

2010

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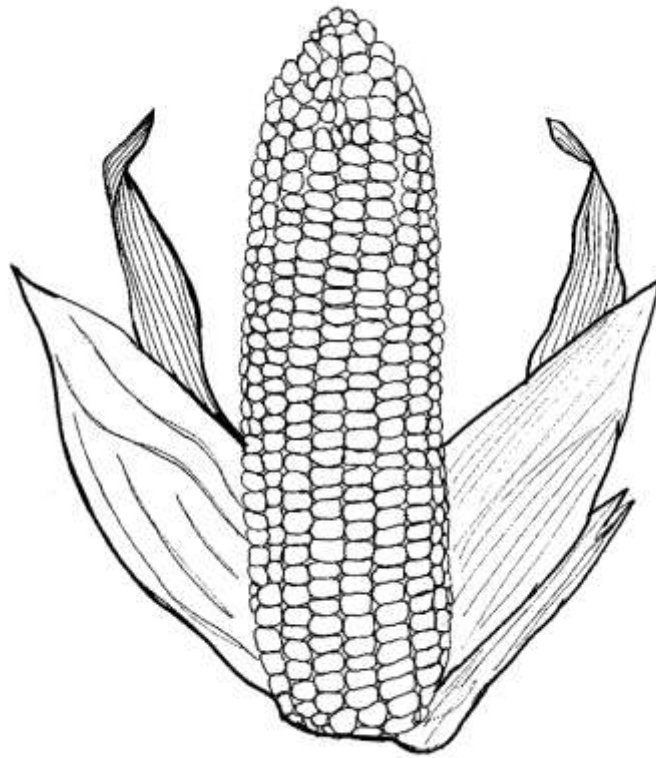
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2010 Vermont Organic Grain Corn Performance Trial Results



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2010 VERMONT ORGANIC GRAIN CORN PERFORMANCE TRIALS

In 2010, the University of Vermont Extension conducted an organic grain corn performance trial in Alburgh, Vermont, in cooperation with Borderview Research Farm and Organic Valley Farmers Advocating for Organics Program (FAFO). The purpose of the program is to provide unbiased performance comparisons of commercially available organic corn varieties. It is important to remember, however, that the data presented is from one replicated research trial in Vermont. Crop performance data from additional tests in different locations and often over several years should be compared before you make conclusions.

TESTING PROCEDURE

In 2010, an organic grain corn performance trial was conducted at Borderview Research Farm in Alburgh, VT. The field was certified organic by Vermont Organic Farmers, LLC. Several seed companies submitted varieties for evaluation. Companies and contact names are listed in Table 1. The organic corn grown in this trial was considered late maturing corn (90-108 RM) based on the Relative Maturities **provided by the companies**. The specific varieties and relative maturities are listed in Table 2.

Table 1. Participating Companies and Local Contact Information

Albert Lea Seed	American Organic	Blue River Organics
1414 West Main Street PO Box 127, Albert Lea, MN 56007 800-352-5247	PO Box 385 Warren, IL 61087 866-471-9465	Boucher Fertilizer 2343 Gore Road Highgate Ctr., VT 802-868-3939
Butterworks Farm	Lakeview Organic Grain	
Jack Lazor 421 Trumpass Rd Westfield, VT 05874 802-744-6855	Klass & Mary-Howell Martens Box 361 Penn Yan, NY 14527 315- 531-1038	

Table 2. Organic corn varieties evaluated in Alburgh, VT.

Company	Variety	RM	Description
Viking Corn, MN	O.6710	98	Hybrid
Viking Corn, MN	E-95	95	Open Pollinated
Viking Corn, MN	O.99-90N	90	Hybrid
American Organic Seed & Grain, IL	C912	91	Hybrid
American Organic Seed & Grain, IL	C714	94	Hybrid
American Organic Seed & Grain, IL	B916	86	Hybrid
American Organic Seed & Grain, IL	rsB716	85	Open Pollinated
American Organic Seed & Grain, IL	rsC710	88-92	Open Pollinated
American Organic Seed & Grain, IL	B915	85	Hybrid
American Organic Seed & Grain, IL	X811	81	Hybrid
Blue River Hybrids, IA	28B19	89	Hybrid
Blue River Hybrids, IA	33N73	92	Hybrid
Blue River Hybrids, IA	14A91	82	Hybrid
Blue River Hybrids, IA	18R91	84	Hybrid
Blue River Hybrids, IA	25A16	87	Hybrid
Butterworks Farm, VT	Early Riser	80	Open Pollinated
Lakeview Organic Grain, NY	Wapsie Valley	90	Open Pollinated
Lakeview Organic Grain, NY	VK13	90	Open Pollinated

Seasonal precipitation and temperature was recorded at weather stations close in proximity to Alburgh (Table 3). This season started off with above average temperatures in April and May. The summer months presented ideal growing conditions for corn. Total accumulated Growing Degree Days (GDD) for corn growth in Alburgh was 2880 which was 449 GDD above the 30 year average.

Table 3. Temperature, precipitation, and growing degree days summary – Alburgh, VT.

	April	May	June	July	August	September	October
Average Temperature (F)	49.3	59.6	66.0	74.1	70.4	64.0	50.6
Departure from Normal	5.80	3.00	0.20	3.00	1.40	3.60	1.80
Precipitation (inches)	2.76	0.92	4.61	4.30	5.48	4.32	*
Departure from Normal	0.25	-2.01	1.40	0.89	1.63	0.86	
Growing Degree Days (base 50)	141	332	479	747	634	419	129
Departure from Normal	101	71.4	4.50	94.6	45.0	107	26.4

* missing data. Data in table is based on National Weather Service data from South Hero, VT. Historical averages are for 30 years of data (1971-2000).

CULTURAL PRACTICES

The seedbed at each location was prepared by conventional tillage methods. The previous crop was an alfalfa/grass mix hayfield. Plots were planted with a John Deere 1750 four row corn planter. Plots measured 10' X 50'. The plots were hand harvested. All ears were removed from two 17.5' row sections and weighed with a small platform scale. The corn was shelled by passing the harvest ears through a Almaco SP50 plot combine. The shelled corn was weighed with a platform scale to determine yields. Pertinent trial information is summarized in Table 4.

Table 4. Organic grain corn variety trial information - 2010

Trial Information	Borderview Research Farm, Alburgh
Soil type	Silt loam
Previous crop	Sod/rye
Row width (in.)	30
Planting date	24-May
Harvest date	29-Sept. & 3-Oct.
Planting population (plants/acre)	34,000
Tillage operations	Spring plow Spring disk Spike tooth harrow
Fertilizer	2.5 tons/acre of North Country Organics Pro-Gro 5-3-4 Applied 23-May
Dairy compost	Spring applied - 2 ton/acre
Tinweeding	1x
Row cultivation	2x

PRESENTATION OF DATA

Results are listed in Table 5. Dry matter yields were calculated and then adjusted to 15% moisture for the report. Varieties are ranked by harvest moisture in Table 5. Population was measured at harvest and is presented as plants per acre. Significant bird damage was observed in the plots and is presented as the percentage of harvested ears with 25% or more damage. Lastly, lodging was recorded as the number of plants lodged per acre. The numbers presented in the tables are an average of two replications.

LEAST SIGNIFICANT DIFFERENCE (LSD)

Variations in yield and quality can occur because of variations in genetics, soil, weather, and other growing conditions. Statistical analysis makes it possible to determine, whether a difference among varieties is real or whether it might have occurred due to other variations in the field. At the bottom of each table a LSD value is presented for each variable (i.e. yield). Least Significant differences (LSD's) at the 10% level of probability are shown. Where the difference between two varieties within a column is equal to or greater than the LSD value at the bottom of the column, you can be sure in 9 out of 10 chances that there is a real difference between the two varieties. Varieties that were not significantly lower in performance than the highest hybrid in a particular column are indicated with an asterisk. In the example below A is significantly different from C but not from B. The difference between A and B is equal to 1.5 which is less than the LSD value of 2.0. This means that these varieties did not differ in yield. The difference between A and C is equal to 3.0 which is greater than the LSD value of 2.0. This means that the yields of these varieties were significantly different from one another. The asterisk indicates that B was not significantly lower than the top yielding variety.

Variety	Yield
A	6.0
B	7.5*
C	9.0*
LSD	2.0

RESULTS

Table 5. Organic grain trial quality and yield. – Alburgh, VT.

Variety	Type	Relative maturity	Harvest moisture	Yield at 15% moisture		Harvest population	Lodging	Bird damage
			%	tons/ac	bu/ac	plants/acre	%	%
E-95	OP	95	23.9*	2.80	100	18,750	30.6*	6.99
Early Riser	OP	80	21.7*	1.41	50.3	20,750	23.1*	2.00
Wapsie Valley	OP	90	21.5*	1.97	70.2	21,000	23.1*	41.7
33N73	Hybrid	92	20.7*	3.18	114	24,500	3.00	21.0
O.6710	Hybrid	98	20.7*	3.53	126	24,750	0.00	26.9
rsC710	OP	88-92	20.2	2.12	75.6	15,750	24.3*	13.9
B916	Hybrid	86	20.1	2.89	103	19,250	17.5*	9.45
rsB716	OP	85	20.0	2.12	75.8	18,500	31.0*	15.3
C714	Hybrid	94	19.6	3.96*	141*	26,250*	2.90	13.9
VK13	OP	90	19.6	2.61	93.1	19,750	26.5*	11.2
X811	Hybrid	81	19.0	3.07	110	30,000*	8.60	17.7
28B19	Hybrid	89	18.7	4.51*	161*	24,500	8.04	5.85
B915	Hybrid	85	18.4	2.53	90.2	16,750	18.6*	25.9
O.99-90N	Hybrid	90	18.1	4.76*	170*	25,500*	7.14	6.41
14A91	Hybrid	82	17.5	2.92	104	21,750	12.4	25.6
18R91	Hybrid	84	17.2	3.61	129	22,000	8.97	21.7
25A16	Hybrid	87	17.2	4.61*	165*	25,750*	12.5	8.13
C912	Hybrid	91	15.7	2.73	97.5	18,250	16.3*	1.72
LSD (0.10)			3.29	0.95	34.0	5,189	14.9	NS
Trial mean			19.4	3.07	110	21,861	15.3	15.3

* Varieties with an asterisk indicate that it was not significantly different than the top performer.

NS - None of the varieties were significantly different from one another.

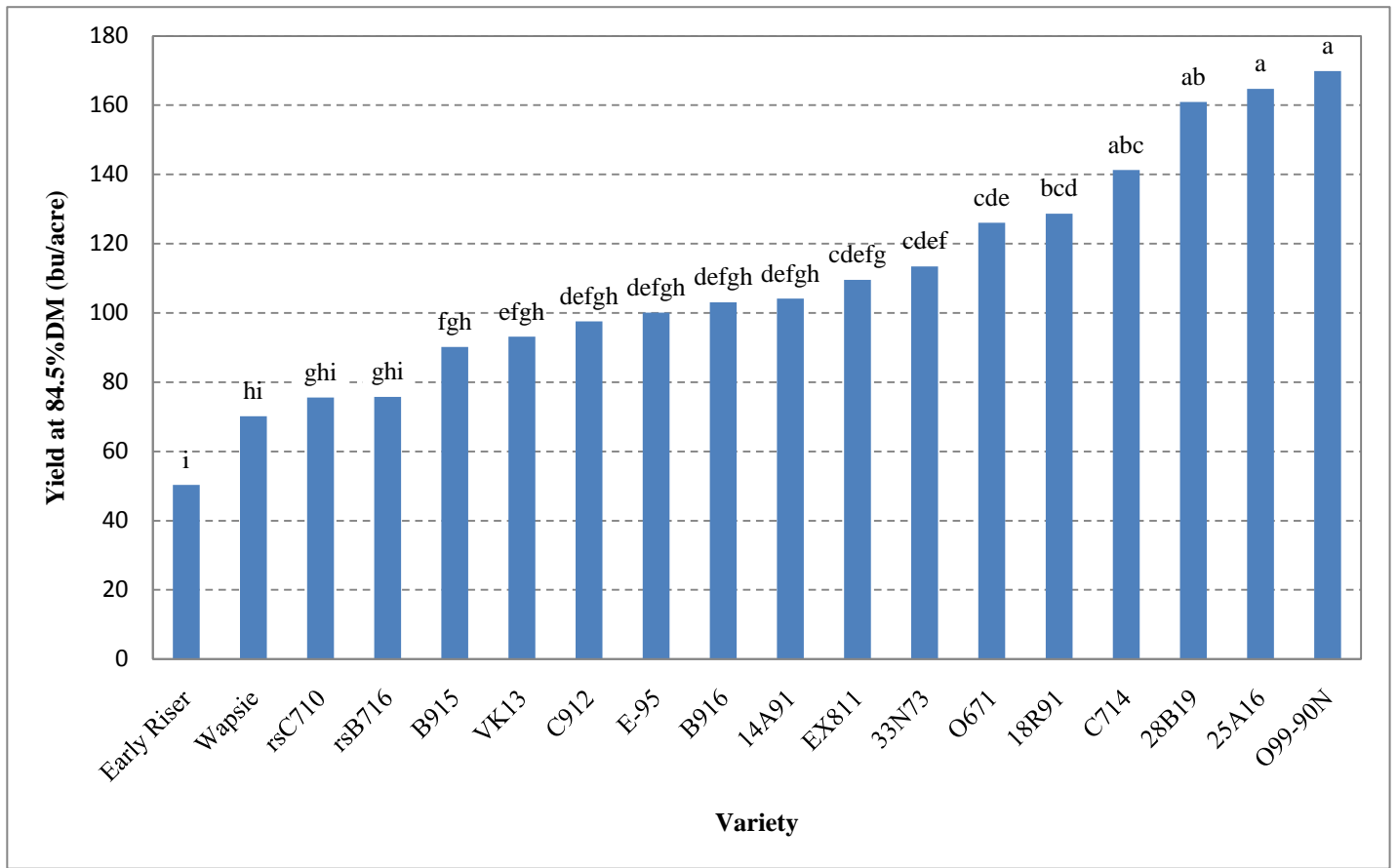


Figure 1. Yield of organic grain corn varieties – Alburgh, VT. Varieties with the same letter did not differ significantly in yield.

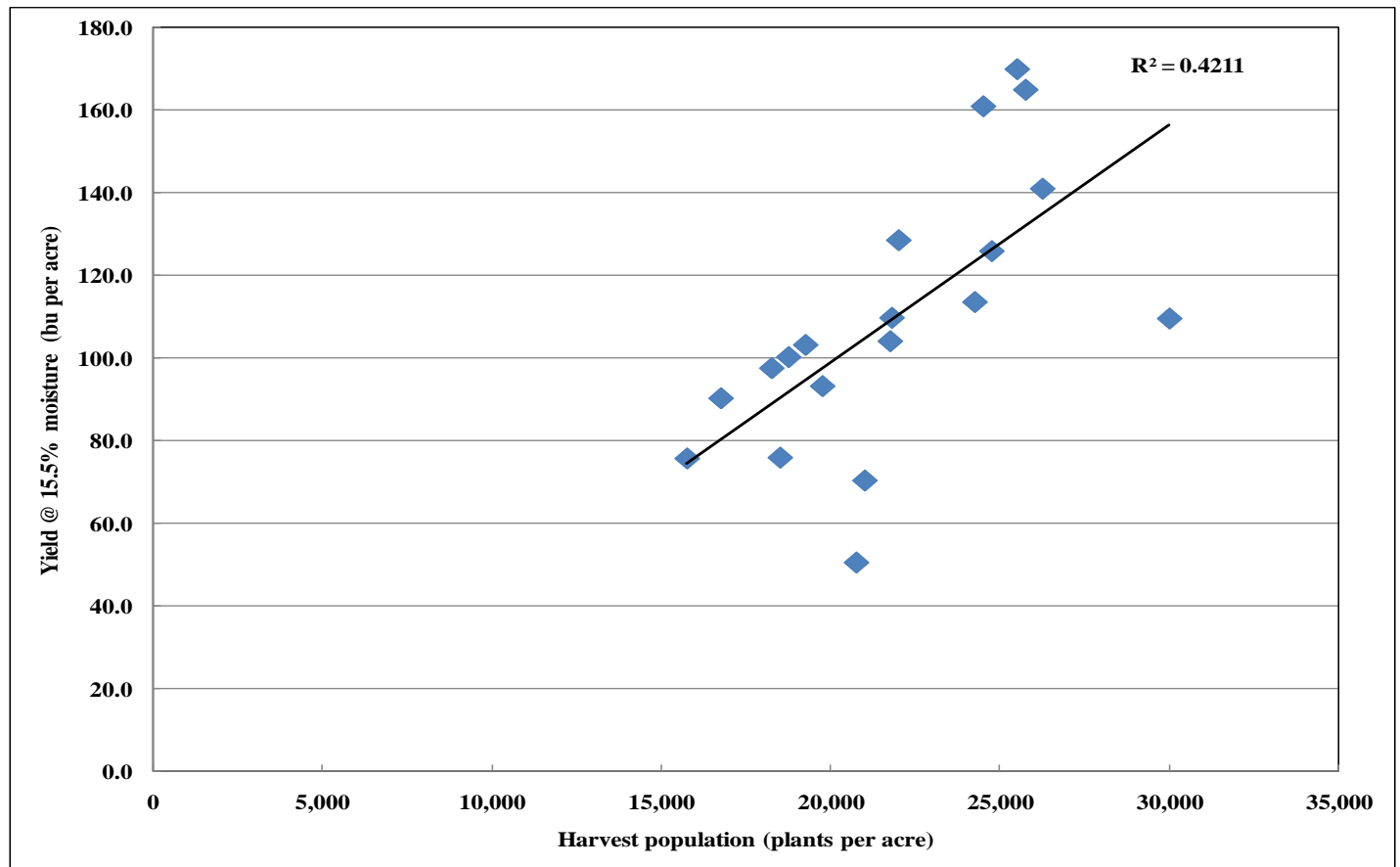


Figure 2. Relationship between plant population and grain yield – Alburgh, VT.

DISCUSSION

This was the first year for the UVM Extension organic grain corn variety trial. Of the varieties trialed, Viking Organic 0.99-90N, Blue River 25A16, 28B19, and American Organics C714 had the highest yields per acre. The open pollinated varieties were amongst the lowest yielding in the trials. Interestingly, these also were the varieties with the highest percentage of lodged plants per acre. Lodging may be attributed to weaker plant stalks but also could be related to increased damage from other wildlife such as raccoons and deer. This may suggest that the overall quality of the ear is preferred. We were unable to analyze the grain for quality due to limited funds. Overall, plant populations were below the desired 24,000 to 28,000 plants per acre range. There was a significant relationship between corn yields and harvest populations. Corn was planted at 34,000 seeds to the acre and the resultant final populations were sometimes 50% less than the initial seeding rate. Low plant populations could be attributed to several factors, low seed germination rates, cultivator damage, and/or reduction from insect and disease pests. Another factor that may have influenced germination was extremely dry conditions at the time of planting. This could have lead to uneven and reduced emergence. Next season we will measure plant population at emergence to differentiate between environmental, pest, and mechanical stand losses.

UVM Extension would like to thank Borderview Farm Research Facility for their help implementing the trial. We would also like to thank Albert Lea Seed House, American Organics, Blue River Hybrids, Butterworks Farm, and Lakeview Organic Grain for the hybrid seed donations. Any reference to commercial products, trade names, or brand names is for information only, and no endorsement or approval is intended.

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