Interpreting Yield Results and Statistics

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For much of the Midwest, harvest is finally starting to wrap up or is very close to finished. This gives growers time to sit down and start finalizing decisions for the upcoming growing season. Regarding seed decisions, a lot of growers (including myself); spend a lot of time studying plot data to see how hybrids are performing. When looking through multiple plots, this process can be quite a headache due to all the variables that can depict performance. By properly understanding the statistics that go into play, we can gather better conclusions when looking at product performance.

First let's look at a common approach to looking at plots and hybrid performance. It is easy for us to look at plots and pay attention to the one hybrid that took first place. Consistency in hybrids should be noticed when studying plot data and if applicable, looking at multiple years of data. If a hybrid is finding its way towards the top multiple times, then it is probably a hybrid we should take a close look at. Soil types and farming practices should also be considered. Just because a plot may not be outside your back door doesn't mean it isn't practical information for your farm. If the environment and practices are similar, it can also be valuable information. Another way I like to look at information is brand averages. If a plot has 4 different brands in the same trial then taking the average of each brand's products and comparing can be a way to see what the brand offers regarding an entire farm package.

Now let's take it a step further and look at the statistics behind plot data. There are a lot of plots that are published such as University trials, F.I.R.S.T. trials, and third party trials, that use statistical analysis when publishing. This allows us to understand the specific plot better, as well as comparing hybrids to see if there is really a significant difference. This is important because no matter how well a plot is conducted, there will always be some form of natural variability.

One concept to understand is **LSD**, which stands for **Least Significant Difference.** The LSD for plots is generally noted at the bottom of a data set. This statistic is used to separate the effect of variability within a plot set. It is sometimes noted as a hard value (bu/A) or as a percent. When looking at yield data that shows the LSD, when the yield between two entries is equal to or greater than the LSD value, then the hybrid would be

Averages =	264.4
LSD (0.10) =	8.1
LSD (0.25) =	4.3
C.V. =	3.4

considered "significantly different". This means that the difference in yield is real and not due to the variability in the plot. For example, if a plot had an LSD of 12.3 and hybrid A yielded 15 bushel better than hybrid B, then hybrid A is "significantly different". However if hybrid A yielded only 12 bushel better, then there would be no significant difference.

Another statistic to understand is **CV**, which stands for **Coefficient** of **Variation**. The CV is a good way to understand the variability and uniformity of the data. The CV is typically noted as a percentage at the bottom of a data set. When the CV is high, there is a higher level of variation, when the CV is low; there is a low level of variation which means the plot was fairly uniform across the trial. In test plots, a CV of less than 15% is desired. The closer we get to 0%, the higher the quality of information we are looking at.

In the example shown, any hybrid's yield that is within 8.1 bushels of a chosen hybrid can be considered "equal", or not significantly different, from the chosen hybrid.

When looking at plot data, it can sometimes be hard to come up with solid conclusions especially when looking at multiple plots. Understanding the statistics and how they can come into play can help you when putting together your seed orders for the upcoming year.

Sources and additional information:

1. https://cropwatch.unl.edu/varietytest/statanalysis
2. http://corn.agronomy.wisc.edu/Management/L016.aspx
3. https://www.agry.purdue.edu/ext/corn/news/timeless/onfarmresearch.pdf
4. http://www.firstseedtests.com/testing-procedures-corn-grain.shtml