

Western Illinois University

2012 Organic Corn Hybrid Trial

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Introduction

In 2012, a corn hybrid trial was conducted at the Allison Organic Research Farm in southern Warren County, IL. The two hybrids compared (Prairie Hybrids 3081 and American Organics 4G52) had similar relative maturities - 104 days and 103 days, respectively.

Methods:

The field (3-2) used for the hybrid trial grew a crop of cereal rye in 2011. On 4/10/12, a moderate stand of medium red clover (~10") and volunteer cereal rye (~16") was mowed to a height of ~6". On 5/14, a Howard Rotavator was used to terminate all vegetation in the field. On 5/29, the field was field cultivated twice in preparation for planting. The next day (5/30), a 12 row 1760 John Deere vacuum planter was used to plant 30,000 seeds/a. The row cleaners were set aggressively to address the high residue field condition and the planting depth was set to 2.5" to place the seed in moisture. The hybrid plots were 1,200' x 20' (8 x 30" rows) and were replicated 4 times. Nearly perfectly straight rows were achieved through the use of RTK guidance on the planter tractor.

Stand counts of 6 per plot (24 per hybrid) were taken on 6/13/12, with each sample area representing 1/1000 acre. The average corn height was 2.5" at the time of the counts.

Post plant field operations included rotary hoeing on 6/5/12 and row crop cultivation on 6/22/12 and 7/3/12. Initial weed pressure was high but excellent weed control was achieved through a combination of hand hoeing of skips and soil thrown into the row by a carefully set IH 153 cultivator.

Harvesting took place on 10/31/12 with a John Deere 9510 combine taking 4 rows up and 4 rows back for each plot. Weights of each plot were obtained by a weigh wagon.

Results:

Prairie Hybrids 3081 out-yielded American Organics 4G52 by 17.9 bu/a and also had a higher stand count (+8000 plants/a). Both parameters were statistically significantly different.

Table 1: Hybrid stand at early growing stage and yield

Hybrid	Corn Stand on 6/13/12	Average Yield (Bu/ac)
Prairie Hybrids 3081	23,042/ac	81.6 ^a
American Organics 4G52	15,042/ac	63.7 ^b
	LSD (alpha 0.05) = 2,123	LSD (alpha 0.05) = 12.7

Discussion:

It seems likely that the stands and yields of both hybrids were negatively affected by the high residue field conditions at the time of planting. Many farmers advise waiting at least 2 weeks after incorporating cover crops to avoid potentially deleterious effects on plant vigor and stand. This hybrid trial was planted 16 days after terminating the preceding vegetation, but no rain occurred during this interval and as a result very little decomposition of the clover and rye residues had occurred prior to planting. Most un-emerged corn seeds, exhumed during an inspection of the poor stands, appeared to be damaged by fungi, wire worms or both. A neighboring corn field with much less surface residue (radishes planted on 30" rows in fall 2011) did not have these same issues and yielded about twice as much as the lower yielding hybrid in this trial.

Severe drought conditions (~ 20% of normal precipitation during June and July) clearly also negatively impacted both hybrids. The American Organics hybrid with the lower population grew taller, appeared darker green in color and produced larger ears but this additional vigor was not sufficient to compensate for the poor stand.

Due to the extremely challenging environmental/biological conditions during this study, it is not really possible to interpret how these hybrids might have fared under more normal conditions. We can speculate that the large difference in stand establishment was hybrid dependant, but it may have been related to a seed treatment applied prior to delivery of the seed. The Prairie Hybrids 3081 seed was pre-coated with a liquid carbon based humic acid product from SoilBiotics called X-Cell ST. The American Organic seed was considerably larger than the Prairie Hybrids seed - large rounds vs. small flats, respectively. The larger seed may have been more attractive to pests and/or required more moisture for germination. Germination for both hybrids, according to the seed tags, reveal that both are similar. Prairie Hybrids is listed at 97% and American Organics is listed at 95% germination, which rules out the possibility that one hybrid had a significantly better tested germination.

Conclusion:

Despite very challenging conditions, both flex ear hybrids compensated impressively for diminished stand and lack of soil moisture. Targeted evaluation in the lab and/or field of the impact of X-Cell ST on seedling emergence seems warranted. Seed treatments, like X-Cell ST, may have an important role to play in reducing the risks associated with high residue planting conditions and/or extended drought. Relationships between seed size/shape and pest/pathogen damage or low moisture germination may also warrant investigation. Lastly, targeted evaluation of methods and/or timing of cover crop termination prior to corn planting may be of value.

See photo on next page of the two hybrids side by side!



American Organics is the taller corn on the left. Prairie Hybrids is the corn on right displaying some sun scalded leaves.