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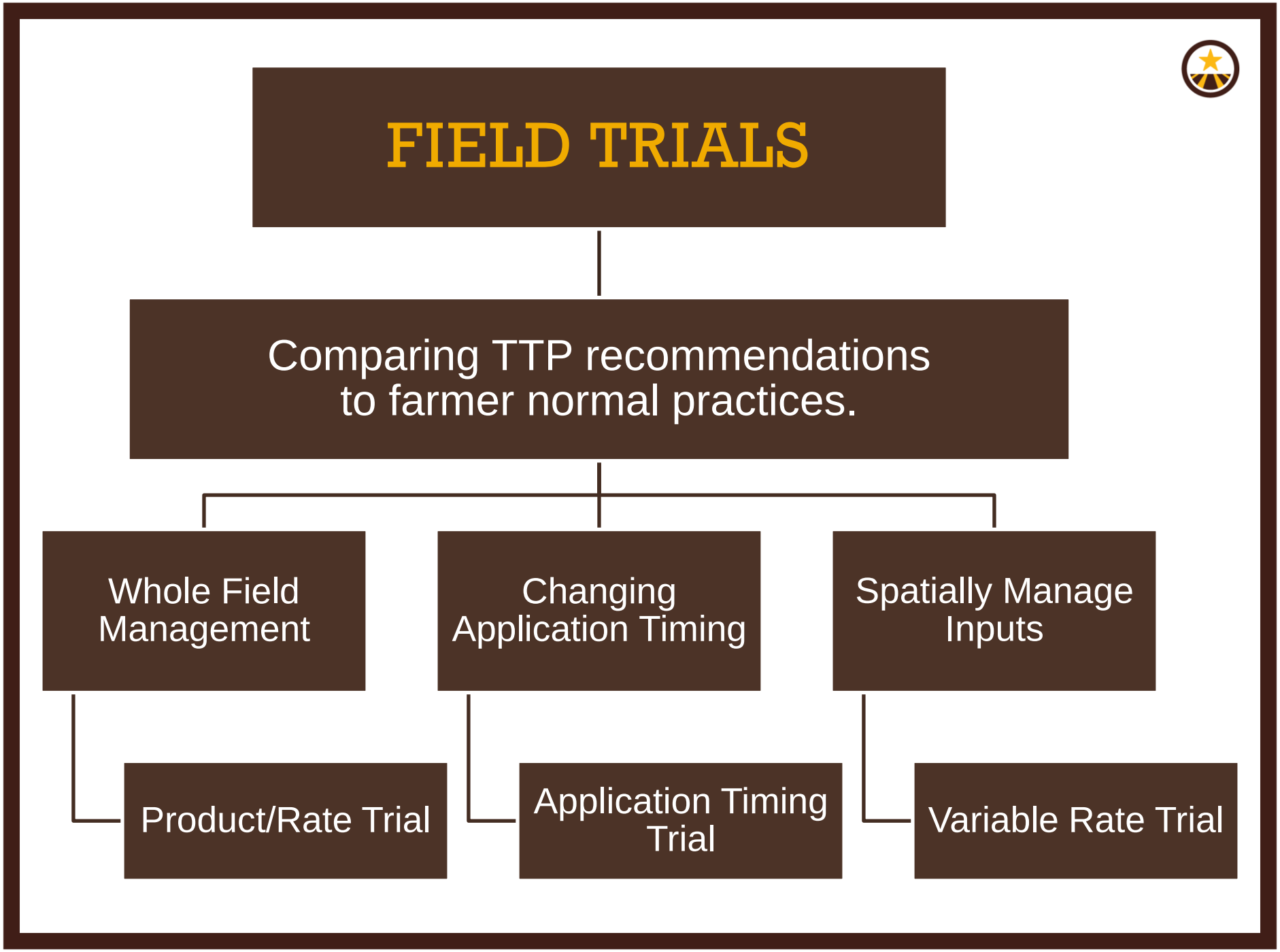
Protocol for conducting production-scale field trials on nutrient use efficiency tools


FIELD TRIALS
Comparing TTP recommendations to farmer normal practices.
Whole Field Management
Changing Application Timing
Spatially Manage Inputs
Product/Rate Trial
Application Timing Trial
Variable Rate Trial

Data required per trial:

- Location (lat/long preferred)
- Previous crop
- Tillage
- Rainfall (when/amount)
- Tile drainage in plot area
- N applied (timing, rate, form, placement)
- Soil (type, texture, organic matter, pH)
- Temperature (when/ value)
- Yield (from calibrated yield monitor)
- Other events impacting plot results

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Product/RATE TRIALS

Protocol for RATE trials (no variable rate application capability)

The minimum requirement is two rates of N applied in strips across the field(more complete information would be gained from 4 rates). The N should be applied at the same time with the same placement and in the same form. Replicate 4 times across the field or 3 as a minimum.

- One rate should be the farmer's typical rate of N.
- The second would be the tool recommended rate.
- Tool recommended rate should be from 25# to 50#/acre different from the farmer's typical rate.

Example:

- If Farmer rate & tool rate both = ~180 lbs N/acre, THEN
- Change farmer rate OR tool rate to ~130 lbs N/acre.
- A four rate trial is achieved by adding and subtracting 50 lbs N/acre from the farmer's normal rate.

Example:

- Tool rate = 150 lbs N/acre, farmer rate = 180 lbs N/acre, farmer+50 = 230 lbs N/acre, farmer-50 = 130 lbs N/acre

Protocol for RATE trials (no VRT capability) – continued

- Fields with long, straight rows are best for strip trials. A length of 1/4 to 1/2 mile is preferred, but shorter row lengths are acceptable. If possible, choose an area in the field with less soils and slope variability.
- The width of treatment strips should match the width of the combine or a multiple of the width of the combine. Harvest should be completed by making at least one pass through a strip without mixing grain from two treatment strips.
- To increase accuracy of the results, especially where the rows are shorter than 1/4 mile, the treatment strips should be two passes wide. The yield monitor should be set for loads or regions to identify the different strips.
- If a trial will be placed in a field for two years in a row, or every other year in a corn soybean rotation, the trial areas from the different years should not overlap.
- Nitrogen applicators should be calibrated before applying treatments.
- Yield monitors on combines should be calibrated before harvesting the strips.

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SYSTEM TRIALS

Protocol for SYSTEM trials
(variable rate nitrogen applicators and/or high clearance applicators)

Each rate will be replicated a minimum of three times with four replications preferred

At minimum two treatments are required. (Figure 3.)

- Treatment one should be the N application as the farmer would have normally applied nitrogen in strips across the field. (This can be with the normal variable rate methods of timing and placement.)
- Treatment two should be to implement adjustments in timing and/or placement practices as recommended by the tool.

More complete information would be gained from 4 rates. (Figure 4.)

- Treatment three should be the average of the farmer normal rate plus 50 additional pounds of nitrogen keeping the rate consistent the entire length of the field (no VRT-N). *(+50 lbs./ac to the season total)*
- Treatment four should be the average of the farmer normal rate minus 50 pounds of nitrogen keeping the rate consistent the entire length of the field (no VRT-N). *(-50 lbs./ac to the season total)*

Timing Consistency

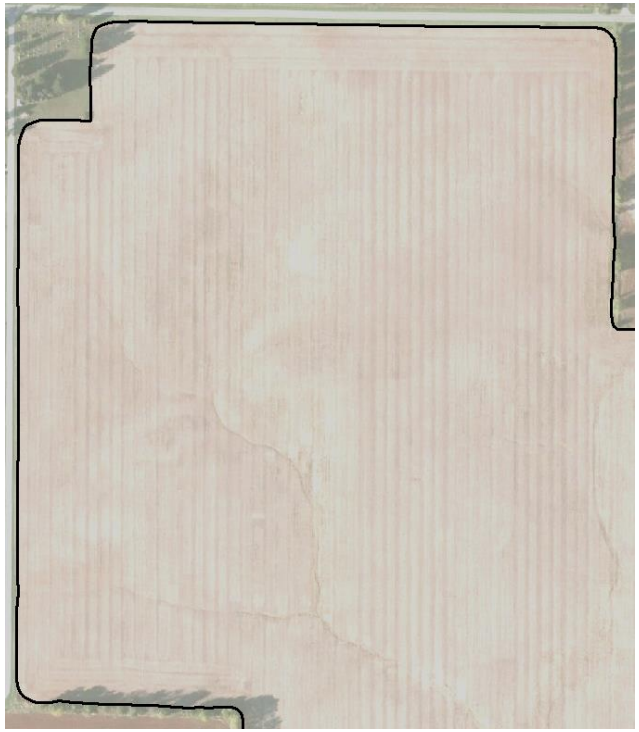
If the farmer would normally have used the same timings of nitrogen application as the tool recommends then plot treatments will only potentially differ based on nitrogen rate. Use the farmer's normal rates in the control strips and use the tool recommended rates in comparison strips (Figure 3.). Additional value would be gained by adding and subtracting fifty pounds of nitrogen per acre from the farmer's average rate (Figure 4.). Assuming these applications would include a side-dress and late application the additional treatments (3 & 4 above) should be derived by adding and deducting twenty five pounds of nitrogen from both the side-dress and late applications respectively. If the farmer chooses to use variable rate seeding as recommended by the tool or some other source then the prescription should be followed across the entire plot area. The prescription should be made available for analysis purposes.

Product/Rate Trial

Plot with 2 treatments
(No VRT App Equip.)

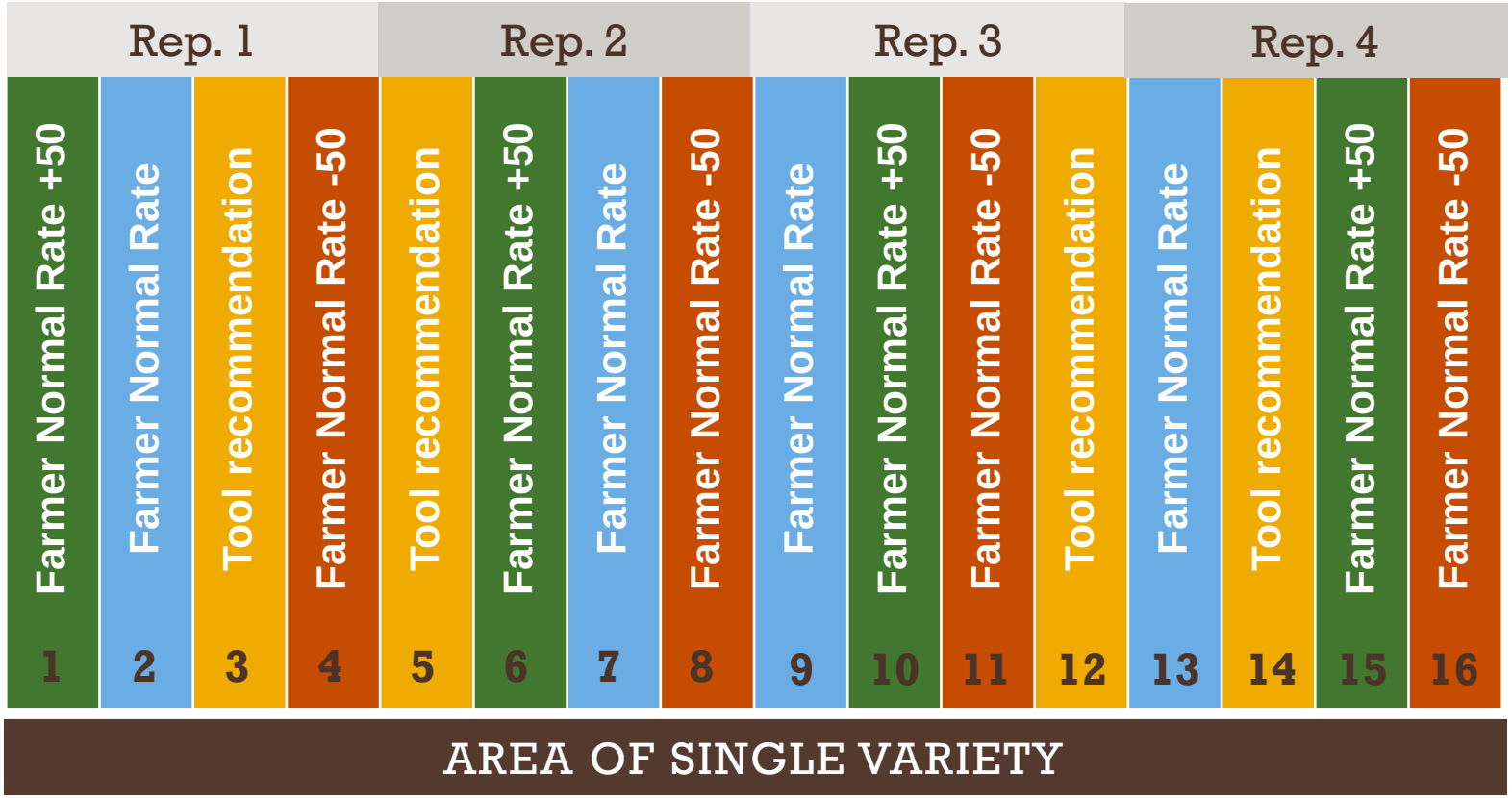
Rep. 1		Rep. 2		Rep. 3		Rep. 4	
Farmer Normal Rate	Tool Recommendation	Tool Recommendation	Farmer Normal Rate	Farmer Normal Rate	Tool Recommendation	Farmer Normal Rate	Tool Recommendation
1	2	3	4	5	6	7	8

AREA OF SINGLE VARIETY



Application Timing Trial

Plot with 4 treatments
(No VRT App Equip.)



Geographic Zones for Assessment

4 factors will be used to develop zones

For more information:

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