

Use Case: Identifying Tillage Tool Impact on Emergence and Yield with AGMRI

Key Highlights

Imagery-Driven

Diagnosis: AGMRI imagery revealed a cross-hatch checkered pattern caused by aggressive tillage—something not visible during normal field operations.

Quantifiable Impact:

Yield forecast and stress layers showed approximately **10 bu/ac yield loss**, clearly connecting emergence issues to tillage settings.

Actionable Change:

Adjustments to tillage tool settings will be made ahead of the next crop season, enabling the growers to prevent the issue from recurring and improve productivity.

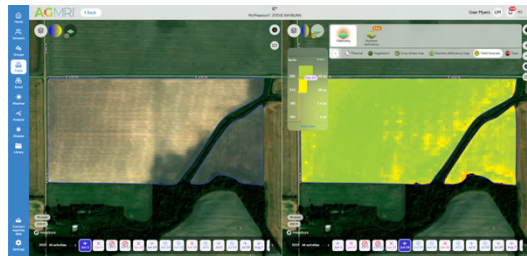
Background:

A multi-generational farming operation, managed by two brothers in Indiana, grows corn and soybeans, and follows a proven management approach built on years of experience. They recognize the importance of staying competitive and take a thoughtful, selective approach to adopting new practices when the benefits are clear.

In this situation, one brother was responsible for operating the vertical tillage (VT) tool early in the spring. Due to heavy weed pressure, he adjusted the disk angle to a more aggressive setting to chop residue more effectively. However, he did not reset the tool when moving on to other fields, assuming the same setup would work across the operation. This oversight led to unintended soil effects that became visible later in the season.

Challenge:

During a planning session, we discussed how **AGMRI imagery and full-farm data** could highlight operational inefficiencies and support better management decisions. We selected a few fields and focused on **equipment management**, since the farm had been using the same machinery and practices for years without modification.



Shortly after planting, **AGMRI imagery revealed a distinct cross-hatch pattern** across multiple fields. This suggested overlapping tillage passes at different angles. After reviewing their tillage practices, we confirmed that all corn acres

had been worked with the same VT tool. By analyzing the imagery, we identified the **angle of tillage**, measured the swath width, and concluded that the pattern originated from the aggressively set VT tool.

The aggressive angle caused what we call a checkered pattern as a result of a “**smearing effect**”—the disk collected soil and residue until it built up, then released it, dragging the soil rather than tilling properly. This created **compacted zones**, which appeared as dark red areas on **NDVI imagery during emergence**, indicating potential poor crop vigor or smaller plants.



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Solution:

Using **AGMRI emergence imagery (early June)** and **yield forecast layers (late June)**, we correlated the checkered pattern to **uneven emergence** and **potential yield drag** in the affected areas.



By overlaying crop stress layers with yield forecasts, we estimated an average impact of approximately **10 bushels per acre** in the affected zones. The clear visual correlation between tillage patterns, emergence, and yield potential helped the growers understand the root cause and consider management practice adjustments going forward.

Results:

The growers were surprised at how clearly the imagery exposed the impact of their tillage settings. They recognized the need to adjust their practices and planned to **run the VT tool in a less aggressive setting** during future tillage passes.

Because the issue was identified ahead of the next **fall and spring tillage seasons**, they can make changes proactively. This insight is expected to **improve emergence and plant health**, ultimately supporting higher yield potential and better ROI in future growing seasons.

