



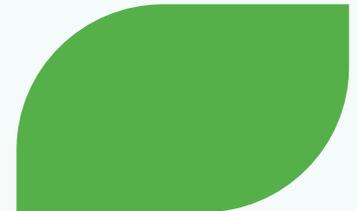
TS201: Multiple Modes of Action for Pest Mitigation as Part of an IPM Strategy

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VP – Research + Discovery

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ABIM

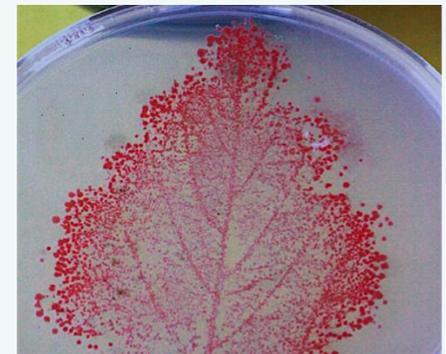




- We are focused on **PPFMs**
Pink-Pigmented Facultative Methylotrophs
- Science-led, data-backed, and performance-driven
- Bringing **biocontrol solutions** to market to revolutionize Ag
 - **TS201 EPA-registered bioinsecticide** to market in 2024
 - Poised to launch TS601 EPA-registered biofungicide in 2026
- Technology portfolio and pipeline includes
 - Biostimulant, nitrogen use efficiency, PGR and methane mitigation solutions
 - NewLeaf's PPFMs power over 100 products



*HQ in a US Biotech Hub
St. Louis, Missouri, USA*



PPFMs on a soybean leaf



Why Is TS201 Innovative?



- **Mode of Action (MOA) Innovation** powered by **Formulation Innovation**
 - MOA Innovation
 - **Induced Systemic Resistance (ISR)** plant defense pathway is primed
 - Combined with deep knowledge of specific defense volatiles induced
 - Result: **Helps the plant defend itself** from corn rootworm and many other insect pests
 - Formulation Innovation
 - **2-year shelf life** as a wettable powder (WP)
 - Result: Adoption of product with **best-in-class stability** for gram-negative bacteria



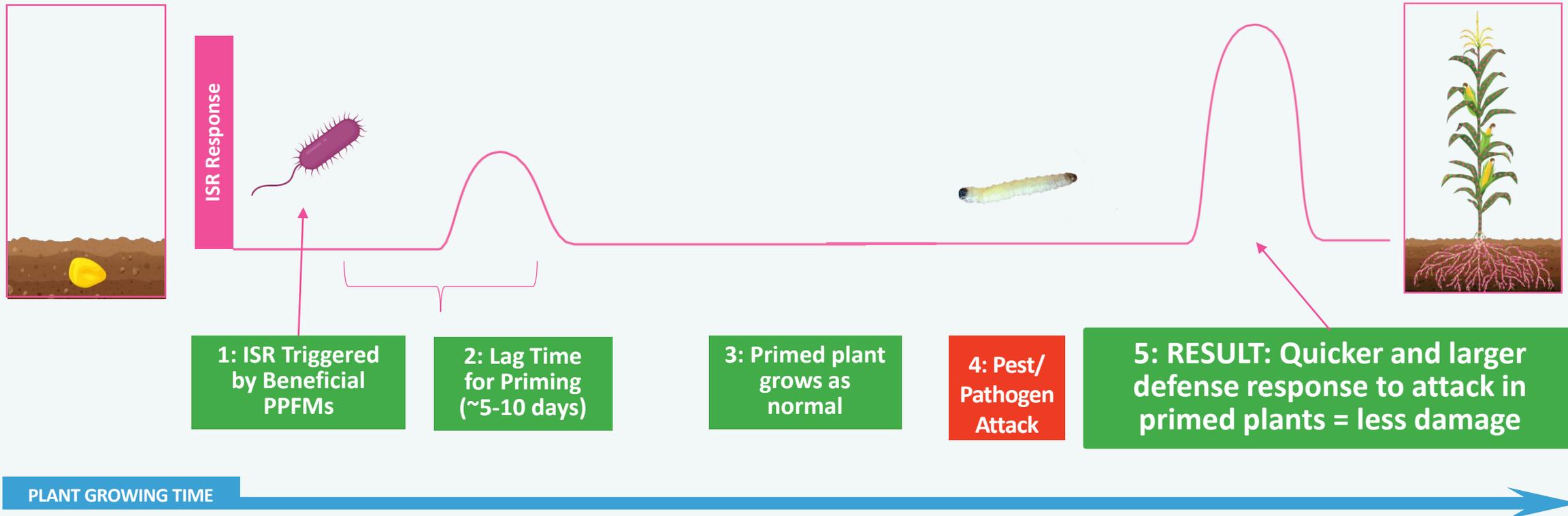
Greater Root Mass
Longer Roots
More Kernels



Mode of Action (MOA) Innovation: Induced Systemic Resistance (ISR)



Primes the plant's own defenses to help plant help itself



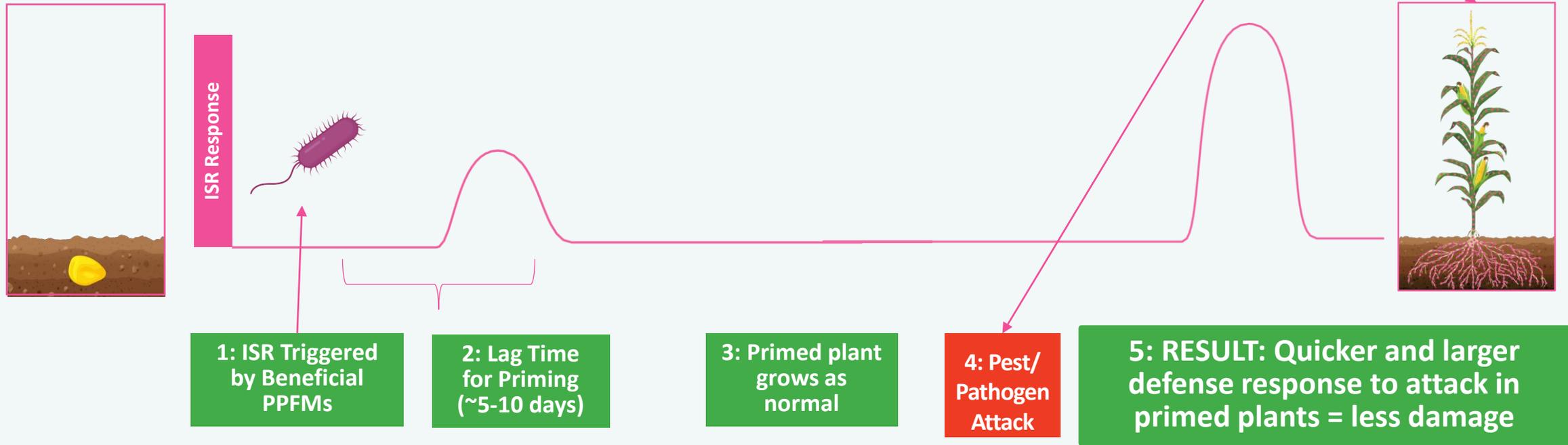


Mode of Action (MOA) Innovation: Induced Systemic Resistance (ISR)



ISR is effective against variety of **pests** (insect/fungal/nematode) in a variety of **plants** (monocots and dicots)

ISR is the core defense pathway:
It explains how we can have so many targets



1: ISR Triggered by Beneficial PPFMs

2: Lag Time for Priming (~5-10 days)

3: Primed plant grows as normal

4: Pest/Pathogen Attack

5: RESULT: Quicker and larger defense response to attack in primed plants = less damage

PLANT GROWING TIME

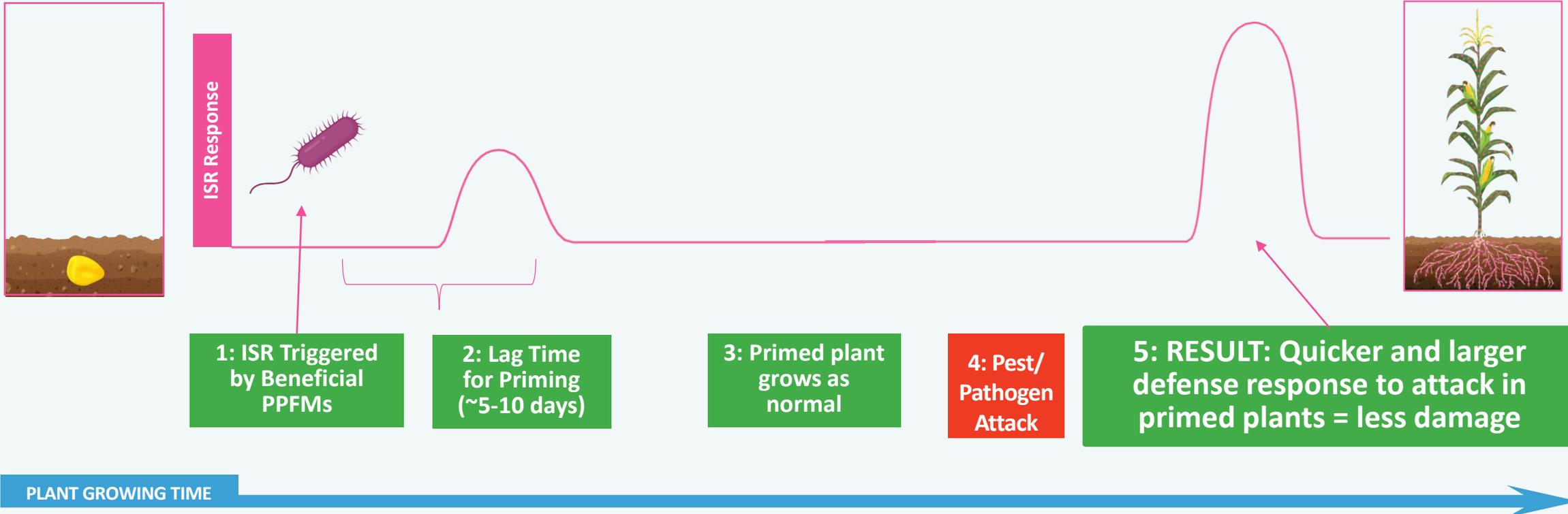


Mode of Action (MOA) Innovation: Induced Systemic Resistance (ISR)



ISR is the core defense pathway
AND we know the specific defense compounds

TS201-treated roots produce **1000x more methyl anthranilate** than untreated control roots



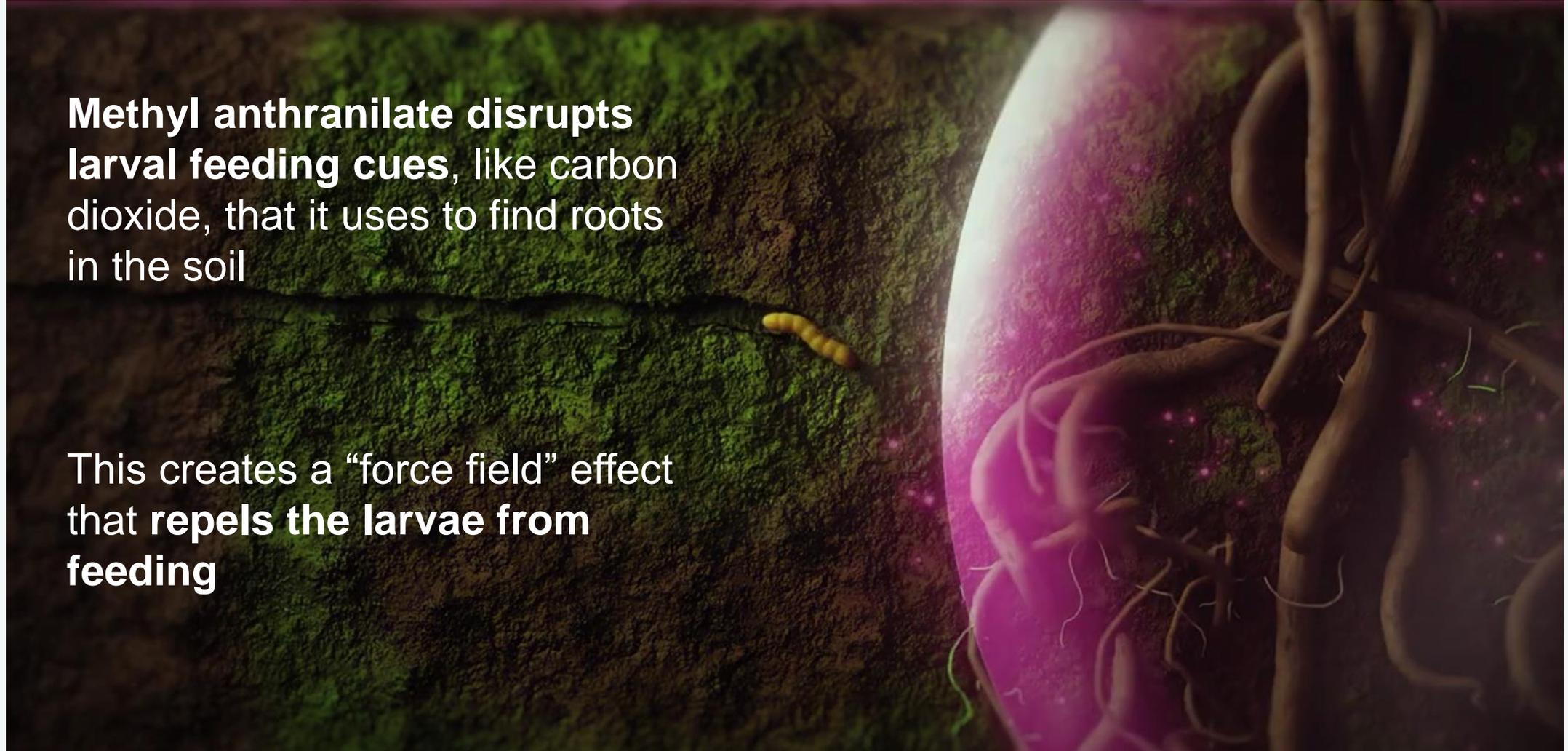


TS201 Repels Larval Feeding



Methyl anthranilate disrupts larval feeding cues, like carbon dioxide, that it uses to find roots in the soil

This creates a “force field” effect that **repels the larvae from feeding**





TS201 Is Also Effective on Other Crops and Pests Due to MOA



- Methyl anthranilate is a known corn rootworm larvae repellent
 - Effects on other pests too

- Manuscript describing these results is under peer review



CORN PEST
Corn Rootworm
Corn Wireworm
Fall Armyworm
Root Knot Nematode



SOYBEAN PEST
Root Knot Nematode
Soybean Looper
Stink Bug

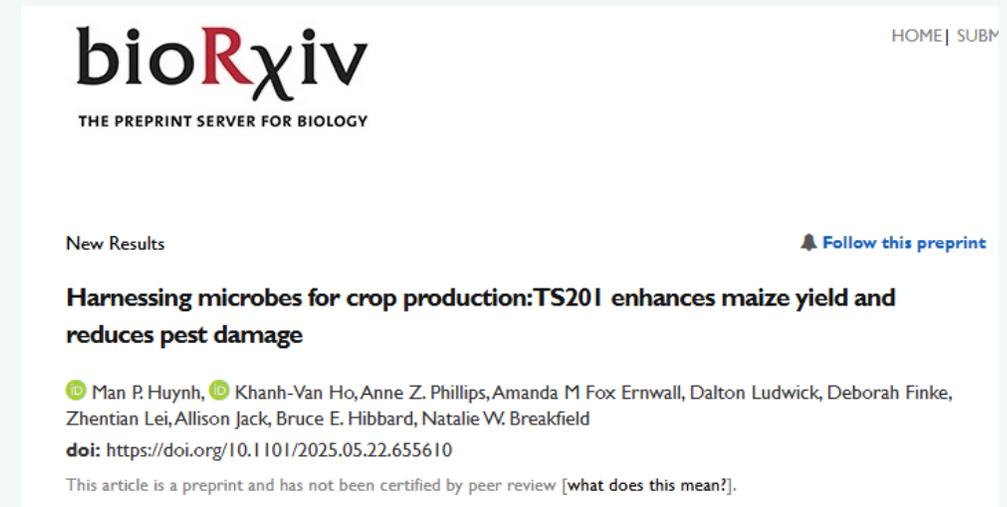


RICE PEST
Water Weevil



COTTON PEST
Root Knot Nematode
Thrips

- *Pending state registrations*



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Harnessing microbes for crop production: TS201 enhances maize yield and reduces pest damage

Man P. Huynh, Khanh-Van Ho, Anne Z. Phillips, Amanda M Fox Ernwall, Dalton Ludwick, Deborah Finke, Zhentian Lei, Allison Jack, Bruce E. Hibbard, Natalie W. Breakfield
doi: <https://doi.org/10.1101/2025.05.22.655610>

This article is a preprint and has not been certified by peer review [what does this mean?].



How TS201 Innovation Benefits the Grower

Yield increases and ROI regardless of insect pressure



Products	Crop	Corn Rootworm Pressure	Performance	Control	Years Trialed	# Trials
TS201	Corn	Yes	+3.5 bu/A (+220 kg/ha)	Untreated	2016-2022	22 small plots
					Limited to 10A total/year	
Terrasym 450 (biostimulant)	Corn	N/A	+4.9 bu/A (+308 kg/ha)	Grower Standard	2020-2024	227*
TS201 + Terrasym 450	Corn	Yes and No	+5.6 bu/A (+352 kg/ha)	Grower Standard	2023-2024	81*

**Commercial scale trialing (10 acres or greater)*

- Most growers decided to add TS201 to our biostimulant as part of IPM strategy
- Average ROI is $\geq 3x$ regardless of insect pressure
- TS201 adoption has increased from **370k acres** in 2024 to **1.2M acres** in 2025



TS201 Take-Home Points



- NewLeaf is the **leader of PPFM technology**
- Our **TS201 technology helps the plant defend itself** from corn rootworm in multiple ways while delivering **return on investment** for growers
 - We **confirmed the volatiles** produced
 - We are **expanding** our 2026 **TS201 label** for new crops and pest combinations
- We continue to bring **science-led, data-backed** and **performance-driven** solutions to the market to address grower challenges
- Visit **newleafsym.com** to learn more

