Science Societies

Using variety testing data to select soybean varieties: Guidelines for practitioners

March 4, 2026

Photo courtesy of the United Soybean Board. CC BY 2.0.

Soybean variety selection significantly affects farm profitability and requires evaluating performance across diverse environments to distinguish genetic differences from environmental influences. This management guide explains small-plot and large strip-plot trials, presents a data-driven approach for selecting high-yielding stress-resistant varieties, and discusses additional agronomic and seed quality traits that help differentiate varieties.

Earn 1.5 CEUs in Crop Management by reading the article and taking the quiz.

Self-study CEU quiz

Earn 1.5 CEUs in Crop Management by taking the quiz for the article. For your convenience, the quiz is printed below. The CEU can be purchased individually, or you can access as part of your Online Classroom Subscription.

1. What is the primary purpose of university soybean variety testing programs?

a. To determine which company produces the highest seed sales.

b. To provide reliable, unbiased performance data across environments.

c. To promote newly released varieties exclusively.

d. To establish national yield records.

2. What is the benefit of a multilocation, multiyear trial over a multilocation single-year trial?

a. Better yields.

b. Better grain quality.

c. Improved selection accuracy.

d. None of the above.

3. What does a Least Significant Difference (LSD) value represent in variety trial results?

a. The highest yield recorded in the study.

b. The average yield difference between early and late varieties.

c. The variability caused by planting date.

d. The minimum difference required between varieties to be statistically meaningful.

4. When comparing two soybean varieties, if the yield difference between them is smaller than the LSD value, what does this indicate?

a. The higher-yielding variety is clearly superior.

b. The varieties are statistically different.

c. The yield difference may be due to random variation.

d. The trial should be discarded.

5. Selecting varieties that consistently perform well across multiple environments is generally a more reliable strategy than selecting the single highest-yielding entry in one test.

a. True.

b. False.

6. Which of the following is an objective of this article?

a. To describe replicated small-plot trials and unreplicated on-farm large strip-plot demonstrations, including attributes of each type.

b. To recommend best-performing soybean varieties across all U.S. regions.

c. To provide best management recommendations for high-yielding soybeans in Louisianna.

d. To provide seeding rate recommendations.

7. Which of the following is an attribute of small-plot trials?

a. Easier to conduct in many locations, including farmer's growing conditions.

b. Easier to evaluate many varieties.

c. Easier to gain farmer's trust due to local growing conditions.

d. Easier to locate areas of stress and screen for resistance.

8. A variety ranked first in yield at one test location will typically rank first across all locations in a region.

a. True.

b. False.

9. Which of the following traits did the article NOT list as one to be considered when selecting soybean varieties?

a. Plant height uniformity.

b. herbicide resistance.

c. growth habit.

d. seed cost.

10. What is usually the width of the strips in large strip-plot demonstrations?

a. 2 ft.

b. 5 ft.

c. 10 ft.

d. The same as the width of the planting equipment.

11. In replicated small-plot soybean variety trials, randomization and replication are used to reduce the impact of field variability on yield comparisons.

a. True.

b. False.

12. When comparing soybean varieties within a location-year, statistical groupings based on LSD indicate that

a. all varieties differ significantly from each other.

b. varieties sharing the same letter are not statistically different.

c. the highest-yielding variety is always superior.

d. the variety with the lowest CV% is the best performer.

13. Why should caution be exercised when interpreting results with missing data?

a. It can introduce errors in variety selection within locations.

b. It can increase the statistical power of the trial.

c. It can introduce errors in variety selection across locations.

d. Both a and c.

14. In on-farm unreplicated strip-plot demonstrations, it is often observed that there can be significant spatial yield variation within a single variety (Figure 2). What is the main driver of this variability?

a. Genetic variability.

b. In-field nongenetic variability.

c. Different management choices within a strip.

d. Both a and c.

15. In what formats are variety trial datasets typically available?

a. Printed publications.

b. Downloadable online datasheets.

c. Online selection tools.

d. All of the above.

More crop management

Back to issue

Back to home

Rate this article

Text © . The authors. CC BY-NC-ND 4.0. Except where otherwise noted, images are subject to copyright. Any reuse without express permission from the copyright owner is prohibited.