SEED QUALITY RATINGS FROM THE SMART VARIETY DEMONSTRATIONS

Soybean seed that were harvested from varieties that were entered in the SMART On-Farm Variety Demonstrations in seven Miss. Counties (Bolivar, Calhoun, Leflore, Pontotoc, Humphreys, Sharkey, and Sunflower) in 2018 were rated for quality by Midsouth Grain Inspection Services, an official USDA-designated grain inspection agency. The ratings in the below table (provided by Dr. Trent Irby, SMART Director) represent percentage damaged kernels in a sample sent to their laboratory. A description of the procedure for rating "Damaged Kernels Total" shown in the below table follows.

- A 125-gram sample is sieved to remove foreign matter (FM) from the sample. The FM is weighed.
- Damaged kernels (mold damage, immature seed, etc.) are removed from the sample and weighed. ((damaged kernels divided by (sample weight minus FM weight)) x 100) = percentage of damaged kernels.
- Weight of stink bug-damaged kernels divided by ((sample weight minus FM weight) x 100) = percentage of stink bug-damaged kernels.
- The percentages of damaged kernels plus stink bug-damaged kernels are added to obtain Damaged Kernels Total (DKT), which are the values shown in the below table.

The planting dates of the seven tests ranged from May 2 to May 23, 2018. Tests in Calhoun and Pontotoc Counties were not irrigated, whereas tests in the other five counties were irrigated. Maturity group of the varieties in the tests ranged from 4.3 to 4.9.

Harvest was delayed in Bolivar and Calhoun Counties to 173 and 181 days after planting (DAP), respectively. Harvest dates at the other five sites were 147 to 159 DAP, and these harvest dates would have been about 21 days after R8 or maturity. Thus, there was some delay in harvest beyond harvest maturity (usually 8-10 days after R8) at all of the locations.

The data in the below table indicate the following points.

- Calhoun County, where planting date (May 23) and harvest date (Nov. 20) were the latest in the calendar year, had by far the greatest amount of damaged kernels in the sample. Harvest at this site did not occur until 181 DAP, and this delay would certainly have resulted in considerable field weathering of mature soybean seed.
- All tests that were conducted on clay-textured soils (Humphreys, Sharkey, and Sunflower Counties) were planted in early May and harvested in early Oct. Average damage ratings of harvested seed from these Delta sites ranged from 2.6 to 4.8.
- There were no significant differences in damaged kernels among the varieties in these tests. Therefore, no particular variety or varieties in these tests stand out as being either more or less susceptible to conditions that result in mature seed damage. Thus, all of the varieties in these studies responded similarly to conditions that would have occurred to promote damage to mature soybean seed in these tests. In other words, data from this one year give no indication that there is an inherent quality in any soybean variety that makes it less likely to incur damage to its mature seed if conditions to promote this damage occur in a given year.

- The data in the below table are from one year, so they should be considered preliminary. Also, weather variables between R8 and harvest were not recorded, so it is not known what weather conditions occurred that might have promoted seed damage from weathering after maturity at these locations.
- Most grain elevators apply a discount when seed damage (heat damage, frost damage, immature seed, mold damage, insect damage, etc.) exceeds 2%. Damage discounts typically increase as the amount of damage in the sample increases. Click here to see how this would have affected seed with the damage levels shown in the below table, especially in years such as 2017 and 2018 when seed damaging weather conditions were widespread and persistent in the Midsouth. Also, it is likely that the amount of damage in the Calhoun County samples and possible that the amount of damage in the Leflore County samples would have resulted in rejection at the elevator.
- Even though there was no statistical difference in the amount of damaged seed from the various varieties shown in the table, the above-cited seed damage limit for no dockage imposed by elevators would likely have resulted in a significant difference in the net return per bushel of seed of the varieties in these tests based on the damage ratings for each variety.

Further research/evaluation of damage to harvested soybean seed of all varieties will need to focus on when did damage-promoting conditions occur in relation to an individual variety's maturity date–e.g., does delayed harvest increase the likelihood of damage to mature seed of any or all varieties? In other words, how much effect does harvest delay beyond seed maturity of any variety have on seed damage occurrence if weather conditions that promote this damage potential should occur between maturity and harvest?

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Soybean Seed Quality Results for MG IV Varieties from the 2018 On-Farm Variety Demonstration

		Damaged Kernels Total (DKT) Score by Individual County Location									
		Locations with Mixed to Light Soil Texture					Locations with Clay Soil Texture				
		Bolivar	Calhoun	Leflore	Pontotoc		Humphreys	Sharkey	Sunflower		
Brand	Variety	5-3-18[1] 10-23-18[2]	5-23-18 11-20-18	5-3-18 10-5-18	5-10-18 10-4-18	DKT[3] AVG	5-11-18 10-8-18	5-10-18 10-9-18	5-2-18 10-8-18	DKT[4] AVG	Overall DKT[5] AVG
AgriGold	G4440RX	4.1	52.8	13.1	6.5	19.1	1.8	2.5	2.9	2.4	12.0
AGS	GS48X18	5.8	37.1	14.1	3.2	15.1	1.5	6.7	6.3	4.8	10.7
Armor	47-D17	4.8	55.7	44.9	5.5	27.7	2.1	5.6	7.7	5.1	18.0
Armor	48-D24	7.9	48.0	12.0	2.5	17.6	2.8	6.5	4.8	4.7	12.1
Asgrow	AG45X8	4.7	45.7	35.5	4.0	22.5	4.1	3.2	4.5	3.9	14.5
Asgrow	AG46X6	8.0	42.1	23.6	8.0	20.4	3.6	3.8	7.3	4.9	13.8
Delta Grow	DG 48X45 D	6.3	33.1	16.7	2.4	14.6	2.7	4.8	5.8	4.4	10.3
Dyna-Gro	S45XS66	-	-	-	-	-	2.3	3.4	5.2	3.6	-
Dyna-Gro	S48XT56	6.5	30.6	12.9	2.6	13.2	-	-	-	-	-
Local Seed	LS4677X	5.8	30.8	17.4	6.8	15.2	2.9	4.9	5.6	4.5	10.6
NK	S43-V3X	5.2	32.1	26.0	11.2	18.6	1.0	2.3	6.8	3.4	12.1
NK	S45-K5X	3.7	26.2	25.2	5.7	15.2	-	-	-	-	-
NK	S48-R2X	-	-	-	-	-	2.7	3.0	2.2	2.6	-
Pioneer	P48A32X	5.9	27.9	42.4	4.7	20.2	3.5	5.6	3.1	4.0	13.3
Pioneer	P48A60X	5.4	24.4	10.2	6.4	11.6	3.1	-	3.2	3.2	7.5
Progeny	P 4816 RX	10.6	28.3	16.9	4.1	15.0	3.1	-	5.8	4.5	10.2
Progeny	P 4851 RX	5.3	24.0	28.7	3.7	15.4	1.7	-	5.5	3.7	10.2
Terral	REV 4857X	7.2	24.7	13.9	1.8	11.9	2.1	2.0	3.7	2.6	7.9
Terral	REV 4927X	6.2	32.3	25.0	3.1	16.7	2.9	2.3	2.0	2.4	10.5

[1]Planting Date

[2]Harvest Date

[3]DKT scores were analyzed in SAS 9.4, average scores were found to not be significantly different across the varieties that were evaluated ($\alpha = 0.2307$).

[4]DKT scores were analyzed in SAS 9.4, average scores were found to not be significantly different across the varieties that were evaluated ($\alpha = 0.2566$).

[5]DKT scores were analyzed in SAS 9.4, average scores were found to not be significantly different across the varieties that were evaluated ($\alpha = 0.2208$).

DKT scores were determined by Mid-South Grain Inspection Services, which is an official USDA designated grain inspector agency.