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

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ABIM

# NewLeaf Symbiotics - Global Leader of PPFM Technology and Solutions

- 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 bioinsectide** 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*

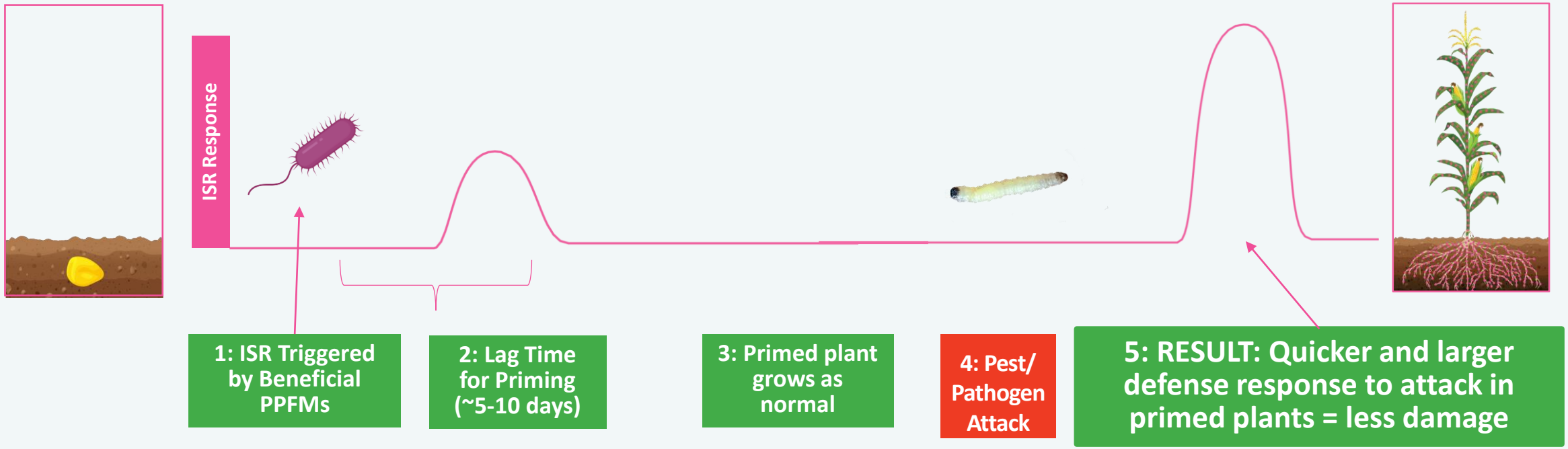
# Why Is TS201 Innovative?

- **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**

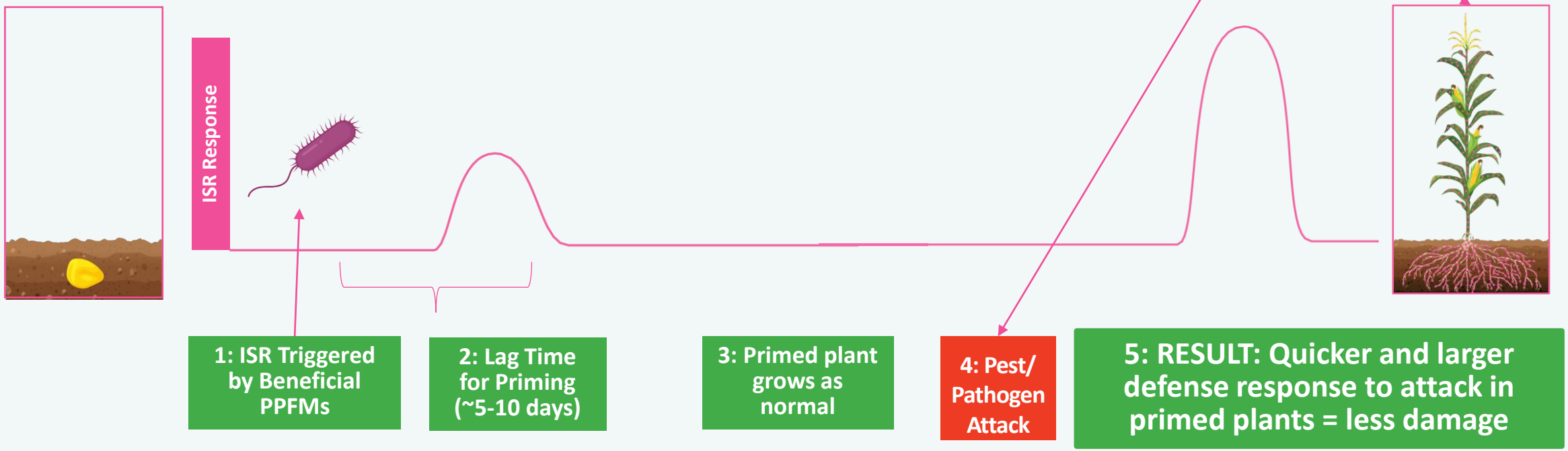


# Mode of Action (MOA) Innovation: Induced Systemic Resistance (ISR)

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**

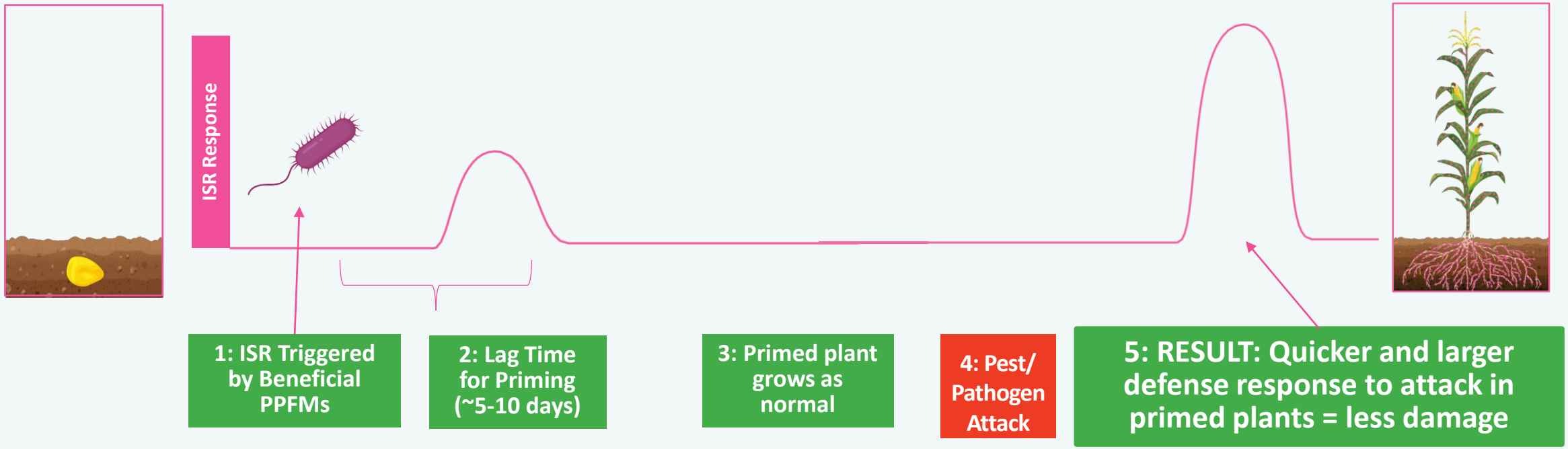


# Mode of Action (MOA) Innovation: Induced Systemic Resistance (ISR)

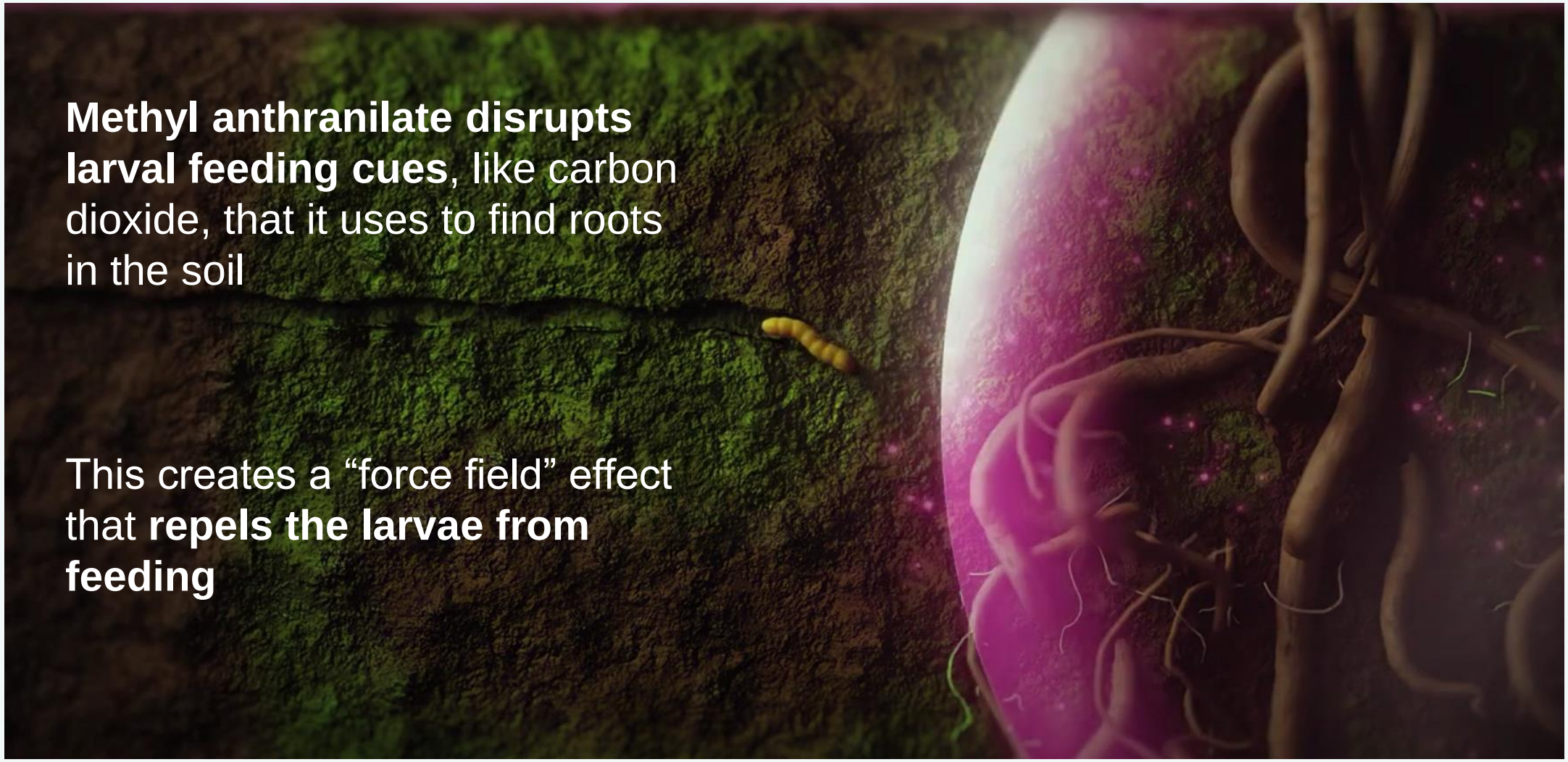
**ISR is the core defense pathway**

**AND we know the specific defense compounds**

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



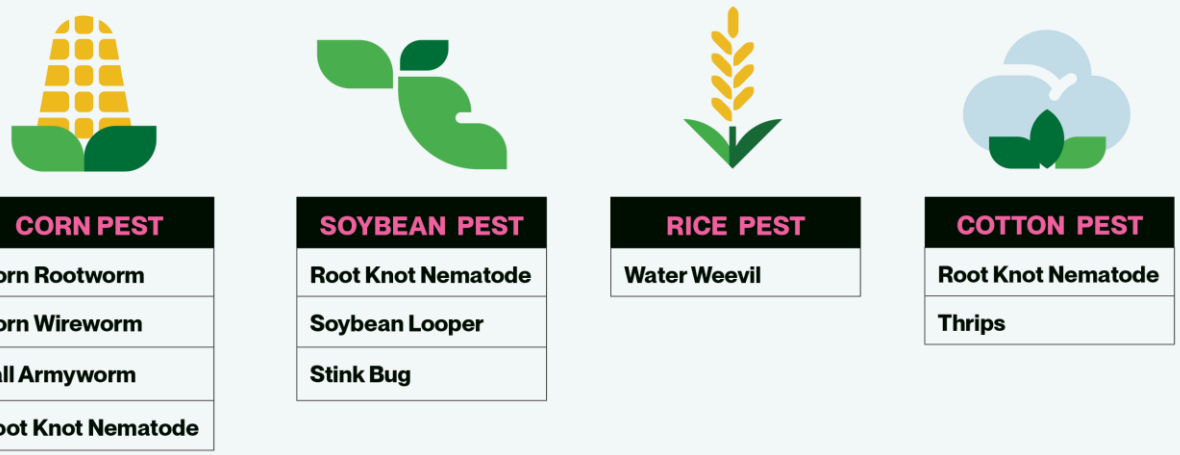
# TS201 Repels Larval Feeding



# 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

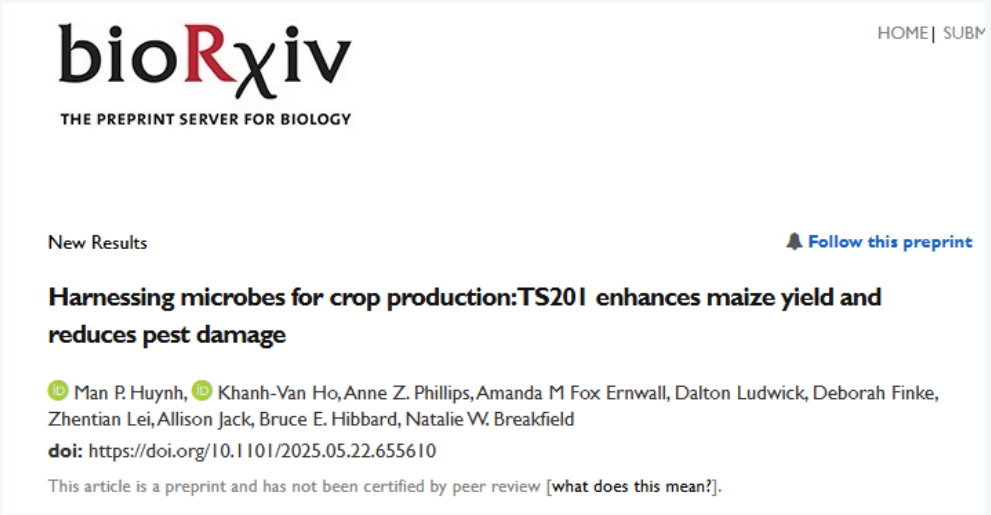


| CORN PEST |
| --- |
| Corn Rootworm |
| Corn Wireworm |
| Fall Armyworm |
| Root Knot Nematode |

| SOYBEAN PEST |
| --- |
| Root Knot Nematode |
| Soybean Looper |
| Stink Bug |

| RICE PEST |
| --- |
| Water Weevil |

| COTTON PEST |
| --- |
| Root Knot Nematode |
| Thrips |




- *Pending state registrations*

# 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 ≥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