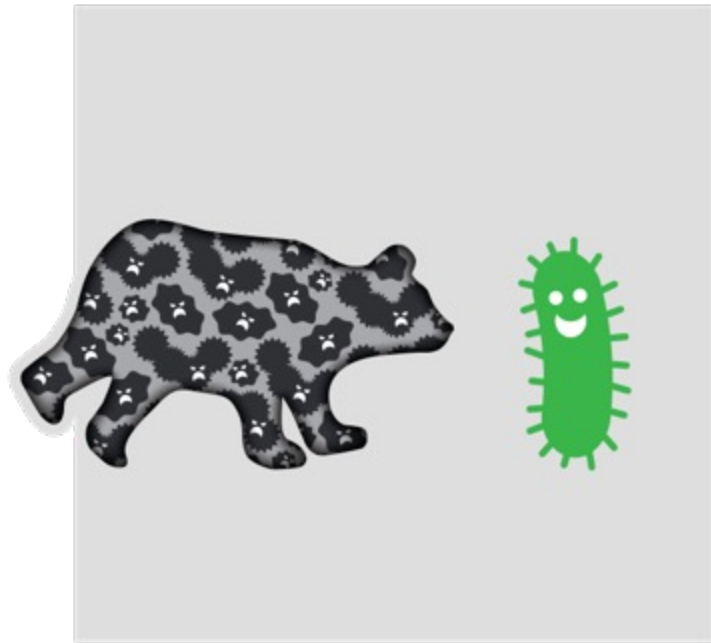
# WELL-DESIGNED FERMENTATION PROCESS

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# BENEFICIAL SOIL MICROBES

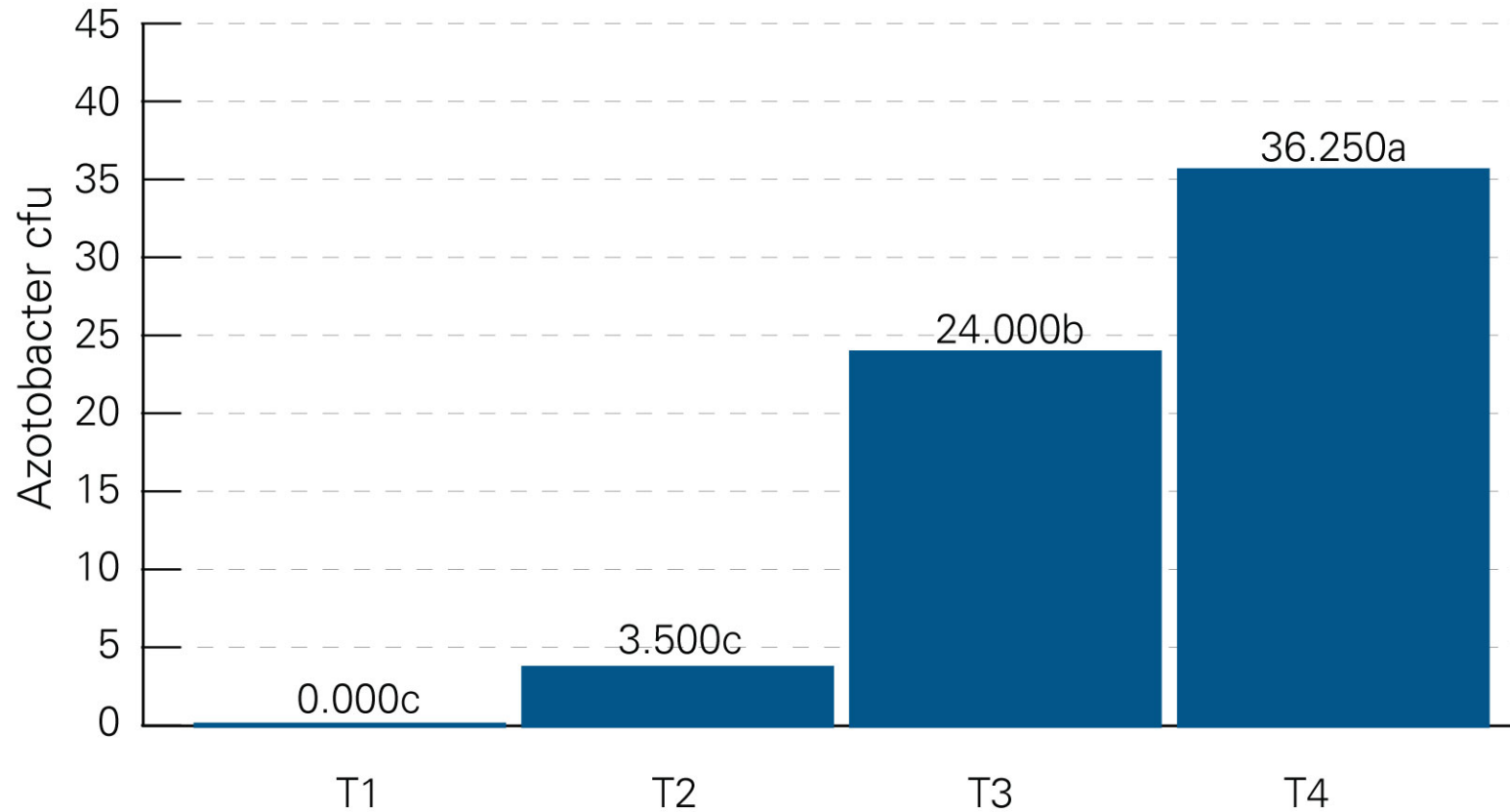
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# SOIL-SET | AZOTOBACTER

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Means (Azotobacter cfu) - Q1

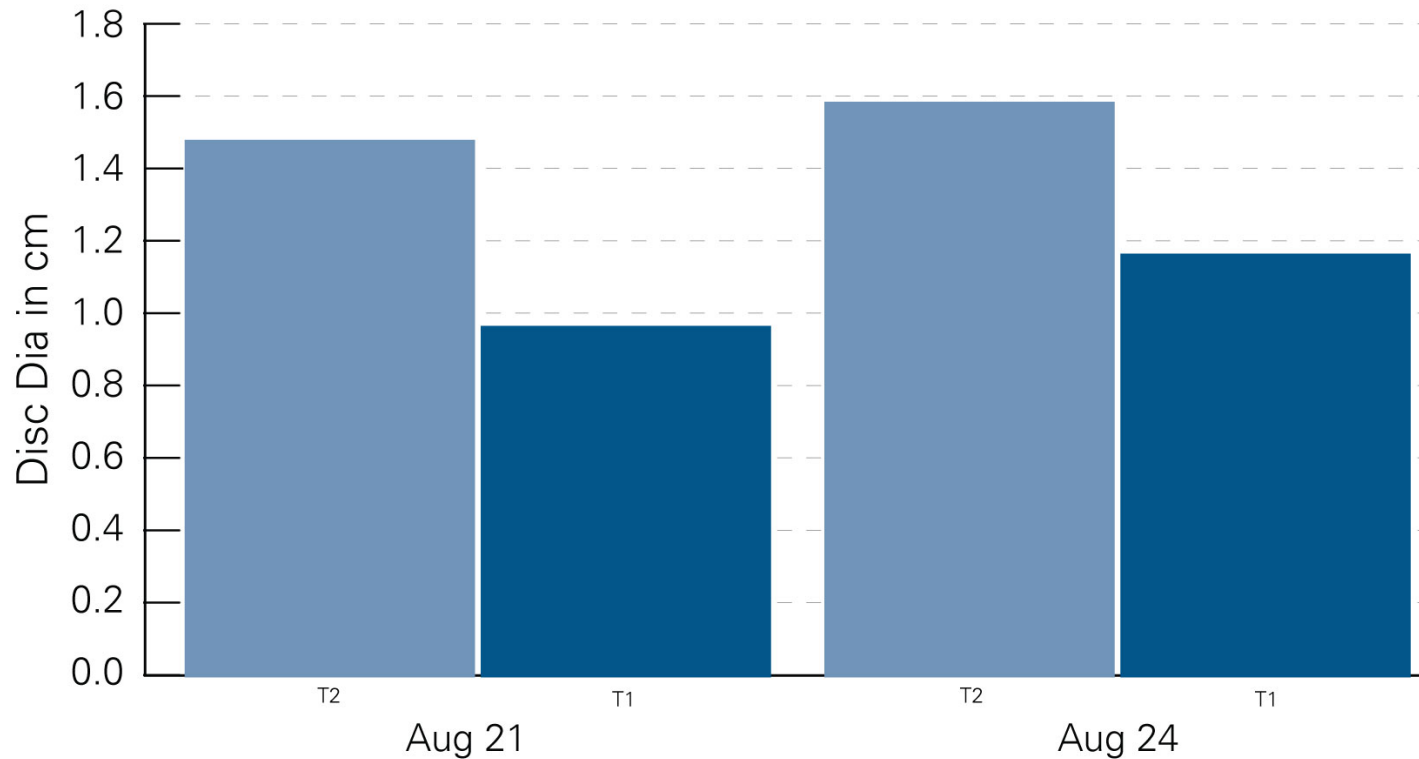


50.83% increase in CFU's when Soil-Set was added to the food source.

# HAG 872 01 D | SCLEROTINIA



Summary (LS Means) - Q1



T1 is with HAG 872 01 D

T2 no HAG 872 01 D

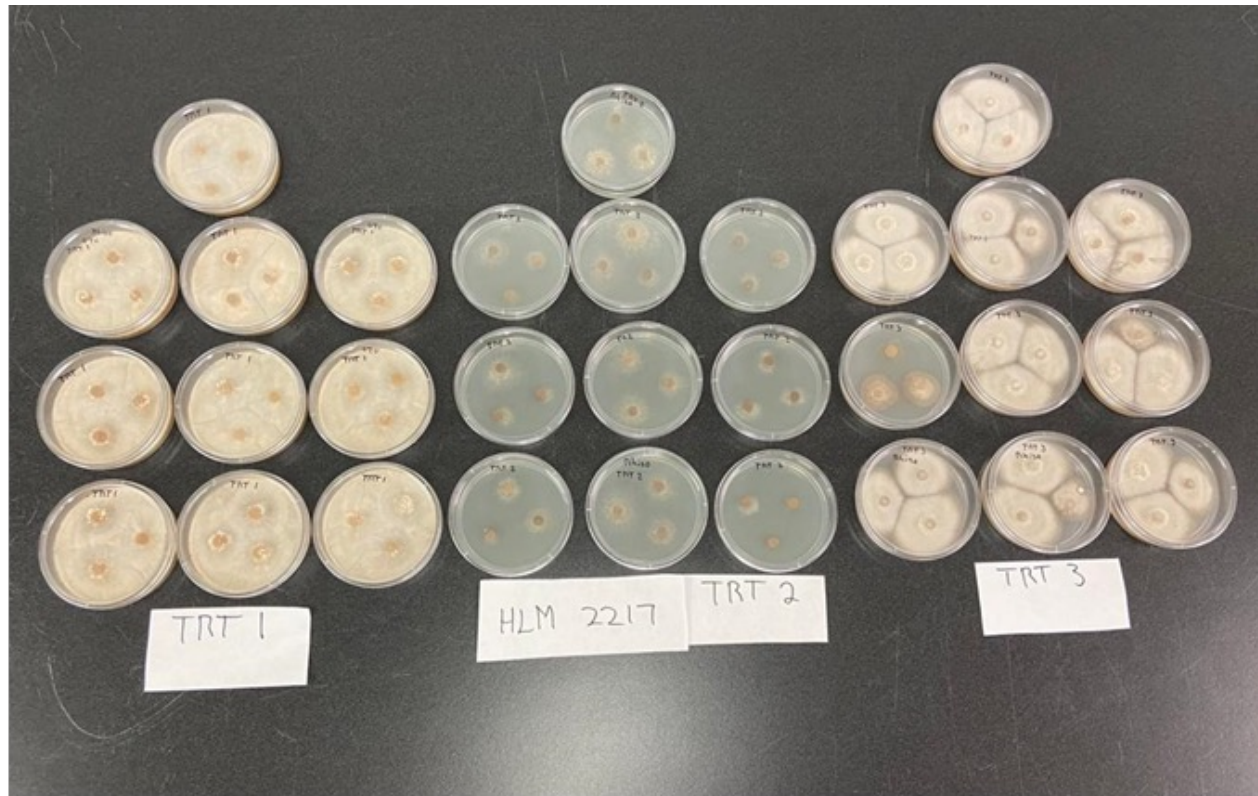
Values are the mycelia diameter in centimeters

Statistically significance in the size of mycelia between T1 and T2, 5 and 8 days after inoculation.



# SHAPING THE SOIL

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## Rhizoctonia

Trt 1 = UTC (Pathogen Only)

Trt 2 = Soil Set

Trt 3 = Commercial Standard

# HELPING GOOD MICROBES WIN

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There are products that **feed and support good microbial populations** to help them **outcompete pathogens**:

- Aids in healthy root growth and development
- Improves residue breakdown and soil organic matter
- Supports balanced soil to help plants thrive under stressful conditions
- Increases soil nutrient availability and uptake



# FULL SEASON WEED CONTROL

EARLY SEASON SETS THE TONE FOR THE YEAR

# TRIVIA QUESTION

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**WHEN** does weed competition  
hurt you the most?  
(not how)

# SPRING AND FALL APPLICATION FOCUS

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Fall and Spring **weed control in cover crops:**

- Why does it matter?
  - Crops develop most of the yield potential in the first three weeks.
  - Weeds come up in the fall and erase all gains made to deplete the weed seed bank.

Cover crops are a crop and treating them like a crop is important. Start clean to stay clean to maximize their benefits. The most options and flexibility you have are **pre- and fall applications.**

In-season weed control options are determined by **your trait package.**

In a no-till system, **when is the termination event and how do we prepare for it?**

# SPRING BURNDOWN

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What makes a high-quality burndown product and termination event product?

## **Efficacy on broadleaves and grasses**

- Emerged weeds
- Residual control for pre and post applications

Utilizing **new technologies** with **low use rates**, **increased safety** and **easy handling**

- This is becoming the new standard.

**Differentiated mode of action** to prevent resistance

**Tank mix compatibility**

# FALL BURNDOWN

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It is equally as important to **start clean** with a cover crop as with a spring crop.

- Eliminating competition and helping to limit weed seed bank

**Emerging fall and winter weeds** like henbit, poa, morningglory, teaweed, chickweed, dandelion, amaranth species, and other tough-to-control species can be an unwelcome sight.

Fall burndown can also **help alleviate supply challenges**

**Look for a broad-spectrum fall burndown herbicide** program with residual to get ahead of weed pressure for a cleaner start to spring planting

# TODAY YOU MAY GET IT BUT MAY NOT BE EXACTLY WHAT YOU ARE USED TO





# COVER CROP BURNDOWN PROGRAMS

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UNTREATED



REVITON 1 FL OZ  
+ GLYPHOSATE 1 QT  
+ 1.0%V/V MSO



HELMQUAT 3SL 2 PT



GLYPHOSATE 1 QT +  
2,4-D 2 PT



# WHAT PRODUCTS WORK WELL TOGETHER

The logo for HELM, consisting of the word "HELM" in a bold, sans-serif font inside a red-bordered oval.

## **Glyphosate**

### **Photosystem II Inhibitors**

Metribuzin  
Atrazine  
Diuron or Linuron (cotton)

### **Auxins**

2,4-D  
Dicamba  
Clopyralid

### **HPPD**

Mesotrione  
Tembotrione  
Isoxaflutole

### **Long-Chain Fatty Acid**

Metolachlor and S-Metolachlor  
Acetochlor  
Dimethenamid

## **Glufosinate**

### **ALS Inhibitors**

### **ACCASE Inhibitors**

Clethodim  
Sethoxydim  
Quizalofop

### **Photosystem I Inhibitors**

Paraquat

### **PPO Inhibitors (no added residual interval)**

Sulfentrazone  
Flumioxazin

# WHAT PRODUCTS WORK WELL TOGETHER?

14 DAT SHERIDAN, IN

HELM

UNTREATED



REVITON + MSO CONCENTRATE



REVITON + ROUNDUP POWERMAX +  
MSO CONCENTRATE



# BEST PRACTICES AND REMINDERS

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**Lock in herbicide commitments early** – You can get the program you want, not necessarily the price.

**Educate yourself on herbicide options** – Lean on your local agronomist, crop adviser or university extension.

**Explore tank mix options** – Find tank mix partners that provide differing modes of action.

**Prioritize problematic fields** – Identify and plan for the “problem child” fields on your farm.

**Go after small weeds** – Time applications appropriately, especially with emerged weeds. The difference in managing a one-inch weed and an eight-inch weed can be exponential.

# BEST PRACTICES AND REMINDERS

The logo for HELM, consisting of the word "HELM" in a bold, red, sans-serif font, enclosed within a white oval with a red border.

**Evaluate adjuvant options** – Look at different options to “heat up” your tank mix that fall in line with label requirements.

**Take the pressure off postemergence** – Utilize burndown options, both spring and fall. Options like Reviton<sup>®</sup> and paraquat can help you start the season with clean fields.

**Get the small things right (details matter!)** – Leave no stone unturned in your sprayer setup. Make sure sprayer nozzles are calibrated correctly, use correct boom height, watch application speed and apply during the day, pending conditions, to avoid dew.



**CONCLUSION**

# KEY TAKEAWAYS

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- Through **shaping the soil**, you can prepare the soil microbiome to support vigorous root growth and plant health
- It pays to educate yourself on new **biological tools** in the face of diminishing numbers of synthetic chemistries
- Utilize a **strong burndown** to preserve in-season herbicide options
- Weed competition hurts production the most in the **first three weeks** of emergence
- When making decisions remember it may not be what you want at the price you want but **look at the alternatives that will work**
- Starting and staying clean before and after harvest **improves your bottom line** down the road for when commodity prices go down

# WHAT'S NEXT?



## HELM HOSPITALITY EVENT

[NNTC]

**Date:** Thursday, January 12  
**Time:** 9:15 – 11:30 PM  
**Location:** Grand Ballroom A/B/C



- Hospitality
- Food
- Beverages
- Chance to win Reviton and Soil-Set

## ROUNDTABLE DISCUSSION

[NNTC]

**Date:** Wednesday, January 11  
**Time:** 4:45 – 5:45 PM

### *"Managing Micronutrients for Bigger No-Till Yields"*

- Discuss the latest in maximizing micronutrients for superior yields

**Moderator:** Tim Eyrich

## HELM NO-TILL WEBINAR

**Date:** Wednesday, January 25  
**Time:** 10:00 AM

### *"Setting a Foundation – Shaping the soil for robust plant health and efficiency"*

**Presenters:** Tim Eyrich and Brock Waggoner

**Register for the webinar**





# FOR MORE INFORMATION



**Brock Waggoner**



[bwaggoner@helmag.com](mailto:bwaggoner@helmag.com)

**Tim Eyrich**



[teyrich@helmag.com](mailto:teyrich@helmag.com)



[\*\*helmcrop.com\*\*](http://helmcrop.com)



**Interested in  
learning more about  
Reviton and Soil-Set?**



**THANK YOU!**