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Field Corn Variety Trial Results

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Table 1 shows the results of the 2018 UCCE Delta field corn variety trial, located on Tyler Island. Three replicate blocks of fourteen varieties were planted on May 9th by air planter. The fourteen varieties included 12 varieties submitted by seed companies and two submitted by the grower. All varieties were glyphosate tolerant. Each plot consisted of four 30-inch beds on an average row length of 1166 feet. Seed was planted approximately two inches deep and six inches apart down the row. The soil is a Rindge mucky silt loam with approximately 20 percent organic matter in the top 15 inches of soil. The Rindge series is a mucky peat soil down to about 60 inches, and approximately 55,600 acres in the Delta are described by the Rindge classification. The previous crop in the field was corn. Subsurface irrigation by “spud ditch” was employed three times. Anhydrous ammonia was applied pre-plant (110 units N/acre), and 8-24-6 with ½ percent of zinc was knifed in at planting (additional 32 units N/acre). Weed control was by cultivation and glyphosate herbicide program, and Zeal miticide was applied. The field was harvested on October 19th.

Stand counts were made approximately two weeks after planting. The stand was assessed in the center two rows of each four-row plot, counting the plants along a 10-foot length. Bloom was assessed over the week of July 16th. While planting occurred on the same day as in 2017, the days to bloom was 68 in 2018, averaged across varieties, compared to 65 in 2017. This equates to an approximate accumulation of 1230 growing degree days (GDD) in both years. In general, the temperatures were lower in 2018 compared to 2017. Over the course of the season, there were four days above 100°F, compared to a total of 14 days over 100°F during the 2017 season. (Temperature data is from the neighboring Staten Island CIMIS station, www.cimis.water.ca.gov.)

We monitored disease incidence and plant lodging in late September. Disease incidence, particularly Fusarium ear rot, was higher in 2018 compared to the two previous years. A sign of Fusarium ear rot is white fungal mycelium around the kernels. The disease is usually introduced to the ears by corn earworm or by thrips that travel down the corn silks at pollination. Incidence may be reduced in varieties with longer husks that prevent insect infestations. Planting earlier in the season may also reduce incidence, as the crop may reach pollination before insect pests are prevalent. Seed company representatives have indicated that Fusarium ear rot incidence was high in other parts of the state as well.

The table presents mean values for the three replicates. The statistical method used to compare the means is called the Tukey’s range test. Varieties were considered statistically different if their P value was less than 0.05, or 5 percent. What this means is that when differences between

varieties exist, we are 95% certain that the two varieties are actually different; the results are not due to random chance. Differences between varieties are indicated by different letters following the mean. For example, a variety that has only the letter “a” after the mean yield value is different from a variety that is followed by only the letter “b”, but it is **not** different from a variety whose mean value is followed by both letters (“ab”). Similarly, a variety whose mean yield is followed by the letters “ab” is not different from a variety whose mean yield is followed by the letters “bc”. Eleven varieties have a letter “a” following their mean yield, which means that those eleven varieties all performed similarly in the trial. In other words, based on this research, we cannot attribute numerical differences to varietal differences. The variety that had the lowest yield in the trial also had the lowest stand count. This may have been the result of the planter settings. Seed inventory records indicate that a standard bag of this variety weighed 54 pounds for 80,000 seeds; whereas, bags of other varieties weighed 39 to 44 pounds for 80,000 seeds. This larger-sized seed may not have dropped consistently from the planter in order to achieve the desired plant stand. Growers should contact the seed company with further questions.

Across varieties, there were also statistical differences in stand count, days to bloom, Fusarium ear rot, head smut, ear height, grain moisture, and bushel weight. The CV, or coefficient of variation, is the standard deviation divided by the mean, or a measure of variability in relation to the mean. For the diseases, the variability among the three replicates was very high.

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Table 1. 2018 UCCE Delta field corn variety trial
By: Michelle Leinfelder-Miles, UCCE farm advisor

Entry Name	Company Name	Stand Count* (Plants/A)	Days to Bloom*	Fusarium Ear Rot* (%)	Head Smut* (%)	Common Smut (%)	Plants Lodged (%)	Ear Height* (in)	Moisture (%)	Bushel Wt. (lbs/bu)	Yield‡ (lbs/acre)
SX 5543VT2P	Balietto Seeds	34267 a	68 ab	9 bcd	0 bc	0	0	55 cde	16.1 ab	61.2 abcd	15652 a
INT 6533VT2PRO	Integra	31363 ab	67 b	7 bcd	2 abc	0	0	56 cde	15.5 abc	60.9 abcde	15488 ab
ES 7514VT2P	Eureka Seeds	33106 ab	68 ab	9 bcd	0 c	0	0	53 e	15.8 ab	61.5 ab	15413 ab
LG 5643VT2RIB	LG Seeds	34848 a	68 ab	21 ab	1 abc	0	0	56 cde	14.9 bcd	59.7 e	15295 ab
DKC 62-08	Grower entry	33396 a	69 ab	3 de	2 abc	0	0	62 ab	14.8 bcd	60.4 bcde	15018 abc
CP 5678VT2P	Croplan	34267 a	69 a	5 cde	1 abc	0	0	52 e	15.7 abc	61.1 abcde	14740 abc
A 646-12STXRIB	Agrigold	31944 ab	69 ab	4 cde	3 abc	2	0	57 bcde	16.5 a	61.5 ab	14730 abc
DKC 67-44RIB	DeKalb	34558 a	68 ab	8 bcd	3 abc	0	0	59 abc	14.5 cd	61.4 abc	14637 abc
LG64C30TRC	LG Seeds	32815 ab	68 ab	2 e	4 abc	0	1	63 a	15.0 bcd	61.5 ab	14055 abc
LG 5701	Grower entry	32815 ab	69 a	14 bc	2 abc	0	0	54 de	16.1 ab	60.4 bcde	14001 abc
CP 5335VT2P	Croplan	33977 a	69 a	3 de	7 a	1	0	54 de	15.2 abc	60.7 abcde	13821 abc
INT 6400SS	Integra	33977 a	68 ab	7 bcde	0 c	0	0	62 a	13.9 de	59.7 de	13678 bcd
A 648-46VT2PRO	Agrigold	33106 ab	69 a	8 bcd	4 ab	0	0	59 abcd	15.1 bcd	61.9 a	13248 cd
DKC 62-20RIB†	DeKalb	28459 b	67 ab	41 a	3 abc	0	0	56 cde	13.0 e	59.9 cde	11909 d
Average		33064	68	10	2	0	0	57	15	60.8	14406
Coefficient of Variation (%)		3	1	40	53	-	-	2	2	0.5	4
Significant variety effect (P value)		0.0024	0.0039	<0.0001	0.0010	N/A	N/A	<0.0001	<0.0001	<0.0001	<0.0001

Results for each variety are expressed as the average across three replications.

* Data were transformed for analysis. Arithmetic means are presented.

‡ Yield adjusted to 15% moisture.

† Larger seed size and planter settings may have caused lower stand and yield. Contact company representative for more information.