



NutrientStar

Data clearinghouse for fertilizer management tools and products

NutrientStar has developed a data ranking system to assess the quality and quantity of data available on a fertilizer management product. NutrientStar will share the ranking system with all companies making product claims. These categories would be used to rank data companies share with NutrientStar, and data we discover through literature reviews or through searching for publicly available company data.

A draft of a ranking system is described below. We invite comments and feedback on the data ranking system from interested parties.

Please submit comments on these draft criteria to kchapman@edf.org by December 21, 2018.

Draft Ranking System

Note:

This ranking system is used to rank data generated from both field-scale and small-plots.

Field-scale trials maximum points = 100

Small-plot trials maximum points = 75

Draft definition of field-scale trials:

Trials that use field-scale equipment - individual plot sizes typically equal to the width of one or two passes of the harvest equipment and 200 feet or more in length.

Draft definition of small-plot trials:

Trials that do not use field-scale equipment - individual plot sizes typically equal to 20 X 60 feet or less.

I. Data Quality Categories

Category 1: Data statement by company - max points = 10

- A. Company states in writing that the data provided to NutrientStar have not been cherry-picked or manipulated to create results favorable to the company = 10 points
- B. No such statement = 0 points.

Category 2: Yield information - max points = 10

- A. Individual strip or plot yields provided = 10 points
- B. Mean and standard deviation by treatment provided = 5 points
- C. Only mean yields by treatment provided = 2 points

Category 3: Where published* max points = 10

- A. Greater than 50% of data published in peer-reviewed scientific journal = 10 points
- B. Greater than 50% of data published in grey literature = 6 points

C. Data published only in NutrientStar = 6 points

*Choose one category only

Category 4: Data protocols - max points = 34

- A. N fertilizer information (12 points total available)
 - i. N rate available = 6 points
 - ii. N rate not available = 0 points
 - iii. N form available = 2 points
 - iv. N form not available = 0 points
 - v. N timing available = 2 points
 - vi. N timing not available = 0 points
 - vii. N placement available = 2 points
 - viii. N placement not available = 0 points
- B. Replications (8 points available)
 - i. Trials replicated 3 or more times = 8 points (NutrientStar's recommended trial design is available [here](#).)
 - ii. Trials replicated 2 times = 4 points
 - iii. Trials not replicated = 2 points
- C. Randomization of treatments (4 points)
 - i. Treatments randomized = 4 points
- D. Soils and landscape (Instructions for finding the TED in which experiments were conducted are available [here](#)) (4 points available)
 - i. Geolocation of field to 4 decimals or to a tenth of a degree, or the following information is available: slope, dominant soil series, TED number = 4 points
 - ii. Location of nearest town to trial provided = 2 points
 - iii. Geolocation not available or dominant soil series and TED number not available = 0 points
- E. Soil fertility information (2 points)
 - i. Routine soil test information available that is 4 or fewer years old = 2 points
 - ii. Routine soil test information not available or > 4 year old = 0 points
- F. Cultural information (4 points)
 - i. Tillage method provided = 2
 - ii. Planting date available = 1 points
 - iii. Planting date not available = 0 points
 - iv. Harvest date available = 1 points
 - v. Harvest date not available = 0 points

Category 5. Trial management (internal vs external) - max points = 10

- A. Greater than or equal to 50% university or external managed = 10 points
- B. Greater than 50% managed directly by company = 2 points

Category 6. Environmental Data - max points = 6 (link to NOAA website for rainfall and ambient temperature will be provided).

- A. Daily rainfall, irrigation and ambient temperature from 2 weeks before the pre- or in-season N application treatment through harvest = 4 points
- B. Long-term monthly rainfall (from the climate record, 30 years prior) = 2 points
- C. No rainfall available = 0 points

II. Data Quantity Categories

Category 1: Number of trials - max points = 10

- A. Fewer than 10 trials total = 1 point
- B. 10 to 20 trials completed = 2 points
- C. 20 to 30 trials completed = 3 points
- D. 30 to 40 trials completed = 4 points
- E. 40 to 50 trials completed = 6 points
- F. 50 to 60 trials completed = 8 points
- G. Greater than 60 trials completed = 10 points

Category 2: Geographical distribution max points = 10

- A. 1 to 5 TEDs = 2 points
- B. 5 to 10 TEDs = 4 points
- C. 10 to 15 TEDs = 6 points
- D. 15 to 20 TEDs = 8 points
- E. Greater than 20 TEDs = 10 points

Small-plot trials: multiply the raw score by 0.75 to obtain ranking. The rationale for setting small plots at 75% of field-scale trials is because NutrientStar believes field-scale trials are the best method to evaluate fertilizer management products and models that are marketed to farmers.

Notes on small plot trials:

1. Fifty to seventy percent of the recommended application rate from the Land Grant University should be applied because small-plot trials are often completed to measure the efficacy of a product and because these trials often have a greater variance in yield measurements compared with field-scale trials.
2. Randomization of small plot trials is much more important than in field-scale trials due to larger variances in field-scale trials.

TBD: method for ranking results from a mix of small plot and field-scale data. One proposed method would be to do a weighted average based on the number of small-plot trials and field-scale trials. An example of how this could be done is:

- a. Product A has 30 small plots and 15 field-scale trials and a score of 90. Because 67% of the trials are small-plot trials, and because small plots start out 25 points lower than field-scale plots, multiply 25 points times 0.67 ($0.67 \times 25 = 16.75$) and subtract that number of points (16.75) from the score of 90 to obtain the final adjusted score of 73.