Introduction to Variety Tests

The purpose of this publication is to provide performance data of the many soybean varieties offered for sale in Virginia. These data should be of benefit to producers and agribusinesses in making selections of varieties for their use. Not all varieties offered for sale in Virginia are included in these tests. This in no way implies that the varieties not included are inferior in any way, but only that they have not been tested. The private varieties that have been evaluated in these tests were submitted for testing by commercial seed companies.

Variety evaluations were conducted under full-season and double-crop conditions at Blackstone, Chesapeake, Orange, Painter, Suffolk, and/or Warsaw. All double-crop tests were no-till planted following small grains. Due to the number of entries, it was necessary to separate the varieties by maturity in all locations.

This was a very good year for Virginia soybean producers. Rainfall was 50 percent to 90 percent higher than normal and resulted in very high yields. In most cases, variability was low, giving very good results. Still, some locations experienced problems. The Orange double-crop test yield was very low. The MG 3 and early MG 4 tests were also variable. Although the test results are included, only the late MG 4 and MG 5 tests should be used to select varieties. The Warsaw double-crop test was dropped due to deer damage.

Interpreting the Results

Tables 1a through 1h contain yield summaries over all locations. Past analyses of test data indicated that variety selection should be made from multiple years and sites. More locations result in more reliable information. However, average yields over locations should not be used to select the highest yielding variety unless all varieties are tested in all locations because data will be skewed to those varieties that are tested in the highest yielding locations. Therefore, relative yield is a better method of comparing varieties over locations. Relative yield is calculated by dividing the yield of a variety by the average yield of all varieties within the same maturity group at that location. A variety with a relative yield of 105 was 5 percent above the average of all varieties at that location. Relative yield is not an actual yield, but a value that is relative to all other yield values at that location. Varieties are ranked by relative yield in descending order.

Tables 2 through 9 contain detailed yield and other information from each location. The highest average yielding varieties are listed first in each table. It is not statistically correct to compare varieties from different maturity groups. However, producers should select two to three of the highest yielding varieties from each maturity group adapted to their region in order to spread out harvesting time and yield risks associated with timing of summer rainfall patterns. Because of year-to-year variability in variety performance, data for varieties with less than three locations or three years of testing should be considered preliminary. The average performance of a variety over multiple environments is more reliable than its performance in one test. Multiple-year data can be obtained from the authors. Many of the new varieties, which do not have two-year averages, are excellent and will probably earn a share of the Virginia soybean acreage. Other traits also are shown in the tables (maturity, lodging, height, seed quality, purple stain, and seed size) because each producer emphasizes certain traits or a combination of traits when selecting varieties for his/her farm. After examining these results, the producer may want to plant limited quantities of several new better-performing varieties to observe how they perform on his/her farm and under his/her management conditions.

An LSD (least significant difference) was calculated within maturity groups at each location. The LSD is a statistical test calculated at the 10 percent probability level to aid the reader in comparing the yield differences among varieties within a particular maturity group. When two entries are compared and the difference between them is greater than the calculated LSD value, the varieties are considered to be significantly different. The “NS” designation indicates that there were no significant differences for yield among the varieties within that maturity group. The coefficient of variation (CV) is a relative measure of variation and is an indicator of the degree of precision associated with the test. For soybean variety evaluation tests, CV values less than 15 percent indicate that the precision of the test was good in distinguishing differences between varieties. R² is also a measure of variability. It gives information regarding significant differences. The higher the R², the more likely that there are significant differences between varieties. When yields are low, R² can be a better indicator of degree of precision associated with the test than CV values.