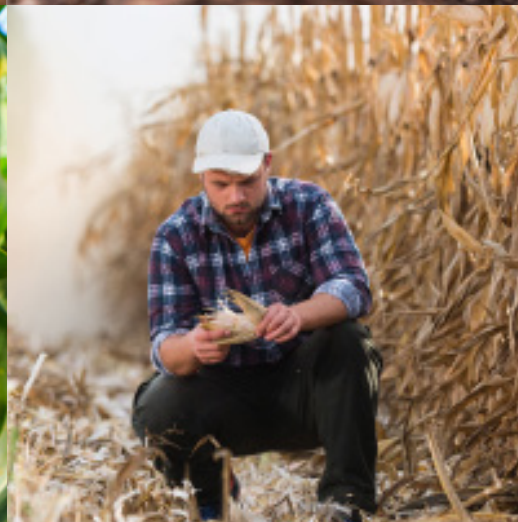


# Bio 800<sup>+</sup> PRODUCT FOLDER

Ready To Revolutionize Growing?



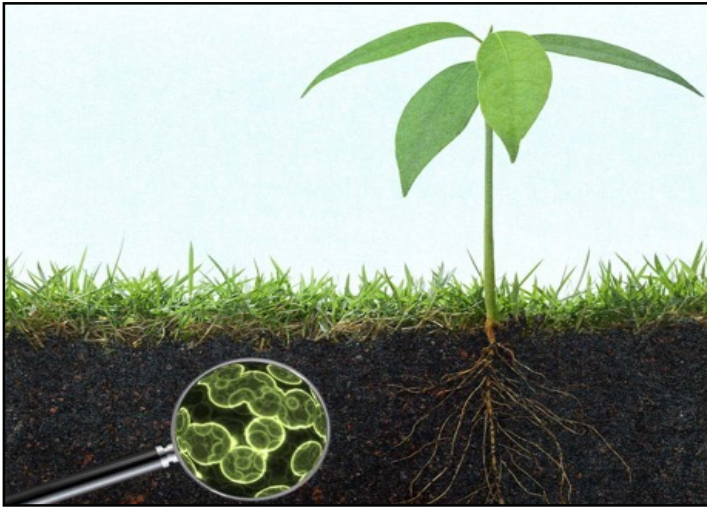
**HOLGANIX<sup>®</sup>**  
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# Microbes and Soil Health



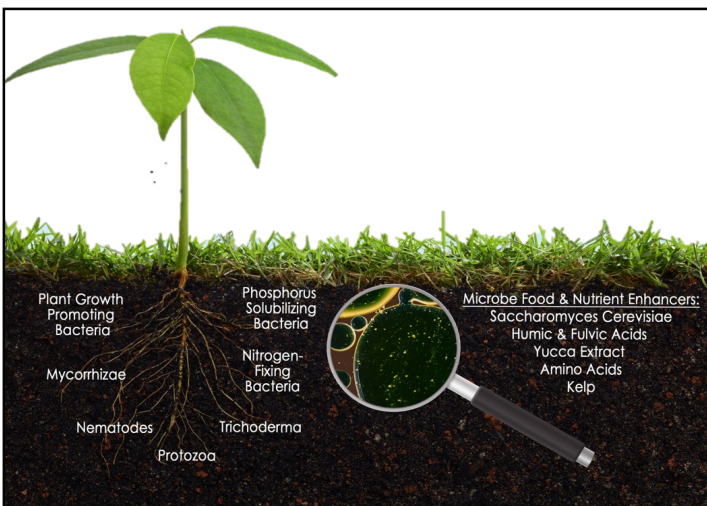
## Role of Microbes

- Eat fertilizer (immobilize), keep it in the root zone, cycle it back to the crop (mineralization)
- Release nutrients from organic material and organic matter
- Build soil organic matter and organic nitrogen



## Negative Impact to Microbe Population

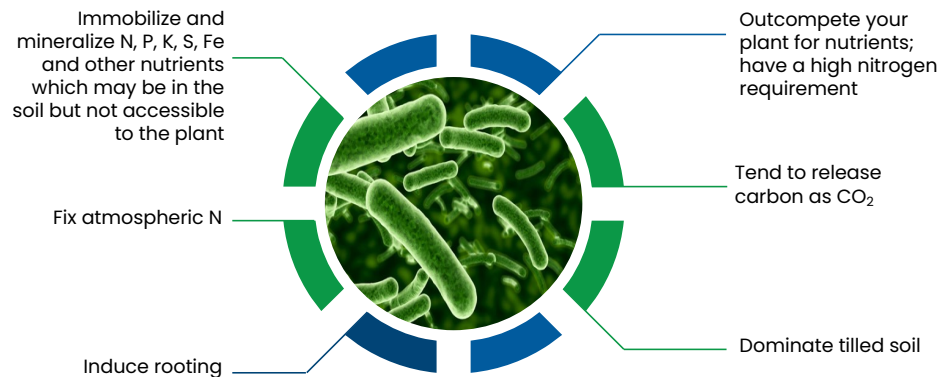
- Chemical applications
- Freezing temperatures
- Flooding
- Tillage



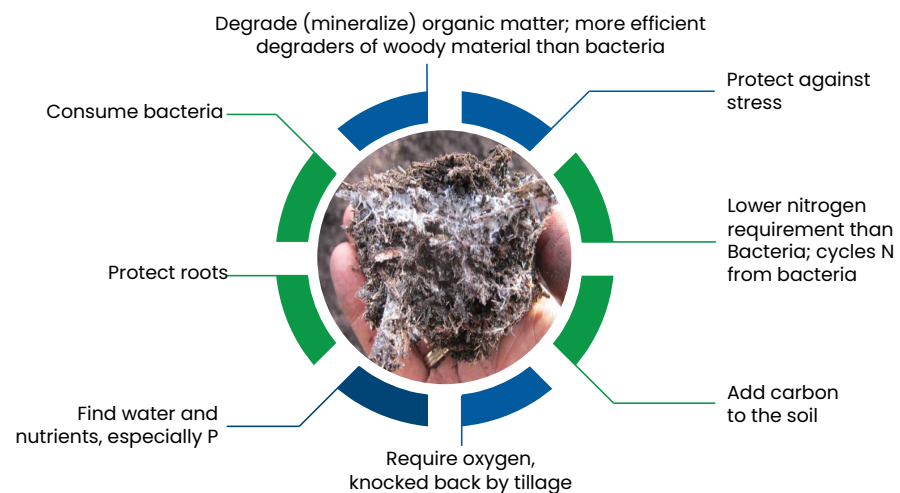
## Benefits of Bio 800+ Ag

- Replenishes the beneficial microbiome, and adds new beneficial biology
- Over 800 species of bacteria, fungi and protozoa
- Amendments & nutrients to support microbial growth
- 100% organic

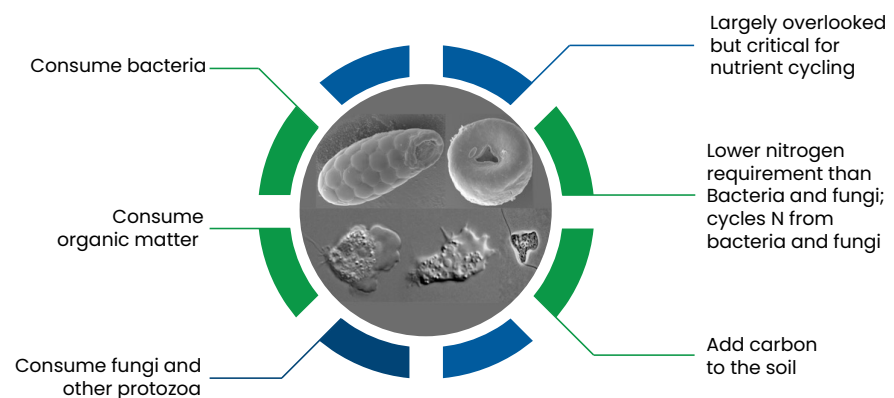
## Bacteria



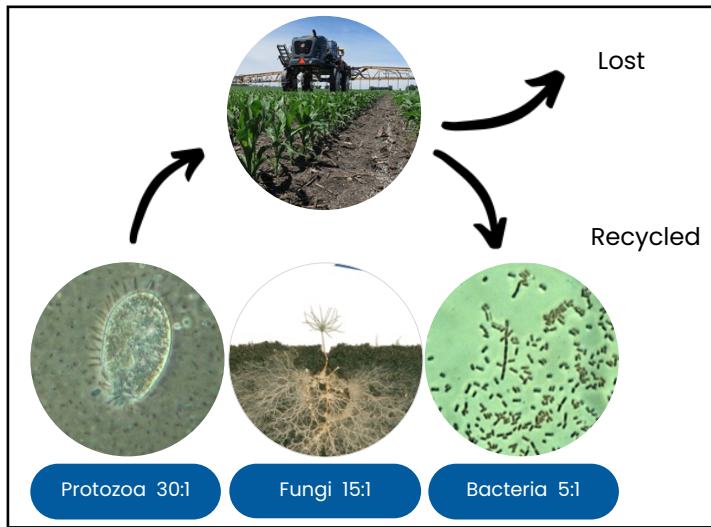
## Fungi



## Protists



# Impact of Microbes



## Microbes Cycle Fertilizer Back to the Crop

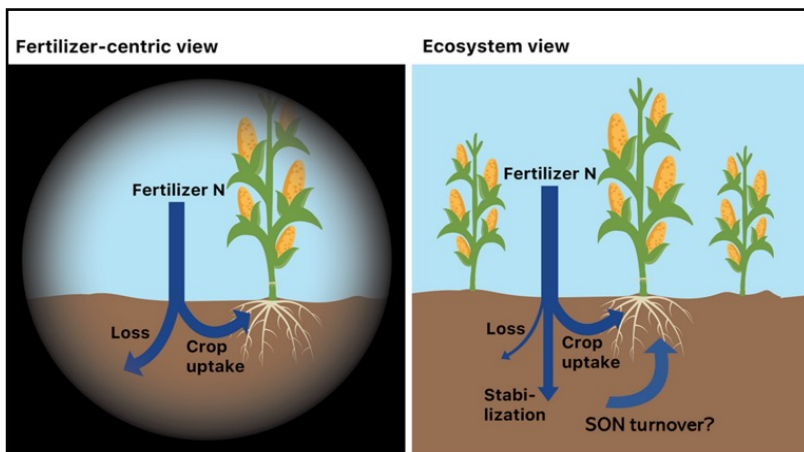
- All microbe types are required to efficiently cycle nutrients, build soil and grow a healthy crop

## Microbes Interact Directly with Nitrogen Fertilizer

*Review of 230 published studies shows*

- Only 36-42% of current year applied nitrogen goes to the crop (corn, rice, small grains)
- Microbes increase soil organic nitrogen and SON turnover efficiency
- Soil organic nitrogen turnover contributes more than current year applied nitrogen
- Biologically healthy soils produce greater corn yields per unit of fertilizer\*

\* Wade, J. et al, Improved soil biological health increases corn grain yield in N fertilized systems across the corn belt, Nature Research Scientific Reports (2020)



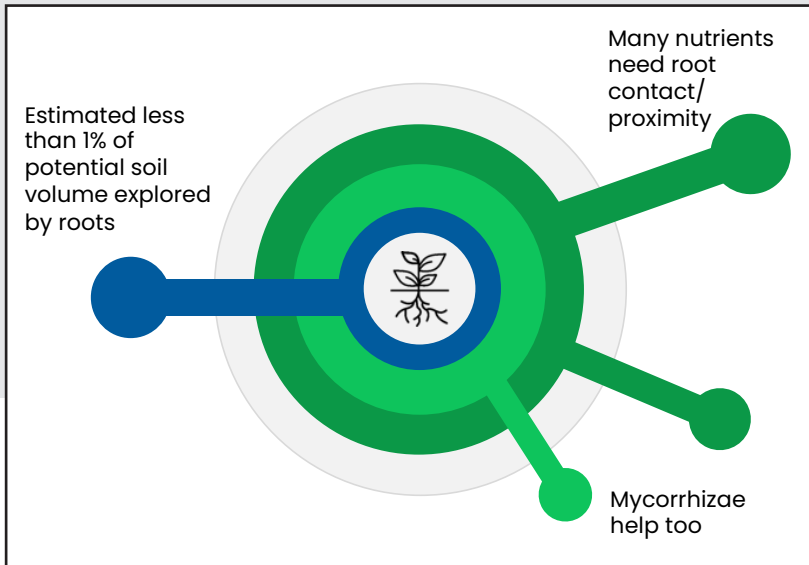
“It is now increasingly acknowledged that the diversity of a microbial inoculum is as important as its plant growth promoting ability. Not surprisingly, outcomes from such plant and soil microbiome studies have resulted in a paradigm shift away from single, specific soil microbes to a more holistic microbiome approach for enhancing crop productivity and the restoration of soil health.”

Ray et al, Microbe to Microbiome: A Paradigm Shift in the Application of Microorganisms for Sustainable Agriculture, Frontiers in Microbiology (Dec. 21, 2020)



# Why Roots Matter

## Water & Nutrient Uptake



*"Roots, already being well distributed and in intimate contact with the soil, tend to contribute a higher percentage of their weight to the more persistent organic matter ("dead" and "very dead") than do aboveground residues."*

*Fred Magdoff, Harold Van Es, Building Soils for Better Crops, SARE Outreach, 2021, 394 pages, chapter 3*

*"Roots contribute 2.3 times more to stable organic matter pools than the same amount of above-crop residue."*

*Katterer et al., Agriculture, Ecosystems and Environment V 141, Issues 1-2, pp 184-192, 2011.*





## Top 5 Reasons to use Bio 800+ Agriculture

### 1 Early Emergence



*5 day old corn, planted side by side field*

### 2 Boosted Root Mass



*Expect 4 to 10 times more root mass*

### 3 Healthy Plants



*Stronger plants that withstand weather, stress, and insect pressure*

### 4 Healthy Soil



*Replenishes beneficial microbiome*

### 5 Increased Yields



*Expect over 2x ROI on corn and soy beans*



# Bio 800+ Breakdown

## Factors Influencing Decomposition Rates



- Microbial community
- Temperature  
Rate doubles every 8-9 degrees Celsius
- Moisture
- Composition of residue  
C:N ration, % lignin
- Soil Type  
Oxygenation; lignin degradation requires oxygen, as do most fungi, PH, Salinity, Micronutrients

## Benefits of Bio 800+ Breakdown

- Protozoa to cycle nutrients back to the soil
- Over 600 species of bacteria
- Over 200 species of fungi, enriched for degraders
- 1 lb. molasses per gallon, 2% slow-release nitrogen, amino acids, and micronutrients



*Photos taken on the same day side by side fields after Vertical Tillage*



**Microbes cycle fertilizer back to the crop...**

**it starts in the fall...**

**...and continues in the spring**



# Application Rates

## Bio 800+ Agriculture

- Spring application as close to planting as possible (up to 2 weeks pre-plant or post plant)
- 1/2 gallon per acre
- Apply in-furrow or broadcast spray  
Broadcast spray 15 gallons of water per acre, in-furrow 5 gallons of water per acre
- May be tank mixed with anything except fungicide

## Bio 800+ Breakdown

- Fall application, post harvest
- 1/2 gallon per acre
- 15 gallon of water per acre
- Enhances tillage post application



Untreated

Bio 800+

Corn fields planted same day, same variety. September 9, 2022



Side by side comparison. June 22, 2022



Bio 800+

Untreated

Side by side comparison. August 6, 2022



Side by side comparison. July 12, 2022