

# Evaluation of Soybean Germplasm Under Pennsylvania Conditions

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In 2016, Penn State soybean evaluation trials were conducted at three locations: Blair, Centre, and Lancaster Counties.

On May 16<sup>th</sup>, on a privately owned farm near Martinsburg, in Blair County, we planted 25 entries in the Roundup Ready – Early (MG 3.0 and earlier) trial and 27 entries in the Roundup Ready - Late (MG 3.1 and later) trial. These trials were no-tilled into a field where the previous crop was corn. The farm where these trials were conducted had highly productive soils, with a history of dairy manure applications. On October 31<sup>st</sup>, we harvested both the early and the late MG trials. The early MG trial averaged 45.6 bushels per acre and the late MG trial averaged a nearly identical 45.4 bushels per acre. These yields were approximately 18% higher than the 2015 yields in the same trials. Early season dry weather caused the plant heights to be much shorter than normal, but timely rains during August allowed the plants to produce grain yields higher than expected considering the short plant heights.

On May 19<sup>th</sup>, at the Russell E. Larson Agricultural Research Center in Centre County, we planted 29 entries in the Roundup Ready – Early (MG 3.0 and earlier) trial, 32 entries in the Roundup Ready - Late (MG 3.1 and later) trial, and 12 entries in the non-Roundup trial. On October 12<sup>th</sup>, we harvested the Early MG trial and averaged 66.8 bushels per acre. On October 15<sup>th</sup>, we harvested the Late MG trial and the non-RR trial and averaged 66.1 and 71.2 bushels per acre respectively. Yields in the Roundup Ready Early and Late MG trials were up approximately 15% compared to 2015 and the 2016 non-RR trial yielded over 20% higher than the 2015 non-RR trial.

Early season wet weather contributed to a delay in planting the Lancaster County trials. On June 1<sup>st</sup>, at the Southeast Agricultural Research and Extension Center in Lancaster County, we planted 21 entries in the Full Season Roundup Ready – Early (MG 3.3 and earlier) trial, 42 varieties in the Full Season Roundup Ready - Late (MG 3.4 and later) trial, and 18 entries in the non-RR trial. On July 7<sup>th</sup>, we planted 17 entries in the double-crop trial. All 3 full season trials were planted in tilled ground and the double-crop trial was no-tilled into barley stubble. On October 6<sup>th</sup> and 7<sup>th</sup>, we harvested the full season trials, which yielded as follows: Early MG (51.5 bushels per acre); Late MG (49.0 bushels per acre); Non-RR (67.1 bushels per acre). Dry weather during August appeared to have been the limiting factor for yield, but the field where the non-RR trial was conducted had much deeper soils and appeared to be much less affected by dry conditions than the field where the RR trials were conducted. On November 17<sup>th</sup>, we harvested the double-crop trial, which averaged 45.6 bushels per acre. Yields in both full season trials were down considerably when compared to 2015. This is especially true for the Late MG trial, which yielded over 35% lower in 2016. The non-RR trial had similar yields when compared to 2015. The double-crop trial yielded approximately 11% less in 2016 than 2015.

As we have seen in many seasons in the past, the weather conditions were considerably different among the different trial locations. In 2016 the Centre and Blair County sites were affected by dry weather during the first half of the summer. This was especially true for Blair County, which experienced the most severe drought stress of all 3 trial locations. By the end of July, Centre County and to a lesser degree Blair County, received some timely rainfalls which helped considerably during pod fill. The Lancaster County trials experienced nearly the opposite weather as the Blair and Centre County trials. Lancaster was wetter than normal early in the season and then dried up later in the summer, which appeared to reduce yields considerably.

Results of these trials were posted on the Department of Plant Science website at:

<http://extension.psu.edu/plants/crops/grains/soybeans/soybean-variety-tests>

In 2017, we plan to expand our use of check treatments in the non RR test to better assess the potential of the Liberty Link entries in the test. This year they appeared to yield well but we had limited comparisons with RR or Extendimax soybeans. We will also be listing the traits of the lines in the test next year to facilitate comparisons between different trait types. In the future we are considering combining the RR and non RR test to allow us to compare performance all in one test.

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