



Interpreting Yield Results - Data Evaluation and Statistical Measurements

Yield trial results offer an opportunity to compare corn and soybean products in a geography similar to one's own farm and can assist growers in selecting quality products for next season. As yield results are examined this fall and winter, keep in mind the following:

Evaluate Multiple Locations

Data from a single plot location near one's farm is only one snapshot of performance, and it may not provide a complete picture of hybrid potential. Hybrids may yield well at one location and poorly at another. Weather, insect pressure, and fertility are just a few variables that can affect hybrid performance across locations. Therefore, evaluation of a hybrid across multiple locations allows the greatest opportunity to get an accurate picture of its performance and consistency. If there is data available, an evaluation of hybrid performance across years is also beneficial.



Evaluate Multiple Scenarios

Field management can also affect hybrid performance. Take a look at the field history. When was the field planted? What was the crop rotation? How much tillage was involved? Was a soil insecticide used? How were weeds controlled? What traits were in the seed and how did they contribute to yield?

Seek Head-to-Head Comparisons

When trying to determine if one hybrid is superior to another, compare the hybrids not just at one plot, but at many. You may find that one product consistently outperforms the other.

In large plots with many entries, it may be tempting to compare two hybrids in the same plot. However, if Hybrid A is entry #3 and Hybrid B is entry #15, it probably would not make sense to compare the two hybrids when they are located so far from each other in the plot. It is better to compare each hybrid to the nearest "check" hybrid. A "check" hybrid or variety is to be used as a reference in comparing the yields of products that are in close proximity to it. The purpose of the "check" is to provide a relative measure of hybrid performance in that general area of the field. When the check is yielding well, you would expect neighboring products to also respond closer to the higher end of their yield potential. Conversely, if a check is

not performing well, the neighboring products would be demonstrating their yield potential within that non-optimal part of the field. Another good practice is to plant and harvest a second replication of the products you are trying to compare.

Statistical Differences

"Statistical differences" signify that the results are unlikely to have occurred by chance and have a high probability of repeating themselves. If yields are not determined to be statistically significant, it indicates that the differences due to seed products are not large enough relative to the experimental variation in the field. Plot results may include an LSD, which stands for least significant difference. This numerical value is usually listed at the bottom of yield tables. Differences among varieties are significant only if they are equal to or greater than the LSD value. For example, if the LSD value is 10, and Variety A yielded 12 bu/A greater than Variety B, then Variety A had a significantly higher yield at that plot location (Figure 1). If the LSD is 10, and Variety C yielded 7 bu/A greater than Variety B, then the varieties are not statistically different in yield at that location (Figure 1).

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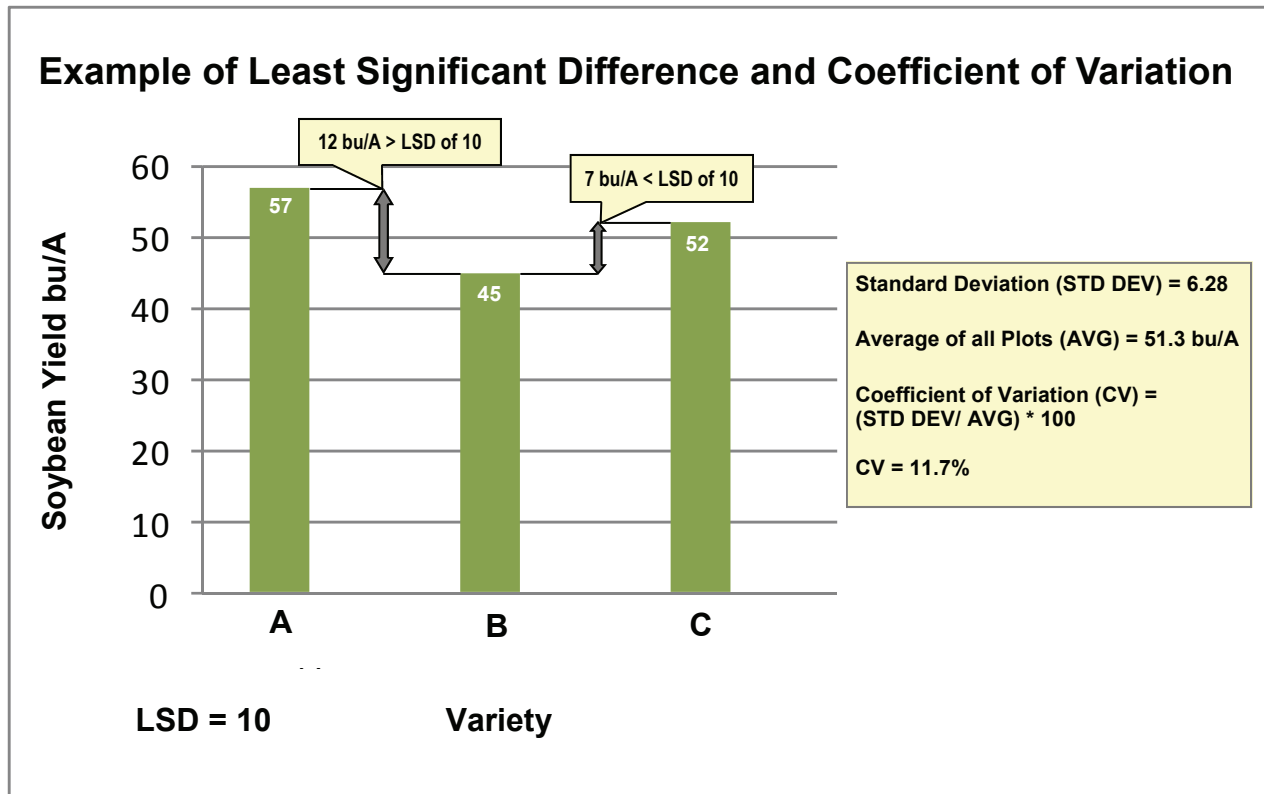


Figure 1. Difference in yield between Variety A and B is 12 bu/A. Since this is greater than the Least Significant Difference of 10, the yield difference is SIGNIFICANT and is NOT likely to be due to experimental variation in the field but genetic differences. Difference in yield between Variety C and B is 7 bu/A. Since this is less than the Least Significant Difference of 10, the yield difference is NOT SIGNIFICANT and IS likely due to experimental variation in the field and not genetic differences. The Coefficient of Variation from this test is 11.7%. A CV \leq 15% is desired and the closer it is to zero the lower the amount of variability in the data.

Additionally, plot results may include a coefficient of variation, or CV. This value refers to the magnitude of experimental variability relative to the mean, usually reported as a percentage (Figure 1). A high CV indicates that there is excessive experimental variability, leading to less precise estimates of yields of seed products. A low CV normally results from a more uniform plot location. In field test results, a CV of 15% or less is desired and the closer the CV is to zero, the higher the quality of data from that test.

Identify Differences not Related to the Seed

Plot results may include differences in yields that can come from variations across a plot test site. Care should be taken to identify how much of the yield variations reported may be attributed to other field factors not related to the seed choices.

In summary, yield trials can provide growers with important information that can help select quality corn and soybean

products for the next season. To obtain quality yield data comparisons, follow the suggestions below:

- **Evaluate Multiple Locations** to help achieve the most accurate look at a hybrid or varietal performance and consistency.
- **Look at Field History.** Management practices such as tillage or weed control may have had an affect on hybrid performance.
- **Seek Head-to-Head Comparisons.**
 - Compare products at multiple locations.
 - Compare each product to the nearest “check” hybrid in close proximity to it.
- **Consider Statistical Differences and Reliability.**
 - Least Significant Difference (LSD) is a value used to determine if plot values are statistically different.
 - Coefficient of Variation (CV) is a value used to determine how reliable a data set may be.

Individual results may vary, and performance may vary from location to location and from year to year. This result may not be an indicator of results you may obtain as local growing, soil and weather conditions may vary. Growers should evaluate data from multiple locations and years whenever possible. **ALWAYS READ AND FOLLOW PESTICIDE LABEL DIRECTIONS.** Technology Development by Monsanto and Design(SM) is a servicemark of Monsanto Technology LLC. All other trademarks are the property of their respective owners. ©2010 Monsanto Company. ABT092410; AMB092910