

Certified



Corporation

This company meets the  
highest standards of social  
and environmental impact



AGRICULTURAL SOLUTIONS

**Carbon Now™**

Grow More Food & Fight Climate  
Change

This company works to directly impact the following UN Sustainable Development Goals





**Locus AG delivers fresh “probiotics”  
proven to supercharge the natural ability  
of plants to sequester carbon and  
reduce greenhouse gas (GHG) emissions  
while also improving crop productivity.**



## Probiotic Experience

Founders Andy Lefkowitz and Sean Farmer previously built one of the leading probiotic food & beverage ingredient companies in the world

GanedenBC<sup>30</sup>®, Ganeden's main ingredient, is used in over 1,000 products on sale in 70+ countries

## Proven Approach

**Bioinformatics** identify unique combinations of proven microorganisms, and **disruptive fermentation technology** develops high-potency, organic “probiotic” solutions at up to 100x higher concentrations that are low-cost, customized to individual users and can address key pain points. **Over 180 patents** have been filed to date. First agricultural input provider in North America, Europe, and Asia to be named a B Corp™



# Problem: The World is Facing a Climate Emergency



## CLIMATE ACTION: WHY IT MATTERS

### What's the goal here?

Taking urgent action to tackle climate change and its impacts.

### Why?

As greenhouse gas levels continue to climb, climate change is occurring at much higher rates than anticipated, and its effects are evident worldwide. By addressing climate change, we can build a sustainable world for everyone. But we need to act now.

### Are people's lives really being affected by climate change?

Yes. Severe weather and rising sea levels are affecting people and their property in developed and developing countries. From a small farmer in the Philippines to a businessman in London, climate change is affecting everyone, especially the poor and vulnerable, as well as marginalized groups like women, children, and the elderly.

13 CLIMATE ACTION



To limit global warming to 1.5°C, global carbon emissions need to fall by a staggering 45 per cent by 2030 from 2010 levels



Over 20 countries have committed to being net zero by 2050, but have no path to it. Most technologies in development aim to mitigate future emissions, but do not remove carbon already in the atmosphere.

The 2019 UN Environment Program states that if emissions can be reduced by 7.6% annually, the world can avoid exceeding the 1.5°C global temperature threshold.

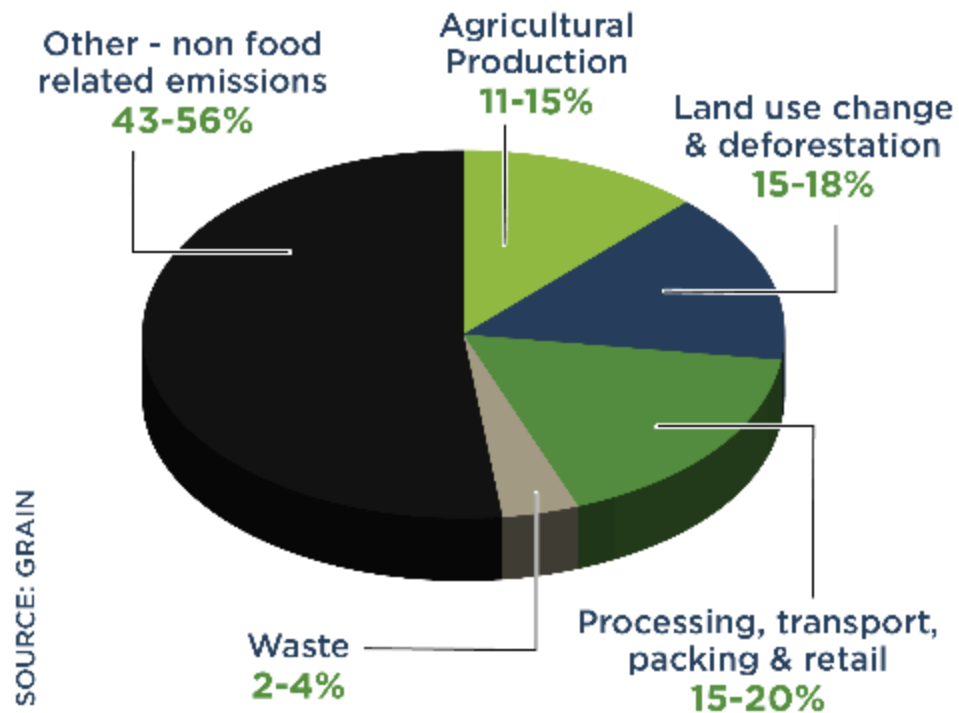




# Recognizing Agriculture as Part of the Problem

Industrial agriculture causes **between 11-33%** of global greenhouse gas (GHG) emissions

## FOOD AND CLIMATE CHANGE



- The UN estimates that in less than 60 years almost all fertile topsoil will be lost due to industrial agriculture<sup>1</sup>
- Regenerative agricultural practices, such as minimum tillage and cover cropping, can help put carbon back into the soil at rates of 0.2-0.5 tons per acre annually<sup>2</sup>
  - However, due to issues such as short-term yield loss, very few conventional farmers have transitioned to regenerative practices

<sup>1</sup><https://www.scientificamerican.com/article/only-60-years-of-farming-left-if-soil-degradation-continues/> <sup>2</sup>Rodale Institute

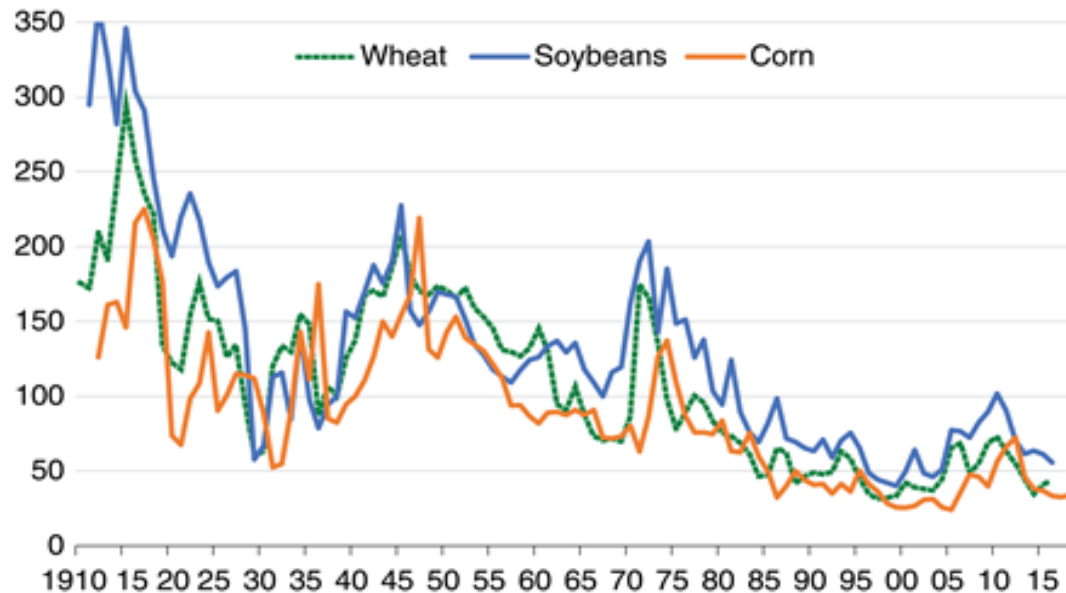


# Farmers are under environmental and societal stresses to survive

While **cost rises**, produce prices remain depressed. Climate change effects, such as increasingly unpredictable weather patterns, **add to these challenges**

Inflation-adjusted corn, wheat, and soybean prices, 1912-2018

Index, 1940 = 100



Source: USDA, Economic Research Service calculations using data from USDA, National Agricultural Statistics Service and U.S. Department of Labor, Bureau of Labor Statistics.



## Midwest flooding is drowning corn and soy crops. Is climate change to blame?

This year's constant deluge of rain has led some to wonder if farmers are finally feeling the predicted impacts of a warming world.





# The Solution lies right under our feet – SOIL

## What if it were possible...



..to substantially  
reduce agriculture's  
carbon footprint  
IMMEDIATELY?



..for farmers to grow more  
with less, improving their  
bottom-lines as well as the  
health of their soils?



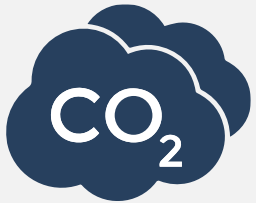
..for farmers to be  
secure against weather  
changes?

**Locus AG Can Accomplish All of This and More**

# The Answer to Sustainability is Right Under Our Feet

Healthy soils are crucial for sustaining the future of agriculture by:

1.



Supercharging  
Carbon  
Sequestration

2.



Increasing Organic  
Matter and Water  
Holding Capacity

3.



Growing  
More Food  
On Less Land

4.



Enhancing  
Biological  
Diversity

Our technology can **sequester carbon** while simultaneously increasing yields and profits **without changing grower practice, TODAY.**





# Solution: Rhizolizer® Soil “Probiotic” Technology

Grow more food on less land, fight climate change **AND** reduce the use of chemical inputs **TODAY** on a worldwide basis



- 🌱 **10%+ reduced fertilizer inputs without impacting yields**  
Money to farmer, reduction in carbon intensity, improved soil health
- 🌱 **75%+ reduction in soil nitrous oxide emissions**  
One of the key contributors to global warming
- 🌱 **Up to 9 tons of carbon sequestered/acre annually**  
Potential to make negative-carbon food and fuel when combined with other sustainability efforts
- 🌱 **Organic treatments with no change to grower practice**  
Cost-effective and easy to apply
- 🌱 **Up to 43% yield increases to incentivize farmers**  
Across most crops, soil types and geographies



# How Carbon Sequestration is Supercharged

Locus AG's "probiotics" increase a plant's ability to capture carbon from the atmosphere and store it in the soil

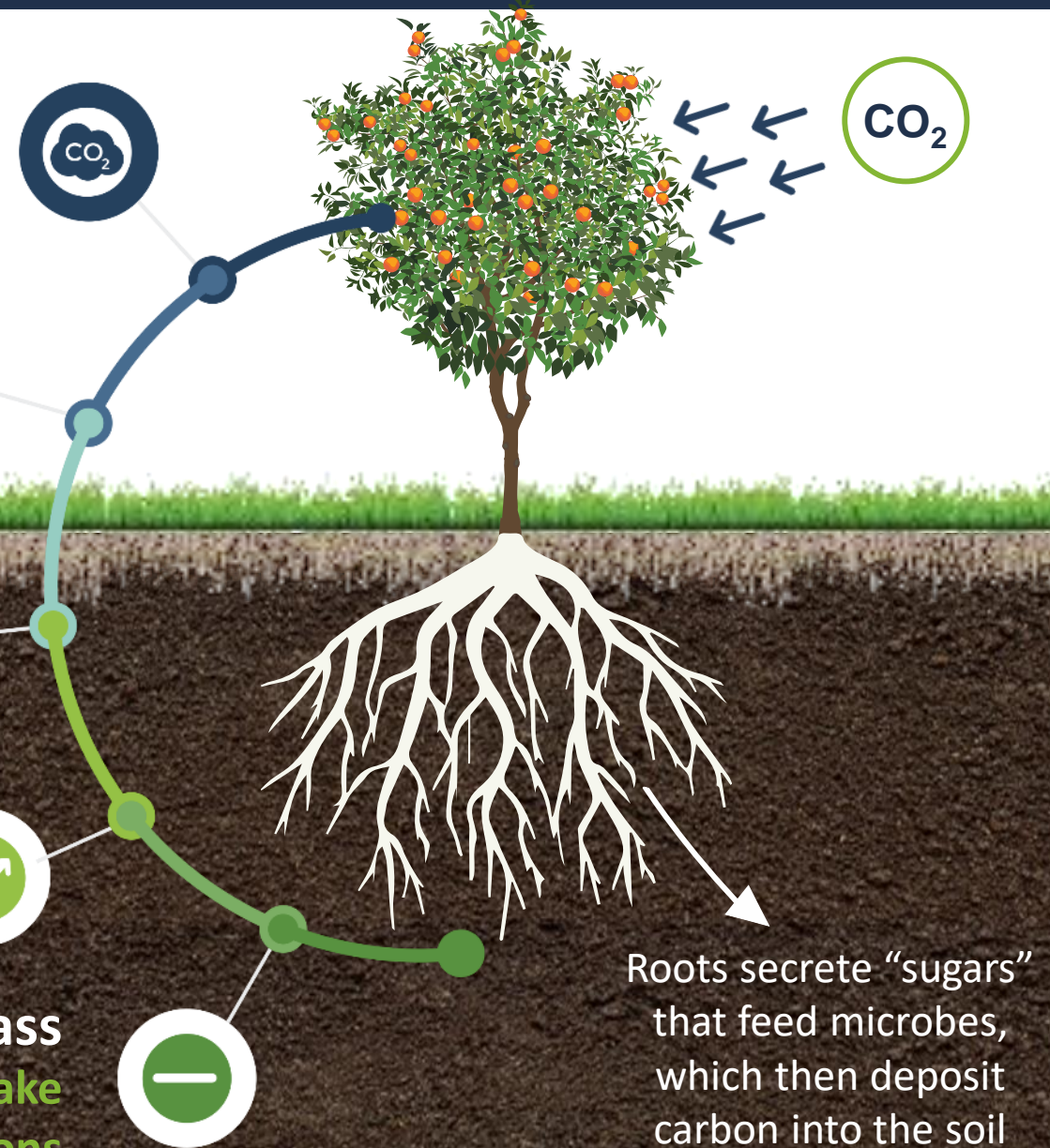
**Enhance Photosynthesis**  
Proven and effective mechanism for utilizing CO<sub>2</sub>

**Improve Soil Health**  
Healthy soil maximizes crop productivity and fixes carbon

**Increase Root Mass**  
Root mass increases stored carbon

**Build Microbial Biomass**  
Biomass improves nitrogen uptake and prevents N<sub>2</sub>O emissions

Locus AG  
"Probiotics"





# Typical Agronomic Results



**Crop yield increases up to:**

**42%** Cantaloupe

**34%** Citrus

**10%** Corn

**14%** Cotton

**4%** Peanuts

**31%** Potatoes

**9%** Sod

**21%** Strawberries

**35%** Apples







**40%** Tomatoes

**20%** Watermelon



# Locus AG's "Probiotics" Supercharge Carbon Sequestration

## Drastic Increases in Carbon Sequestration

Third-Party Verified Measurements <sup>3</sup>	Increases in CO <sub>2</sub> e Sequestration	Total U.S. Acreage <sup>2</sup>	CO <sub>2</sub> e Sequestration Potential
 <b>Turfgrass</b> AZ, CA, NC	<b>8.6</b> tons per acre <sup>1</sup>	40,000,000	344,000,000 tons <sup>1</sup>
 <b>Corn</b> CA	<b>7.0</b> tons per acre <sup>1</sup>	94,000,000	658,000,000 tons <sup>1</sup>
 <b>Almonds</b> CA	<b>6.2</b> tons per acre <sup>1</sup>	1,090,000	6,758,000 tons <sup>1</sup>
 <b>Citrus</b> FL	<b>4.4</b> tons per acre <sup>1</sup>	700,000	3,080,000 tons <sup>1</sup>
 <b>Grapes</b> CA	<b>3.5</b> tons per acre <sup>1</sup>	1,060,000	3,710,000 tons <sup>1</sup>
 <b>Cherries</b> CA	<b>3.3</b> tons per acre <sup>1</sup>	92,000	303,600 tons <sup>1</sup>

Sequestration in just these six crops alone can reduce annual greenhouse gas emissions in the U.S. by **5.8%**

(compared to 7.6% annual target from the UN Environment Program)

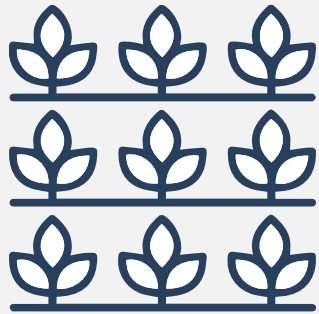
**1,015,582,000 tons**



# Impact Potential on Negating Carbon Emissions

The way we sequester soil carbon can **have a BIG impact.**

We currently  
treat...

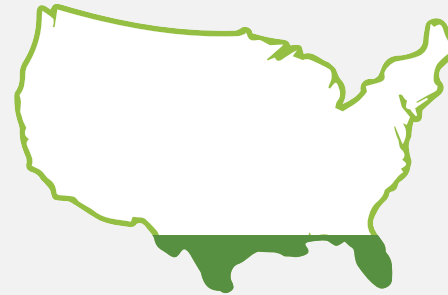


**40,000+**  
acres

Which could offset  
the emissions of...

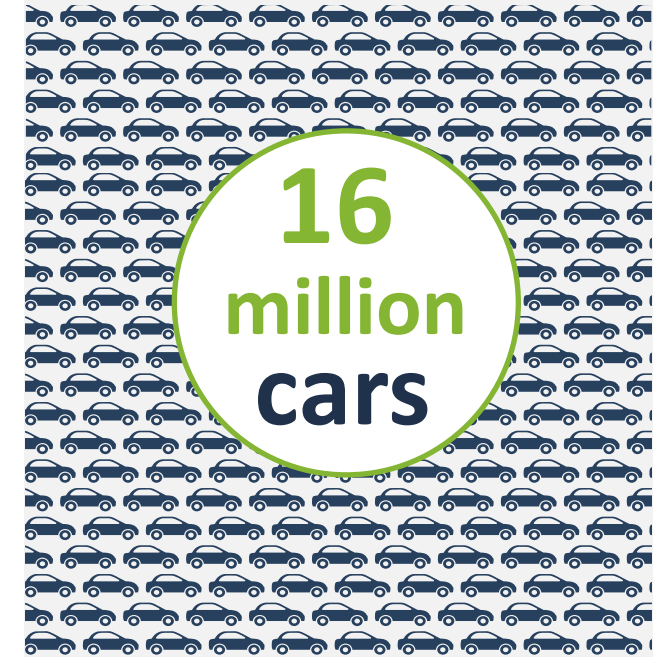


If we treat...



**10%** of the  
acreage  
(in the 6 crops trialed)

We could offset  
the emissions of...



Calculations based off EPA estimation of 4.7 metric tons CO<sub>2</sub>e annually per passenger vehicle; average of 5.5 more metric tons of CO<sub>2</sub>e sequestered/acre annually from treatments





# Productivity Improvements in Trees Impacted by Citrus Greening

Citrus Greening Disease has  
**Devastated Florida Citrus**



**57% Decrease**  
in annual revenues since  
early 2000's

The industry is slowly  
rebuilding and needs  
effective solutions.

Locus AG has turned around citrus groves affected by  
the incurable Citrus Greening Disease:

## Higher Fruit Quality

Up to  
**11%**  
increase in

**Fruit  
Diameter**

Up to  
**9%**  
increase in

**Brix**  
(sugar content)

Up to  
**6%**  
increase in

**Fruit  
Weight**

## Accelerated Growth

Up to  
**2.4%**  
increase in

**Trunk Diameter**  
(accelerated growth in  
young trees)

## Better Harvests

Up to  
**34%**  
increase in

**Total Pound Solids  
Harvested\***  
(the metric by which all  
growers are paid)

## Improved Tree Vigor

Up to  
**33%**  
increase in

**Canopy Density**  
(in young trees; 19% in  
mature trees)

Up to  
**153%**  
increase in

**Root Mass**  
(Continues to increase from  
original 82% improvement)

Grower's Practice



**Rhizolizer**



Grower's Practice



**Rhizolizer**



\*Even when increasing prior year's yields to account for fruit drop associated with Hurricane Irma

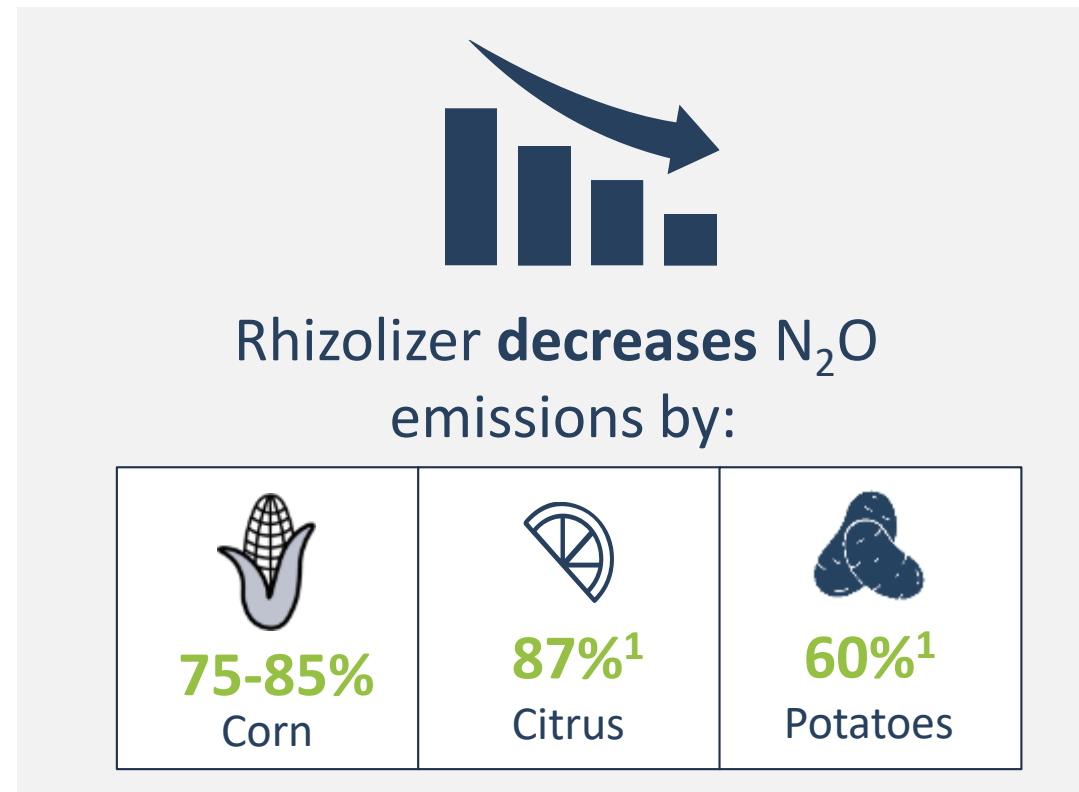
# Significant Reduction in Soil Nitrous Oxide Emissions

More than **70%** of human generated Nitrous Oxide ( $\text{N}_2\text{O}$ ) emissions, which is **300x worse** as a greenhouse gas (GHG) compared to  $\text{CO}_2$ , come from **fertilizer use**



$\text{N}_2\text{O}$  accounts for **6%** of global GHG emissions

<sup>1</sup>Citrus and potato data collected and verified by researchers at Texas A&M University  
Source: EPA

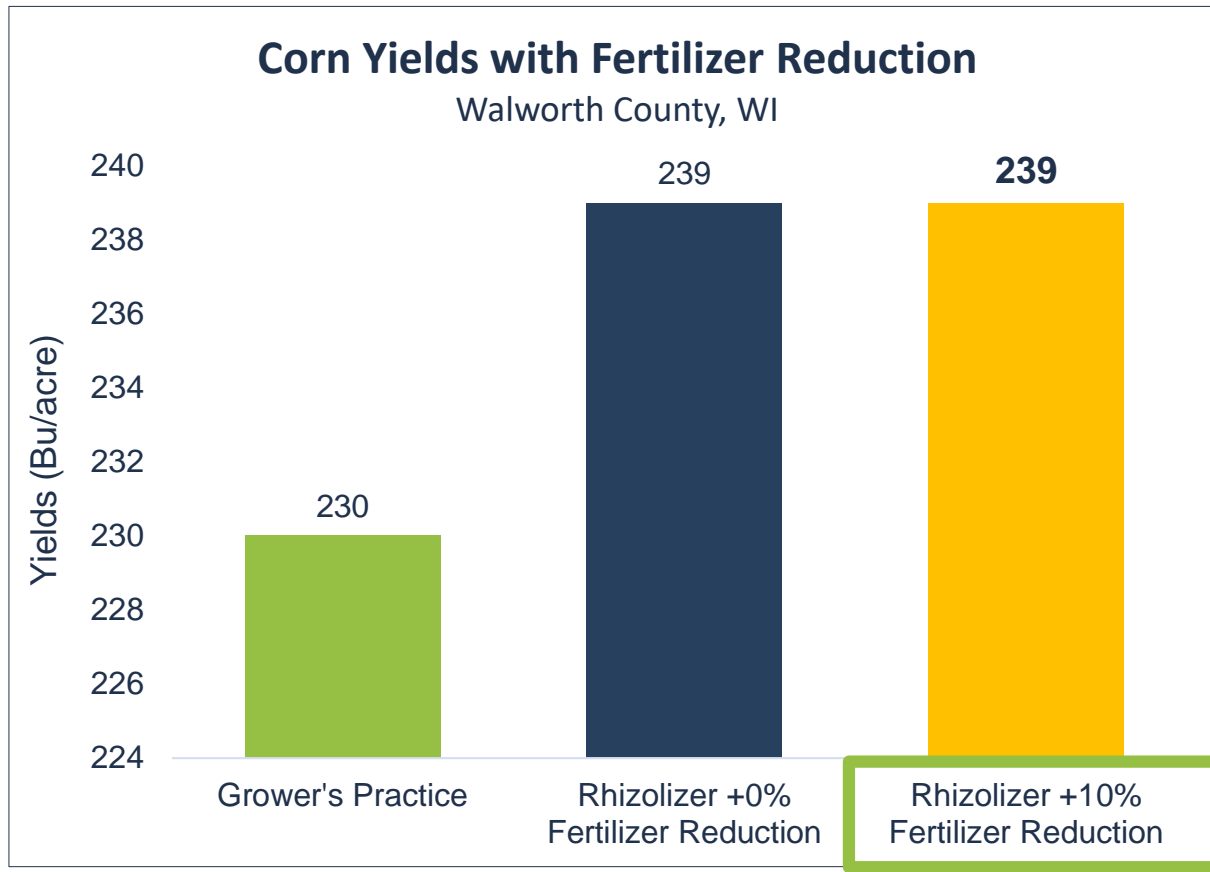


**Why is this impressive?**

This reduction is ***separate*** and ***in addition***  
***to*** any fertilizer input reductions

# Yield Increases with Reduction in Fertilizer Inputs

Fertilizer inputs **add** to the carbon intensity of agriculture



Growers in numerous crops have **reduced NPK fertilizer by 10%-50% on their own** after the second year of treatments without impacting yield

Reduction in fertilizer use directly impacts **downstream water bodies**

A 10% reduction in fertilizer use (without including yield increases) approximates to savings of \$15-\$20/acre for a corn farmer who averages between \$40-\$75/acre in profitability





Grower's Practice

**Treated**



Grower's Practice

**Treated**



Grower's Practice

**Treated**



Grower's Practice

**Treated**



Grower's Practice



**Treated**



Grower's Practice

**Treated**



Grower's Practice



**Treated**



Grower's Practice



**Treated**



## **Improves Worker Safety**

Non-toxic, non-GMO solutions are safer for humans

## **Feeds An Ever-Increasing Population**

Increases crop productivity to grow more food in less time

## **Lowers Inputs**

Reduces time to harvest, decreasing usage of water and other inputs

## **Reduces Chemical Reliance**

Enhances nutrient uptake, improving fertilizer efficiency

## **Minimizes Environmental impact**

Reduces run-off of by-products and chemicals

## **Improves Soil Health**

Restores the soil microbiome

## **Enhances Other GHG Reduction Techniques**

Cover crops, reforestation, reduced tillage, crop rotation and more

## **Supports Local Economies**

Helps provide meaningful employment in developing nations





.....for what was only commercialized in January 2018



FoodTech AgTech Investment Industry Research Opinion Events ▾ Jobs ▾ Sponsors ▾ About



Sunrise in soybean field, sunlight beaming through the leaves of small green young plants of soya

## If we really want to sequester more carbon, agriculture can't be made the enemy, says microbial input startup Locus

August 19, 2019 Lauren Stine

Last week, the Intergovernmental Panel on Climate Change (IPCC) released a [report](#) stressing the importance of land management to fight climate change. Through human activities, and agriculture, land surface has been altered, it

climate-warming emissions and making it more difficult for forests and other ecosystems to absorb greenhouse gases.

*"...let's understand the biology, how these processes work and give growers tools to help them be even better stewards...more sustainability means better yields, and better yields means more profit."*

*"Rhizolizer was created by a firm dedicated to developing problem-solving products, some with the potential for worldwide impact."*



## Replacing chemistry with biology: Solon firm cultivates problem-solving products with worldwide impact

By Brian Albrecht, The Plain Dealer



Andrew Fox, with Locus Fermentation Solutions, sets up in the field to record data on a field of romaine lettuce and other vegetables at Rainbow Farms in Madison. Locus has developed a product to boost CO2 absorption in plants and increase their size and yield. (Gus Chan / The Plain Dealer)

MADISON, Ohio — Neat green rows of lettuce, tomatoes, peppers and other vegetables rise in a small corner of Rainbow Farms.



TECH | WORK LIFE | CREATIVITY | IMPACT | AUDIO | VIDEO | NEWS | RECOMMENDED

02.07.19 | WORLD CHANGING IDEAS

## These probiotics for plants help farms suck up extra carbon dioxide

A mix of fungi and bacteria added to the soil makes agriculture more productive—and helps stop climate change.



*"Agricultural soils are one of the world's largest carbon sinks. If they're treated right, you're going to absorb a lot of carbon dioxide out of the atmosphere."*





# Carbon-Focused Partnerships: Gevo

**GEVO is trialing Locus AG's probiotics and their potential to produce corn-based "carbon negative" jet fuel**

## **Gevo Begins Field Trials To Amplify Soil Carbon Sequestration Using Locus AG "Probiotics"**

**ENGLEWOOD, Colorado (July 31, 2019)** Gevo, Inc. (NASDAQ: GEVO) announces a partnership with Locus Agricultural Solutions® (Locus AG) to trial a new technology, developed by Locus AG, that is expected to improve capture of soil carbon, reduce applied nitrogen fertilizer needs and improve yield.

Locus AG's Rhizolizer® is a line of fresh, non-GMO soil "probiotic" treatments which are produced from proven microorganisms and tailored to meet the needs of local farmers. Rhizolizer has been used to treat 40,000 commercial agriculture acres across several crops, with positive results in improving crop productivity, crop quality, vigor and sustainability. Treatments are now being tested on Gevo's 30-acre farm co-located at its Luverne, MN facility.



<https://locusag.com/gevo-begins-field-trials-to-amplify-soil-carbon-sequestration-using-locus-ag-probiotics/>

Certified



Corporation

This company meets the  
highest standards of social  
and environmental impact



**We are at the forefront of simple,  
clean solutions to the world's largest challenges**

---