



Mississippi Corn Promotion Board 2015 Progress Report

Project Title: Fertility, Hybrid Selection, and Input Strategies to Optimize Yield and Early Harvest

PI: Brien Henry, Jac Varco, Erick Larson, Normie Buehring and Bobby Golden

Department: Plant and Soil Sciences

Project Summary (Issue/Response)

Heat and drought limit corn productivity in MS; the last two wet and cool years with exceptional corn yield remind us of this. One way to avoid the negative consequences of summer heat and drought this is to plant earlier so that a plant's environment is more like what we experienced last summer. We have generated (2) years of data at multiple sites that suggests that if done correctly, planting early is a good thing for producers to consider. However, planting earlier may expose corn to additional risks like freeze and flood, which were both issues this past growing season (2014). Another way to avoid the heat and drought is to select a shorter season corn hybrid. In other words, get the crop in *and out* faster. For instance, most commercial hybrids in MS are in the 115 to 120 RM range. DKC62-08 is a 112 day RM hybrid that was cited in multiple categories as a winner in the NCGA yield competition; in fact it resulted in a 503 bu/A champion yield in Georgia (2014 NCGA). Conventional wisdom suggests that yield has the potential to increase with increasing maturity, but if a limiting factor to yield is high temperatures, drought, or both, we may be better off going with a shorter season hybrid? DKC62-08's performance as a 112 RM hybrid suggests that yield may not be as tightly linked to maturity as we have always thought. We propose a trial to evaluate the highest yielding commercially available hybrids in the 100-110 RM group. We also propose a trial to examine starter fertilizer, Zn application, and the extremes of RM (100 vs 120) to determine exactly how early can we push our harvest window forward in MS with a combination of these factors.



Project Results/Outcomes

2015 was a challenging growing season for us as it was for most corn growers throughout the state. Although wet weather kept us out of the field early, we still planted both the fertility trial (MSU (2) and Verona) and the early hybrid trial (MSU and Brooksville) at two separate locations. Because we were physically unable to plant until early May, the benefits of starter, zinc, and hormones were minimal. Our seedlings emerged fully within 4 days after planting. Soil temperature was well above 60 degrees by the time we planted so all treatments grew vigorously essentially negating any potential treatment effects. We have these trials set up for next year and optimizing early season plant growth is critical. It will be tempting for producers to limit spending on starter fertilizer, but it is difficult to "save yourself rich". Planting late as noted in our other trials limits yield potential and for corn production budgets to work, corn needs to be planted in a timely fashion, or early and we need data like these to determine the effect of these fertilizer and hormone amendments on early planted corn. We also need to further evaluate how early RM hybrids perform in our environment. We had a nice year of data in 2015 even though we didn't get planted until May. These data suggest that the most recently released early RM hybrids tolerate the heat stress in our environment with one of our entries yielding comparably to our standard full season hybrids.

Project Results

2015 Early RM (Relative Maturity) hybrid yield data at MSU and Brooksville, MS.

MSU 2015 Planted 9 May

TRT	HYB	RM	% Moist	Bu/A @ 15.5
1	DKC 49-29	99 RM	14.0	166
2	DKC 50-84	100 RM	13.5	149
3	DKC 53-78	103 RM	14.2	187
4	DKC 54-38	104 RM	15.0	156
5	DKC 55-93	105 RM	17.0	182
6	DKC 60-63	110 RM	16.3	159
7	DKC 62-08	112 RM	19.2	204
8	DKC 67-57	116 RM	18.5	204
9	DKC 69-29	119 RM	19.2	198
10	PHB 106	106 RM	16.3	181
11	PHB 1197	111 RM	18.6	178
12	PHB 1637	116 RM	21.0	199
13	PHB 2089	120 RM	22.8	204
14	2V717	111 RM	17.1	193
15	2C799	113 RM	21.0	181
16	2J794	115 RM	20.6	160
17	AGR-N68	111 RM	17.4	186
18	AGR-N79	115/116 RM	20.9	191

Brooksville 2015 Planted 5 May

TRT	HYB	RM	% Moist	Bu/A 15.5%
1	DKC 49-29	99 RM	12.7	133
2	DKC 50-84	100 RM	12.6	142
3	DKC 53-78	103 RM	13	149
4	DKC 54-38	104 RM	12.8	141
5	DKC 55-93	105 RM	12.9	142
6	DKC 60-63	110 RM	13	149
7	DKC 62-08	112 RM	13.8	157
8	DKC 67-57	116 RM	15.5	139
9	DKC 69-29	119 RM	12.3	163
10	PHB 106	106 RM	12.9	134
11	PHB 1197	111 RM	13.8	134
12	PHB 1637	116 RM	13.4	134
13	PHB 2089	120 RM	14.1	135
14	2V717	111 RM	13.1	106
15	2C799	113 RM	13.7	146
16	2J794	115 RM	12.7	118
17	AGR-N68	111 RM	13.2	142
18	AGR-N79	115/116 RM	13.7	110

Project Results



Figure 1. Graduate students supported by MCPB research presenting our 2015 Early hybrid research plots to producers and agriculture professionals at the Black Prairie Research Station in Brooksville, MS.

Project Impacts/Benefits

There were no obvious treatment effects in responses to fertilizer or hormone application so data were pooled by hybrid and by location. This was likely because we planted late and the plants grew rapidly as soon as they emerged; moisture and heat units were non-limiting. The short season hybrid performed well at MSU but the full season hybrid was 18 bu better at Verona. The short season hybrid was 5% drier at harvest than the full season at MSU and they were about the same at Verona. This suggests that planted late, under hot conditions the short season might provide a 1 week earlier harvest, but this might be larger if our planting date were as scheduled two months earlier at the beginning of March.

A local producer who observed our research plots at a field day and at the MSU research station is planting two 40 acre production scale fields nearby to evaluate the early in, early out concept on a large scale. Pioneer has also come to us with additional early hybrids to evaluate in this manner as well as planting date and density trials that incorporate this early germplasm. Another potential benefit is getting to market earlier and capturing a premium.

Project Deliverables

MS ASA Grenada, MS Nov. 4, 2015 (Invited)

Foliar zinc application, starter fertilizer and hormones to assist corn maturity and yield; and wild hog pressure on MS corn. **W. Brien Henry**, H. Foster, B. Strickland, and J. Tegt.

MS ASA Agronomy Field Day Black Belt Experiment Station, Brooksville, MS July 2015 *Invited* Graduate Students (Hock and **Whittenton**) presented our data to a large group of producers and industry representatives.