2019 OHIO ORGANIC CORN PERFORMANCE TEST

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The purpose of the Ohio Organic Corn Performance Test (OCPT) is to evaluate certified organic corn hybrids for grain yield and other important agronomic characteristics. Results of the test can assist farmers in selecting hybrids best suited to their farming operations and production environments. Corn hybrids differ considerably in yield potential, standability, maturity, and other agronomic characteristics that affect profitable crop production. Hybrid selection should be based on proven performance from multiple test locations and years. The presentation of data does not imply endorsement of any hybrid by The Ohio State University.

EVALUATION PROCEDURES

Seed companies marketing organic corn hybrids in Ohio are invited to enter hybrids in the test. An entry fee is charged to cover expenses. In 2019, companies were permitted to enter an unlimited number of hybrids. The tests were conducted on certified organic fields in Apple Creek and Wooster (Fry and West Badger Farms) and intensively managed for nutrients and weed control. Each hybrid entry was evaluated using four replications per site in a randomized complete block design. Hybrids were planted either in an early or full season maturity trial based on relative maturity information provided by the companies. The relative maturity of hybrid entries in the early maturity trial was 106 days or earlier; the relative maturity of hybrid entries in the full season trial was 107 days or later. Hybrids were planted with an Almaco Seed Pro 360 vacuum plot planter with SkyTrip GPS. Each plot consisted of four 30-inch rows 25 feet long with the center two rows utilized for data collection. The planting rate was 34,000 seeds/acre with a final stand target of 30K – 31K plants/acre. Composted manure and Chilean Nitrate were applied according to recommended cultural practices for obtaining optimum grain yields. Details concerning the establishment and management of each 2019 test are listed in footnotes below the tables.

MEASUREMENTS AND RECORDS

YIELD. The center two rows of each plot were harvested with a self-propelled two-row picker sheller combine. Yields were reported as bushels of grain per acre (BU/A) at 15.5 percent moisture.

MOISTURE (Harv Mst). A grain moisture determination was made from each plot with an electrical conductance moisture meter. Grain moisture was reported as percent grain moisture.

LODGING (Stk Ldg). The number of broken stalks in each plot was determined just prior to harvest. Only those plants with a stalk broken below the ear were considered stalk lodged. Stalk lodging was reported as a percentage of final plant stand.

FINAL STAND (Final Std). Seed corn producers selected a desired planting rate for each hybrid entered. Differences between the planting rate and the final stand may be attributed to seed quality and/or environmental conditions present. Populations were reported in hundreds (100/A) per acre.

EMERGENCE (Emg). An emergence count was made on each plot after plant emergence. The emergence percentage was computed based on the number of plants and the number of seeds planted and was reported as a percentage of the seeds planted.

TEST WEIGHT (TW). Test weights were recorded in pounds per bushel on grain samples at field moisture. The results are an average of all sites in the regional tests.

LSD 0.10 - Least Significant Differences at probability level 0.10 (LSD 0.10) are reported for yield and other agronomic characteristics. Differences between hybrids are significant only if they are equal to or greater than the LSD value. If a given hybrid out yields another hybrid by as much or more than the LSD value, then we are 90% confident (i.e. the odds are 10:1) that the yield difference is real, with only a 10% probability that the difference is due to chance variation (such as soil variation, etc.). For example, if Hybrid X is 19 Bu/A higher in yield than Hybrid Y, then this difference is statistically significant if the LSD is 19 Bu/A or less. If the LSD is 20 Bu/A or greater, then we are less confident that Hybrid X is really higher yielding than Hybrid Y under conditions of the test. If 'NS' is indicated for a characteristic, then the differences among hybrid entries are not significant at the 10% probability level.

2019 GROWING CONDITIONS

The spring of 2019 was one the wettest on record and resulted in major planting delays throughout Ohio. According to the National Agricultural Statistics Service, only 33% of Ohio's corn was planted by June 2. The Organic OCPT fields were planted May 24th and 25th into fields with optimal soil moisture & temperature for uniform emergence and early growth. Frequent rain events continued into June limiting weed control opportunities. Timely rains in August and September, combined with above average temperatures, were favorable for corn development and extended the grain fill period. Diplodia ear rot was observed in a few hybrids at low levels. Stalk lodging, while present, was generally one or two nodes below the ear node and did not impact harvestability for most hybrids. The Wooster/Apple Creek areas were fortunate and missed most of the weather extremes experienced in other parts of Ohio. Excellent conditions throughout the growing season minimized stress.

RESULTS

Results of the 2019 testing program are presented in Tables 1 and 2. The seed source and table location for hybrids are shown in Table 3. The seed treatments associated with each hybrid entry (information provided by seed companies) are indicated in Table 3. Yields and other agronomic performance characteristics have been averaged across the individual test sites and shown under the SUMMARY heading for each maturity group. Hybrids are listed in alphabetical order by brand.

Despite delayed planting dates, above normal rainfall and warmer than normal conditions during grain fill, Organic OCPT yields exceeded expectations. Averaged across hybrid entries in the early and full season tests, yields were 236 bu/A. Yields at individual test sites, averaged across hybrid entries in the early and full season tests, ranged from 232 bu/A at Apple Creek to 240 bu/A at Wooster.

Confidence in test results increases with the number of years and the number of locations in which the hybrid was tested. Look for consistency in a hybrid's performance across a range of environmental conditions. Yield, standability, grain moisture, and other comparisons should be made between hybrids of similar maturity to determine those best adapted to your farm. Results of the crop performance trials for 2019 are available online at: http://www.oardc.ohio-state.edu/organiccorntrials. Hybrids can be sorted by yield, brand, and other variables online.

Acknowledgments: We thank Kevin and Sue Hennis for proposing the Organic Corn Performance Test and for working with their industry contacts to promote hybrid submission. Thank you to the organic seed industry for their contributions and support of this new endeavor. We are grateful for the assistance provided by Gerald Reid, Organic Farm Manager with field operations, and Ken Scaife and Mike Sword, OSU-OARDC Wooster.

Table 1. Performance of hybrids in the Organic Early Maturity trial. (106 Day RM and Earlier) North Central / Northeast Ohio, 2019.

			Apple Creek						Wooster						Summary					
Brand	Hybrid	RM	Yield	Harv. Mst.	Stk. Ldg.	Final Std.	Emg.	TW	Yield	Harv. Mst.	Stk. Ldg.	Final Std.	Emg.	TW	Yield	Harv. Mst.	Stk. Ldg.	Final Std.	Emg.	TW
			Bu/A	-----%-----		100/A	--%--	Lbs.	Bu/A	-----%-----		100/A	--%--	Lbs.	Bu/A	-----%-----		100/A	--%--	Lbs.
Blue River	48G35	102	244.6	20.1	8	299	89	55	244.4	19.8	1	306	89	56	244.5	20.0	4	303	89	55.8
Blue River	49K70	103	225.5	23.5	1	310	91	55	224.4	22.4	0	325	94	56	224.9	22.9	1	318	93	55.5
Blue River	51T59	103	228.1	20.2	14	303	89	56	237.7	20.7	2	317	93	56	232.9	20.5	8	310	91	56.1
Masters Choice	MC 5250	102	221.5	21.1	1	298	86	57	233.4	20.5	1	314	89	57	227.4	20.8	1	306	87	57.3
Merit	O 3238	98	203.6	19.2	2	319	93	57	208.7	18.7	8	330	96	58	206.2	18.9	5	325	94	57.4
Merit	O 5345	103	219.8	22.1	7	316	93	55	225.7	20.7	6	340	98	56	222.7	21.4	6	328	96	55.0
Merit	O 5454	104	252.0	21.7	3	305	88	54	253.0	20.8	5	317	94	55	252.5	21.2	4	311	91	54.5
Merit	O 6160	106	238.5	22.6	1	319	93	55	235.3	20.8	0	334	98	54	236.9	21.7	0	327	96	54.3
Merit	O 6765	105	220.6	21.3	5	296	88	55	221.3	20.2	2	324	94	55	221.0	20.8	3	310	91	55.3
Prairie Hybrid	PH 2741	102	231.3	19.9	3	312	91	55	254.0	19.5	4	318	93	55	242.7	19.7	4	315	92	55.4
Prairie Hybrid	PH 3081	104	241.2	21.9	3	313	92	59	244.3	21.0	2	324	96	59	242.7	21.4	2	318	94	58.7
Prairie Hybrid	PH 4711	106	243.9	21.4	21	304	92	56	243.9	20.9	34	322	94	56	243.9	21.1	28	313	93	55.9
Viking	O.51-04PGS	104	247.3	19.6	8	320	94	56	246.4	20.0	14	334	96	56	246.8	19.8	11	327	95	55.6
Viking	O.55-02UP	102	200.7	22.2	1	272	80	57	205.0	20.7	0	280	83	57	202.8	21.4	1	276	81	57.2
Viking	O.98-98P	98	213.0	18.5	3	294	87	56	220.7	18.4	2	299	88	56	216.9	18.4	2	297	87	56.4
Welter Seed & Honey	WS 2482	104	250.0	22.4	5	286	86	54	235.7	21.1	1	289	84	55	242.8	21.7	3	287	85	54.4
High			252.0	23.5	21	320	94	59	254.0	22.4	34	340	98	59	252.5	22.9	28	328	96	58.7
Average			230.1	21.1	5	304	90	56	233.4	20.4	5	317	92	56	231.7	20.8	5	311	91	55.9
Low			200.7	18.5	1	272	80	54	205.0	18.4	0	280	83	54	202.8	18.4	0	276	81	54.3
LSD .10			14.6	1.0	10	18	5	1	12.9	0.9	13	14	4	1	9.8	0.8	7	8	3	0.6
CV			5.3	3.9	150	5	5	1	4.7	3.6	214	4	4	1	2.4	2.2	75	2	2	0.6

Soil Type	Canfield Silt Loam	Canfield Silt Loam
Soil Test (pH,P,K) M-3 ppm	7.4, 116, 233	6.9, 45, 153
Previous Crop	Barley / Double Crop Soybean	Red Clover
Planting /Harvest Dates	May 24 / Nov. 15, 2019	May 25 / Nov. 16, 2019
Tillage	Conventional Tillage	Conventional Tillage
Nutrients Applied (N,P,K)	148, 227, 265	129, 191, 222
Cooperator	Gerald Reid / Ken Scaife, OARDC	Gerald Reid / Ken Scaife, OARDC
County	Wayne	Wayne

Table 2. Performance of hybrids in the Organic Full Season trial. (107 Day RM and Later) North Central / Northeast Ohio, 2019.

			Apple Creek						Wooster						Summary					
Brand	Hybrid	RM	Yield	Harv. Mst.	Stk. Ldg.	Final Std.	Emg.	TW	Yield	Harv. Mst.	Stk. Ldg.	Final Std.	Emg.	TW	Yield	Harv. Mst.	Stk. Ldg.	Final Std.	Emg.	TW
			Bu/A	-----%-----		100/A	--%--	Lbs.	Bu/A	-----%-----		100/A	--%--	Lbs.	Bu/A	-----%-----		100/A	--%--	Lbs.
American Organic	AM 2468	107	234.8	22.7	1	315	92	54	248.3	20.8	1	326	95	55	241.6	21.7	1	320	94	54.3
American Organic	AM 2500	109	231.0	23.0	2	278	82	56	257.1	21.9	2	322	95	56	244.0	22.5	2	300	88	56.3
American Organic	AM 2785	111	260.5	24.6	2	324	95	53	257.7	23.0	1	324	96	54	259.1	23.8	2	324	95	53.5
Blue River	57A30	107	230.0	21.9	1	313	92	54	240.5	20.7	1	318	94	55	235.2	21.3	1	315	93	54.6
Blue River	62G22	110	249.5	23.3	1	325	95	54	255.9	20.7	2	334	98	55	252.7	22.0	1	330	97	54.0
Blue River	66G25	112	237.4	24.7	2	320	94	54	255.3	23.3	2	324	95	56	246.4	24.0	2	322	95	55.1
Masters Choice	MC 5790	107	236.9	24.1	0	303	89	54	240.0	23.6	1	313	92	54	238.5	23.8	1	308	91	54.2
Masters Choice	MC 6150	111	229.4	26.5	1	318	93	50	246.2	24.1	3	329	96	51	237.8	25.3	2	323	94	50.8
Masters Choice	MC 6580	115	228.7	28.6	4	305	89	51	235.4	25.9	7	317	93	51	232.1	27.3	6	311	91	50.9
Merit	O 6869	109	228.7	21.9	0	312	91	53	245.7	21.4	1	330	97	53	237.2	21.7	0	321	94	52.9
Merit	O 6969	107	228.6	22.0	3	285	83	54	237.8	21.8	6	318	94	55	233.2	21.9	4	301	88	54.8
Prairie Hybrid	PH 5351	109	210.9	24.3	2	321	95	57	231.6	24.0	2	326	96	57	221.3	24.1	2	324	96	56.9
Prairie Hybrid	PH 7781	112	241.7	25.2	4	321	94	54	245.2	24.2	8	318	93	55	243.4	24.7	6	320	93	54.4
Prairie Hybrid	PH 7861	112	218.0	23.3	2	314	91	57	222.7	22.4	1	326	94	58	220.3	22.9	1	320	93	57.4
Prairie Hybrid	PH 8751	114	256.8	24.3	10	312	91	53	250.1	24.7	6	327	96	52	253.5	24.5	8	319	94	52.7
Viking	O.48-08PGS	108	233.1	24.4	3	308	90	52	252.1	21.9	1	318	94	52	242.6	23.1	2	313	92	52.1
Viking	O.74-10PGS	110	241.7	22.9	1	314	93	55	242.8	22.4	1	318	93	55	242.2	22.6	1	316	93	54.5
Viking	O.82-14PGS	114	220.4	24.2	25	299	88	53	257.6	23.1	4	318	93	54	239.0	23.6	14	309	91	53.4
Welter Seed & Honey	WS 4816	108	239.2	22.1	4	305	90	54	244.7	21.1	3	311	92	56	242.0	21.6	4	308	91	55.0
High			260.5	28.6	25	325	95	57	257.7	25.9	8	334	98	58	259.1	27.3	14	330	97	57.4
Average			234.6	23.9	4	310	91	54	245.6	22.7	3	322	95	54	240.1	23.3	3	316	93	54.1
Low			210.9	21.9	0	278	82	50	222.7	20.7	1	311	92	51	220.3	21.3	0	300	88	50.8
LSD .10			15.5	1.4	8	17	5	1	16.8	1.2	4	NS	NS	1	13.0	1.1	NS	14	NS	0.8
CV			5.6	4.8	175	5	5	1	5.8	4.4	117	3	3	2	3.1	2.7	116	3	3	0.9

Soil Type	Canfield Silt Loam	Canfield Silt Loam
Soil Test (pH,P,K) M-3 ppm	7.4, 116, 233	6.9, 45, 153
Previous Crop	Barley / Double Crop Soybean	Red Clover
Planting /Harvest Dates	May 24 / Nov. 15, 2019	May 25 / Nov. 16, 2019
Tillage	Conventional Tillage	Conventional Tillage
Nutrients Applied (N,P,K)	148, 227, 265	129, 191, 222
Cooperator	Gerald Reid / Ken Scaife, OARDC	Gerald Reid / Ken Scaife, OARDC
County	Wayne	Wayne

TABLE 3. Seed source, table location and seed treatments for hybrids tested in 2019.

Brand	Seed Source	Hybrid No.	Relative Maturity	Table No.	Seed Treatment
AMERICAN ORGANIC	CHAMPAIGN COUNTY SEED CO. 1676 CR 2200 EAST ST. JOSEPH, IL 61873 217-469-2351 american-organic.com	AM 2468	107	2	None
		AM 2500	109	2	None
		AM 2785	111	2	None
BLUE RIVER ORGANIC SEED	BLUE RIVER ORGANIC SEED 2326 230th ST. AMES, IA 50014 800-370-7979 blueriverorganicseed.com	48G35	102	1	1R
		49K70	103	1	1R
		51T59	103	1	1R
		57A30	107	2	1R
		62G22	110	2	1R
		66G25	112	2	1R
MASTERS CHOICE	MASTERS CHOICE, INC. 305 W. VIENNA ST. ANNA, IL 62906 618-697-7031 seedcorn.com	MC 5250	102	1	MicroMaster
		MC 5790	107	2	MicroMaster
		MC 6150	111	2	MicroMaster
		MC 6580	115	2	MicroMaster
MERIT	MERIT SEED P.O. BOX 205 BERLIN, OH 44610 330-893-3196 meritseed.com	O 3238	98	1	Gen II PB
		O 5345	103	1	Gen II PB
		O 5454	104	1	Gen II PB
		O 6765	105	1	Gen II PB
		O 6160	106	1	Gen II PB
		O 6969	107	2	Gen II PB
		O 6869	109	2	Gen II PB
PRAIRIE HYBRID SEEDS	PRAIRIE HYBRID SEEDS 27445 HURD RD. DEER GROVE, IL 61243 815-438-7815 prairiehybrids.com	PH 2741	102	1	1R
		PH 3081	104	1	1R
		PH 4711	106	1	1R
		PH 5351	109	2	1R
		PH 7781	112	2	1R
		PH 7861	112	2	1R
		PH 8751	114	2	1R
VIKING	ALBERT LEA SEED 1414 W. MAIN ST. ALBERT LEA, MN 56007 800-352-5247 alseed.com	O.98-98P	98	1	Soil Biotics 1r + SabrEx
		O.55-02UP	102	1	Soil Biotics 1r + SabrEx
		O.51-04PGS	104	1	Soil Biotics 1r + SabrEx
		O.48-08PGS	108	2	Soil Biotics 1r + SabrEx
		O.74-10PGS	110	2	Soil Biotics 1r + SabrEx
		O.82-14PGS	114	2	Soil Biotics 1r + SabrEx
WELTER SEED & HONEY	WELTER SEED & HONEY 17724 HWY. 136 ONSLOW, IA 52321 800-852-3325 welterseed.com	WS 2482	104	1	None
		WS 4816	108	2	None