2010 RESEARCH REPORT

SAGINAW VALLEY

RESEARCH & EXTENSION CENTER
and
RELATED BEAN - BEET RESEARCH

MICHIGAN STATE UNIVERSITY

AgBio**RESEARCH**

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SAGINAW VALLEY RESEARCH AND EXTENSION CENTER REPORT

James D. Kelly, Coordinator

Paul E. Horny, Farm Manager

Dennis Fleischmann, Technician

INTRODUCTION

The Michigan sugar beet grower cooperative, Michigan Sugar Company, and the Michigan dry bean growers and industry represented by the Michigan Bean Commission and Michigan Bean Shippers Association, donated the proceeds of the 120 acre Saginaw Valley Bean and Beet Research Farm, located in Saginaw County for 38 years, to Michigan State University in 2009. The Michigan State University Office of Land Management purchased a 250 acre farm near Richville Michigan in Denmark Township. An additional 60 acres was purchased in 2010. The site is being established as a Michigan Agricultural Experiment Station field laboratory. The main site, 120 acres was tiled at 17 foot average spacing, a machinery storage building was built in 2009 with the shop/office completed in May 2010. The contiguous 60 acres was tiled in the fall of 2010 with an average tile spacing of 20 foot. The site is located on the southeast corner of Reese and Krueger Roads, address of 3775 South Reese Road, Frankenmuth, Michigan 48734.

Field research was initiated in 2009 and the 2010 season was the second season of research at the site. This research report is primarily a compilation of research conducted at the site in 2010. Most of the work represents one year's results, and even though multi-season results are included, **this work should be considered a progress report.**

Soil – The soil type on the farm is classified as a Tappan-Londo loam, these are very similar soil types separated by subsoil drainage classifications, the Tappan not being as naturally well drained as the Londo. The site was soil tested in spring 2009 at 2.5 acre increments. The soil pH averages 7.9, soil test phosphorus averages 56 pounds P/acre, soil test Potassium averages 294 pounds K/acre. The main site, 120 acres, was re-tested in fall of 2009 at 1 acre increments.

Weather – The monthly rainfall for 2010 collected with the automated rain gauge is given in Table 1. The monthly totals are given at the bottom of the table. Rainfall was adequate through May and June, July and August were very dry, which affected the dry bean yields greatly. Corn, soybean and sugarbeet yields were lower, at 140 bushels/acre, 40 bushels/acre and 25 tons/acre, but the earlier rainfalls helped get them through the season. The rainfall total of 18.56 inches was the lowest recorded since 1971. Maximum and minimum daily temperatures along with growing degree days (base 50) are given in Table 2. The 2010 season was warm with 9 days above 90 degrees and 44 days above 85 degrees. There was 2819 growing degree days for 2010 which was also the highest since 1971.

MONTHLY PRECIPITATION, SAGINAW VALLEY RESEARCH & EXTENSION CENTER

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
1978	2.26	0.34	1.27	1.43	2.18	2.03	2.27	1.71	4.52	1.13	1.77	2.08	22.99
1979	1.65	0.39	1.76	2.51	1.36	3.59	5.64	2.10	0.10	2.47	3.46	2.10	27.13
1980	1.00	0.71	1.84	3.91	2.60	4.04	5.90	2.11	4.61	3.26	0.94	2.44	33.36
1981	0.29	1.73	0.53	3.43	3.52	3.09	2.41	3.83	9.09	2.74	2.21	0.68	33.56
1982	2.37	0.46	2.26	1.27	3.32	3.09	2.65	2.55	3.02	0.76	4.01	3.26	29.02
1983	0.89	0.90	3.29	4.55	6.15	3.55	1.91	2.50	5.11	2.95	3.06	2.00	36.86
1984	0.56	0.73	3.18	3.20	3.66	3.94	2.42	3.75	3.29	3.05	2.67	2.18	32.63
1985	1.85	2.12	4.08	3.96	2.30	1.87	2.38	7.02	4.38	3.08	4.66	1.05	38.75
1986	1.34	2.24	1.62	1.87	3.10	3.48	1.38	2.76	18.05	2.64	0.75	1.38	40.61
1987	1.11	0.82	1.03	2.03	0.67	4.11	1.35	3.92	5.03	1.88	2.13	2.63	26.71
1988	1.04	1.01	1.70	3.26	0.56	0.59	3.45	3.52	2.46	3.25	4.36	1.08	26.28
1989	1.09	0.34	1.40	2.05	5.03	6.25	1.06	2.92	4.43	1.72	3.24	0.48	30.01
1990	1.23	1.21	1.17	1.54	2.81	2.07	2.53	6.94	3.74	5.87	4.51	1.45	35.12
1991	0.85	0.60	3.68	6.61	3.71	2.66	4.53	2.61	1.50	3.52	2.04	1.24	31.58
1992	1.20	1.65	1.31	4.56	1.10	2.10	4.33	2.92	4.08	2.54	4.50	2.10	32.39
1993	2.72	0.47	0.87	4.08	2.76	3.03	2.46	4.62	4.00	3.70	1.99	0.53	31.23
1994	0.55	0.66	0.91	3.58	2.04	6.99	2.57	4.44	2.19	2.24	4.40	1.03	31.60
1995	1.67	0.35	1.38	2.72	1.44	1.96	1.29	5.00	1.33	2.39	4.05	0.79	24.37
1996	0.83	0.94	0.49	3.18	5.47	5.65	2.32	1.53	3.52	3.31	1.37	2.21	30.82
1997	1.51	4.25	1.32	1.38	3.00	0.69	2.44	3.61	3.46	1.31	1.03	0.36	24.36
1998	2.66	2.05	3.17	2.14	1.87	1.56	1.02	2.01	1.41	3.18	1.79	1.32	24.18
1999	2.75	0.41	0.62	5.01	2.33	3.07	5.02	3.01	2.52	1.12	1.04	1.90	28.80
2000	0.57	1.35	0.89	2.94	5.34	2.65	3.03	3.69	3.27	0.90	2.07	1.57	28.27
2001	0.33	3.16	0.11	2.38	4.42	2.45	0.53	3.52	4.34	4.90	1.76	1.61	29.51
2002	1.02	1.49	2.47	3.49	4.46	3.15	3.00	4.50	0.50	1.87	1.19	0.97	28.11
2003	0.27	0.21	1.66	0.36	4.19	2.04	2.49	1.33	1.99	1.09	5.35	1.20	22.18
2004	1.09	0.55	2.50	1.31	7.34	2.70	2.01	2.32	0.66	2.41	3.44	1.51	27.84
2005	2.90	0.71	0.62	1.32	1.74	4.97	3.20	0.72	0.72	1.30	3.83	1.49	23.52
2006	1.91	1.57	1.59	1.87	4.17	2.03	5.72	2.61	2.53	3.77	3.05	2.81	33.63
2007	1.11	0.35	1.27	3.02	2..20	1.06	2.59	4.80	2.64	2.86	0.89	1.93	22.52
2008	1.76	2.59	1.23	1.99	1.13	3.88	3.94	2.10	5.61	1.70	1.36	1.21	28.50
*2009	0.01	2.12	1.84	4.69	1.23	4.81	2.73	3.48	0.82	3.61	0.47	1.88	27.69
2010	0.14	0.20	0.40	2.15	3.36	2.71	0.89	1.27	3.11	1.94	1.97	0.42	18.56
AVG.	1.29	1.17	1.62	2.84	2.98	3.09	2.77	3.20	3.58	2.56	2.59	1.54	29.23

**Station moved from Saginaw, MI to Richville, MI*

PRECIPITATION - SAGINAW VALLEY RESEARCH & EXTENSION CENTER- 2010

Day:	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1					0.02			0.01	0.75			
2					0.35	0.57			0.03	0.61		
3				0.06		0.03			0.34			
4						0.04						
5		0.03		0.04		0.33						
6				0.80		0.43			0.05			
7				0.27	0.67							
8				0.10	0.05		0.23	0.03				
9						0.20		0.09				
10								0.01				
11		0.06			0.56		0.11	0.10	0.46	0.04		
12			0.22				0.06	0.16				0.12
13	0.01		0.11		1.20					0.38		
14			0.02					0.40				
15							0.11			0.01		0.02
16		0.01				0.14			0.47		0.02	
17									0.01		0.20	
18							0.03		0.10			
19								0.47				
20			0.05				0.06			0.30		
21					0.23				0.43	0.03		
22					0.02	0.33	0.22		0.06		1.15	0.01
23		0.07				0.03				0.05	0.01	
24	0.12			0.01		0.13	0.02			0.10		
25	0.01			0.86						0.20	0.22	
26		0.01		0.01		0.01			0.06	0.22		
27		0.02				0.47			0.06			
28							0.01		0.22			
29												
30									0.07			0.01
31					0.26		0.04				0.37	0.26
TOTAL	0.14	0.20	0.40	2.15	3.36	2.71	0.89	1.27	3.11	1.94	1.97	0.42

Rainfall is measured in inches

2010 YEAR END TOTAL: 18.56 INCHES

MAXIMUM-MINIMUM AIR TEMPERATURES (F)
SAGINAW VALLEY RESEARCH & EXTENSION CENTER - 2010

	JANUARY		FEBRUARY		MARCH		APRIL		MAY		JUNE	
DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	22	11	25	8	34	23	81	49	77	65	81	62
2	13	3	27	18	34	20	53	52	67	54	70	61
3	20	2	29	10	35	24	76	45	74	52	67	58
4	22	17	28	8	37	19	70	38	72	46	73	55
5	26	18	33	18	38	22	72	46	69	52	83	59
6	26	20	26	16	43	22	59	47	63	44	63	50
7	25	20	29	9	46	26	50	44	46	43	70	46
8	24	3	30	7	52	29	47	31	48	35	70	44
9	19	-1	26	17	57	30	44	30	55	30	78	53
10	24	1	24	20	54	38	69	27	58	29	74	54
11	23	13	28	10	64	41	67	38	45	40	81	58
12	25	0	28	9	53	42	61	30	54	41	84	61
13	31	15	28	16	47	39	58	43	53	43	72	61
14	39	14	30	24	42	36	70	40	64	49	79	63
15	37	31	27	22	52	31	83	47	64	41	76	60
16	31	23	27	19	58	28	68	38	68	38	74	61
17	28	21	33	22	64	27	44	35	67	43	80	59
18	31	21	33	20	62	35	52	30	70	51	89	58
19	33	27	36	19	65	38	61	29	79	43	84	66
20	28	15	37	18	38	28	65	31	83	50	80	58
21	33	17	38	28	43	30	65	35	78	57	85	58
22	32	19	29	26	49	27	55	28	75	59	85	65
23	35	20	34	15	54	31	64	28	85	56	86	65
24	42	34	33	14	58	26	60	44	88	63	77	63
25	40	30	26	14	44	26	55	46	86	61	82	51
26	30	24	28	21	37	18	58	42	89	62	86	65
27	25	17	32	27	48	23	52	34	89	66	78	62
28	22	4	36	30	46	29	59	31	85	59	80	60
29	17	4			46	28	66	33	84	55	69	49
30	22	4			59	22	82	51	89	57	71	45
31	27	12			74	35			83	66		

Growing Degree Days

Base 50 (max + min / 2 - 50)

	Apr	May	Jun	Jul	Aug	Sep	Oct	**Total**
2009	50.5	190.0	432.0	458.5	517.5	345.0	27.0	2020.5
2010	89.0	385.0	528.5	729.0	697.5	311.5	95.0	2835.5

MAXIMUM-MINIMUM AIR TEMPERATURES (F)
SAGINAW VALLEY RESEARCH & EXTENSION CENTER - 2010 cont.

	JULY		AUGUST		SEPTEMBER		OCTOBER		NOVEMBER		DECEMBER	
DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	75	45	83	64	88	69	64	42	48	23	33	26
2	83	48	86	63	76	68	51	44	49	25	28	25
3	65	56	88	65	73	55	53	38	45	25	32	23
4	91	59	88	65	62	49	56	33	45	31	29	23
5	94	74	85	63	71	43	65	33	38	31	29	21
6	93	70	81	55	68	56	71	38	41	25	28	21
7	94	70	83	48	81	59	70	44	55	32	27	18
8	84	73	85	69	64	52	77	43	60	27	26	10
9	93	71	77	68	67	45	69	43	59	28	28	9
10	87	68	86	64	68	43	75	43	53	27	35	24
11	87	59	86	66	66	44	66	47	64	33	36	30
12	79	60	86	67	74	55	64	43	63	39	35	11
13	82	65	87	65	76	48	56	44	61	42	12	4
14	88	63	83	71	69	44	60	39	52	37	20	2
15	92	57	88	64	70	39	60	40	48	33	24	4
16	89	69	79	59	61	53	62	34	51	28	24	6
17	89	61	80	59	65	50	61	39	49	36	27	19
18	86	66	81	56	64	53	54	38	42	30	23	18
19	79	59	84	59	68	49	58	34	43	27	23	18
20	81	66	85	59	68	45	64	41	41	27	29	10
21	86	65	80	66	87	60	48	33	55	27	31	15
22	80	66	79	65	74	57	54	32	61	54	30	17
23	87	59	71	63	81	56	61	43	59	28	30	24
24	82	70	75	62	80	58	71	50	37	28	24	20
25	80	62	77	58	59	48	70	56	43	28	25	21
26	86	56	74	49	56	42	67	52	30	24	26	17
27	86	59	80	49	59	47	64	52	35	26	24	14
28	87	66	87	58	60	48	52	41	40	27	30	19
29	82	55	94	56	70	41	49	38	48	28	31	20
30	82	58	92	67	70	50	57	39	56	33	40	24
31	71	63	93	70			46	28			52	39

GROWING DEGREE DAYS - SAGINAW VALLEY RESEARCH & EXTENSION CENTER

Base 50 (max + min / 2 - 50)

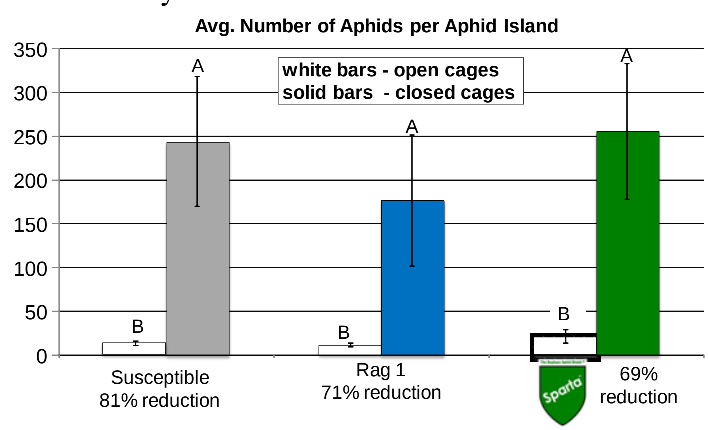
	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	TOTAL
1974	62.50	143.00	391.00	529.00	458.00	218.50		1802.00
1975	30.50	307.00	445.00	543.50	491.50	168.50		1986.00
1976	113.00	151.50	537.50	596.00	500.50	276.50	72.00	2247.00
1977	140.50	398.00	389.00	675.00	485.00	344.00	43.00	2474.50
1978	4.00	316.50	474.50	571.50	588.50	393.50	75.00	2423.50
1979	47.50	228.50	458.50	577.50	479.00	330.00	116.00	2237.00
1980	34.00	281.50	369.00	617.50	606.00	317.50	33.50	2259.00
1981	55.50	187.00	491.00	579.50	312.00	265.00	13.50	1903.50
1982	54.50	428.50	365.50	626.00	476.00	298.00	156.00	2404.50
1983	16.00	118.50	491.00	716.00	645.00	369.50	97.00	2453.00
1984	67.50	164.50	506.00	558.50	627.00	282.00	114.50	2320.00
1985	183.50	306.00	388.00	603.50	523.00	394.50	100.00	2498.50
1986	124.50	310.00	435.00	664.00	459.50	370.00	96.50	2459.50
1987	84.00	336.50	566.50	725.50	537.50	334.00	19.50	2603.50
1988	35.50	290.50	544.50	739.50	667.50	283.00	48.00	2608.50
1989	21.50	202.00	456.50	648.00	535.00	315.00	167.00	2345.00
1990	165.50	146.00	493.50	587.50	553.50	332.50	100.50	2379.00
1991	144.00	423.50	541.00	641.00	567.50	289.50	114.00	2720.50
1992	56.00	241.50	367.00	446.50	403.50	257.50	41.50	1813.50
1993	23.50	208.00	430.00	642.00	613.50	184.50	25.00	2126.50
1994	95.50	227.50	526.50	613.50	501.50	380.00	115.00	2459.50
1995	3.00	221.00	536.00	698.50	745.00	225.00	125.50	2554.00
1996	41.00	157.00	486.00	572.00	611.00	357.50	91.50	2316.00
1997	27.00	48.00	534.00	596.50	443.00	299.50	134.50	2082.50
1998	46.00	267.00	505.50	623.50	648.00	456.00	114.00	2660.00
1999	49.50	299.00	578.50	684.50	500.00	339.00	67.50	2518.00
2000	17.00	284.00	474.50	509.50	544.50	289.00	157.00	2275.50
2001	78.00	289.50	504.00	649.50	654.00	282.00	114.00	2571.00
2002	123.00	141.50	535.00	710.00	575.00	443.00	99.00	2626.50
2003	66.50	147.50	410.00	606.00	608.00	312.50	82.00	2232.50
2004	89.00	240.50	429.50	561.00	450.50	421.50	69.00	2261.00
2005	58.00	145.00	623.00	647.50	611.50	429.00	130.00	2644.00
2006	79.00	283.50	470.50	661.00	555.50	260.00	38.50	2348.00
2007	53.50	277.00	534.00	564.00	594.00	393.00	231.00	2646.50
2008	110.00	116.50	512.00	620.00	532.50	343.00	56.50	2290.50
*2009	50.50	190.00	432.00	458.50	517.50	345.00	27.00	2020.50
2010	89.00	368.50	528.50	729.00	697.50	311.50	95.00	2819.00
AVERAGE	68.62	240.31	479.99	616.00	549.14	321.89	90.84	2366.79

* Station moved to from Saginaw, MI to Richville, MI

Saginaw Valley Research Farm Report, 2010 Field season
PI: Chris DiFonzo, Department of Entomology

a. Soybean aphid suction trap
The Farm has one of the traps in the Northcentral Regional Aphid Suction Trap Network, which has over 40 sites in the Midwest. The suction trap is a 24-foot tall pipe that draws air as well as migrating aphids into a collection jar. This year, no aphids were detected in suction traps in the fall, except in Monroe County. No aphid eggs have been found on buckthorn either. This suggests a low overwintering population heading into 2011.

b. Evaluating the impact of biological control on soybean aphid-resistant lines.
Replicated quarter-acre blocks of aphid susceptible and resistant lines were planted in May. Plants with Rag have a single dominant gene for aphid resistance; plants with rag 1b/rag 3 (trademarked as 'Sparta') have recessive multi-gene resistance. In each plot, 16 seeds were removed and replaced by seeds of the susceptible line. These 16 plants were infested to create 'aphid islands' in a background of susceptible or resistant beans, to simulate hot spots encountered in commercial fields early in an aphid outbreak. Eight plants were caged and eight left open. Aphid numbers on caged and open plants were compared and related to natural enemy sampling to determine if background predation on aphids in 'hot spots' differed between susceptible and resistant lines. There was no difference in % reduction of hot spots among the three lines, nor was there a difference in number of natural enemies. This is good news, but the results may be drastically different in a year with higher aphid populations. Then we believe predator numbers would be lower in field planted to resistant lines, and small hot spots may go unchecked by natural enemies.



c. Western bean cutworm
Western bean cutworm moths were sampled in bucket traps and corn fields scouted for egg masses. Moth flight was relatively low, and no natural population of eggs or larvae were found on the farm. The heavier soils in the area may result in poor overwintering. To test this hypothesis, 10-inch plastic pots were filled with soil from the Saginaw (heavy) and Montcalm (sandy) Research Farms, and infested with 10 larvae each. Pots were sunk into holes on the MSU campus and left for the winter. The first set was dug in November. Larvae were primarily found between 4-9 inches in the Saginaw soil, but at the bottom of the pot in the lighter soil. The ability of larvae to go deeper may increase their overwintering success. More pots will be sacrificed in the winter to see if more larvae die from freezing temperatures in the heavy versus the light soil.

Control of Rhizoctonia crown and root rot with fungicides, 2010.

W. W. Kirk, J. Hao, R. L Schafer, P. Tumbalam
Department of Plant Pathology
Michigan State University
East Lansing, MI 48824

Sugar beet cv. ACH RR-824 was PAT-treated and planted at the Michigan State University Bean and Beet Farm, Richville, MI on 14 Apr. Seed was planted at 1" depth into four-row by 50-ft plots (ca. 4.375 in. between plants to give a target population of 275 plants/100ft. row) with 30" between rows replicated four times in a randomized complete block design. Fertilizer was drilled into plots immediately before planting, formulated according to results of soil tests (125 lb 46-0-0/A). No additional nitrogen was applied. All fungicides were applied with a hand held R&D spray boom delivering 10 gal/A (50 p.s.i.) and using one XR8003 nozzle per row in a 6" band at planting or at GS 2-4 and 4-6. Fungicides were applied broadcast with a hand-held R&D spray boom delivering 25 gal/A (80 p.s.i.) and using three XR11003VS nozzles per row for Proline treatments (except the in-furrow at planting treatment). Applications were made at planting (A); and banded applications on 20 and 27 May and 9 Jun at GS 2-4 (B), 4-6 (C) and GS 6–8 (D), respectively. Cercospora leaf spot was controlled with two applications of Eminent 125SL (13 fl oz) on 28 Jun and 19 Jul. Weeds were controlled by cultivation and with Roundup Original Max 2.0 pt/A applied at GS2-4 and GS 6-8. Insects were controlled as necessary. Plant stand was rated 8, 15, 21 and 30 days after planting (DAP) and relative rate of emergence was calculated as the Relative Area Under the Emergence Progress Curve [RAUEPC from 0 – 39 DAP, maximum value = 100]. Plots were inoculated on 7 May [23 days after planting (DAP)] by spreading *R. solani* Anastemoses Group 2.2 (IIIB) infested barley across all plants in each plot. Samples of 50 beets per plot were harvested 126 DAP (10 ft from start of each plot from two center rows) and assessed for crown and root rot (*R. solani*) incidence (%) and severity. Severity of crown and root rot was measured as an index calculated by counting the number of roots (n = 50) falling in class 0 = 0%; 1 = 1 - 5%; 2 = 6 -10%; 3 = 11 – 15%; 4 =15 - 25%; 5 = 25 – 50%; 6 = 50 – 100% surface area of root affected by lesions; and 7 = dead and/or extensively decayed root. The number in each class is multiplied by the class number and summed. The sum is multiplied by a constant to express as a percentage. Increasing index values indicated the degree of severity. The trial was not harvested for yield due to the high incidence and severity of crown and root rot but the percentage of marketable beets were estimated calculating the percentage falling into the severity classes 0, 1 and 2. Meteorological variables were measured with a Campbell weather station located at the farm, latitude 43.3995 and longitude -83.6980 deg. Meteorological variables were measured with a Campbell weather station located at the farm, latitude 43.3995 and longitude -83.6980 deg. Maximum, minimum and average daily air temperature (^{o}F) from planting on 14 Apr were 83.3, 27.3 and 38.9 (Apr), 89.7, 29.6 and 60.8 (May), 89.4, 44.2 and 68.6 (Jun), 94.8, 45.4 and 73.9 and 5-d with maximum temperature >90^{o}F (Jul), 94.1, 48.4 and 72.5 and 2-d with maximum temperature >90^{o}F (Aug) and 93.0, 43.8 and 64.2 (to 14 Sep). Maximum, minimum and average daily soil temperatures (^{o}F) over the same period were 68.3, 34.4 and 51.7 (Apr), 80.2, 37.8 and 60.8 (May), 89.4, 44.2 and 68.6 (Jun), 96.4, 60.5 and 78.9 (Jul), 93.7, 61.6 and 78.1 (Aug) and 93.2, 53.0 and 68.0 (to 14 Sep). Maximum, minimum and average daily relative humidity (%) over the same period was 95.1, 13.0 and 57.2 (Apr), 94.8, 14.0 and 61.6 (May), 94.6, 28.8 and 68.3 (Jun), 94.4, 21.9 and 64.1 (Jul), 94.6, 23.5 and 67.2 (Aug) and 94.3, 19.8 and 66.2 (Sep to 14 Sep). Maximum, minimum and average daily soil moisture (% of field capacity at 4" depth) was 51.7, 44.8 and 46.9 (Apr); 58.2, 34.7 and 45.8 (May); 52.8, 35.2 and 42.2 (Jun); 51.9, 46.8 and 49.3 (Jul), 51.3, 43.1 and 45.8 (Aug) and 51.2, 46.4 and 44.6 (Sep to 14 Sep). Precipitation was 2.10-in. (Apr), 3.10-in. (May), 3.00-in. (Jun), 0.90-in. (Jul), 1.30-in. (Aug) and 1.60-in. (to 14 Sep).

Soil temperature and moisture conditions enhanced development of crown and root rot. There were no significant differences among treatments in terms of plant stand or RAUEPC except both YT669 and Q8Y78 applied at planting had a significant reduction in plant stand at the final assessment timing in comparison to the untreated control. Treatments with less than 87.5% incidence of crown and root rot on the beetroots were significantly different to the untreated control. No treatments had significantly lower incidence of crown and root rot on the roots in comparison to the current commercial standard Quadris (48.5%). Treatments with less than 77.1% severity of crown and root rot on the beetroots were significantly different to the untreated control. No treatments had significantly lower severity of crown and root rot on the roots in comparison to the current commercial standard Quadris (16.4%). Treatments with greater than 20.5% marketable beetroots were significantly different to the untreated control. No treatments had a significantly greater percentage of marketable beetroots in comparison to the current commercial standard Quadris (86.5%).

Treatment and rate/1000 ft. row	Plant stand[z] DAP[y] (%)				RAUEPC[x] 0 – 39 DAP (%)	Crown and root rot				Marketable beets (%)[u]	
	24	30	39			Incidence (%)[w]		Severity[v]			
LEM17 200EC 1.6 fl oz (A[t])…...........	7.6	60.0	78.7	abc[s]	35.7	73.0	cd	35.5	fgh	66.5	c-g
LEM17 200EC 1.6 fl oz (C)…………						67.0	c-f	34.9	f-i	66.0	d-g
YT669 2.08SC 1.3 fl oz (A)……...…	6.9	60.5	70.4	d	34.2	76.5	bc	48.3	def	49.5	gh
YT669 2.08SC 1.3 fl oz (C)……...…						64.0	c-f	31.0	g-k	69.0	b-f
Q8Y78 240SC 1.6 fl oz (A)…………	6.5	53.8	74.6	cd	32.6	63.5	c-f	31.9	g-j	64.5	efg
Q8Y78 240SC 1.6 fl oz (B)…………						98.0	a	77.1	ab	10.5	jk
Proline 480SC 0.33 fl oz + Induce 0.125% (C)……………...……						53.0	fgh	15.8	kl	87.5	ab
Proline 480SC 0.33 fl oz + Induce 0.125% (D)……………...……						87.5	ab	58.4	cd	34.5	hi
Quadris 2.08FL 0.6 fl oz (A); Proline 480SC 0.33 fl oz (D)………...	6.2	64.4	84.4	a	37.6	41.0	h	11.0	l	89.0	a
Quadris 2.08FL 0.6 fl oz (A); Quadris 2.08FL 0.6 fl oz (C)………...	6.6	64.9	78.5	abc	37.0	48.5	gh	16.4	jkl	86.5	ab
Headline 2.09EC 0.69 fl oz (A)……...	7.2	67.2	84.7	a	39.0	87.5	ab	51.9	de	37.5	hi
Headline 2.09EC 0.69 fl oz (A); Headline 2.09EC 0.69 fl oz (C)……...	8.6	67.1	82.5	ab	39.0	59.5	d-g	24.8	h-l	76.5	a-e
Headline 2.09EC 0.69 fl oz (C)……...						57.0	efg	19.6	i-l	84.5	a-d
Actinogrow 0.0371WP 0.172 oz (A)..	7.2	62.3	80.3	abc	36.6	96.0	a	80.1	ab	6.0	jk
Actinogrow 0.0371WP 0.344 oz (A)..	5.5	65.5	79.7	abc	37.0	90.5	ab	69.6	bc	20.5	ijk
Actinogrow 0.0371WP 0.527 oz (A)..	7.1	62.7	77.1	bcd	36.2	93.0	a	67.6	bc	23.5	ij
Actinogrow 0.0371WP 0.69 oz (A)..	7.5	57.7	76.7	bcd	34.6	70.0	cde	42.0	efg	53.0	fgh
Actinogrow 0.0371WP 0.344 oz (A); Quadris 2.08FL 0.6 fl oz (C)………..	6.4	64.8	83.7	ab	37.7	67.5	cde	27.4	g-k	76.5	a-e
Topsin-M 70WP 1.84 oz (C)……..…						46.5	gh	16.1	kl	85.0	abc
Untreated……………………………	6.9	62.0	80.0	abc	36.4	100.0	a	87.0	a	2.5	k
$LSD_{0.05}$	2.7	10.1	7.06		4.05	14.03		15.57		18.93	

[a] Plant stand expressed as a percentage of the target population of 275 plants/100ft. row from a sample of 2 x 50 ft rows per plot.
[y] DAP = days after planting on 14 Apr.
[x] Relative area under the emergence progress curve from planting to 31 days after planting.
[w] Percent crown and root incidence on sample of 20 beets on 4 Sep (percentage above category 0).
[v] Severity of crown and root rot was measured as an index calculated as described in the text.
[u] Marketable beets are the percentage of beets falling in percentage severity percentage categories 0, 1 or 2.
[t] Application dates; A= 14 Apr; B= 20 May; C= 27 May; D= 9 Jun.
[s] Means followed by same letter are not significantly different at P = 0.05 (Fishers LSD).

Efficacy of application of foliar fungicides for control of Cercospora leaf spot in sugar beet, 2010.

W. W. Kirk, R. L Schafer and P. Tumbalam
Department of Plant Pathology, Michigan State University, East Lansing, MI 48824

Sugar beet cv. ACH RR-824 was PAT-treated and planted at the Michigan State University Bean and Beet Farm, Richville, MI on 14 Apr. Seed was planted at 1" depth into four-row by 50-ft plots (ca. 4.375 in. between plants to give a target population of 275 plants/100ft. row) with 30" between rows replicated four times in a randomized complete block design. Fertilizer was drilled into plots immediately before planting, formulated according to results of soil tests (125 lb 46-0-0/A). No additional nitrogen was applied to the growing crop. Plots were inoculated by spreading sugarbeet foliar residue collected the previous season on 16 Jun across all plots. Fungicides were applied starting after the 55 Beetcast disease severity values were recorded in the area (Ontario Weather Network, Ridgetown, ON, Canada), starting on 14 Jul and three applications were made. Fungicides were applied with a hand-held R&D spray boom delivering 25 gal/A (80 p.s.i.) and using three XR11003VS nozzles per row. Induce 480XL 0.125 % v/v was applied where indicated as "Induce" on the results table unless a different rate was indicated. Weeds were controlled by cultivation and with Roundup Original Max 2.0 pt/A applied at GS2-4 and GS 6-8. Insects were controlled as necessary. Foliar leaf spot severity (%) was measured on 24 Aug and 5 Sep using a 1 – 10 scale. Foliar leaf spot severity was measured using a 1 - 10 scale; 1 = 1 - 5, 0.1%; 2 = 6 -12, 0.35%; 3 = 13 - 25, 0.75%; 4 = 26 - 50, 1.5%; 5 = 51 - 75, 2.5%; spots/leaf or severity %; respectively; 6 = 3% (proven economic damage); 7 = 6%; 8 = 12%; 9 = 25%; and 10 $\geq$ 50% severity. Beet roots were machine-harvested on 13 Sep and individual treatments were weighed. Sugar content was measured at the Michigan Sugar Company analytical service laboratory. Meteorological variables were measured with a Campbell weather station located at the farm, latitude 43.3995 and longitude -83.6980 deg. Maximum, minimum and average daily air temperature (^{o}F) from planting on 14 Apr were 83.3, 27.3 and 38.9 (Apr), 89.7, 29.6 and 60.8 (May), 89.4, 44.2 and 68.6 (Jun), 94.8, 45.4 and 73.9 and 5-d with maximum temperature >90^{o}F (Jul), 94.1, 48.4 and 72.5 and 2-d with maximum temperature >90^{o}F (Aug) and 93.0, 43.8 and 64.2 (to 14 Sep). Maximum, minimum and average daily soil temperatures (^{o}F) over the same period were 68.3, 34.4 and 51.7 (Apr), 80.2, 37.8 and 60.8 (May), 89.4, 44.2 and 68.6 (Jun), 96.4, 60.5 and 78.9 (Jul), 93.7, 61.6 and 78.1 (Aug) and 93.2, 53.0 and 68.0 (to 14 Sep). Maximum, minimum and average daily relative humidity (%) over the same period was 95.1, 13.0 and 57.2 (Apr), 94.8, 14.0 and 61.6 (May), 94.6, 28.8 and 68.3 (Jun), 94.4, 21.9 and 64.1 (Jul), 94.6, 23.5 and 67.2 (Aug) and 94.3, 19.8 and 66.2 (Sep to 14 Sep). Maximum, minimum and average daily soil moisture (% of field capacity at 4" depth) was 51.7, 44.8 and 46.9 (Apr); 58.2, 34.7 and 45.8 (May); 52.8, 35.2 and 42.2 (Jun); 51.9, 46.8 and 49.3 (Jul), 51.3, 43.1 and 45.8 (Aug) and 51.2, 46.4 and 44.6 (Sep to 14 Sep). Precipitation was 2.10-in. (Apr), 3.10-in. (May), 3.00-in. (Jun), 0.90-in. (Jul), 1.30-in. (Aug) and 1.60-in. (to 14 Sep). There were 180 Beetcast DSV values accumulated in the Saginaw area from 15 May to 3 Sep at Richville.

Weather conditions during the growing season were very conducive for the development of Cercospora leaf spot and of note were the hot and humid conditions during Jul and Aug. Cercospora leaf spot reached an index of about 10 in the untreated control by 25 Aug. All treatments had significantly less Cercospora leaf spot than the untreated control at both evaluation dates but still had substantial disease development. All treatments had significantly greater yield, sugar content, recoverable white sucrose per ton and recoverable white sucrose per acre of sugarbeets in comparison to the untreated control. There were no significant differences among treatments in clear juice purity. No phytotoxicity was observed from any treatments.

Treatment and rate/acre	Cercospora leaf spot[z] (1-10 scale) 25 Aug		3 Sep		Yield (t/A)		Sugar %		CJP[y] (%)	RWST[x] (lb)		RWSA[w] (lb)	
Eminent 125SL 13 fl oz + Induce 0.125% v/v (A); Headline 2.09EC 9 fl oz Induce (B)……..	6.5	cde	8.3	def	26.7	bcd	19.6	ab	94.6	289	ab	7738	bcd
Proline 480SC 5 fl oz + Induce (A); Gem 500SC 3.5 fl oz (B); Super Tin 80WP 8 oz + Topsin M 70WP 6.1 oz (C)…………………...	7.3	bcd	8.8	bcd	25.9	cd	19.5	ab	94.5	287	abc	7422	bcd
Gem 500SC 3.5 fl oz (A); Proline 480SC 5 fl oz + Induce (A); (B); Super Tin 80WP 3.75 oz + Topsin M 70WP 6.1 oz (C)…………………	6.5	cde	8.8	bcd	25.9	cd	19.2	a-e	94.8	284	a-e	7358	bcd
Proline 480SC 5 fl oz + Induce (A); Headline 2.09EC 9 fl oz (B); Super Tin 80WP 3.75 oz + Topsin M 70WP 6.1 oz (C)………………...…	6.5	cde	8.5	cde	30.3	a	19.4	ab	94.8	288	abc	8703	a
Gem 500SC 3.5 fl oz (A); Inspire SB 2.08EC 7 fl oz (B); Super Tin 80WP 3.75 oz + Topsin M 70WP 6.1 oz (C)…………………………...	6.0	e	8.0	ef	28.6	ab	19.6	ab	94.6	290	ab	8275	ab
YT669 2.08SC 6 fl oz + Induce 0.25% v/v (A,B,C);………………….....	7.3	bcd	9.0	bc	26.1	bcd	18.3	fg	94.4	267	ef	6993	d
YT669 2.08SC 9 fl oz + Induce 0.25% v/v (A,B,C);………………….....	7.8	b	9.0	bc	27.2	bcd	18.1	gh	94.5	265	fg	7205	cd
YT669 2.08SC 12 fl oz + Induce 0.25% v/v (A,B,C);……………….…...	7.5	bc	9.3	b	26.6	bcd	18.4	efg	94.6	270	c-f	7198	cd
Headline 2.09EC 9 fl oz + Induce 0.25% v/v (A,B,C)………………….……	6.5	cde	9.0	bc	26.9	bcd	18.5	d-g	94.1	268	def	7248	cd
Topguard 1.04SC 10 fl oz + Super Tin 4L 8 fl oz (A,B,C)…………………..…	6.3	de	8.3	def	27.2	bcd	19.3	a-d	94.6	285	a-d	7782	a-d
Topguard 1.04SC 14 fl oz + Super Tin 4L 8 fl oz (A,B,C)…………………..…	6.0	e	7.8	f	26.0	cd	19.6	ab	94.8	289	ab	7506	bcd
Super Tin 4L 8 fl oz (A,B,C)…………………..…	7.0	b-e	9.0	bc	25.4	d	18.9	b-g	93.9	274	b-f	6974	d
Topguard 1.04SC 14 fl oz (A,B,C)……………	6.0	e	8.3	def	26.6	bcd	19.7	ab	94.6	290	ab	7748	bcd
Topguard 1.04SC 14 fl oz + Topsin M 70WP 6.1 oz (A,B,C)………………	7.5	bc	9.0	bc	27.4	bcd	18.5	c-g	93.4	265	fg	7284	cd
Topguard 1.04SC 10 fl oz (A); Super Tin 4L 8 fl oz (B); Headline 2.09EC 9 fl oz (C)…...…	6.8	b-e	8.0	ef	28.0	abc	19.6	ab	94.4	288	ab	8057	abc
Eminent 125SL 13 fl oz (A,B,C)………...……	6.3	de	8.5	cde	27.6	bcd	19.4	abc	94.5	285	a-d	7860	a-d
Headline 2.09EC 9 fl oz Induce (A,B,C)……..	6.8	b-e	8.8	bcd	27.6	bcd	19.4	abc	94.8	287	abc	7913	a-d
Untreated Check………………………………	10.0	a	10.0	a	22.8	e	17.3	h	93.6	248	g	5672	e
$LSD_{0.05}$	1.00		0.64		2.47		0.86		0.99	17.5		942.6	

[z] Foliar leaf spot severity; 1 - 10 scale; 1 = 1 - 5, 0.1%; 2 = 6 -12, 0.35%; 3 = 13 - 25, 0.75%; 4 = 26 - 50, 1.5%; 5 = 51 - 75, 2.5%; spots/leaf or severity%; respectively; 6 = 3% (proven economic damage); 7 = 6%; 8 = 12%; 9 = 25%; and 10 ≥ 50% severity.
[y] Clear juice purity.
[x] RWST = Recoverable White Sucrose per Ton of sugarbeets
[w] RWSA = Recoverable White Sucrose per Acre (Ton/A*RWST)
[v] Application dates: A= 14 Jul; B= 2 Aug; C= 18 Aug.
[u] Means followed by same letter are not significantly different at P = 0.05 (Fishers LSD).

Michigan Sugar Company Research

Official Variety Trial: This trial was planted at eight locations and four were usable for the variety approval process including the location at the Saginaw Valley Research Farm.

Purpose: To evaluate the production differences in varieties. Tons per acre, sugar content, and purity are measured and used to figure Recoverable Sugar per Ton(RWST) and Sugar per Acre(RWSA).

Results: Results were good from the locations we used. All varieties tested were resistant to Glyphosate/Roundup. This RR trait in sugarbeets is still relatively new and most varieties do not have a desired level of all other traits. The main differences are many varieties with the best RWST lack tolerance to diseases and the varieties with the better disease tolerance package have lower RWST and RWSA. The Official Variety Trials and the nurseries evaluate these differences. The results from our trials provide the information needed to approve the best varieties to be sold and give the growers the information they need to select the best varieties for their farm.

Rhizoctonia Nursery: The trial did not provide results because of too dry growing conditions.

Purpose: The Rhizoctonia Nursery is conducted to evaluate resistance in the varieties. The test is inoculated. Knowledge of varietal differences is important to help the growers select the best varieties for their conditions.

Results: There are a few varieties containing a level of tolerance to Rhizoctonia and many that have very little or no tolerance to the disease.

Cercospora Leafspot Nursery:

This nursery was planted at four locations and three gave us good results including the location at the Saginaw Valley Research Farm.

Purpose: The Cercospora Leafspot nursery is conducted to evaluate resistance in the varieties. These are two row plots with a susceptible variety planted every third row which helps to spread the disease evenly. The entire plot area is inoculated with Cercospora.

Results: The results of this nursery indicates which varieties have a level of resistance that is acceptable in our growing region. The most tolerant variety had a rating of 3.97 and the most susceptible variety had a rating of 5.93 on a scale of 0-9.

Michigan Sugar Company

Official Variety Trial

Average of 4 Locations

*Use of these varieties are subject to it being lawful to purchase, receive, distribute, and plant the varieties.

No.	*Variety	**RWSA**	RWST	Tons/A	% Suc	% CJP	% Emerg	Cls
43	BTS 19RR1N	9712	276.9	35.32	18.67	95.0	79.3	5.4
42	BTS 18RR4N	9628	281.7	34.48	18.94	95.1	67.2	5.3
1	Crystal RR827	9588	289.7	33.36	19.54	94.8	63.3	5.9
11	Crystal RR074NT	9528	279.5	34.17	18.97	94.7	70.3	5.5
2	Crystal RR808	9385	288.0	32.76	19.43	94.8	62.3	5.3
8	Crystal RR046	9264	270.6	34.39	18.33	94.9	69.8	4.7
3	Crystal RR824	9261	271.4	34.35	18.48	94.6	67.9	5.3
7	Crystal RR197	9126	266.2	34.55	18.09	94.8	68.4	4.7
9	Crystal RR059	8943	281.2	32.04	19.08	94.6	73.2	5.3
39	BTS 17RR32	8879	266.2	33.52	18.11	94.7	66.1	5.5
28	BTS 10RR34	8775	272.7	32.35	18.47	94.8	71.9	4.6
5	Crystal RR191	8728	266.7	33.00	18.10	94.8	74.0	4.5
45	BTS 10RR10	8717	263.4	33.31	18.01	94.5	61.0	4.6
41	BTS 18RR26	8610	276.9	31.36	18.77	94.6	56.4	4.3
4	Crystal RR840	8561	277.4	31.14	18.90	94.4	58.3	4.4
23	HM-9175RR	8504	259.9	32.98	17.86	94.3	68.3	5.6
25	HM-9259RR	8477	256.4	33.32	17.73	94.0	69.7	5.5
13	HM-28RR	8400	262.6	32.26	17.95	94.5	65.8	4.6
29	BTS 10RR73	8355	271.5	30.97	18.52	94.5	67.6	4.1
14	HM-29RR	8351	262.2	32.08	17.93	94.5	62.9	4.4
40	BTS 18RR06	8346	280.0	30.09	19.03	94.5	59.9	5.9
33	SX 1260RR	8335	258.0	32.47	17.71	94.3	66.6	4.6
44	BTS 19RR90	8308	273.3	30.64	18.62	94.5	74.9	4.7
22	HM-9174RR	8206	266.1	31.07	18.28	94.2	70.4	5.2
46	BTS 10RR17	8204	269.0	30.68	18.40	94.4	73.5	4.6
35	SX 1291RR	8152	261.7	31.40	17.91	94.5	74.0	4.5
15	HM-42RR	8117	270.6	30.22	18.62	94.0	60.8	4.0
18	HM-110RR	8101	269.6	30.21	18.38	94.6	60.5	4.3
27	HM-9261RR	8080	258.1	31.73	17.79	94.1	67.1	4.5
21	HM-9173RR	8076	262.8	30.99	18.16	94.0	70.2	4.4
16	HM-50RR	8047	270.2	30.03	18.53	94.2	64.3	4.0
36	SX 1203RR	8044	246.6	32.96	16.95	94.4	59.8	5.9
24	HM-9258RR	8040	265.8	30.55	18.32	94.1	70.0	5.6
19	HM-131RR	8017	266.1	30.38	18.39	93.9	61.9	4.0
34	SX 1281RR	7996	268.4	30.01	18.39	94.3	60.7	4.3
37	SX 1204RR	7970	264.5	30.40	18.21	94.2	68.3	4.4
10	Crystal RR086	7956	266.3	30.06	18.36	94.0	67.0	4.0
17	HM-39RR	7947	257.7	31.11	17.72	94.2	65.7	5.5
32	HM-9266RR	7935	251.6	31.73	17.40	94.1	52.2	5.9
20	HM-133RR	7931	272.0	29.40	18.72	94.1	61.1	4.0
26	HM-9260RR	7850	251.6	31.48	17.44	93.9	59.0	5.4
30	HM-9264RR	7831	259.4	30.31	17.84	94.2	52.1	5.5
12	HM-27RR	7781	264.9	29.63	18.13	94.4	63.4	4.4
38	SX 1205RR	7739	266.6	29.30	18.30	94.2	59.5	5.0
6	Crystal RR193	7631	267.9	28.68	18.35	94.3	52.7	4.8
31	HM-9265RR	7343	261.5	28.17	17.84	94.6	49.7	5.8
Average		8408	267.6	31.64	18.30	94.4	65.0	4.9
LSD (P=.05)		503.1	8.6	1.6	0.5	0.4	2.8	4.8
CV		4.3	2.3	3.6	2.0	0.3	4.5	0.3

Michigan Sugar Company
Cercospora Resistance Nursery*

*Variety	Avg of 3 Loc 0-9	Frankenmuth 0-9	Saginaw 0-9	Blumfield 0-9
HM 131RR	3.97	4.08	3.70	4.14
HM 133RR	3.98	4.08	3.76	4.09
HM 42RR	4.01	4.28	3.84	3.90
Crystal RR086	4.01	4.45	3.50	4.09
HM 50RR	4.04	4.32	3.67	4.11
BTS 10RR73	4.09	4.30	3.80	4.16
SX 1281RR	4.26	4.50	3.75	4.53
HM 110RR	4.34	4.46	4.05	4.50
BTS 18RR26	4.34	4.21	4.52	4.30
Crystal RR840	4.35	4.25	4.40	4.40
HM 9173RR	4.36	4.49	4.58	4.01
HM 27RR	4.36	4.66	4.20	4.23
SX 1204RR	4.39	4.75	4.05	4.36
HM 29RR	4.42	4.45	4.42	4.39
SX 1291RR	4.45	4.84	4.16	4.34
Crystal RR191	4.48	4.47	4.70	4.27
HM 9261RR	4.49	4.36	4.54	4.56
BTS 10RR17	4.55	4.72	4.15	4.76
BTS 10RR34	4.56	4.79	4.37	4.52
BTS 10RR10	4.58	4.81	4.05	4.88
SX 1260RR	4.58	4.70	4.07	4.99
HM 28RR	4.59	4.94	4.35	4.49
BTS 19RR90	4.68	4.61	4.55	4.88
Crystal RR046	4.73	4.61	4.56	5.03
Crystal RR197	4.74	4.80	4.78	4.63
Crystal RR193	4.81	5.25	4.36	4.82
SX 1205RR	4.99	5.47	4.92	4.59
HM 9174RR	5.23	5.08	4.81	5.80
Crystal RR824	5.27	4.98	5.26	5.57
Crystal RR059	5.27	5.32	5.50	4.99
Crystal RR808	5.33	4.99	5.70	5.29
BTS 18RR4N	5.34	5.05	5.67	5.31
HM 9260RR	5.36	5.40	5.14	5.54
BTS 19RR1N	5.40	5.05	5.65	5.49
Crystal RR074NT	5.46	5.33	5.67	5.39
BTS 17RR32	5.48	5.23	5.25	5.97
HM 9264RR	5.49	5.93	5.18	5.38
HM 39RR	5.51	5.56	5.32	5.65
HM 9259RR	5.52	5.56	5.22	5.76
HM 9258RR	5.58	4.81	5.03	6.88
HM 9175RR	5.64	5.78	5.78	5.37
HM 9265RR	5.76	6.10	5.29	5.88
Crystal RR827	5.86	5.24	5.98	6.37
BTS 18RR06	5.89	5.84	5.81	6.03
HM 9266RR	5.91	6.08	5.30	6.34
SX 1203RR	5.93	5.54	6.28	5.97
Average	4.88	4.92	4.73	4.98
CV	4.8	7.3	8.2	10.9
LSD	0.29	0.45	0.48	0.68

*Use of these varieties are subject to it being lawful to purchase, receive, distribute, and plant the varieties.

Sugar beet activities of the USDA-ARS East Lansing conducted in cooperation with Saginaw Valley Bean and Beet Farm during 2010

Mitch McGrath, Linda Hanson, Tim Duckert, and Tom Goodwill
USDA – Agricultural Research Service, East Lansing, MI

Evaluation and rating plots were planted at the Saginaw Valley Research & Extension Center in Frankenmuth, MI in 2010 that focused on Cercospora leaf spot performance, conducted in conjunction with Beet Sugar Development Foundation and including USDA-ARS cooperators. All trials were planted, following normal fall and spring tillage operations, with a USDA-ARS modified John Deere / Almaco research plot planter utilizing global positioning with real time kinematic correction signals. Seed with the designation of EL-A0xxxxx (East Lansing material) was planted in untreated form to maximize stand and seedling vigor traits inherent in the breeding germplasm. A randomized complete-block design with one to four replications depending on the specific test was used. Internal controls included a susceptible check, variety CE (kindly provided by Syngenta Seeds), and a resistant check, ACH355 (kindly provided by ACH Seeds). All plots were 4.5 m long, with 51 cm between rows and were planted from April 14-16, 2010. Azoxystrobin was applied in a band in furrow at planting and again on May 28 to control Rhizoctonia damping-off and crown and root rot. The field was microrate-sprayed four times with phenmedipham, desmedipham, triflusulfuron methyl, and clopyralid, once with S-metolachlor, and one cultivation was performed to control weeds. Plots were thinned by hand by early June, and we thank Michigan Sugar for their generous assistance with this onerous task. The nursery was inoculated on July 1 with a liquid spore suspension of *Cercospora beticola*. Visual evaluations on the plot with a disease index (DI) on a scale from where 0=no symptoms, 1=a few scattered spots, 2=spots coalescing or in large numbers on lower leaves only, 3= some dieback on lower leaves, but leaves not entirely dead, 4-8 are increasing amounts of dead and diseased tissue, 9= mostly dead with few remaining living leaves with large dead patches, and 10=all leaves dead (Ruppel, E.G., and J.O. Gaskill. 1971. Techniques for evaluating sugarbeet for resistance to *Cercospora beticola* in the field. J. Am. Soc. Sugar Beet Technol. 16:384-389). Evaluations were made between July 29 and August 26, with the peak of the epidemic occurring around August 19.

Cercospora Leaf Spot Evaluations of Sugar Beet Varieties and Breeding Lines from BSDF-Member Companies: The need continues within the sugarbeet industry for objective evaluations of commercial hybrids for their reaction to *Cercospora beticola*, the cause of Cercospora leaf spot in sugar beet. High night-time temperatures in the summer of 2010, combined with high humidity and low rainfall, contributed to a moderate leaf spot epidemic. The Beetcast Advisory daily severity values accumulated in the Frankenmuth area from May 15 to August 26 was 156. Disease severity peaked by late August, after which regrowth started to outpace new disease development, so that disease ratings for several accessions remained constant or decreased after that rating, thus ratings are not given after this date. At the August 19 rating, means of the resistant and susceptible internal control for the entire nursery were 3.2 and 5.5 (scale of 0-10), respectively, across the nursery. At the peak of the epidemic in 2009 (September 9), these means were 2.5 and 5.3 respectively. Means of contributor lines in the entire nursery in 2010 ranged from 3.0 to 7.3. An analysis of variance (PROC GLM - SAS) on the disease indices (visual evaluation scores) determined that there were significant differences among entries ($P \leq 0.05$) on all dates of evaluation.

One hundred and ninety five commercial entries and checks were received and tested from two BSDF member companies in 2-row plots, replicated four times. In addition, 192 breeding lines were tested in one- or two-row, three-replication plots from USDA collaborators from Fargo, ND, Salinas, CA, and Ft. Collins, CO. East Lansing USDA entries included 791 entries, including 79 open-pollinated accessions (**Table 1**) and 712 (partially) inbred lines. These nurseries were only rated twice, with observation dates selected based on the results from evaluating the commercial nursery. East Lansing results are sorted from high to low resistance on August 19 ("Aug 19 Mean", Table1), with dispersion measures given by standard deviations ("sd", Table 1). "Entry #" is an identifier unique to this test and year, however the "Accession ID" is the primary identifier, e.g. this is the seedlot number and represents a physical packet of seed. All seed was produced by or for the USDA-East Lansing sugar beet program during previous years, and for various purposes relating to improvement of germplasm for growers in Michigan and worldwide. These purposes are roughly indicated in the "Description" (Table 1) as a broadly construed desired outcome. Typically, these seedlots are produced using mother roots selected in USDA East Lansing nurseries (agronomic, Cercospora, Rhizoctonia, nematode, emergence and evaluation, or special), vernalized, and roots are arranged in isolated seed productions nurseries in the greenhouse or the field according to their perceived utility and stage of development. Most often, three or four large seed production nurseries are used, each isolated by a physical barrier in the greenhouse, or by > 0.5 miles in the field. Material deemed most useful for the industry is increased in greenhouse isolation as a single entry following a last cycle of selection for type or performance. Projects listed under "Description" are geared towards the stated primary goal by starting with germplasm with demonstrated performance under that particular stress (e.g. Rhizoctonia resistance, nematode resistance, stress emergence tolerance, or Cercospora resistance) and using elite smooth-root, high sucrose germplasm developed at East Lansing to improve agronomic performance prior to germplasm release to the seed companies. Thus, the Cercospora nursery is used both to evaluate current germplasm for disease reaction, but more importantly as a source of selected mother roots for continued seed production and germplasm enhancement. In Table 1, germplasm with scores <4.9 would be good candidates for release solely based on Cercospora tolerance criteria, in our estimation. One promising germplasm for release is EL-A024988 has shown good nematode resistance and yield traits in other nurseries, however the sucrose content has not been determined. It would be best to select and evaluate our material for sucrose yield under disease conditions since this is the ultimate protection against yield loss due to disease, however harvesting equipment is not currently available for 20" rows.

Seventy self-fertile F1 hybrid East Lansing breeding accessions were evaluated. All of these are seed harvested from male-sterile plants placed in the nurseries where open-pollinated, self-sterile seed is produced. These materials thus capture the best traits selected over the years in a form amenable to genetic analyses. Two streams follow for these materials. First is development of inbred lines to dissect the genetic basis of various traits required for profitable sugar production. Two populations (CRB and Y20) for a total 642 plots of advanced inbreds were evaluated in this line of experimentation, with good results in that the spectrum of disease scores was recovered, and markers will eventually allow the genetic determinants of Cercospora leaf spot resistance to be localized. A second new stream is to use self-fertile materials for population development for efficient extraction of parental materials for hybrid seed production. This will eventually benefit growers with varieties better tailored to their specific growing conditions. The first population so constructed, Population B, showed good performance in many nurseries.

Table 1: Open pollinated East Lansing germplasm tested for Cercospora reaction in 2010.

Entry #	Accession ID	Description	Aug 7 Mean	Aug 7 sd	Aug 19 Mean	Aug 19 sd
1422	EL-A021482	EL50/2 (Cercospora release)	1.2	0.4	1.7	0.8
786	EL-A021738	EL50 / EL55 intercross	1.3	0.5	3.0	0.8
788	EL-A021739	EL50/2 / SR intecross (2006 Cercospora selections)	2.3	0.5	3.0	0.8
1418	EL-A010297	Fodder x Sugar introgression	2.8	0.4	3.0	0.0
792	EL-A021742	EL0204, EL40 ,EL50, USH20 intercross	1.5	0.6	3.3	1.3
790	EL-A021740	Rhizoctonia & multiple disease resistance	1.5	0.6	3.3	0.5
827	EL-A024953	SR98 (seedling Rhizoctonia release)	1.5	0.6	3.5	0.6
825	EL-A022808	Broad Intercross of 26 Cercospora selections	1.5	0.6	3.8	0.5
795	EL-A021745	Rhizoctonia & multiple disease resistance	2.5	1.7	3.8	1.0
774	EL-A019298	Rhizoctonia & multiple disease resistance	2.3	1.3	4.0	1.4
776	EL-A021504	SR / High sugar / Low water content selection	1.8	0.5	4.0	0.8
1421	EL-A015037	USH20 A	3.9	0.7	4.0	0.0
785	EL-A021732	Intercross and selection from SR97	2.3	0.5	4.3	0.5
816	EL-A022783	Nematode / CMS & O-Type intercross	3.0	1.0	4.3	1.0
839	EL-A024978	O-Type population improvement	2.5	1.0	4.3	1.0
805	EL-A022459	Rhizoctonia & multiple disease resistance	2.8	1.5	4.3	1.3
809	EL-A022469	Rhizoctonia & multiple disease resistance	1.8	0.5	4.3	0.5
821	EL-A022803	Rhizoctonia & multiple disease resistance	1.8	0.5	4.3	0.5
836	EL-A024973	Rhizoctonia & multiple disease resistance	2.3	1.5	4.3	1.3
808	EL-A022465	SR / High sugar / Low water content selection	1.8	0.5	4.3	1.3
772	EL-A019277	Rhizoctonia & multiple disease resistance	2.7	1.2	4.3	1.5
781	EL-A021510	Cercospora & multiple disease resistant intercross	3.0	0.8	4.5	1.0
811	EL-A022773	Nematode / EL55 intercross	2.5	1.3	4.5	2.4
773	EL-A019297	Rhizoctonia & multiple disease resistance	2.3	1.3	4.5	1.3
777	EL-A021506	Rhizoctonia & multiple disease resistance	2.0	0.0	4.5	0.6
782	EL-A021602	SR / High sugar / Low water content selection	3.3	1.9	4.5	1.3
810	EL-A022471	SR / High sugar / Low water content selection	2.0	0.8	4.5	1.7
804	EL-A022456	Wild germplasm inrogression / Aphanomyces	3.0	1.4	4.5	0.6
780	EL-A021509	Multiple disease resistance breeding	2.7	0.6	4.7	0.6
806	EL-A022460	Cercospora & multiple disease resistant intercross	2.8	1.7	4.8	1.0
807	EL-A022464	CMS population improvement	2.3	0.5	4.8	1.0
794	EL-A021744	High sugar / Low water content selection	3.3	1.0	4.8	1.0
803	EL-A022447	High sugar / Low water content selection	2.5	0.6	4.8	1.0
838	EL-A024975	High sugar / Low water content selection	3.3	0.5	4.8	0.5
846	EL-A024988	Nematode breeding: M1-3	3.0	0.8	4.8	1.0
796	EL-A022411	Wild introgression for improved emergence	5.8	0.5	4.8	1.0
831	EL-A024967	Rhizoctonia & multiple disease resistance	2.5	1.7	4.8	1.0
832	EL-A024968	Rhizoctonia & multiple disease resistance	2.5	1.0	4.8	1.0
775	EL-A021502	USH20 D	3.0	0.8	4.8	1.0
818	EL-A022791	Nematode resistance breeding	3.0	1.0	5.0	1.0
1419	EL-A013699	Fodder x Sugar introgression	5.0	0.5	5.0	0.0
778	EL-A021507	High sugar / Low water content selection	3.5	1.7	5.0	0.8
779	EL-A021508	High sugar / Low water content selection	3.0	2.0	5.0	1.4
822	EL-A022805	High sugar / Low water content selection	3.0	1.4	5.0	0.8
823	EL-A022806	High sugar / Low water content selection	3.5	1.3	5.0	1.4
819	EL-A022799	Wild introgression for improved emergence	3.0	2.2	5.0	0.8
817	EL-A022784	Nematode resistance breeding	3.3	1.5	5.0	0.8
820	EL-A022801	Nematode resistance breeding	1.0	.	5.0	.
824	EL-A022807	Nematode resistance breeding	3.5	1.3	5.0	0.8
828	EL-A024961	Rhizoctonia & multiple disease resistance	3.3	1.5	5.0	1.0
833	EL-A024969	Rhizoctonia & multiple disease resistance	3.5	2.4	5.0	1.8
826	EL-A022809	Self Fertile intercross & multiple disease resistance	3.5	1.5	5.0	0.6
797	EL-A022412	Wild introgression for improved emergence	2.5	1.3	5.0	1.4
834	EL-A024971	CMS population improvement	3.0	1.4	5.3	1.7
812	EL-A022774	Nematode / High sugar / Low water content selection	3.0	1.4	5.3	1.0
813	EL-A022775	Nematode resistance breeding	3.3	1.3	5.3	0.5
814	EL-A022776	Nematode resistance breeding	4.3	1.0	5.3	0.5
841	EL-A024983	Nematode resistance breeding	3.3	0.5	5.3	0.5
844	EL-A024986	Nematode resistance breeding	4.0	1.2	5.3	1.0
802	EL-A022445	Rhizoctonia & multiple disease resistance	2.5	1.0	5.3	0.5
837	EL-A024974	SR / High sugar / Low water content selection	3.3	0.5	5.3	1.0
768	EL-A013486	USH20 B	3.3	1.3	5.3	1.5
800	EL-A022420	Wild introgression for improved emergence	3.8	1.9	5.3	1.0
801	EL-A022425	Wild introgression for improved emergence	3.5	1.0	5.3	0.5
829	EL-A024965	Wild introgression for improved emergence	3.8	1.3	5.3	1.0
769	EL-A013506	SR / High sugar / Low water content selection	3.0	1.0	5.3	0.6
770	EL-A013522	SR / High sugar / Low water content selection	3.7	2.1	5.3	2.5
771	EL-A015033	USH20 C	3.0	1.0	5.3	0.6
815	EL-A022782	Nematode resistance breeding	3.8	1.3	5.5	0.6
840	EL-A024982	Nematode resistance breeding	3.5	1.7	5.5	0.6
835	EL-A024972	SR / High sugar / Low water content selection	4.0	0.8	5.5	1.7
798	EL-A022413	Wild introgression for improved emergence	4.0	1.8	5.5	1.0
799	EL-A022419	Wild introgression for improved emergence	2.5	1.0	5.5	0.6
830	EL-A024966	Wild introgression for improved emergence	3.5	1.0	5.5	0.6
843	EL-A024985	Nematode resistance breeding	4.0	1.0	5.7	0.6
767	EL-A013484	CMS population improvement	4.8	1.3	5.8	0.5
845	EL-A024987	Nematode resistance breeding	5.0	1.4	5.8	0.5
1420	EL-A015027	CMS population improvement	5.5	0.6	6.0	0.0
842	EL-A024984	Nematode resistance breeding	4.8	1.0	6.0	0.0
		Mean	3.05		4.42	
		LSD (0.05)	1.42		1.08	
		CV (%)	49.40		30.86	
		F-value	7.28***		14.34***	

In addition, 30 Plant Introductions (PIs) from the USDA-ARS National Plant Germplasm System (NPGS) (Garden Beet, Sugar Beet, Leaf Beet, Fodder Beet, and wild beet) were evaluated in single-row plots 4.5 m long, with 51 cm between rows, and these results are shown in **Table 2**. Bolting beets were removed throughout the season, after which some annual materials could not be rated as there was not sufficient remaining leaf tissue. Two accessions (PI 540659 and PI540579) had average ratings that were significantly lower than the susceptible control at the second and third rating dates, but not at the other rating dates, and one of these (PI 540659) was not significantly different from the resistant control at the first rating date. One accessions (PI 540586) had a significantly lower rating than the susceptible control at the third rating date only. In addition, two accessions (PI 518400 and PI 540687) were highly susceptible, having significantly higher average disease severity ratings than the susceptible control on three of the five rating dates. Only 10 accessions (PI 518400, PI540672, PI540673, PI540674, PI 540694, PI 540697, PI 540699, PI 546406, PI 546412, and PI 599350) and the two control varieties did not require removal of seed stalks during the course of the ratings. These data, and more information on the accessions evaluated, are available through the USDA-ARS GRIN database at http://www.ars-grin.gov/npgs.

Table 2: USDA Plant Introduction (wild species) Cercospora leaf spot scores, 2010.

	Identification			Disease Index[z]				
Entry	Donor's ID	subsp.	Origin	29-Jul	5-Aug	12-Aug	19-Aug	26-Sep
PI 518400	IDBBNR 5894	*maritima*	Ireland	2.3	4.3	6.7	7.7	7.3
PI 540579	WB 833	*maritima*	France	2.0[w]	2.5	3.5	5.0	5.0
PI 540586	WB 840	*maritima*	France	2.0	3.0	4.0	5.0	5.0
PI 540587	WB 841	*maritima*	France	2.3	3.7	5.0	5.3	5.0
PI 540593	WB 847	*maritima*	France	2.0	4.0	5.0	5.7	5.3
PI 540601	WB 855	*maritima*	France	2.0	3.3	5.0	5.7	5.7
PI 540607	WB 861	*maritima*	France	2.0	3.7	5.7	5.0	4.7
PI 540621	WB 875	*maritima*	France	2.7	4.0	5.3	6.0	6.3
PI 540622	WB 876	*maritima*	France	2.0	3.7	5.3	5.7	5.3
PI 540624	WB 878	*maritima*	France	2.0	3.7	4.3	6.0	6.0
PI 540634	WB 888	*maritima*	United States	2.0	4.0	5.7	6.0	6.3
PI 540648	WB 902	*maritima*	France	2.3	4.0	5.0	5.7	5.7
PI 540655	WB 909	*maritima*	France	2.0	3.7	4.7	6.3	6.0
PI 540659	WB 913	*maritima*	France	1.3	2.7	4.0	5.0	5.0
PI 540672	WB 926	*maritima*	Denmark	2.3	3.3	5.3	5.7	5.3
PI 540673	WB 927	*maritima*	Denmark	2.3	3.7	5.3	5.7	6.7
PI 540674	WB 928	*maritima*	Denmark	2.0	3.7	5.0	6.0	5.7
PI 540677	WB 931	*maritima*	Denmark	2.3	4.3	5.3	6.0	6.0
PI 540685	WB 939	*maritima*	Denmark	2.0	4.3	5.3	6.3	6.3
PI 540687	WB 941	*maritima*	Belgium	2.0	5.0	6.3	7.0	6.3
PI 540688	WB 942	*maritima*	Belgium	2.3	3.7	5.0	5.7	6.0
PI 540693	WB 947	*maritima*	France	2.0	4.0	5.7	6.3	5.7
PI 540694	WB 948	*maritima*	France	2.0	3.3	5.0	5.7	6.3
PI 540696	WB 950	*maritima*	France	2.0	4.3	5.7	6.0	6.0
PI 540697	WB 951	*maritima*	France	2.3	4.3	6.3	6.3	6.0
PI 540699	WB 953	*maritima*	France	1.3	3.7	5.0	5.7	5.7
PI 540700	WB 954	*maritima*	France	2.0	4.0	5.7	6.0	5.7
PI 546406	IDBBNR 5435	*maritima*	Denmark	2.0	3.3	4.7	5.3	5.7
PI 546412	IDBBNR 5607	*maritima*	Denmark	1.3	3.3	4.7	5.7	6.3
PI 599350	R423	*maritima*	United States	2.0	3.3	5.0	5.3	5.3
Leaf Spot Susceptible Check[y] (CE)				2.0	3.7	5.3	5.7	5.0
Leaf Spot Resistant Check[x] (ACH355)				1.0	1.0	2.7	3.0	3.0
	$LSD_{0.05}$			0.9	1.2	1.5	1.4	1.3
Trial Mean				2.0	3.7	5.1	5.7	5.7

[z]Disease Index is based on a scale where 0=healthy to 10=all leaves dead.

[y]The Leafspot Susceptible Check is "CE".

[x]The Leafspot Resistant Check is ACH 355.

[w]Numbers based on average from two plots as the third plot had no emergence.

2010 DRY BEAN YIELD TRIALS

J.D. Kelly, E. Wright, N. Blakely, and J. Heilig
Crop and Soil Sciences

The bean breeding program initiated its second season on the new 250 acre research farm, Saginaw Valley Research & Extension Center near Frankenmuth in 2010. A total of 2994 plots were harvested for yield in 2010 and over 2600 single plant selections were made in the early generation nurseries. Yield trials were conducted at Frankenmuth, Montcalm, East Lansing, and Tuscola counties in addition to 20 acres of early generation nurseries under development in 10 different market classes. At the Saginaw Valley Research & Extension Center, yield trials included 36-entry standard navy test; 64-entry standard black test; 16-entry preliminary black test; 56-entry prelim navy and black test: 36-entry standard GN and 64-entry standard pinto tests; 12-entry standard Tebo test; 16-entry GN PYT test; red/pink test with 30 entries; 42-entry Co-op and regional test that includes pinto, GN, red and pinks; two canning quality trials for CONAGRA: 8-entry navy and 14-entry pinto. At Montcalm; bush cranberry test with 25 entries; kidney test with 42 entries; three white mold tests: national test with 64-entries and two 96-entry pinto trials for genetic studies; one 36-entry certified organic trial in Tuscola county; one potato leaf hopper (PLH) trial with 80-entries on MSU campus; and 375 single row plots as part of the BeanCAP project.

Plots in Frankenmuth suffered from severe drought (3.35 inches rain from planting to harvest) in 2010 that resulted in lower yields (average yield reduction exceeded 50% across nurseries compared to 2009) and some entries remained green and never matured. Normal rainfall for this period is 7”. The stress provided the opportunity to select for drought tolerance under these harsh conditions. Plots at Montcalm had adequate rainfall and severe white mold infection developed under supplemental irrigation. As a result the program was able to identify sources of drought resistance in black, navy, pinto, red and great northern market classes and modest levels of white mold tolerance in cranberry and kidney bean trials. All trials except for kidney, cranberry and white mold, organic, and PLH were direct harvested using new self-propelled plot combine. The organic trial planted in the certified organic grower’s field in Tuscola county suffered from localized flooding early in the season and as result a portion of the plot was lost to flooding. Conditions favored the development of common bacterial blight (CBB) and the trial proved to be an excellent screen for CBB. Weeds were controlled by cultivation and hand weeding and no additional control for insects was applied. The trial in East Lansing to screen for reaction to potato leaf hoppers (PLH) had adequate moisture and rainfall throughout the season. Insect pressure was minimum so only the caged plots were PLH were trapped proved useful in screening for genetic resistance. The 375 single rows of BeanCAP genotypes grown at East Lansing were hand harvested and notes were taken on adaptation of lines to local conditions. Seed samples were forwarded for nutritional analysis. Two recombinant inbred line populations were advanced to F5 generation in Frankenmuth. The populations were derived from crosses of Zorro with Puebla 152 and Jaguar x Puebla and will be used to study biological nitrogen fixation in black beans. Seed of another RIL population (B89311 x TLP 19) was increased and will be used to study root systems related to drought tolerance in black beans.

The data for all tests are included in an attached section. Procedures and details on nursery establishment and harvest methods are outlined on the first page. Since the data collected on each test are basically the same, a brief discussion of each variable measured is presented below for clarification purposes.

1. Yield is clean seed weight reported in hundredweight per acre (cwt/acre) standardized to 18% moisture content. Dry beans are commercially marketed in units of 100 pounds (cwt).

2. Seed weight is a measure of seed size, determined by weighing in grams a pre-counted sample of 100 seeds, known as the 100-seed weight. To convert to seeds per 100g (10,000/100 seed wt); for example 100-seed weight of 50 converts to 200 seeds per 100 g (used in marketing).

3. Days to flower is the number of days from planting to when 50% of plants in a plot have one or more open flowers.

4. Days to maturity is the actual number of days from planting until date when all the plants in a plot have reached harvest maturity.

5. Lodging is scored from 1 to 5 where 1 is erect while 5 is prostrate or 100% lodged.

6. Height is determined at physiological maturity, from soil surface to the top of plant canopy, and is recorded in centimeters (cm).

7. Desirability score is a visual score given the plot at maturity that takes into consideration such plant traits as; moderate height, lodging resistance, good pod load, favorable pod to ground distance, uniformity of maturity, and absence of disease, if present in the nursery. The higher the score (from 1 to 9) the more desirable the variety, hence DS serves as a subjective selection index.

At the bottom of each table, the mean or average of all entries in a test is given to facilitate comparisons between varieties. In order to better interpret data, certain statistical factors are used. The LSD values refer to the Least Significant Difference between entries in a test at two levels of probability. The LSD value is the minimum difference by which two entries must differ before they can be considered significantly different. Two entries differing in yield by 1 cwt/acre cannot be considered as performing significantly different if the LSD value is greater than 1 cwt/ acre. Such a statement is actually a statement of "probable" difference. We could be wrong once in 20 times (p=0.05), on the average, or once in 100 times (p=0.01) depending on the level of probability. The other statistic, Coefficient of Variation (CV), indicates how good the test was in terms of controlling error variance due to soil or other differences within a location. Since it is impossible to control all variability, a CV value of 10% or less implies excellent error control and is reflected in lower LSD values. Under the pedigree column, all released or named varieties are **bolded** and always preceded by a comma (,); when preceded by a slash (/), the variety was used only as a parent to produce that particular breeding line.

Expt. 0101: Standard Navy Bean Yield Trial

This 36-entry trial included standard commercial navy bean varieties, and advanced lines from the MSU breeding program, which carry the N-prefix. Yields ranged from 9 to 19.4 cwt/acre with a mean of 14.3 cwt/acre. The trial was fairly uniform but variability was high (CV=12.2%) due to drought and the LSD needed for significance was 2.5 cwt/acre. Only six entries significantly out-yielded the test mean and included new line OAC7-2 from Ontario. The best yielding check varieties Vista, T9905, and Coop 02084. Medalist, and Lightning, ranked near the bottom of the test mean, whereas Avalanche ranked below the mean. These full season varieties did not tolerate extreme drought. Two new breeding line N09174 and B09175 topped the trial but canning tests and seed color characteristics will determine whether these breeding lines be considered for release.

Expt. 0102: Standard Black Bean Yield Trial

This 64-entry trial included the standard commercial black bean varieties and advanced breeding lines. Yields ranged from 11.4 to 19.2 cwt/acre with a test mean of 15.7 cwt/acre, but did not exceed the yield potential of the advanced navy trial. Variability was high in this test, (CV=12.8%) and the LSD was 2.9 cwt/acre. Only one breeding line B09174 significantly out-yielded the test mean and was black seeded selection derived from the top navy line in test 0101. Top yielding checks included Zorro, Loreto Eclipse, T-39, Black Velvet and Shania exceeded the test mean, whereas Jaguar and Condor were below the mean. The test will allow selection for those breeding line with drought tolerance and the elimination of those with no tolerance. Future advances will largely depend on disease reactions and canning quality of the entries.

Expt. 0103: Preliminary Navy and Black Bean Yield Trial

This 16-trial included new navy bean lines along with check varieties developed by breeding programs at TARS and University of Puerto Rico. Yields ranged from 11.9 to 17.5 cwt/acre with a mean of 15 cwt/acre. Variability was high in this 3-rep test (CV=12%) and the LSD was 2.9 cwt/acre resulting in no lines that significantly outyielded the test mean. Many of the lines were derived from Zorro and carry additional disease resistance for CBB, but future advances of many of these lines will largely depend on disease reactions and canning quality of the entries.

Expt. 0104: Preliminary Navy and Black Bean Yield Trial

This 56-trial included new black bean lines along with check varieties. Yields ranged from 4.9 to 18.5 cwt/acre with a mean of 12 cwt/acre. Variability was very high in this 3-rep test (CV=18.9%) and the LSD was 4.5 cwt/acre resulting in only 3 lines that significantly outyielded the test mean. The top yielding entries were very erect and appear to tolerate drought stress. The two black varieties Zorro and Jaguar yielded above the test mean whereas the two navy varieties Vista and Medalist produced dramatically lower yields. The drought stress favored the early efficient maturity of black beans over longer-season navy bean varieties. Future advances of many of the new breeding lines will largely depend on disease reactions and canning quality of the entries.

Expt. 0105: Standard Great Northern Bean Yield Trial

This 36-entry trial included MSU great northern breeding lines and standard commercial check varieties. The test ranged in yield from 9 to 16.2 cwt/acre with a mean yield of 13.2 cwt/acre. Variability was high (CV= 12.7%) resulting in a high LSD value (2.4 cwt/acre) needed for significance. Only one breeding line significantly outperformed the test mean. Line G09303 topped the trial, showed no quality problems and carries resistance to anthracnose (*Co-4*^{2} gene). The check variety Matterhorn performed well and was 2nd in the test. We encountered a major seed quality problem in many GN lines in 2010, very similar to problems seen in 2009. A large number of lines exhibited severe 'fish-mouth' seed damage making them commercially unacceptable. This seed condition was previously expressed in some lines in 2009, but appears to be antagonized by the severe drought conditions in 2010. Only those entries with larger seed size, improved dry seed quality and cracking resistance better than Matterhorn will be advanced in 2011.

Expt. 0106: Standard Tebo Bean Yield Trial

This 12-entry trial included tebo bean varieties and MSU breeding lines with similar in seed size to check varieties. The test ranged in yield from 4.3 to 13.4 cwt/acre with a mean yield of 9.2 cwt/acre. Variability was high (CV= 17.2%) resulting in a high LSD value (2.2 cwt/acre) needed for significance. Only three breeding lines significantly outperformed the test mean. The two bush tebo bean varieties were lowest yielding entries on the station in 2010. The varieties did not tolerate drought and they continued to reset pods which aborted due to stress, so the varieties never fully matured. In the trial all indeterminate lines yielded better and these lines will continue to be tested to determine their suitability for release as future tebo bean varieties.

Expt. 0107: Standard Pinto Bean Yield Trial

This 64-entry trial included standard commercial pinto bean varieties and advanced breeding lines from the MSU breeding program with the P-prefix. The trial ranged in yield from 8.4 to 16.8 cwt/acre with a mean of 12.2 cwt/acre. There was greater variability (CV=14.9%) in this trial than in past years and the LSD needed for significance was 2.6 cwt/acre. Only seven entries significantly out-yielded the test mean and these included the varieties La Paz and Othello. The major surprise was the yield of Othello under drought stress. It would appear that its early season maturity helped it avoid the severity of the drought whereas longer season varieties like Lariat and Stampede never fully reached their potential. Breeding line P07863 was the highest yielding pinto in the white mold trials in Montcalm in 2007 2008 and 2009 was 2nd in this test. Other lines from the same cross exceeded the test mean. The new varieties Lariat Stampede, Croissant and Santa Fe yielded above the test mean, and many MSU breeding lines will be discarded due to poor performance in this test. A few lines exhibited the fish-mouth defect but not with the same frequency as the GNs. Only those high-yielding entries with more upright architecture and equivalent canning quality to Othello will be advanced in 2011.

Expt. 0108: Standard Pink and Small Red Bean Yield Trial

This 30-entry trial included small red and pink breeding lines from MSU (R-S-prefix), standard commercial check varieties. The test ranged in yield from 7.9 to 17.7 cwt/acre with a mean yield of 13.4 cwt/acre. Variability was very high (CV=18.6%) due to direct harvesting resulting in a LSD value (3.5 cwt/acre) for significance. Only two lines significantly outperformed the test mean including Merlot and the pink line S07501. Some lines in the trial showed high levels of resistance to CBB but lacked the seed quality of Merlot, whereas others were highly susceptible, similar to Merlot. Check varieties Merlot and Sedona yielded above the test mean, whereas Brooks was lower than the test mean. Included in the test were two new lines from NDSU (prefix NDZ) and both were shorter and earlier. A few breeding lines tended toward a single stem with pods hanging on small branches. Many of these types lost yield as the dry pods shattered in high winds prior to harvest as a result of direct contact with the main stem. Only those small red entries equivalent to Merlot and pink lines equivalent to Sedona in canning quality with BCMV resistance will be advanced in 2010.

Expt. 0109: Combined Midwest Regional Performance Nursery (MRPN) & Cooperative Dry Bean Nursery (CDBN) Yield Trial

The MRPN is conducted annually in cooperation with North Dakota (ND-prefix), Nebraska (NE-prefix) and Colorado (CO-prefix) in order to test new pinto and great northern lines from all four programs and access their potential in the different regions. The CDBN is a national trial and includes all classes but only medium-sized entries were included in this trial. The 42-entry trial ranged in yield from 7.5 to 21.8 cwt/acre with a mean of 13.6 cwt/acre. Variability was high (CV=18.1%) resulting in a LSD value (4 cwt/acre) for significance. As a result only four lines were significantly higher in yield than the test mean. The top yielding entries were all pintos included La Paz, Othello and Odyssey varieties and breeding line P07863. The test mirrored pinto test 0107 in order of performance as it favored early season varieties which avoided the drought. Among the check varieties, Lariat, Stampede, Sequoia, Max, Montrose, Matterhorn and Buster yielding above the test mean, whereas Coyne, Santa Fe, Jackpot, yielded below the test mean. The longer-season vine cranberry varieties Chianti and Bellagio did not tolerate drought. Many of the lower yielding entries did not tolerate drought stress and some remained green and never fully matured (100d). This cooperative trial continues to be valuable as it allows an evaluation of potential new lines prior to release in other states and a number of full-season, high-yielding pinto bean lines were identified in 2010.

Expt. 0210: Standard Bush Cranberry Bean Yield Trial

This 25-entry trial was conducted on the Montcalm Research Farm to compare new and standard bush cranberry bean varieties under supplemental irrigation (5x total 3.2”). Yields ranged from 20.8 to 35.4 cwt/acre with a mean of 28.7 cwt/acre. Variability was very high (CV=15.3%) in this test due to severe white mold pressure and the LSD needed for significance was high (6.2 cwt/acre). As a result two lines significantly outyielded the test mean. White mold was rated on 1-9 scale and ranged from low of 1.3 to high of 9.1 for variety Krimson. Despite the very high levels of white mold pressure, a family of full-sibs originating from cross X03516/C99804 all showed relatively high yield combined with lower disease ratings (<4). The same lines exhibited similar performance in 2009.

Check varieties, Capri, T. Hort, yielded above the test mean, whereas Chianti, Crimson, Bellagio and Hooter yielded below the test mean and exhibited high levels of white mold. Two vine cranberry lines Bellagio and Chianti were also severely infected with white mold and should not be grown under this irrigated management system. Only those entries equivalent to Capri in seed size with improved canning quality will be advanced in 2011.

Expt. 0211: Standard Kidney Bean Yield Trial

This 42-entry trial was conducted on the Montcalm Research Farm to compare the performance of standard and new light red kidney (LRK), dark red kidney (DRK) and white kidney (WK) bean varieties from MSU and CDBN under supplemental irrigation (5x total 3.2"). Yields ranged from 21.2 to 36.8 cwt/acre with a mean of 29.6 cwt/acre. Variability was moderate (CV=12.1%) resulting in a large LSD value (5.1 cwt/acre) needed for significance. Only two entries significantly outyielded the test mean, included WK K08961 and three checks Chinook, Red Hawk and CELRK. K08961 was also the top-yielding entry in 2009, yielding 4 cwt/a more than the next entry, while the same line ranked 4th in 2008. A new early-season selection from Beluga (K10902) yielded 3cwt more than Beluga and was 5-days earlier. White mold was not as severe in this test, compared to cranberry test and ranged from 0.9 to 6.0. Early season check varieties CELRK seemed to avoid the worse infections. Redcoat, Montcalm also yielded above the test mean, whereas Beluga and Badillo yielded below the test mean. Three LRK breeding lines from Puerto Rico, T21-Badillo T-27 and T-28 which showed potential in 2009 were lower yielding and Badillo never fully matured (105d). Since canning quality is vital in kidney beans, only those DRK lines equivalent in canning quality to Red Hawk, LRK lines equal or better than CELRK and WK lines equivalent to Beluga will be advanced in 2011.

Expt. 0212: National White Mold Variety Yield Trial

This 64-entry trial was conducted at Montcalm to evaluate a range of diverse dry bean varieties and breeding lines for reaction to white mold under natural field conditions. Genotypes included commercial navy and black bean cultivars, elite MSU lines, and new sources of white mold resistance entered as part of the National *Sclerotinia* Initiative (NSI) Nursery. Lines in the National trial were developed at MSU, OSU, CSU, Cornell, NDSU and USDA-WA. Entries were planted in two row plots with two rows of susceptible spreader variety Beryl between plots. Supplemental overhead irrigation was applied 6 times for a total of 3.7" to maintain adequate levels of moisture for favorable disease development at the critical flowering period. Natural white mold infection occurred across the entire trial and was extremely severe in certain plots. White mold was rated on a per plot basis on a scale of 1 to 9 based on disease incidence and severity where 9 had 90+% incidence and high severity index. White mold ranged from 33 to 94% and pressure was higher than in past years. The test ranged in yield from 8 to 33 cwt/acre with a mean yield of 23.6 cwt/acre. Variability was high (CV=17.6%), thus a high LSD value (6.8 cwt/acre) was needed for significance. As a result only 4 lines significantly outyielded the test mean but overall yields were similar in 2009. The top group included new pinto 37-2 from USDA-WA along with pinto line P07863 that was the top yielder in 2007, 2008 and 2009 and two small red lines R08512 and R08516. The P07863 line continues to demonstrate superior yield performance under white mold pressure. Small red and navy lines from NDSU (prefix ND) did well as did Zorro black bean. The major surprise was high yielding of Beryl the susceptible check in 2010. Santa Fe, Jaguar, Merlot and Medalist performed above the test mean, whereas all high-yielding pintos La Paz, Lariat, Stampede, performed below the mean due to white mold pressure. The same group also included Condor, Sedona, Eclipse, Capri, Bunsi and Matterhorn. K08961 white kidney that was in top group in 2009 dropped below test mean in 2010 due to high white mold pressure. White mold resistance in G122 cranberry broke down (39%) in 2010 as in 2009 and G122 only yielded 14.5 cwt or 7 cwt/a less than the new bush cranberry line C08709. This was the first year that five of entries in NSI trial yielded above the test mean as many of the standard entries from NSI trial were among the lowest yielding lines in the past. Highly resistant VCW54 from Idaho was the lowest yielding entry in 2010. Past experience using low-yielding white mold resistant germplasm as parents has not proved useful in breeding for white mold resistance. Overall the trial confirmed results from previous years (exception Beryl) and this trial will continue to be a vital part of the breeding effort to improve tolerance to white mold in dry beans.

Expt. 0213: White Mold Genetic Yield Trial- AP630

A 4-replicate 96-entry trial was conducted at Montcalm to evaluate the genetic resistance to white mold in the recombinant inbred line (RIL) pinto population AP630 developed from the cross of AN 37/P02630. The cross was made to introduce white mold resistance from AN 37 into the upright pinto line P02630 from the MSU program and this is the four year to evaluate this population. Natural white mold infection occurred across the entire trial and ranged from 19 to 92% so disease pressure was high due to the cool wet season and additional 6 irrigations for a total of 3.7 inches to promote disease development. The test was planted in the same arrangement as test 0212. Yield ranged from 16.2 to 32.1 cwt/acre with a mean yield of 25.7 cwt/acre. Variability was high (CV=16.2%), and a LSD value (6.8 cwt/acre) was needed for significance. Due to the high variability, no lines significantly outyielded the test mean. Top entry in past 3-years was pinto line P07863, but it dropped to 30th position in 2010. This was a major surprise as it was the second entry in the adjacent test 0212, but white mold rating of 81% was noted in this trial. One parent AN 37 yielded above the test mean whereas other parent was below the test mean and many of the lowest yielding entries were similar in both years. A genetic mapping experiment to find markers associated with white mold resistance and high yield under white mold pressure in this population is underway.

Expt. 0214: White Mold Genetic Yield Trial- AP647

A second 4-replicate 96-entry trial was conducted at Montcalm to evaluate the genetic resistance to white mold in the recombinant inbred line (RIL) pinto population AP647 developed from the cross of AN 37/P02647. The cross was made to introduce white mold resistance from AN 37 into the upright pinto line P02647 from the MSU program and this is the second year to evaluate this population. Natural white mold infection occurred across the entire trial and ranged from 25 to 92% so disease pressure was high due to the cool wet season and additional 6 irrigations for a total of 3.7 inches to promote disease development. The test was planted in the same arrangement as test 0213. Yield ranged from 22.9 to 36.9 cwt/acre with a mean yield of 29.1 cwt/acre and yielded ~4 cwt/a more than test 0213. Variability was high (CV=15.6%), and a LSD value (7.4 cwt/acre) was needed for significance. Due to the high variability, only two lines significantly outyielded the test mean. One parent yielded above while other yield below the test mean. A genetic mapping experiment to find markers associated with white mold resistance and high yield under white mold pressure in this population is underway. Elite lines will be included in standard pinto bean yield tests in 2011.

Expt. 0116: Preliminary Great Northern Bean Yield Trial

This 18-entry trial included new MSU great northern breeding lines and standard commercial check varieties. The test ranged in yield from 5.1 to 18.5 cwt/acre with a mean yield of 10.3 cwt/acre. Variability was high (CV= 23.5%) in 2-rep experiment resulting in a high LSD value (4.3 cwt/acre) needed for significance. Only one breeding line G10409 significantly outperformed the test mean. The check variety Matterhorn yield above the test mean. We encountered a major seed quality problem in some of GN lines that appears to be antagonized by the severe drought conditions in 2010. Only those entries with larger seed size, improved dry seed quality and cracking resistance better than Matterhorn will be advanced in 2011.

Expt. 0117: Commercial Navy Bean Yield Trial

This trial was conducted to test current commercial navy bean varieties and evaluate their production potential and canning quality in Michigan. The trial was conducted at a second location in Michigan and at two other locations in ND and NE. The 8-entry trial ranged in yield from 7.6 to 19.1 cwt/acre with a mean of 12.6 cwt/acre. Variability was high (CV=18.1%) resulting in a high LSD value (3.2 cwt/acre) for significance. Due to the small number of entries only one line was significantly higher in yield than the test mean. The top yielding entry Schooner appeared to tolerate drought better due to its earlier maturity. The full-season variety Medalist did not perform well in 2010 and was 9 cwt/a less than Schooner. Among the other varieties, Norstar was the lowest yielding. All entries will be canned at MSU and evaluated by Conagra brand team for suitability in their canned products.

Expt. 0118: Commercial Pinto Bean Yield Trial

This trial was conducted to test current commercial pinto bean varieties and evaluate their potential and canning quality in Michigan. The trial was conducted at a second location in Michigan and at two other locations in ND and NE. The 14-entry trial ranged in yield from 12.1 to 17.8 cwt/acre with a mean of 14.9 cwt/acre. Variability was high (CV=15.7%) resulting in a high LSD value (3.3 cwt/acre) for significance. Due to the small number of entries no line was significantly higher in yield than the test mean. The top yielding entry P07863 appeared to tolerate drought better despite its full-season maturity. This trial mirrored pinto test 0107, with La Paz and Othello in the top group. The surprise was the full-season variety Stampede in this group along with Poncho (not previously tested). Lariat did not perform well in 2010, below Maverick and Santa Fe, bred for white mold tolerance (test 0212) showed no tolerance to drought either. All entries will be canned at MSU and evaluated by Conagra brand team for suitability in their canned products.

Expt. 0915: Organic Dry Bean Yield Trial, Tuscola County

A 36-entry navy and black trial was conducted in a commercial organic grower’s fields in Tuscola County near Unionville to evaluate new breeding lines, current and old varieties for potential under this management system. Heavy rainfall in late June resulted in localized flooding, resulting in low stands and damaged plots which resulted in variable yields. Yields ranged in yield from 6.1 to 23 cwt/acre with a mean of 15.1 cwt/acre. Variability was extremely high (CV=37.1%) resulting in a high LSD value (7.9 cwt/acre) for significance. Due to the high variability only one line was significantly higher in yield than the test mean which prevents a true comparison of the yield potential of the 36-entries. Since organic growers plant later than conventional growers as they wait to cultivate the first flush of weeds in early June, we wanted to evaluate older early-season varieties that could be planted later. Despite a planting date of June 17, the early-season varieties performed very poorly and grouped at the bottom of the test. Organic growers should plant the best full-season commercial varieties available and not consider the lower yield older varieties like Seafarer and Albion as their yield potential is inferior. The early wet conditions favored the development of CBB which was rated on 1-5 scale (5=very susceptible). The test proved very useful screen for CBB and many of the new high-yielding MSU showed excellent levels of tolerance to CBB with scores under 1.0. Since organic growers may choose to save seed as organic seed is not widely available, resistance to seed-borne CBB would be an important criterion in their selection of bean varieties to grow. The trial will be repeated in 2011.

Expt. 0420: Potato Leafhopper Trial – PLH.

A single 80-entry trial was conducted in East Lansing to compare reaction of RIL population to natural infection with PLH. The population was developed from cross of Matterhorn with EMP507 line selected in Puerto Rico with resistance to PLH. The trial was rated for reaction to PLH based on PLH count and leaf curl symptoms – typical damage caused by the pest. Yield ranged from 14.4 to 36.6 cwt/acre with a mean of 26.7 cwt/acre. Variability was high (CV=22.8%), and a LSD value of 9.9 cwt/acre was needed for significance. As a result only one line significantly exceeded test mean. A number of lines exceeded the performance of the Matterhorn parent and will be evaluated further. Leaf curl ratings ranged from low 1.3 to 4.3 but showed a high CV=22.6%. Likewise the PLH count showed an unsatisfactory high CV=62.2% which suggests that there is too great variability in this measurement to use this as a useful screening method. The trial will be repeated in the growth chamber where there is better control of the numbers of insect pests and in field cages where the same numbers of insects/nymphs can be placed on the bean plants being evaluated. Tolerance to PLH would be useful trait for organic bean producers who cannot apply conventional insecticides to control this insect pest.

Early Generation Breeding Material grown in Michigan in 2010

F3 through F5 lines

Navy and Black - 1176 lines
Pinto - 551 lines
GN - 90 lines
Pinks and Reds - 127 lines
Kidneys (DR, LR, White) - 196 lines
Cranberry (bush, vine) - 337 lines
Yellow Eye – 6 lines
Flor De Mayo – 50 lines

F2 populations

Navy and Black -128 populations
Pinto - 130 populations
GN - 65 populations
Pinks and Reds - 167 populations
Kidneys (DR, LR, White) – 87 populations
Cranberry (bush, vine) – 109 populations

F1 populations: 667 different crosses among nine contrasting seed types.

2010 DRY BEAN YIELD TRIALS

EXPERIMENT	TITLE	PLANTING DATE	LOCATION		ENTRIES	DESIGN	REPS	HARVEST METHOD
0101	STANDARD NAVY BEAN YIELD TRIAL	06/10/10	SVR&EC	FRANKENMUTH	36	SQ. LATTICE	4	DIRECT HARVESTED
0102	STANDARD BLACK BEAN YIELD TRIAL	06/10/10	SVR&EC	FRANKENMUTH	64	SQ. LATTICE	4	DIRECT HARVESTED
0103	PRELIMINARY NAVY&BLACK YLD TRIAL-1	06/10/10	SVR&EC	FRANKENMUTH	16	SQ. LATTICE	3	DIRECT HARVESTED
0104	PRELIMINARY NAVY&BLACK YLD TRIAL-2	06/10/10	SVR&EC	FRANKENMUTH	56	REC. LATTICE	2	DIRECT HARVESTED
0105	STANDARD GREAT NORTHERN YIELD TRIAL	06/10/10	SVR&EC	FRANKENMUTH	36	SQ. LATTICE	4	DIRECT HARVESTED
0106	STANDARD TEBO BEAN YIELD TRIAL	06/10/10	SVR&EC	FRANKENMUTH	12	REC. LATTICE	4	DIRECT HARVESTED
0107	STANDARD PINTO BEAN YIELD TRIAL	06/11/10	SVR&EC	FRANKENMUTH	64	SQ. LATTICE	4	DIRECT HARVESTED
0108	STANDARD PINK & SMALL RED YLD TRIAL	06/11/10	SVR&EC	FRANKENMUTH	30	REC. LATTICE	4	DIRECT HARVESTED
0109	MIDWEST & CO-OP. REGIONAL TRIAL	06/11/10	SVR&EC	FRANKENMUTH	42	REC. LATTICE	3	DIRECT HARVESTED
0116	PRELIMINARY GREAT NORTHERN YLD TRIAL	06/11/10	SVR&EC	FRANKENMUTH	20	REC. LATTICE	2	DIRECT HARVESTED
0117	CONAGRA NAVY BEAN QUALITY TRIAL	06/11/10	SVR&EC	FRANKENMUTH	08	RCBD	4	DIRECT HARVESTED
0118	CONAGRA PINTO BEAN QUALITY TRIAL	06/11/10	SVR&EC	FRANKENMUTH	14	RCBD	4	DIRECT HARVESTED
0210	STANDARD BUSH CRANBERRY YIELD TRIAL	06/21/10	ENTRICAN	MONTCALM	25	SQ. LATTICE	4	ROD PULLED
0211	STANDARD BUSH KIDNEY YIELD TRIAL	06/21/10	ENTRICAN	MONTCALM	42	REC. LATTICE	4	ROD PULLED
0212	WHITE MOLD NATIONAL YIELD TRIAL	06/21/10	ENTRICAN	MONTCALM	64	SQ. LATTICE	3	ROD PULLED
0213	WHITE MOLD GENETIC TRIAL-1	06/21/10	ENTRICAN	MONTCALM	96	RCBD	3	ROD PULLED
0214	WHITE MOLD GENETIC TRIAL-2	06/21/10	ENTRICAN	MONTCALM	96	RCBD	3	ROD PULLED
0420	PLH TOLERANCE TRIAL	06/18/10	CAMPUS	E.LANSING	80	RCBD	3	DIRECT HARVESTED
0915	ORGANIC YIELD TRIAL-NAVY & BLACK	06/17/10	WISNER	TUSCOLA	36	SQ. LATTICE	4	DIRECT HARVESTED

SVR&EC: SAGINAW VALLEY RESEARCH & EXTENSION CENTER

PROCEDURE: PLANTED IN 4 ROW PLOTS, 21 FEET LONG, 20 INCH ROW WIDTH, 4 SEEDS/FOOT, 15 FOOT SECTION OF CENTER 2 ROWS WAS HARVESTED AT MATURITY.

FRANKENMUTH: FERTILIZER BROADCAST: 200 POUNDS OF 19-19-19 + 2% MN + 1% ZN PRIOR TO PLANTING.
HERBICIDES APPLIED: 1.25 QT DUAL + 2 QT. EPTAM APPLIED PPI.
PESTICIDES APPLIED: 3.0 OZ. WARRIOR ON JULY 15.

ENTRICAN: FERTILIZER BROADCAST: 200 POUNDS OF 19-19-19 PRIOR TO PLANTING. 50 POUNDS 46-0-0 SIDE DRESSED ON JULY 21.
HERBICIDES APPLIED: 2 PT. SONALAN + 1.25 QT EPTAM + 2PT. DUAL APPLIED PPI.
PESTICIDES APPLIED: 3.0 OZ. WARRIOR ON JULY 30.
IRRIGATION APPLIED: 3.7 INCHES ON WHITE MOLD TRIALS - 6 APPLICATIONS; 3.2 INCHES ON STANDARD YIELD TRIALS - 5 APPLICATIONS

E. LANSING: FERTILIZER: 75 POUNDS 46-0-0 SIDE DRESSED ON AUGUST 5.
HERBICIDES APPLIED: 2 PT. SONALAN + 1.25 QT EPTAM + 2PT. DUAL APPLIED PPI.

EXPERIMENT 0101 STANDARD NAVY YIELD TRIAL						PLANTING DATE 06/10/10			
ENTRY	**NAMES**	**NO.**	**YIELD CWT /ACRE**	**100 SEED WT.**	**DAYS TO FLOWER**	**DAYS TO MATURITY**	**LODGING**	**HEIGHT**	**DES. SCORE**
N09175	N05311/B05055	17	19.4	21.9	41.0	89.1	1.0	50.3	6.0
N09174	N05311/B05055	20	18.2	22.3	41.0	88.4	1.0	50.6	5.9
N08003	N00844/N02237	3	17.9	20.9	39.0	88.2	1.0	49.2	5.5
I10103	**OAC 7-2**	36	17.4	20.8	37.0	89.9	1.5	47.0	4.0
N09021	N05319/B04316	23	17.3	19.8	37.5	87.3	1.0	48.3	5.5
N09045	N05311/B05034	22	16.8	20.1	40.0	88.1	1.0	47.5	5.0
N08004	N00844/N02237	5	16.7	18.7	39.5	86.6	1.0	47.5	5.1
N05324	N00838/N00809//N00792	2	16.6	20.8	38.5	88.3	1.0	49.8	5.5
N09020	N05319/B04316	25	16.3	19.3	39.0	87.2	1.0	47.7	4.6
I10101	**COOP 02084**	35	16.2	22.2	38.0	87.8	1.0	49.2	4.9
N09046	B04554/N05357	34	16.1	18.8	40.5	90.2	1.5	50.5	5.0
N09054	N04152/N05346	26	15.3	20.4	37.5	87.0	1.0	48.9	5.4
I92002	C-20*6/CN49-242 NAVY GENTEC, **VISTA**	1	15.2	20.6	38.0	90.5	2.0	50.5	4.9
I08902	**HYLAND T9905**	4	14.8	22.2	37.0	89.8	1.0	49.0	4.0
N08007	N01792/N03614	9	14.6	18.3	41.5	87.1	1.0	48.2	5.5
N09104	N05311/B05055	29	14.5	19.4	41.5	87.2	1.0	48.3	4.9
N09050	N04154/N00833	31	14.2	18.1	40.5	86.6	1.0	45.6	4.0
N06702	N00809//B95556*2/I93154	8	14.0	19.3	40.5	86.3	1.0	47.2	3.5
N07007	N03614/N00844	11	13.9	17.3	38.0	86.8	1.0	46.7	4.1
N08002	N00844/N02237	6	13.9	19.7	38.0	88.3	1.0	47.8	5.0
I06271	ND012103,**AVALANCHE**	14	13.7	20.6	38.5	90.2	2.0	48.9	4.9
N07009	N03614/N00844	12	13.6	21.5	39.5	88.0	1.0	50.0	5.1
N09044	N05311/X06121	30	13.5	18.3	41.5	89.2	1.0	47.9	4.6
N09056	N04152/N05346	15	13.3	19.9	40.0	88.1	1.0	47.7	4.6
N09055	N04152/N05346	32	12.9	18.3	39.5	87.0	1.0	47.4	4.0
N09059	N04141/N05317	13	12.9	19.3	40.0	89.2	1.0	49.7	5.4
N09038	B04316/B00101	21	12.8	21.2	35.5	87.8	2.0	48.6	4.9
N09041	B05070/B05044	18	12.4	20.5	38.5	87.9	2.0	48.7	4.4
N09053	N04154/I04101	19	12.2	20.3	41.5	87.3	1.0	45.8	3.6
N09034	B05055/B05070	16	12.0	20.8	37.0	87.2	1.0	48.7	4.1
N09035	B05055/B05070	24	11.5	19.9	38.5	88.3	1.5	48.4	4.0
I08958	**MEDALIST**	7	11.5	20.0	38.5	91.2	2.0	50.7	4.0
N09039	B05070/B05040	27	11.4	20.4	36.5	87.9	1.0	47.9	3.6
N09106	N04109/B05055	33	10.6	17.3	36.0	86.5	1.0	44.5	4.0
N09037	B04316/B00101	28	10.5	20.2	38.5	86.6	1.0	47.9	3.9
I08903	**LIGHTNING**	10	9.0	18.8	38.5	92.6	1.5	49.7	3.1
AVERAGE OF PRECEDING 36 MEANS			14.3	20.0	38.9	88.2	1.2	48.4	4.6
LSD (P=.05)			2.5	1.2	1.4	0.9	0.2	0.9	0.4
LSD (P=.01)			3.2	1.6	1.8	1.2	0.2	1.2	0.5
COEFFICIENT OF VARIATION (%)			12.2	4.3	2.5	0.8	11.2	1.4	6.3

EXPERIMENT 0102 STANDARD BLACK YIELD TRIAL				PLANTING DATE 06/10/10					
ENTRY	**NAMES**	**NO.**	**YIELD CWT /ACRE**	**100 SEED WT.**	**DAYS TO FLOWER**	**DAYS TO MATURITY**	**LODGING**	**HEIGHT**	**DES. SCORE**
B09174	N05311/B05055	15	19.2	25.7	42.5	88.0	1.0	49.0	6.0
B09128	B05055/B05044	14	18.3	19.0	40.0	86.8	1.0	48.3	4.6
B04554	B00103 */ X00822, **ZORRO**	5	18.2	19.1	41.0	88.9	1.0	48.4	4.9
B09208	B04644/B04588	63	17.8	21.0	41.0	86.5	1.0	46.0	5.0
B09135	B04316/B05040	12	17.7	20.6	41.0	88.8	1.0	49.8	6.1
B09175	N05311/B05055	13	17.6	25.1	39.5	87.7	1.0	48.1	5.1
I10102	**LORETO**	11	17.6	22.2	40.0	89.2	1.0	48.7	4.5
B09188	B05054/B04588	37	17.2	22.9	42.0	89.9	1.0	49.1	5.4
B09166	B04554/B04587	55	17.2	20.9	41.5	87.3	1.0	47.2	5.5
B09200	B04444/B05044	43	17.2	17.7	40.0	88.1	1.0	49.6	4.9
B09129	B05055/B04587	30	17.1	20.0	42.0	86.8	1.0	47.7	4.9
I81066	SEL-BTS,**T39**	9	17.1	20.6	42.0	88.6	2.0	48.7	4.6
B09202	B04444/B04588	42	17.0	19.6	40.5	87.1	1.0	46.7	4.5
I03390	ND9902621-2, **ECLIPSE**	2	17.0	20.2	38.5	86.2	1.0	47.5	4.6
B09194	B05055/B05044	34	16.9	18.1	42.5	88.5	1.0	47.5	5.6
B09196	B05055/B04588	38	16.8	21.2	39.0	89.1	1.0	46.5	4.0
B09138	B05054/B04588	17	16.8	23.1	41.0	87.9	1.0	47.4	5.5
I07116	B201240, **SHANIA**	8	16.8	20.6	41.0	90.0	1.0	49.1	4.6
B08102	B01792/B02549	4	16.8	21.2	41.5	87.0	1.0	46.1	5.1
B09184	B04349/B05001	33	16.8	17.9	38.0	89.3	1.0	47.4	5.1
B09198	B05055/B04587	45	16.6	19.6	39.5	88.0	1.0	48.4	5.4
B09165	B04554/B04587	47	16.5	20.2	40.5	86.6	1.0	48.1	4.5
B09170	B04554/B04587	41	16.5	19.3	42.0	88.9	1.0	46.9	5.4
B09136	B04316/B05040	27	16.3	21.8	39.0	87.5	1.0	47.3	5.4
B09224	B05054/B04588	61	16.3	23.2	40.5	87.0	1.0	46.9	5.0
I08907	**BLACK VELVET**	7	16.3	24.8	41.5	91.0	1.0	49.0	4.1
B09183	B04349/B05001	40	16.2	17.4	38.5	87.3	1.0	47.4	4.9
B09210	B04644/B04588	51	16.1	20.7	41.0	86.6	1.0	45.7	4.2
B09203	B05054/B04588	35	16.1	21.8	40.5	86.1	1.0	45.6	4.1
B09164	B04554/B04587	57	16.0	19.4	42.0	87.0	1.0	48.5	4.5
B09104	N05311/B05055	18	16.0	20.6	40.0	86.5	1.0	47.1	5.0
B05055	34-27/JAGUAR*2/SEL 1308//HR45/KABOON	3	16.0	20.6	41.0	87.4	1.0	45.9	4.1
B09209	B04644/B04588	62	15.9	21.9	39.0	86.9	1.0	47.3	5.5
B09199	B05055/B04587	39	15.9	22.3	41.5	87.3	1.0	46.2	5.3
B09119	B04554/X06127	21	15.9	19.6	42.0	86.1	1.0	47.1	4.7

EXPERIMENT 0102 STANDARD BLACK YIELD TRIAL			PLANTING DATE 06/10/10							
ENTRY	**NAMES**	**NO.**	**YIELD CWT /ACRE**	**100 SEED WT.**	**DAYS TO FLOWER**	**DAYS TO MATURITY**	**LODGING**	**HEIGHT**	**DES. SCORE**
B09120	B04554/X06127	22	15.8	19.7	40.5	87.0	1.0	47.1	4.0
B09171	B04554/B04587	46	15.4	19.2	41.5	87.0	1.0	47.0	5.0
B95556	B90211/N90616,**JAGUAR**	10	15.4	19.0	42.0	86.0	1.0	46.0	4.0
B09130	B05055/B04587	28	15.4	19.3	39.0	85.9	1.0	45.9	5.0
B09201	B04444/B05044	44	15.3	17.2	42.0	89.4	1.5	49.4	5.3
B05066	B98304//N99216/I00752	1	15.2	19.1	40.5	86.6	1.0	46.6	5.1
B00101	PHANTOM/BLACKJACK, **CONDOR**	6	15.2	20.8	39.5	89.0	1.5	48.5	5.0
B09223	B05054/B04588	53	15.2	22.4	42.0	86.6	1.0	45.7	4.1
B04644	B98306 // B95556 / I99229	64	15.1	20.6	42.0	86.6	1.0	47.5	4.9
B09126	B04349/B05044	23	15.1	19.0	40.0	86.9	1.0	46.9	4.5
B09125	B04349/B05055	24	15.0	17.6	42.5	85.9	1.0	45.3	4.3
B09195	B05055/B04588	54	15.0	21.8	40.5	89.0	1.0	46.9	4.6
B09185	B05055/B04587	60	14.9	18.8	40.5	86.0	1.0	44.4	4.0
B09143	B04554/B04588	26	14.8	20.8	40.0	90.0	1.0	48.1	4.5
B09204	B05054/B04588	36	14.8	21.3	39.0	87.8	1.0	46.3	4.8
B09134	B04316/B05070	25	14.8	21.5	43.5	89.5	1.0	48.0	5.0
B09131	B05055/B04587	20	14.5	20.0	40.5	87.1	1.0	46.6	4.5
B09172	B04554/B04587	48	14.5	20.5	41.0	87.2	1.0	47.2	4.4
B09160	B05055/X07723	19	14.3	20.5	42.0	86.6	1.0	45.6	4.6
B09127	B05055/B04316	16	14.3	19.8	39.0	86.6	1.0	45.6	4.5
B09176	N04109/B05055	56	14.2	23.4	40.5	88.5	1.0	46.9	4.0
B09197	B05055/B04588	32	14.2	20.2	40.0	87.9	1.0	45.4	4.0
B09186	B05054/B04588	52	13.6	18.1	41.0	86.3	1.0	45.8	4.5
B09178	B04554/N05357	49	13.3	20.3	42.0	87.2	1.0	46.1	4.9
B09110	B04554/N05357	29	13.2	17.5	37.0	86.7	1.0	45.7	4.5
B09113	I06281/N06705	31	13.2	18.8	39.5	85.9	1.0	45.0	4.1
B09182	I06281/N06705	59	11.9	19.3	42.0	86.4	1.0	45.0	4.4
B09179	I06281/N06705	58	11.5	18.8	40.0	86.5	1.0	43.6	4.0
B09222	B05053/B04588	50	11.4	19.5	41.5	89.5	1.0	46.1	3.9
AVERAGE OF PRECEDING 64 MEANS			15.7	20.4	40.7	87.6	1.0	47.0	4.7
LSD (P=.05)			2.9	1.1	1.1	0.8	0.1	0.8	0.4
LSD (P=.01)			3.7	1.4	1.5	1.1	0.1	1.0	0.5
COEFFICIENT OF VARIATION (%)			12.8	3.8	1.9	0.7	6.8	1.1	6.2

EXPERIMENT 0103 PRELIMINARY NAVY AND BLACK YIELD TRIAL			PLANTING DATE 06/10/10						
ENTRY	**NAMES**	**NO.**	**YIELD CWT /ACRE**	**100 SEED WT.**	**DAYS TO FLOWER**	**DAYS TO MATURITY**	**LODGING**	**HEIGHT**	**DES. SCORE**
I09213	ZORRO*//TACANA/VAX6 (08IS8715)	6	17.5	26.3	42.5	87.5	1.0	48.5	5.0
B10202	N05311/X06121	12	16.6	24.2	39.5	87.5	1.0	47.6	5.0
I09216	ZORRO*//TACANA/VAX6 (08IS8748)	9	16.0	24.5	39.0	88.5	1.0	47.1	4.0
I09215	ZORRO*//TACANA/VAX6 (08IS8736)	8	15.9	25.8	41.5	88.5	1.0	47.6	4.5
B10203	B05054/B04588	13	15.9	21.8	39.0	87.4	1.0	46.0	4.0
I10107	**RELIANT (GTS 554)**	16	15.7	20.5	40.0	89.0	1.5	48.3	4.0
I08958	**MEDALIST**	14	15.6	21.7	37.5	91.0	2.0	50.8	5.0
B04554	B00103* / X00822, **ZORRO**	15	15.5	19.6	41.5	88.5	1.0	48.5	5.0
I09212	ZORRO*//TACANA/VAX6 (08IS8714)	5	15.0	27.2	43.0	88.0	1.0	43.4	4.0
B10201	N05311/B05055	11	15.0	22.7	39.0	87.6	1.0	48.9	5.0
I09129	PR0443-151 (BLK) (RR, Low-N, No I-gene)	3	14.8	21.5	43.0	90.0	2.0	50.0	5.0
I09211	ZORRO*//TACANA/VAX6 (08IS8705)	4	14.6	23.4	39.5	88.0	1.0	47.6	4.5
I09214	ZORRO*//TACANA/VAX6 (08IS8727)	7	13.8	27.3	41.0	89.0	1.0	48.0	4.0
I09218	BelMiDakRMR10/B01741//BAT 477/L88-63/3/Black Rhino/SEN10 (08IS8790) *NAVY*	2	13.7	26.1	39.5	89.5	1.0	49.0	4.0
N10101	N04109/B05044	1	12.1	14.1	37.0	89.5	1.0	48.6	4.0
I09217	ZORRO*//TACANA/VAX6 (08IS8754)	10	11.9	26.3	40.5	93.5	1.0	47.6	4.0
AVERAGE OF PRECEDING 16 MEANS			15.0	23.3	40.2	88.9	1.2	48.0	4.4
LSD (P=.05)			2.9	1.0	1.9	2.2	0.2	1.6	0.3
LSD (P=.01)			3.8	1.3	2.4	2.8	0.3	2.1	0.4
COEFFICIENT OF VARIATION (%)			12.0	2.6	2.9	1.5	10.8	2.1	4.1

EXPERIMENT 0104 PRELIMINARY NAVY AND BLACK YIELD TRIAL **PLANTING DATE 06/10/10**

ENTRY	NAMES	NO.	YIELD CWT /ACRE	100 SEED WT.	DAYS TO FLOWER	DAYS TO MATURITY	LODGING	HEIGHT	DES. SCORE
B10240	B04591/B05039	46	18.5	19.3	41.0	86.0	1.0	45.0	5.0
N10104	N05319//N05311/N04109	3	16.5	21.7	40.0	88.0	1.0	48.5	5.0
B10244	B04610/N05346	50	16.5	23.0	42.0	87.5	1.0	48.0	5.5
B10225	B04644//B05055/B05044	31	16.3	23.9	39.0	86.0	1.0	46.0	4.0
N10108	N05311/B04587	7	16.0	23.6	40.5	89.5	1.5	50.0	5.5
B04554	B00103 */ X00822, **ZORRO**	56	15.8	18.4	42.0	88.5	1.0	49.0	5.0
B10243	B04610/N05346	49	15.4	18.5	42.0	87.0	1.0	49.0	5.0
B10246	B05039/ZORRO	52	15.3	20.7	42.5	87.5	1.0	48.5	5.5
B10245	B05039/ZORRO	51	15.1	18.3	41.5	88.0	1.0	49.0	6.0
B10227	B05055/N05324	33	15.0	23.2	41.5	88.5	1.0	50.0	4.5
B10206	N04120/ZORRO	12	14.9	22.6	42.0	87.0	1.0	47.0	4.5
N10109	B05055/N05324	8	14.8	19.4	38.5	90.5	1.5	50.5	5.0
B10222	B05052//B04349/B05044	28	14.7	22.5	45.0	86.0	1.0	47.0	4.5
B95556	B90211/N90616,**JAGUAR**	55	14.4	18.8	40.0	87.0	1.0	48.0	5.0
B10233	B04644/B190	39	14.3	20.9	42.0	88.0	1.0	46.0	4.5
N10103	N05319//N05311/N04109	2	14.0	22.3	37.0	87.5	1.0	49.5	5.0
B10239	B04591/ZORRO	45	13.9	20.2	42.0	86.5	1.0	45.5	4.0
B10211	B04587//ZORRO/B05044	17	13.8	21.3	39.5	87.0	1.0	47.5	5.5
B10234	B04644/B190	40	13.7	20.3	43.5	86.5	1.0	45.0	4.5
B10228	B06311/B05039	34	13.6	22.8	42.5	87.0	1.0	48.0	5.5
B10242	B05039/ZORRO	48	13.6	17.6	42.0	86.0	1.0	47.0	5.0
B10212	B04587//ZORRO/DPC-1	18	13.5	21.8	40.0	86.5	1.0	47.5	5.5
B10231	B06311/N05311	37	13.4	16.7	42.0	86.0	1.0	46.0	5.0
N10102	N05319//N05311/N04109	1	13.4	21.1	39.5	88.5	1.0	48.5	5.5
N10105	N05324//N05319/B05044	4	13.3	22.1	40.0	90.5	2.0	51.5	5.0
B10208	N05324/B05055	14	13.2	22.2	42.0	83.0	1.0	47.5	4.5
B10217	B04587//ZORRO/DPC-1	23	13.2	20.9	40.0	86.0	1.0	46.5	4.5
B10214	B04587//ZORRO/DPC-1	20	13.2	20.6	42.0	87.0	1.0	47.5	5.5
B10238	ZORRO/B05055	44	13.0	19.6	41.5	86.0	1.0	46.5	5.0
B10215	B04587//ZORRO/DPC-1	21	13.0	21.0	40.5	87.5	1.0	48.0	5.5

EXPERIMENT 0104 PRELIMINARY NAVY AND BLACK YIELD TRIAL							PLANTING DATE 06/10/10		
ENTRY	**NAMES**	**NO.**	**YIELD CWT /ACRE**	**100 SEED WT.**	**DAYS TO FLOWER**	**DAYS TO MATURITY**	**LODGING**	**HEIGHT**	**DES. SCORE**
B10210	N05324/B04431	16	12.7	26.3	41.5	90.0	1.0	50.5	5.5
B10213	B04587//ZORRO/DPC-1	19	12.6	20.5	41.0	86.5	1.0	46.5	4.5
B10224	B04587//B05070/B05044	30	11.7	22.1	40.5	87.5	1.0	46.5	5.0
B10221	B05055/B04644	27	11.7	17.6	41.0	86.0	1.0	45.5	4.0
B10241	B05039/ZORRO	47	11.6	18.7	39.5	86.5	1.0	47.0	5.0
B10223	B05052//B04349/B05044	29	11.5	22.3	42.5	88.0	1.0	47.5	4.5
B10216	B04587//ZORRO/DPC-1	22	11.4	20.6	40.5	86.0	1.0	47.5	5.0
B10207	N05324/B05055	13	11.1	21.5	40.5	86.0	1.0	46.0	5.0
I92002	C-20*6/CN49-242 NAVY GENTEC, **VISTA**	53	10.9	23.5	39.0	88.5	1.5	51.0	4.5
B10230	B06311/B05055	36	10.6	20.6	41.5	86.5	1.0	47.5	4.5
B10218	B05055/B04644	24	10.4	18.3	40.5	86.0	1.0	46.0	4.0
B10220	B05055/B04644	26	10.1	17.2	39.5	86.0	1.0	45.0	4.5
N10107	N05346/N05311	6	9.9	21.2	42.0	87.5	1.0	48.0	4.5
B10237	B04644/B190	43	9.1	20.8	41.0	86.5	1.0	47.0	4.5
B10229	B06311/B05055	35	8.9	21.2	41.5	86.5	1.0	46.5	4.5
B10226	B05055/B05044	32	8.7	18.0	39.5	87.5	1.0	49.0	5.0
B10209	N05346/B05055	15	8.4	21.6	41.0	86.5	1.0	46.5	4.5
B10219	B05055/B04644	25	7.8	17.9	41.5	87.0	1.0	47.0	4.5
B10235	B04644/B190	41	7.4	18.8	43.0	87.5	1.0	47.5	4.5
B10236	B04644/B190	42	7.1	18.7	41.0	86.0	1.0	46.0	4.5
B10232	ZORRO/B03622	38	6.7	22.7	40.0	87.0	1.0	47.5	4.5
N10110	B05055/N05324	9	6.4	20.3	39.5	89.0	1.0	50.0	4.5
N10106	N05324//N05319/B05044	5	6.3	19.4	41.0	92.0	2.0	52.0	3.0
B10205	N04120/B05041	11	5.5	21.8	41.5	89.5	1.0	47.0	4.0
I08958	**MEDALIST**	54	5.4	21.3	37.0	91.0	2.0	51.5	4.0
B10204	N05311//B05053/B05055	10	4.9	21.3	38.5	88.5	1.0	47.5	4.0
AVERAGE OF PRECEDING 56 MEANS			12.0	20.7	40.9	87.4	1.1	47.7	4.8
LSD (P=.05)			4.5	1.8	2.5	2.0	0.3	1.5	1.1
LSD (P=.01)			5.9	2.3	3.3	2.6	0.4	1.9	1.4
COEFFICIENT OF VARIATION (%)			18.9	4.3	3.1	1.1	15.2	1.6	11.3

EXPERIMENT 0105 STANDARD GREAT NORTHERN YIELD TRIAL PLANTING DATE 09/22/10

ENTRY	NAMES	NO.	YIELD CWT /ACRE	100 SEED WT.	DAYS TO FLOWER	DAYS TO MATURITY	LODGING	HEIGHT	DES. SCORE
G09303	G04207/P05437	26	16.2	33.0	35.0	82.1	1.0	52.0	5.5
G93414	**MATTERHORN**	16	15.3	34.5	34.9	81.2	1.0	49.0	5.0
G08254	G04514/G93414	2	15.2	37.5	35.1	81.0	0.9	48.8	4.5
G10401	MATTERHORN/P05436	35	15.2	33.9	34.5	84.0	0.9	49.7	5.5
G09320	G04514/G02647	20	14.8	36.7	34.5	82.3	1.0	49.8	5.0
G08243	G02460/G04514	10	14.4	36.5	35.9	81.0	1.1	47.7	4.5
G07309	G02646/G02454	8	14.4	44.6	36.0	83.2	1.5	50.7	4.5
G08239	G04514/G02647	11	14.4	38.7	35.0	81.3	1.0	49.8	4.5
G08260	G04517/G02647	15	14.3	36.5	36.9	82.8	1.0	48.1	4.5
G09330	G04514/G02647	17	14.0	39.2	35.6	81.7	0.9	49.0	5.0
G09328	G04514/G02647	18	14.0	40.1	36.1	82.1	1.0	49.4	5.0
G09329	G04514/G02647	19	14.0	40.2	35.4	83.6	1.1	49.5	4.5
G08264	G98601/G04514	5	14.0	36.0	35.5	81.5	1.0	48.9	5.0
G08259	G04517/G02647	12	13.9	37.5	36.0	81.1	1.0	48.0	4.5
G08240	G04514/G02647	14	13.9	38.9	36.0	82.1	1.0	48.6	4.5
G09321	G04514/G02647	22	13.6	40.7	35.6	83.1	0.9	51.0	5.0
G09317	G04514/G02647	28	13.6	39.6	34.5	83.1	1.0	51.1	5.0
G09302	G93414/P05436	27	13.5	37.6	36.0	84.9	1.6	50.6	4.0
G09323	G98602/G04517	34	13.2	35.8	35.4	82.4	1.0	48.1	4.0
G08258	G04517/G02647	4	13.1	34.8	34.5	81.5	1.0	48.4	5.0
G08263	G98601/G04514	1	13.1	37.3	34.1	82.4	0.9	48.1	4.5
G09315	G04514/G02647	21	13.1	35.7	35.0	81.5	0.9	48.2	5.0
G08245	G98601/I03354	9	12.8	36.3	34.4	80.9	1.0	47.6	4.5
G08262	G98601/G04514	6	12.8	36.0	35.4	81.0	1.0	48.3	4.0
G08256	G04514/G93414	7	12.7	35.8	35.0	80.4	1.0	48.9	5.0
G09333	G98602/G02647	31	12.7	40.1	36.0	84.5	1.6	48.8	4.0
G08261	G98601/G04514	3	12.7	35.7	35.5	82.0	1.0	47.9	4.5
G09325	G04207/I06206	32	12.6	43.9	35.5	84.6	1.0	50.6	4.0
G09322	G04514/G02647	24	12.0	38.4	35.5	84.0	1.0	50.0	4.5
G09326	G04207/I06206	33	11.9	44.6	35.1	83.4	1.0	51.3	5.0
G09301	G93414/P05436	29	11.9	40.3	36.0	85.9	2.0	53.2	4.0
G09318	G04514/G02647	23	11.0	39.7	35.5	84.8	1.5	53.6	5.0
G08268	G05241/I06206	13	10.5	33.2	36.0	81.2	1.0	47.1	5.0
G09331	G02460/G04514	30	10.3	41.7	35.5	85.1	1.6	52.8	4.0
G09332	G02460/G04514	25	9.6	40.8	35.9	86.4	1.6	51.6	3.5
G10402	B04588/G04207	36	9.0	34.4	37.0	83.3	1.0	44.9	4.0
AVERAGE OF PRECEDING 36 MEANS			13.2	38.0	35.4	82.7	1.1	49.5	4.6
LSD (P=.05)			2.4	2.5	0.7	0.8	0.2	1.2	0.5
LSD (P=.01)			3.1	3.2	1.0	1.1	0.3	1.5	0.6
COEFFICIENT OF VARIATION (%)			12.7	4.6	1.5	0.7	13.6	1.7	7.3

EXPERIMENT 0106 STANDARD TEBO YIELD TRIAL **PLANTING DATE 06/10/10**

ENTRY	NAMES	NO.	YIELD CWT /ACRE	100 SEED WT.	DAYS TO FLOWER	DAYS TO MATURITY	LODGING	HEIGHT	DES. SCORE
N09060	G05241/B04588	2	13.4	30.5	37.5	89.9	2.0	49.0	4.5
G09312	G05241/B04588	9	12.0	29.8	37.0	87.9	1.5	47.5	4.5
N09067	G05241/B04588	1	11.4	25.9	37.0	90.0	1.5	49.0	4.0
N09063	G05241/B04588	4	11.3	25.4	40.5	87.1	1.0	46.5	4.5
G10901	G05241/B04588	10	10.8	29.0	38.5	88.4	1.5	48.0	4.0
N09065	G05241/B04588	3	10.6	25.5	38.0	89.5	1.5	48.5	4.5
G06209	G93414//G00536/N00760	7	9.0	30.6	36.0	87.6	1.5	48.0	4.5
G06211	G93414//G00536/N00760	8	8.0	33.5	37.0	88.1	2.0	49.0	4.5
G07321	G93414//G00536/N00760	5	7.7	25.1	34.5	85.9	1.0	46.5	4.5
G07324	G93414//G00536/N00760	6	7.5	27.9	36.0	87.0	1.5	47.5	4.5
G05922	HIME TEBO*4/MATTERHORN,**FUJI**	11	4.4	24.8	36.0	95.5	2.5	44.0	3.0
I03388	**HIME TEBO**	12	4.3	28.7	35.5	95.5	2.5	44.5	3.0
AVERAGE OF PRECEDING 12 MEANS			9.2	28.1	37.0	89.4	1.7	47.3	4.2
LSD (P=.05)			2.2	1.4	1.0	1.0	0.5	0.9	0.3
LSD (P=.01)			2.9	1.9	1.3	1.3	0.6	1.1	0.4
COEFFICIENT OF VARIATION (%)			17.2	3.6	2.0	0.8	20.4	1.3	4.8

EXPERIMENT 0107 STANDARD PINTO YIELD TRIAL **PLANTING DATE 06/11/10**

ENTRY	NAMES	NO.	YIELD CWT /ACRE	100 SEED WT.	DAYS TO FLOWER	DAYS TO MATURITY	LODGING	HEIGHT	DES. SCORE
I07113	**LAPAZ**	5	16.8	41.6	39.5	84.0	1.5	49.7	4.5
P07863	I02545/P02630	10	16.4	41.3	36.5	84.5	1.5	51.5	5.0
P07839	I02545/P02630	27	16.1	36.6	37.0	85.0	2.0	51.9	5.0
P06125	P02646/P02630	18	15.5	37.7	35.5	81.5	1.0	48.4	5.0
I84002	NW410//VICTOR/AURORA,GH215,USDA-WA, **OTHELLO**	39	15.5	36.0	34.4	82.5	3.0	46.4	3.0
P08403	P05463/I06206	29	15.2	35.0	37.1	82.0	1.0	48.2	5.0
P07751	I02545/P02647	2	14.9	38.9	36.0	83.9	1.5	49.5	4.0
P09408	I04305/P00218	46	14.4	45.1	34.6	81.6	1.0	48.0	4.0
P08402	P05463/I06206	26	14.1	34.3	37.5	82.0	1.0	47.8	5.0
I06249	ND020069,**LARIAT**	1	13.7	44.3	35.6	88.0	2.0	53.9	4.0
I99117	ASG85-5051-7, **BUSTER**	38	13.6	41.0	35.5	81.5	2.5	47.2	3.0
I09101	**ND307**	36	13.4	36.9	36.4	83.0	1.5	48.3	4.0
P08325	P00218/X05129	23	13.4	40.0	37.0	82.0	1.0	48.7	5.0
P08320	P00226/P02627	20	13.0	39.1	35.1	82.5	1.0	46.8	4.5
P09420	P02630/I03386	42	12.9	41.4	35.5	82.5	1.0	47.4	5.0
P09425	P00225/I06205	58	12.9	42.9	36.5	82.6	1.0	49.6	5.0
P10502	P06121/P05436	64	12.8	34.1	35.5	82.5	1.0	48.0	4.5
P09424	P00225/I06205	54	12.8	42.0	35.6	81.5	1.0	48.5	4.0
P08396	P05457/P04204	22	12.5	38.2	35.6	83.5	1.0	48.1	4.5
I06251	CO23704,**CROISSANT**	37	12.5	36.7	37.4	86.0	2.0	51.8	4.5
P06130	P02646/P02630	12	12.4	39.1	37.5	81.0	1.0	47.0	4.0
P08364	P02633/P00225	32	12.4	37.1	36.0	80.9	1.0	47.4	4.5
P08329	X05129/P02646	7	12.3	39.1	37.0	81.0	1.0	46.7	4.5
P09417	P02630/I04305	47	12.3	34.2	35.4	81.5	1.0	48.5	5.0
I05834	ND020351,**STAMPEDE**	8	12.3	43.9	37.6	83.5	1.0	49.2	4.0
P09426	P00225/I06205	60	12.2	45.6	37.1	83.0	1.0	48.6	4.0
P08339	X05129/P02646	9	12.1	37.2	36.5	80.6	1.0	48.2	4.5
P09404	P06121/P05436	50	12.1	36.5	35.9	81.6	1.0	46.5	4.5
P07740	I02545/P02647	17	12.1	48.3	33.9	85.0	2.0	52.0	4.5
P08388	P05463/P04207	13	12.0	35.2	35.0	82.0	1.0	49.0	5.0
P04205	P99119/G99750, **SANTA FE**	14	12.0	40.7	35.4	82.5	1.0	48.6	5.0
P09402	I06220/P05436	44	11.9	34.3	35.9	82.1	1.0	49.9	5.0
P09422	P02630/I03386	45	11.9	37.0	34.5	83.5	1.5	47.4	4.0
P09410	X05129/P02647	56	11.9	37.8	38.0	80.9	1.0	46.4	4.5
P09413	P02633/I03386	53	11.9	36.4	37.1	81.0	1.0	46.4	5.0

EXPERIMENT 0107 STANDARD PINTO YIELD TRIAL **PLANTING DATE 06/11/10**

ENTRY	NAMES	NO.	YIELD CWT /ACRE	100 SEED WT.	DAYS TO FLOWER	DAYS TO MATURITY	LODGING	HEIGHT	DES. SCORE
P09418	P02630/I04305	59	11.9	35.1	34.0	81.9	1.0	48.7	4.5
P09416	P02630/X05129	55	11.8	35.5	36.1	81.5	1.0	47.5	5.0
P08337	X05129/P02646	30	11.8	38.0	37.4	81.5	1.0	47.5	4.5
P08307	I02545/P02630	31	11.8	40.1	35.9	81.5	1.5	49.9	4.0
P09414	X05129/P02647	61	11.8	36.2	36.4	81.9	1.0	47.0	5.0
P08312	I04324/P02646	6	11.7	39.7	35.9	82.5	1.0	49.0	5.0
P08369	P05410/P04205	35	11.7	33.8	36.6	82.0	1.0	47.9	5.0
P07406	P00227/I03385//P00207	4	11.7	36.4	34.5	84.0	1.0	50.6	4.5
P08408	P05410/P04203	24	11.6	35.6	36.5	81.5	1.0	48.1	5.0
P09405	P06121/P05436	43	11.4	36.6	36.5	81.0	1.0	47.4	4.5
P09421	P02630/I03386	41	11.3	40.4	36.0	81.5	1.0	46.8	5.0
P09419	P02630/I03386	48	11.2	38.7	35.5	82.0	1.0	47.0	4.0
P08362	P04205/I06203	19	11.1	37.3	38.5	81.5	1.0	48.5	5.0
P08327	X05129/P02646	21	11.0	37.1	38.0	81.0	1.0	46.7	4.0
P08336	X05129/P02646	11	10.9	40.3	36.1	81.0	1.0	49.0	5.5
P09407	P05436/X06146	51	10.9	34.5	34.0	82.5	1.0	49.1	5.0
P09411	X05129/P02647	57	10.8	36.3	35.9	81.4	1.0	46.9	4.5
P09406	P06121/P05436	40	10.7	32.9	35.0	81.0	1.0	47.9	4.0
P10501	USPT-CBB-3/P05436	63	10.7	37.6	34.6	83.0	1.0	49.0	4.5
P08391	P05410/P00225	34	10.6	35.1	37.1	81.0	1.0	48.5	5.5
P08319	P00226/P02627	16	10.6	36.9	35.5	82.6	1.0	48.5	5.0
P09409	X05129/P02647	52	10.5	36.1	37.5	81.4	1.0	46.0	4.5
P08371	P05410/P04205	33	10.4	34.5	36.9	82.0	1.0	49.9	5.5
P09403	I06220/P05436	62	10.2	35.6	34.5	82.5	1.0	49.0	4.0
P08331	X05129/P02646	15	10.1	38.4	36.0	81.6	1.0	47.5	4.5
P09430	P05457/P04205	28	10.0	32.9	36.4	81.6	1.0	47.5	4.5
P08340	X05129/P02646	25	9.9	38.3	35.5	81.0	1.0	47.6	4.5
P09401	I06220/P05436	49	9.9	36.5	34.1	81.5	1.0	48.2	4.5
P07407	P00227/I03385//P00207	3	8.4	35.2	36.4	83.5	1.0	48.6	4.0
AVERAGE OF PRECEDING 64 MEANS			12.2	37.9	36.1	82.3	1.2	48.4	4.6
LSD (P=.05)			2.6	2.6	0.8	0.6	0.2	1.0	0.4
LSD (P=.01)			3.3	3.3	1.0	0.8	0.2	1.2	0.5
COEFFICIENT OF VARIATION (%)			14.9	4.8	1.6	0.5	11.6	1.4	6.1

EXPERIMENT 0108 STANDARD RED AND PINK YIELD TRIAL **PLANTING DATE 06/11/10**

ENTRY	NAMES	NO.	YIELD CWT /ACRE	100 SEED WT.	DAYS TO FLOWER	DAYS TO MATURITY	LODGING	HEIGHT	DES. SCORE
R98026	R94037/R94161, **MERLOT**	10	17.7	39.8	37.2	92.0	1.0	50.0	5.0
S07501	S00809/I03386//R02205	15	17.4	31.9	40.1	92.6	1.5	54.5	5.5
R08516	R98026/S02753	1	16.6	40.9	36.1	92.1	1.5	53.0	4.5
S00809	R94142/X94076, **SEDONA**	16	16.5	36.5	39.5	89.6	2.0	52.0	5.0
S08409	R98026/S02753	8	16.2	37.3	37.0	89.6	1.0	52.0	4.0
R08542	I04310/R98026	9	16.0	37.9	39.0	89.2	1.0	49.0	5.0
R08541	R98026/X05139	13	15.4	38.0	37.7	90.9	1.0	49.0	5.0
I09207	NDZ06209 (RED-I-GENE)	25	14.7	33.5	36.6	85.6	1.0	45.5	4.5
R09509	R06415/R06427	5	14.5	35.3	36.0	92.6	1.5	49.5	3.5
R09501	X05137/X05145	19	14.1	38.7	36.3	90.0	1.0	49.0	4.0
R09504	S02068/S04504	22	14.0	41.2	35.5	88.4	1.0	47.5	4.0
I09219	Merlot*//VAX 3/Salagnac (08IS9087)	27	14.0	32.2	36.6	86.5	1.0	47.5	4.5
S08419	S02754/S04503	6	13.9	34.4	35.7	90.5	1.0	49.0	5.0
R08512	R97003//I03385/R98026	3	13.6	37.9	40.1	92.9	1.0	55.5	4.0
R06413	S01944/R02205	7	13.5	28.7	39.0	92.8	2.0	49.0	4.0
R09506	R06249/R98026	20	13.3	38.6	36.4	89.1	1.0	50.0	5.5
S08418	S02754/S04503	12	13.0	31.4	36.0	88.4	1.0	47.5	4.5
I95322	BROOKS-18(RM), **BROOKS**	30	13.0	34.4	40.2	94.8	2.0	50.5	3.5
I09208	NDZ06249 (RED-I-GENE)	26	13.0	30.2	35.9	87.2	1.0	46.0	4.5
R08514	R98026/S02753	18	12.7	38.7	42.4	92.4	1.5	55.0	4.0
R09513	R98026/R06427	24	12.6	35.2	36.8	89.9	1.5	50.0	4.0
S08437	S00809/I06202	14	12.1	36.4	36.0	88.7	1.0	47.0	4.0
R09511	X07723/R06422	11	11.6	34.8	36.2	91.5	1.0	50.5	5.0
S09601	S00809/S02068	17	11.6	28.1	38.7	94.0	1.0	58.0	5.5
S08422	S04503/X05143	23	11.2	36.1	36.5	87.0	1.0	46.5	4.0
R09512	R06422/R06429	21	11.1	34.2	35.0	88.4	1.0	47.5	4.0
R06412	S01944/R02205	2	10.7	27.6	37.7	92.0	1.0	47.0	3.5
I09221	05IS-1611/VAX 3 (08IS0580)	29	10.4	26.2	36.9	89.1	1.0	45.5	4.5
R09508	R06415/R06427	4	10.4	30.7	36.5	93.0	1.5	50.5	3.0
I09220	Morales/XAN 176//EAP 9503-32A (08IS0343)	28	7.9	28.9	40.9	86.9	1.0	45.0	4.0
AVERAGE OF PRECEDING 30 MEANS			13.4	34.5	37.5	90.3	1.2	49.6	4.4
LSD (P=.05)			3.5	3.6	0.9	0.9	0.3	1.2	0.5
LSD (P=.01)			4.6	4.6	1.1	1.2	0.3	1.6	0.6
COEFFICIENT OF VARIATION (%)			18.6	7.3	1.6	0.7	15.3	1.7	7.7

EXPERIMENT 0109 CDBN/MRPN YIELD TRIAL **PLANTING DATE 06/11/10**

ENTRY	NAMES	NO.	YIELD CWT /ACRE	100 SEED WT.	DAYS TO FLOWER	DAYS TO MATURITY	LODGING	HEIGHT	DES. SCORE
I07113	**LAPAZ**	42	21.8	38.6	41.5	91.4	1.0	49.9	5.0
I84002	NW410//VICTOR/AURORA,GH215,USDA-WA, **OTHELLO**	1	18.4	31.9	35.0	85.0	3.0	45.5	3.0
I10106	**ODYSSEY** (ISB)	11	18.3	36.2	35.0	90.0	3.5	45.1	3.5
P07863	I02545/P02630	36	18.2	39.7	37.0	90.4	1.0	49.6	5.5
G08254	G04514/G93414	34	16.7	33.2	36.5	88.5	1.0	49.1	6.0
I09106	**MAX**	8	16.5	36.4	34.5	85.1	4.0	43.5	3.0
I10115	CO55024-11	24	16.5	36.4	36.0	89.5	1.5	50.1	5.5
I09101	**ND307**	5	16.0	35.5	36.1	89.9	2.0	48.1	5.0
I10104	PT9-18 (Co-4(2)	2	15.8	34.8	37.5	97.5	2.0	51.9	3.0
I98313	CO 51715, **MONTROSE**	41	15.8	36.0	36.5	87.7	3.5	43.0	3.0
I06249	ND020069,**LARIAT**	3	15.7	40.4	38.6	91.6	2.0	52.6	4.5
I05834	ND020351,**STAMPEDE**	4	15.6	39.5	36.0	90.0	1.0	51.9	6.0
P08339	X05129/P02646	37	15.3	37.3	36.5	86.5	1.0	47.5	4.5
I10110	ND041062-1	16	15.0	34.3	37.0	91.0	1.0	50.5	5.5
I08918	ND040494-4(PINTO)	15	14.9	36.9	36.0	87.5	2.5	48.5	4.0
I09105	**SEQUOIA**	9	14.4	33.5	36.0	91.2	1.5	53.6	4.5
I10112	ND080213	18	14.3	38.2	38.0	87.8	1.0	47.5	5.0
G93414	**MATTERHORN**	40	14.3	31.7	38.5	87.5	1.5	46.6	5.0
I08908	CO24972(PINTO)	21	14.1	39.1	38.5	91.0	1.5	51.5	5.5
I10111	ND060067	17	13.9	40.1	39.4	91.0	1.0	54.0	5.0
I99117	ASG85-5051-7, **BUSTER**	39	13.7	38.7	35.5	86.8	2.0	47.1	3.5
I08912	CO33986(PINTO)	22	13.6	37.1	39.5	92.2	2.0	51.2	6.0
I09116	NE2-08-17 (PINTO)	32	13.0	34.8	38.5	92.8	2.0	51.9	3.5
I07146	NE-2-06-8	12	12.9	40.2	35.6	87.2	2.0	48.1	4.0
I10114	CO55024-8	23	12.8	33.6	37.5	91.4	2.0	49.4	4.5
G08263	G98601/G04514	33	12.7	34.6	36.0	87.8	1.0	34.4	6.0
I09107	**JACKPOT**	10	12.6	38.5	36.0	85.1	4.0	42.3	3.0
P09420	P02630/I03386	38	12.4	37.5	36.0	87.4	1.0	47.1	5.0
I09114	NE2-08-15 (PINTO)	31	12.4	39.1	39.5	92.1	2.5	34.4	4.0
I09112	NE1-08-16 (GN)	29	12.2	32.1	35.5	91.1	2.0	47.9	3.5

EXPERIMENT 0109 CDBN/MRPN YIELD TRIAL					PLANTING DATE 06/11/10				
ENTRY	**NAMES**	**NO.**	**YIELD CWT /ACRE**	**100 SEED WT.**	**DAYS TO FLOWER**	**DAYS TO MATURITY**	**LODGING**	**HEIGHT**	**DES. SCORE**
G09330	G04514/G02647	35	12.1	38.4	36.5	88.5	1.0	49.3	5.0
I09120	NDF09003 (GN)	19	11.9	30.8	35.5	86.4	1.0	46.9	5.0
I09110	NE1-08-9 (GN)	27	11.2	36.7	37.0	91.4	2.0	49.0	4.0
I10113	ND080412	20	11.1	31.0	39.5	89.8	2.0	47.0	4.5
I07142	NE-1-06-12,**COYNE**	28	10.4	40.6	36.5	91.9	2.0	48.4	3.5
I09109	CO55646 (PINTO)	25	10.0	34.2	45.5	100.0	2.0	53.6	3.0
P04205	P99119/G99750, **SANTA FE**	6	9.8	39.0	36.0	89.1	1.5	48.5	5.5
I04317	ASGROW 0759 V, **CHIANTI**	14	9.8	51.5	36.0	93.2	1.5	48.0	3.5
I09113	NE1-08-29 (GN)	30	9.6	36.3	36.5	92.9	2.0	48.1	3.5
I09103	IP08-2 (PINTO)	7	8.5	34.7	40.0	99.8	2.5	49.0	2.5
C06808	I01800/C03129, **BELLAGIO**	13	8.3	42.8	36.0	92.8	2.0	51.0	4.5
I10116	CO55695	26	7.5	32.3	46.0	100.0	3.0	51.5	3.0
AVERAGE OF PRECEDING 42 MEANS			13.6	36.8	37.4	90.5	1.9	48.2	4.3
LSD (P=.05)			4.0	3.8	0.8	1.1	0.4	5.4	0.6
LSD (P=.01)			5.2	4.9	1.1	1.4	0.5	7.0	0.8
COEFFICIENT OF VARIATION (%)			18.1	6.3	1.4	0.8	13.3	6.9	8.4

EXPERIMENT 0210 STANDARD CRANBERRY YIELD TRIAL **PLANTING DATE 06/21/10**

ENTRY	NAMES	NO.	YIELD CWT /ACRE	100 SEED WT.	DAYS TO FLOWER	DAYS TO MATURITY	LODGING	HEIGHT	DES. SCORE	WM (1-9)
C07411	X03516/C99804	5	35.4	47.1	35.2	91.0	2.0	49.5	6.0	1.3
C08709	X03516/C99804	1	35.3	48.2	36.0	92.0	2.0	49.5	5.5	3.2
C99833	CARDINAL/K94803,**CAPRI**	19	34.6	54.0	36.4	91.5	2.5	46.0	5.0	3.6
C08710	X03516/C99804	3	32.6	47.5	36.8	92.0	2.0	48.5	5.0	2.8
C81008	**T HORT**	22	32.6	57.3	36.3	90.0	1.5	47.5	5.5	3.4
C08713	X03516/C99804	4	32.1	46.5	35.9	91.0	1.5	48.5	6.0	4.1
C08711	X03516/C99804	7	31.6	50.6	36.0	93.0	2.0	49.5	6.0	2.6
C08705	C99804/X03594	13	31.2	55.2	36.4	90.5	2.0	48.5	5.0	5.0
C08714	X03516/C99804	6	30.9	47.8	35.4	91.5	1.5	48.5	5.0	3.5
C08708	X03516/C99804	2	29.7	46.8	36.0	92.0	2.0	48.5	5.5	3.6
C08716	C99804/C03151	11	29.5	40.4	37.0	92.0	3.0	42.5	4.0	6.5
C08706	C99804/X03594	18	29.4	56.5	35.5	91.0	2.5	46.5	4.5	4.9
I04317	ASGROW 0759 V, **CHIANTI**	23	28.2	56.7	37.8	95.5	3.5	40.5	3.5	4.6
C08712	X03516/C99804	15	27.9	48.2	37.1	91.0	2.5	45.5	4.5	5.9
C08715	C99804/C03151	8	27.7	42.4	37.1	89.0	2.5	43.0	4.5	4.6
C08725	C99833/I06210	17	27.6	50.0	35.1	95.5	2.5	46.5	4.0	3.6
C07403	X03510/C99833	16	27.4	48.6	36.3	94.0	4.0	44.5	3.5	6.5
C66001	**MICRAN**	25	26.9	47.5	39.5	100.0	5.0	40.0	3.0	2.7
C81004	CRAN 425,**CARDINAL**	9	26.3	52.7	35.8	92.5	3.0	43.0	3.5	7.3
C08722	C99833/I06210	14	25.8	54.3	36.2	96.5	3.5	44.0	3.0	6.0
C06814	C99833/C03151	10	25.3	53.8	36.9	92.0	3.0	41.9	3.5	8.1
I07126	BD 1003,**KRIMSON**	21	23.7	51.1	34.9	89.0	4.0	40.0	3.0	9.1
C08724	C99833/I06210	12	22.4	51.6	37.0	93.0	3.0	46.5	4.0	7.6
C06808	I01800/C03129, **BELLAGIO**	20	21.7	50.2	37.8	96.0	4.0	41.0	3.5	6.4
I99149	B386ASGROW,CRAN, **HOOTER**	24	20.8	56.9	38.4	100.0	3.0	47.0	3.0	5.7
AVERAGE OF PRECEDING 25 MEANS			28.7	50.5	36.5	92.9	2.7	45.5	4.4	4.9
LSD (P=0.05)			6.2	3.6	1.5	1.2	0.4	1.4	0.5	1.0
LSD (P=.01)			8.1	4.7	1.9	1.6	0.6	1.8	0.6	1.3
COEFFICIENT OF VARIATION (%)			15.3	5.1	2.9	0.9	11.2	2.2	7.3	14.0

EXPERIMENT 0211 STANDARD KIDNEY YIELD TRIAL **PLANTING DATE 06/21/10**

ENTRY	NAMES	NO.	YIELD CWT /ACRE	100 SEED WT.	DAYS TO FLOWER	DAYS TO MATURITY	LODGING	HEIGHT	DES. SCORE	WM 1-9
K08961	K04604/I05101	1	36.8	63.3	34.5	92.5	1.9	48.7	5.1	2.1
K94601	CN49242/3*MONT//REDKLOUD, **CHINOOK2000**	34	36.2	48.0	37.5	98.9	2.6	51.9	4.0	2.7
K90101	CHAR/2*MONT, **RED HAWK**	33	35.1	47.0	36.0	93.0	2.1	48.8	4.9	2.4
I90013	(LRK)UCD,**CELRK**	14	34.8	62.4	35.3	93.1	1.1	47.0	4.0	0.9
K06014	K90101/K02601	5	32.8	45.4	36.3	90.8	1.9	46.9	5.0	4.0
K08920	K99974/X04201	42	32.8	84.1	35.8	93.5	2.0	48.0	5.0	3.0
K08205	I02535//K90101/K74002	31	32.8	45.8	37.0	94.0	2.0	47.9	4.5	3.6
K08938	X05104/K04605	17	32.5	49.0	35.5	91.5	1.0	47.5	5.0	1.0
K08228	K03271/I05101	3	32.5	44.3	36.0	91.6	1.9	46.6	5.0	3.3
K01234	**REDCOAT**	16	32.3	49.6	37.0	92.0	1.3	46.6	5.1	2.1
K08915	X04307/X04203	2	31.7	51.0	36.8	93.5	2.0	48.0	5.0	2.3
K06001	I99105/X02151	23	31.6	52.5	36.5	94.5	2.0	47.4	4.5	4.3
K08231	K03271/I05101	24	31.4	48.7	37.0	92.4	1.5	48.5	5.5	2.5
K08224	K90101/I05101	22	31.3	45.4	36.5	92.3	2.0	49.0	4.0	5.3
K08918	X04307/X04203	15	31.1	49.0	36.8	93.4	1.5	50.0	5.5	2.6
K07305	K90101/K02601	12	31.1	48.4	36.5	93.1	1.1	47.9	5.0	2.2
K10902	**BELUGA SELECTION FROM ADM**	11	30.8	43.4	36.5	90.4	1.5	50.0	6.0	1.3
K08229	K03271/I05101	19	30.8	43.1	38.0	92.0	2.5	47.6	4.5	2.5
I05101	PS 99-009F-5-15-1	38	30.3	46.1	36.8	91.5	2.5	47.5	4.5	4.4
K74002	MDRK/CN(3)-HBR(NEB#1), **MONTCALM**	35	29.8	51.2	36.8	96.6	3.0	47.9	3.9	3.0
K08222	K90101/I05101	7	29.8	48.2	36.8	92.0	1.6	49.0	5.5	1.7
K08211	K74002/K02601	13	29.4	46.4	35.8	94.4	2.0	50.5	5.0	3.6
K08220	K90101/I05101	9	29.3	44.9	38.8	92.4	1.9	48.5	5.0	2.8
K08225	K90101/I05101	26	29.1	49.6	36.5	91.0	1.9	47.6	5.1	3.1
K08903	K99974/X02153	10	28.8	46.1	35.8	89.0	1.4	46.7	5.1	1.7
K08233	K04601/I05101	4	28.7	44.2	37.8	91.6	1.5	48.9	5.0	3.1
K06619	I00639/K02601	37	28.7	46.3	38.0	96.6	2.0	49.1	4.5	2.9
K06012	K90101/K02601	27	28.6	44.7	36.8	91.5	2.5	47.0	4.0	4.4
K08209	K74002/K02601	8	28.5	47.9	36.5	91.4	2.4	46.1	4.0	4.3
K08232	K04601/I05101	18	28.2	47.8	38.0	91.4	2.5	47.0	4.5	5.5

EXPERIMENT 0211 STANDARD KIDNEY YIELD TRIAL **PLANTING DATE 06/21/10**

ENTRY	NAMES	NO.	YIELD CWT /ACRE	100 SEED WT.	DAYS TO FLOWER	DAYS TO MATURITY	LODGING	HEIGHT	DES. SCORE	WM 1-9
K08907	K03244/I05103	6	28.2	43.6	37.5	91.6	1.4	49.7	5.1	1.1
K90902	BEA/50B1807//LASSEN, **BELUGA**	40	27.8	47.7	38.0	95.7	1.0	51.0	5.0	1.7
K08905	K03244/I05103	25	27.1	42.4	37.8	90.1	2.1	50.5	5.0	2.1
K08227	K90101/I05101	30	27.1	47.4	36.5	93.9	2.5	47.9	4.0	6.0
K08604	K02601/K01635	32	26.8	48.2	38.3	93.9	2.0	49.1	5.1	3.5
K07712	K02601/K01635	36	26.2	47.3	37.5	95.1	2.1	52.9	4.9	2.2
K07921	K03244/I05103	20	25.4	48.6	39.3	95.3	1.5	53.5	5.0	1.7
K08230	K03271/I05101	28	24.0	41.2	39.5	92.1	2.5	47.0	2.9	5.8
I08230	PRO 422-39 (T-27), LRK	21	23.8	43.9	38.3	99.9	2.1	51.4	4.0	3.3
I08229	PRO 422-41 (T-28), LRK	29	23.7	42.0	39.0	96.6	1.0	48.6	3.5	0.7
K08608	K04604/K03601	39	23.6	45.5	38.5	95.5	2.1	50.5	4.5	5.1
I09130	T-21 (V.LRK) (CBB, I-gene), **BADILLO**	41	21.2	48.5	41.0	104.9	3.0	49.0	4.0	1.4
AVERAGE OF PRECEDING 42 MEANS			29.6	48.3	37.1	93.5	1.9	48.7	4.7	2.9
LSD (P=.05)			5.1	3.6	1.8	1.2	0.4	1.0	0.5	1.0
LSD (P=.01)			6.6	4.7	2.3	1.6	0.5	1.4	0.6	1.3
COEFFICIENT OF VARIATION (%)			12.1	5.3	3.4	0.9	14.8	1.5	7.4	24.5

EXPERIMENT 0212 NATIONAL WHITE MOLD YIELD TRIAL **PLANTING DATE 06/21/10**

ENTRY	NAMES	NO.	YIELD CWT /ACRE	100 SEED WT.	DAYS TO FLOWER	DAYS TO MATURITY	LODGING	HEIGHT	DES. SCORE	WM(1-9) SCORE	WM %
I08933	37-2 (PINTO)	7	33.0	33.9	38.1	90.0	2.0	49.6	5.0	3.0	33.3
P07863	I02545/P02630	1	32.5	38.0	38.8	95.0	1.5	49.9	5.0	3.0	33.3
R08512	R97003//I03385/R98026	57	31.4	32.7	39.6	95.6	2.0	56.0	5.5	3.0	33.3
R08516	R98026/S02753	56	31.2	33.7	42.4	95.0	2.0	54.0	5.5	5.0	55.5
B09184	B04349/B05001	43	29.6	16.1	40.3	92.0	1.5	51.5	6.0	4.5	50.0
I10125	ND080547(Red-WM)	5	29.4	26.5	38.9	95.0	3.0	45.9	4.0	4.0	44.4
B09175	N05311/B05055	39	29.1	21.9	40.0	92.5	1.4	51.8	5.0	4.5	50.0
R09508	R06415/R06427	58	29.1	28.4	37.7	92.0	2.0	50.6	5.5	6.0	66.6
B04554	B00103 */ X00822, **ZORRO**	28	28.4	17.4	39.7	91.0	2.0	50.0	5.0	6.0	66.6
B09197	B05055/B04588	42	28.4	18.2	39.0	91.9	2.0	48.9	4.5	6.0	66.6
P08329	X05129/P02646	52	28.0	33.4	37.7	89.6	2.0	50.6	5.0	5.0	55.5
S08419	S02754/S04503	59	27.9	32.3	39.3	93.5	2.0	49.1	5.5	4.0	44.4
I10126	50-2(Red-WM)	6	27.6	29.3	37.8	94.1	2.0	51.0	5.5	4.0	44.4
G09320	G04514/G02647	48	26.7	25.8	37.6	89.0	2.5	49.7	5.5	6.0	66.6
I89011	**BERYL**	10	26.7	32.0	38.6	95.1	3.0	46.3	3.0	5.5	61.1
N08007	N01792/N03614	33	26.6	16.4	40.4	93.9	1.5	49.3	5.5	3.5	38.9
I10124	ND060514(Navy-WM)	4	26.6	19.2	40.2	94.0	2.0	46.6	4.5	4.5	50.0
B09204	B05054/B04588	46	26.5	20.8	39.0	92.5	2.5	49.5	4.5	6.0	66.6
N09034	B05055/B05070	35	26.3	19.2	38.3	92.5	2.0	47.8	5.0	4.5	50.0
P07751	I02545/P02647	2	26.2	33.5	38.1	93.0	2.0	48.5	5.0	5.0	55.5
P04205	P99119/G99750, **SANTA FE**	20	26.2	37.2	38.4	90.0	2.5	46.6	4.5	5.5	61.1
N09041	B05070/B05044	37	26.1	20.2	39.4	93.9	2.4	46.8	4.5	6.0	66.6
B09128	B05055/B05044	40	25.9	17.0	39.7	93.9	2.5	47.6	4.5	6.5	72.2
N09056	N04152/N05346	34	25.6	19.5	39.7	93.9	2.0	48.1	4.5	6.0	66.6
G08256	G04514/G93414	47	25.5	29.7	38.7	89.0	2.5	49.0	4.5	5.0	55.5
B95556	B90211/N90616,**JAGUAR**	29	25.3	15.9	39.0	93.9	1.5	48.9	5.0	4.0	44.4
B09135	B04316/B05040	38	25.2	19.4	39.0	91.4	2.4	45.9	4.0	7.0	77.7
I10127	70-1(Pinto-WM)	8	25.1	29.9	37.8	89.4	3.0	47.0	4.0	6.5	72.2
B09194	B05055/B05044	44	24.9	16.3	41.0	93.1	2.5	47.7	4.0	6.5	72.2
P08312	I04324/P02646	51	24.8	34.5	37.6	89.5	2.0	48.0	4.0	7.0	77.7
B09104	N05311/B05055	41	24.6	18.1	40.0	92.5	2.5	48.7	4.0	7.5	83.3
P09419	P02630/I03386	55	24.4	30.7	38.5	87.5	2.5	46.8	4.0	7.5	83.3
I81066	SEL-BTS,**T39**	27	24.3	17.5	39.0	92.5	3.0	45.3	3.5	4.5	50.0
R98026	R94037/R94161, **MERLOT**	23	23.9	31.0	39.3	94.0	2.0	51.6	5.0	3.0	33.3
I08958	**MEDALIST**	30	23.7	15.9	40.9	94.5	2.0	49.2	5.0	5.0	55.5

EXPERIMENT 0212 NATIONAL WHITE MOLD YIELD TRIAL **PLANTING DATE 06/21/10**

ENTRY	NAMES	NO.	YIELD CWT /ACRE	100 SEED WT.	DAYS TO FLOWER	DAYS TO MATURITY	LODGING	HEIGHT	DES. SCORE	WM(1-9) SCORE	WM %
P09420	P02630/I03386	17	23.4	32.6	37.3	88.0	3.0	46.2	3.5	7.5	83.3
G09330	G04514/G02647	15	23.3	29.4	40.1	90.1	2.0	49.6	5.5	4.0	44.4
G08263	G98601/G04514	13	23.3	31.5	38.5	89.5	2.5	46.0	3.5	8.5	94.4
P08339	X05129/P02646	16	23.2	32.0	38.9	90.0	2.0	50.3	5.0	5.5	61.1
I07113	**LAPAZ**	18	23.1	27.9	39.7	94.5	3.0	46.7	3.5	7.5	83.3
N09175	N05311/B05055	36	22.7	18.7	38.2	90.9	2.4	49.8	4.5	7.0	77.7
B09203	B05054/B04588	45	22.5	19.2	40.0	93.0	3.0	47.2	4.0	6.5	72.2
P08388	P05463/P04207	53	22.2	31.7	37.7	90.0	3.0	45.5	3.5	8.0	88.8
I06271	ND012103,**AVALANCHE**	32	21.8	16.5	38.1	92.6	2.0	47.9	4.5	6.0	66.6
I05834	ND020351,**STAMPEDE**	21	21.8	30.0	40.0	92.4	1.5	51.0	5.0	3.5	38.9
P07406	P00227/I03385//P00207	50	21.8	29.1	38.7	90.9	2.5	47.0	4.0	6.5	72.2
G08254	G04514/G93414	14	21.7	27.7	38.5	88.9	2.0	48.9	4.5	5.5	61.1
C08709	X03516/C99804	3	21.5	47.2	36.7	90.5	1.5	48.8	4.5	7.0	77.7
B00101	PHANTOM/BLACKJACK, **CONDOR**	25	21.3	18.0	39.6	94.0	3.0	47.4	3.5	7.0	77.7
S00809	R94142/X94076, **SEDONA**	24	20.7	32.2	40.4	92.5	2.5	47.8	4.5	4.0	44.4
K07305	K90101/K02601	64	20.3	42.0	37.3	92.6	1.0	48.2	4.5	5.0	55.5
I03390	ND9902621-2, **ECLIPSE**	26	20.1	17.3	39.7	90.0	2.5	46.1	3.5	8.5	94.4
I06249	ND020069,**LARIAT**	19	19.5	30.5	39.7	91.5	3.0	47.9	4.0	7.5	83.3
K08961	K04604/I05101	61	19.0	56.5	35.7	91.5	1.0	49.3	5.5	5.5	61.1
C99833	CARDINAL/K94803,**CAPRI**	31	18.9	49.5	36.0	92.5	2.0	47.3	3.5	6.5	72.2
P09417	P02630/I04305	54	18.1	28.4	38.3	89.5	3.0	47.9	3.0	8.0	88.8
K08228	K03271/I05101	62	17.4	42.3	38.2	92.5	2.0	48.8	4.5	6.0	66.6
I81010	JAPON3/MAGDALENE, **BUNSI**	11	17.2	18.7	40.0	94.6	3.0	42.9	4.0	4.0	44.4
P07407	P00227/I03385//P00207	49	16.1	24.0	38.7	88.1	3.0	46.4	3.5	8.5	94.4
K08222	K90101/I05101	63	16.1	46.6	39.0	94.5	2.5	48.5	3.5	7.0	77.7
I96417	G122 MAGNUSON	12	14.5	29.9	40.3	98.0	2.0	50.5	3.0	3.5	38.9
G93414	**MATTERHORN**	22	14.0	24.6	38.3	89.0	2.0	47.4	4.0	5.5	61.1
C08715	C99804/C03151	60	10.5	41.0	38.4	90.1	2.0	47.3	3.0	9.0	99.9
I09209	VCW54	9	8.0	15.7	41.1	90.0	1.4	30.4	1.0	3.5	38.9
AVERAGE OF PRECEDING 64 MEANS			23.6	27.7	38.9	92.0	2.2	48.2	4.4	5.7	63.3
LSD (P=.05)			6.8	3.1	2.1	1.6	0.6	2.1	0.8	2.0	22.2
LSD (P=.01)			8.8	4.0	2.7	2.1	0.7	2.7	1.1	2.6	28.9
COEFFICIENT OF VARIATION (%)			17.6	6.8	3.3	1.1	15.4	2.7	11.4	22.0	22.0

EXPERIMENT 0213 GENETIC WHITE MOLD, POP-1 (I02545/P02630) PLANTING DATE 06/21/10

ENTRY	NAMES	NO.	YIELD CWT /ACRE	100 SEED WT.	DAYS TO FLOWER	DAYS TO MATURITY	LODGING	HEIGHT	DES. SCORE	WM(1-9) SCORE	WM (%) Score
P07908	I02545/P02630	80	32.1	34.5	39.3	94.3	1.0	52.0	4.7	2.3	25.5
P07826	I02545/P02630	8	31.8	31.8	38.0	92.3	1.3	50.0	3.3	4.3	47.7
P07909	I02545/P02630	92	31.6	32.2	39.0	94.0	2.0	49.7	2.7	2.7	30.0
P07835	I02545/P02630	77	31.4	33.0	38.7	99.0	3.7	49.3	2.7	3.0	33.3
P07806	I02545/P02630	2	31.2	33.6	38.0	92.3	3.0	49.3	3.0	5.3	58.8
P07832	I02545/P02630	36	30.8	31.1	38.7	95.3	3.3	49.7	2.7	4.3	47.7
P07851	I02545/P02630	39	30.7	30.7	39.7	94.7	2.7	52.3	2.7	3.3	36.6
P07849	I02545/P02630	79	30.3	33.0	40.7	95.0	2.7	50.3	2.7	3.3	36.6
P07878	I02545/P02630	47	30.3	39.1	37.7	93.3	1.7	52.3	2.3	2.7	30.0
P07856	I02545/P02630	21	29.8	34.7	38.0	95.0	4.0	49.7	3.7	5.3	58.8
P07869	I02545/P02630	20	29.8	32.5	39.0	93.3	3.3	51.7	2.7	4.7	52.2
P07874	I02545/P02630	70	29.7	36.7	37.0	97.0	3.0	52.0	3.0	4.3	47.7
P07888	I02545/P02630	13	29.6	40.0	39.0	91.0	2.3	51.3	3.3	5.7	63.3
P07839	I02545/P02630	3	29.6	33.9	40.3	96.0	1.3	52.3	4.3	1.7	18.9
P07833	I02545/P02630	19	29.5	29.3	37.3	91.0	2.7	51.7	3.0	4.7	52.2
P07831	I02545/P02630	63	29.5	34.1	38.7	94.3	4.0	51.0	2.3	4.7	52.2
P07857	I02545/P02630	31	29.2	32.8	39.0	95.7	2.7	49.0	3.0	2.3	25.5
P07838	I02545/P02630	34	29.0	38.3	39.0	94.7	3.3	50.3	3.0	6.3	69.9
P07840	I02545/P02630	89	28.7	30.8	41.0	95.7	3.3	51.0	2.0	5.7	63.3
P07819	I02545/P02630	22	28.6	39.4	38.7	93.3	3.0	52.3	3.0	6.0	66.6
P07870	I02545/P02630	72	28.5	32.4	37.7	94.7	3.0	49.0	2.7	5.0	55.5
P07830	I02545/P02630	14	28.4	33.0	38.7	94.0	3.3	51.7	3.3	6.0	66.6
P07802	I02545/P02630	59	28.3	32.1	39.3	92.3	2.3	53.0	3.3	3.7	41.1
I02545	AZTEC/ND88-106-04, AN 37	46	28.2	33.4	38.0	92.0	2.0	49.0	2.7	4.0	44.4
P07854	I02545/P02630	43	28.0	32.0	39.3	97.7	3.3	44.7	1.3	5.3	58.8
P07866	I02545/P02630	86	27.9	31.4	37.7	94.3	2.0	51.7	3.0	4.3	47.7
P07902	I02545/P02630	32	27.7	35.5	39.7	94.3	2.0	53.0	2.3	3.3	36.6
P07803	I02545/P02630	25	27.5	35.8	38.0	94.3	4.7	53.0	2.7	6.3	69.9
P07827	I02545/P02630	45	27.3	33.9	38.7	93.0	3.3	52.3	2.7	5.3	58.8
P07863	I02545/P02630	1	27.3	35.6	39.0	95.0	3.3	51.7	3.0	7.3	81.0
P07872	I02545/P02630	33	27.1	36.7	37.3	97.3	3.7	48.0	1.7	7.3	81.0
P07855	I02545/P02630	17	27.1	26.4	39.7	96.3	1.3	50.7	2.7	2.7	30.0
P07813	I02545/P02630	81	27.0	31.8	39.3	97.3	2.3	49.3	3.7	4.7	52.2
P07810	I02545/P02630	71	27.0	37.2	37.7	90.7	3.3	54.0	3.3	6.7	74.4
P07814	I02545/P02630	78	26.9	30.5	39.3	95.7	3.7	50.3	2.7	4.3	47.7

EXPERIMENT 0213 GENETIC WHITE MOLD, POP-1 (I02545/P02630) **PLANTING DATE 06/21/10**

ENTRY	NAMES	NO.	YIELD CWT /ACRE	100 SEED WT.	DAYS TO FLOWER	DAYS TO MATURITY	LODGING	HEIGHT	DES. SCORE	WM(1-9) SCORE	WM (%) Score
P07844	I02545/P02630	23	26.9	31.9	36.7	97.7	2.7	54.3	3.0	4.3	47.7
P07818	I02545/P02630	64	26.9	31.7	38.0	96.7	1.7	52.7	3.7	3.3	36.6
P07880	I02545/P02630	29	26.8	32.5	39.3	92.7	3.0	52.0	2.0	5.0	55.5
P07843	I02545/P02630	24	26.7	34.8	39.0	95.0	3.0	51.0	3.3	5.7	63.3
P07901	I02545/P02630	90	26.4	33.6	40.7	102.7	3.0	53.3	2.0	2.0	22.2
P07822	I02545/P02630	58	26.4	33.8	37.0	94.7	3.3	51.3	2.3	5.7	63.3
P07892	I02545/P02630	57	26.2	34.0	37.7	93.0	2.3	53.0	4.3	5.7	63.3
P07897	I02545/P02630	51	26.1	32.5	40.7	96.7	2.3	54.7	3.0	2.7	30.0
P07883	I02545/P02630	62	26.1	35.0	37.7	90.7	4.3	54.3	2.3	6.3	69.9
P07804	I02545/P02630	67	26.1	30.5	38.3	93.7	3.0	52.7	3.0	3.3	36.6
P07816	I02545/P02630	85	25.5	33.0	38.7	95.3	1.7	54.0	4.0	2.7	30.0
P07876	I02545/P02630	28	25.3	30.9	39.7	96.0	3.0	52.7	2.3	2.3	25.5
P07895	I02545/P02630	68	25.3	34.9	38.7	93.7	2.3	53.3	3.0	4.0	44.4
P07848	I02545/P02630	18	25.1	36.1	37.7	93.7	2.0	54.0	3.0	3.7	41.1
P07896	I02545/P02630	91	25.0	36.5	39.3	94.7	1.3	51.0	4.0	3.3	36.6
P07889	I02545/P02630	93	24.9	33.8	38.3	97.0	3.7	56.3	3.0	3.7	41.1
P07882	I02545/P02630	26	24.9	34.5	38.3	97.3	3.0	48.7	2.0	5.0	55.5
P07867	I02545/P02630	5	24.8	31.6	41.3	96.3	2.7	49.7	2.0	3.7	41.1
P07850	I02545/P02630	73	24.8	34.9	38.7	94.3	1.7	52.7	4.3	2.3	25.5
P07885	I02545/P02630	11	24.8	29.8	39.3	97.0	3.0	51.0	2.3	3.7	41.1
P07809	I02545/P02630	87	24.8	37.7	39.7	93.7	3.0	53.3	3.3	5.3	58.8
P07893	I02545/P02630	88	24.7	38.1	39.3	91.0	3.3	52.0	2.0	5.3	58.8
P07907	I02545/P02630	53	24.6	34.0	38.0	96.3	2.3	51.0	3.3	3.3	36.6
P02630	P99120/MATTERHORN	83	24.4	35.7	39.3	92.3	2.7	54.3	3.0	4.7	52.2
P07815	I02545/P02630	15	24.4	30.9	39.0	94.0	2.0	50.3	2.3	3.0	33.3
P07821	I02545/P02630	94	24.3	33.8	38.3	95.0	2.3	52.0	3.0	3.7	41.1
P07894	I02545/P02630	4	24.3	33.7	37.3	93.3	1.3	50.7	4.0	4.0	44.4
P07820	I02545/P02630	44	24.3	31.4	36.7	91.7	3.7	50.7	2.3	7.0	77.7
P07847	I02545/P02630	35	24.2	31.3	38.0	96.0	2.7	52.3	3.0	3.7	41.1
P07853	I02545/P02630	30	24.2	38.7	38.3	92.3	3.7	52.0	3.7	7.7	85.5
P07868	I02545/P02630	49	24.2	32.1	39.0	92.0	3.7	47.3	2.3	6.3	69.9
P07836	I02545/P02630	48	24.1	35.3	39.0	92.0	2.7	51.3	3.0	3.7	41.1
P07811	I02545/P02630	55	24.1	32.9	37.7	90.3	2.3	53.0	2.7	7.7	85.5
P07861	I02545/P02630	84	24.0	33.8	39.7	92.7	3.7	49.7	2.7	6.7	74.4
P07903	I02545/P02630	9	24.0	38.6	38.3	94.7	2.7	49.3	2.0	3.0	33.3

EXPERIMENT 0213 GENETIC WHITE MOLD, POP-1 (I02545/P02630) PLANTING DATE 06/21/10

ENTRY	NAMES	NO.	YIELD CWT /ACRE	100 SEED WT.	DAYS TO FLOWER	DAYS TO MATURITY	LODGING	HEIGHT	DES. SCORE	WM(1-9) SCORE	WM (%) Score
P07865	I02545/P02630	76	24.0	34.1	38.0	90.3	1.7	51.3	4.3	3.0	33.3
P07812	I02545/P02630	50	23.8	36.6	38.0	92.0	3.7	50.3	2.0	7.7	85.5
P07879	I02545/P02630	60	23.7	33.4	40.7	95.7	3.3	48.7	2.7	4.3	47.7
P07860	I02545/P02630	40	23.7	32.0	38.3	94.0	4.0	52.7	2.3	4.7	52.2
P07886	I02545/P02630	37	23.4	29.9	38.7	92.7	3.7	50.3	2.3	6.3	69.9
P07905	I02545/P02630	27	23.3	32.5	38.7	91.3	4.0	48.7	2.3	6.3	69.9
P07891	I02545/P02630	69	23.3	36.6	38.3	98.3	2.3	57.0	2.3	3.7	41.1
P07862	I02545/P02630	52	23.3	32.1	38.0	94.7	4.0	50.3	1.7	6.7	74.4
P07846	I02545/P02630	82	22.9	38.5	37.0	94.7	3.0	52.0	2.0	4.3	47.7
P07877	I02545/P02630	95	22.7	31.0	39.0	96.0	3.3	48.7	1.7	7.7	85.5
P07900	I02545/P02630	56	22.7	37.3	38.7	94.0	2.7	53.3	1.7	4.0	44.4
P07887	I02545/P02630	61	22.6	37.1	38.3	94.0	3.0	51.3	2.7	4.3	47.7
P07829	I02545/P02630	7	22.4	31.2	37.7	92.3	2.7	55.3	3.3	3.3	36.6
P07834	I02545/P02630	75	22.3	33.1	40.3	95.0	4.7	53.7	2.0	5.0	55.5
P07841	I02545/P02630	41	22.3	32.0	39.0	99.7	3.0	52.3	3.0	2.3	25.5
P07858	I02545/P02630	42	22.2	33.1	36.7	91.0	4.0	50.3	2.3	6.0	66.6
P07842	I02545/P02630	10	22.2	29.5	38.7	91.7	2.7	50.3	3.0	2.7	30.0
P07881	I02545/P02630	16	21.9	38.9	38.0	91.3	3.0	51.0	3.3	6.7	74.4
P07805	I02545/P02630	66	21.9	31.8	37.7	94.3	3.7	48.3	2.0	6.0	66.6
P07808	I02545/P02630	96	21.7	31.2	37.7	95.0	2.7	50.0	2.0	6.7	74.4
P07845	I02545/P02630	12	21.2	30.4	37.7	92.7	4.0	48.7	2.0	7.7	85.5
P07825	I02545/P02630	54	21.0	33.1	37.7	92.0	2.7	49.0	2.0	5.7	63.3
P07823	I02545/P02630	74	20.7	30.9	38.3	92.3	3.3	50.3	2.7	3.7	41.1
P07875	I02545/P02630	65	17.9	31.0	38.0	93.3	2.3	50.3	4.3	6.3	69.9
P07904	I02545/P02630	6	17.8	36.6	38.0	95.3	3.3	53.0	3.0	6.7	74.4
P07899	I02545/P02630	38	16.2	27.4	40.3	93.0	4.0	51.0	2.3	8.3	92.1
AVERAGE OF PRECEDING 96 MEANS			25.7	33.6	38.6	94.3	2.9	51.3	2.8	4.7	52.2
LSD (P=.05)			6.8	3.6	1.8	5.1	1.8	4.8	2.0	3.2	35.5
LSD (P=.01)			8.8	4.7	2.3	6.6	2.4	6.3	2.5	4.1	45.5
COEFFICIENT OF VARIATION (%)			16.2	6.6	2.8	3.3	39.0	5.8	42.8	41.4	41.4

EXPERIMENT 0214 GENETIC WHITE MOLD, POP 2(I02545/P02647) PLANTING DATE 06/21/10

ENTRY	NAMES	NO.	YIELD CWT /ACRE	100 SEED WT.	DAYS TO FLOWER	DAYS TO MATURITY	LODGING	HEIGHT	DES. SCORE	WM(1-9) SCORE	WM %
P07720	I02545/P02647	22	36.9	33.4	39.3	92.3	2.0	53.7	4.0	2.3	25.5
P07762	I02545/P02647	58	36.8	33.7	38.3	96.3	2.0	54.7	3.3	5.0	55.5
P07796	I02545/P02647	91	36.0	34.1	37.7	94.0	2.7	49.7	4.7	5.0	55.5
P07737	I02545/P02647	36	34.9	34.8	38.7	94.3	3.0	53.0	2.0	6.0	66.6
P07799	I02545/P02647	94	34.6	31.9	39.3	95.7	2.0	50.0	2.7	4.7	52.2
P07711	I02545/P02647	13	34.4	39.5	37.3	92.7	3.0	53.3	3.0	7.0	77.7
P07734	I02545/P02647	34	34.0	32.4	37.7	99.3	2.0	54.3	2.7	3.7	41.1
P07725	I02545/P02647	27	33.2	32.7	38.3	96.3	2.7	50.3	2.7	3.3	36.6
P07746	I02545/P02647	42	32.9	40.2	39.0	92.7	1.3	53.7	3.3	4.0	44.4
P07759	I02545/P02647	55	32.8	35.2	40.7	95.0	3.0	56.3	4.0	4.3	47.7
P07721	I02545/P02647	23	32.5	29.7	38.7	100.0	2.3	57.3	3.7	2.0	22.2
P07793	I02545/P02647	88	32.4	34.5	38.7	93.3	2.0	52.0	3.7	2.3	25.5
P07783	I02545/P02647	78	32.3	31.4	40.7	98.3	2.7	49.3	3.0	2.3	25.5
P07750	I02545/P02647	46	32.3	32.9	38.3	96.7	2.0	49.3	2.7	2.3	25.5
P07794	I02545/P02647	89	32.2	37.3	39.0	98.0	3.3	50.7	3.3	3.0	33.3
P07719	I02545/P02647	21	32.2	37.1	38.0	97.7	4.0	52.3	2.0	6.7	74.4
P07704	I02545/P02647	6	32.1	39.1	39.0	91.7	2.7	54.0	2.0	5.7	63.3
P07770	I02545/P02647	66	32.0	31.5	38.7	99.0	1.7	49.7	1.7	2.0	22.2
P07797	I02545/P02647	92	32.0	28.5	43.0	100.7	3.0	47.7	1.3	2.7	30.0
P07767	I02545/P02647	63	31.8	39.5	39.0	93.7	3.0	54.0	3.3	4.7	52.2
P07755	I02545/P02647	51	31.8	28.6	42.0	95.3	1.7	56.0	4.7	2.7	30.0
P07792	I02545/P02647	87	31.7	32.5	40.7	96.3	3.7	49.3	2.7	5.3	58.8
P07730	I02545/P02647	31	31.7	32.4	39.0	99.0	4.3	49.7	2.7	3.7	41.1
P07788	I02545/P02647	83	31.7	40.8	37.7	92.7	2.0	51.7	4.0	5.3	58.8
P07748	I02545/P02647	44	31.6	36.6	39.0	92.7	3.3	54.7	3.7	5.0	55.5
P07735	I02545/P02647	35	31.4	35.0	39.7	97.7	1.7	51.7	3.3	4.0	44.4
P07742	I02545/P02647	38	31.4	38.2	38.7	93.3	3.0	52.7	4.7	5.3	58.8
P07771	I02545/P02647	67	31.2	35.7	40.3	94.7	2.3	56.0	4.0	3.0	33.3
P07705	I02545/P02647	7	31.2	31.1	39.0	94.0	3.0	52.3	3.0	5.7	63.3
P07765	I02545/P02647	61	31.0	30.1	38.0	98.3	3.0	49.3	1.7	4.3	47.7
P07751	I02545/P02647	47	30.7	34.5	38.7	91.3	2.7	49.3	3.3	4.0	44.4
P07706	I02545/P02647	8	30.3	31.5	39.3	96.0	2.3	50.3	2.0	3.7	41.1
P02647	G99750/P97803	2	30.2	37.4	39.3	92.7	2.3	52.7	3.0	4.7	52.2
P07773	I02545/P02647	69	30.1	35.8	38.7	96.0	3.0	53.0	2.7	5.0	55.5
P07710	I02545/P02647	12	30.1	27.1	38.3	92.7	3.3	50.0	3.7	6.3	69.9

EXPERIMENT 0214 GENETIC WHITE MOLD, POP 2(I02545/P02647) PLANTING DATE 06/21/10

ENTRY	NAMES	NO.	YIELD CWT /ACRE	100 SEED WT.	DAYS TO FLOWER	DAYS TO MATURITY	LODGING	HEIGHT	DES. SCORE	WM(1-9) SCORE	WM %
P07702	I02545/P02647	4	30.1	34.5	38.7	91.3	3.0	48.0	2.7	4.0	44.4
P07761	I02545/P02647	57	29.9	33.0	38.3	92.3	1.7	53.3	4.0	4.7	52.2
P07777	I02545/P02647	73	29.9	34.4	38.3	92.7	2.3	54.0	4.3	3.7	41.1
P07752	I02545/P02647	48	29.9	37.4	38.3	92.7	2.7	51.0	3.3	5.3	58.8
P07787	I02545/P02647	82	29.8	36.6	40.0	98.0	1.7	50.0	2.0	2.3	25.5
P07703	I02545/P02647	5	29.8	34.3	38.3	94.7	2.3	48.3	3.0	5.3	58.8
P07757	I02545/P02647	53	29.8	29.9	39.3	93.0	2.7	53.3	4.3	3.7	41.1
P07723	I02545/P02647	25	29.7	31.3	38.7	92.0	4.3	49.0	2.3	7.3	81.0
P07774	I02545/P02647	70	29.6	28.8	42.3	101.3	2.3	57.3	3.3	2.3	25.5
P07756	I02545/P02647	52	29.6	34.1	40.0	98.3	2.0	54.3	3.7	3.3	36.6
P07708	I02545/P02647	10	29.5	36.0	39.3	98.3	3.0	47.7	3.3	4.0	44.4
P07763	I02545/P02647	59	29.4	36.9	39.0	93.3	2.7	54.3	3.0	4.3	47.7
P07782	I02545/P02647	77	29.4	36.3	39.0	93.3	3.3	50.3	2.7	4.7	52.2
P07758	I02545/P02647	54	28.9	30.7	40.0	96.0	1.3	50.3	4.3	2.7	30.0
P07722	I02545/P02647	24	28.9	31.0	41.0	96.3	3.0	53.7	3.0	3.3	36.6
P07727	I02545/P02647	29	28.8	30.4	38.7	94.7	3.0	48.7	2.0	4.3	47.7
P07785	I02545/P02647	80	28.8	33.4	39.0	99.0	2.0	55.0	3.3	2.3	25.5
P07760	I02545/P02647	56	28.6	34.5	39.3	98.7	3.0	51.3	2.7	4.3	47.7
P07772	I02545/P02647	68	28.4	36.2	38.7	93.7	4.0	51.7	2.3	6.7	74.4
P07798	I02545/P02647	93	28.4	33.9	39.7	102.0	2.7	54.7	2.3	1.7	18.9
P07724	I02545/P02647	26	28.4	30.3	38.3	93.7	2.7	45.7	2.7	5.3	58.8
P07786	I02545/P02647	81	28.2	31.3	38.7	93.3	1.7	50.0	4.0	4.3	47.7
P07715	I02545/P02647	17	28.1	30.7	38.7	93.7	1.7	51.3	1.3	4.3	47.7
P07718	I02545/P02647	20	28.1	33.1	41.3	99.3	2.7	52.7	1.7	3.7	41.1
P07768	I02545/P02647	64	28.1	30.0	41.3	92.7	1.3	50.3	4.3	4.7	52.2
P07745	I02545/P02647	41	28.0	32.7	38.3	93.3	2.3	47.3	3.7	4.3	47.7
P07790	I02545/P02647	85	28.0	32.7	38.0	90.7	1.7	51.3	2.3	4.3	47.7
P07712	I02545/P02647	14	28.0	37.7	40.0	98.3	2.7	50.3	2.3	3.0	33.3
P07717	I02545/P02647	19	27.9	31.1	39.7	90.0	3.0	50.7	3.3	4.7	52.2
P07753	I02545/P02647	49	27.9	36.7	38.3	91.3	3.0	49.7	3.3	6.3	69.9
P07733	I02545/P02647	33	27.8	33.1	37.3	93.3	3.0	51.0	3.3	5.3	58.8
P07749	I02545/P02647	45	27.7	35.0	36.7	94.3	2.7	52.0	3.0	5.3	58.8
P07709	I02545/P02647	11	27.7	27.3	39.3	93.3	1.3	51.7	4.0	3.3	36.6
P07714	I02545/P02647	16	27.5	32.5	38.3	91.7	2.0	48.0	3.0	4.3	47.7
I02545	AZTEC/ND88-106-04, AN 37	1	27.4	32.2	38.3	93.7	2.0	50.0	4.3	3.3	36.6

EXPERIMENT 0214 GENETIC WHITE MOLD, POP 2(I02545/P02647) PLANTING DATE 06/21/10

ENTRY	NAMES	NO.	YIELD CWT /ACRE	100 SEED WT.	DAYS TO FLOWER	DAYS TO MATURITY	LODGING	HEIGHT	DES. SCORE	WM(1-9) SCORE	WM %
P07707	I02545/P02647	9	27.3	36.6	38.7	92.3	1.7	52.7	2.7	5.0	55.5
P07701	I02545/P02647	3	27.2	30.0	40.7	92.7	2.3	47.3	2.7	3.3	36.6
P07789	I02545/P02647	84	26.7	32.5	38.0	97.3	3.0	51.0	3.0	4.0	44.4
P07738	I02545/P02647	37	26.7	35.7	38.0	93.0	3.0	48.7	3.0	4.0	44.4
P07778	I02545/P02647	74	26.5	35.0	38.7	92.7	1.3	53.0	4.7	1.3	14.4
P07775	I02545/P02647	71	26.2	37.4	40.0	94.7	3.0	48.3	2.0	5.0	55.5
P07781	I02545/P02647	76	26.2	32.8	38.0	93.0	2.3	53.0	4.0	3.0	33.3
P07716	I02545/P02647	18	26.1	31.6	39.3	94.3	1.7	52.0	4.7	3.0	33.3
P07766	I02545/P02647	62	26.0	30.3	38.0	91.0	4.0	48.7	2.0	8.0	88.8
P07728	I02545/P02647	30	25.9	30.6	37.7	93.0	3.0	48.7	3.3	5.7	63.3
P07769	I02545/P02647	65	25.8	28.8	39.3	94.3	3.0	48.3	3.7	4.0	44.4
P07801	I02545/P02647	96	25.8	31.9	39.7	94.7	3.3	50.7	2.3	6.0	66.6
P07800	I02545/P02647	95	25.5	31.0	39.3	96.3	2.7	47.7	2.0	5.3	58.8
P07744	I02545/P02647	40	25.5	34.1	38.7	99.3	2.3	51.3	2.3	3.0	33.3
P07795	I02545/P02647	90	25.4	30.4	39.0	98.7	3.7	50.3	2.3	4.3	47.7
P07743	I02545/P02647	39	25.3	29.0	39.3	92.3	1.0	49.7	3.0	4.0	44.4
P07776	I02545/P02647	72	25.2	32.9	41.0	95.0	3.0	48.3	2.0	5.0	55.5
P07784	I02545/P02647	79	25.1	30.0	38.3	93.7	3.3	52.7	2.3	5.7	63.3
P07754	I02545/P02647	50	25.1	29.3	38.7	93.7	3.7	50.7	2.3	7.3	81.0
P07726	I02545/P02647	28	24.5	34.1	41.3	98.0	2.0	49.7	2.7	2.7	30.0
P07764	I02545/P02647	60	23.6	27.1	38.3	91.0	2.3	47.0	2.7	6.3	69.9
P07713	I02545/P02647	15	23.5	27.2	38.0	100.3	2.0	50.3	2.3	3.7	41.1
P07779	I02545/P02647	75	23.4	29.8	38.7	97.3	4.0	48.7	1.7	8.3	92.1
P07731	I02545/P02647	32	22.9	29.1	39.0	95.7	2.7	52.0	2.7	4.0	44.4
AVERAGE OF PRECEDING 96 MEANS			29.1	33.1	39.1	95.0	2.6	51.2	3.0	4.3	47.7
LSD (P=.05)			7.4	3.5	2.1	4.1	2.0	4.8	1.9	3.3	36.6
LSD (P=.01)			9.6	4.6	2.8	5.4	2.7	6.3	2.5	4.3	47.7
COEFFICIENT OF VARIATION (%)			15.6	6.5	3.3	2.7	48.6	5.8	39.2	47.2	47.2

EXPERIMENT 0116 PRELIMINARY GREAT NORTHERN YIELD TRIAL PLANTING DATE 06/11/10

ENTRY	NAMES	NO.	YIELD CWT /ACRE	100 SEED WT.	DAYS TO FLOWER	DAYS TO MATURITY	LODGING	HEIGHT	DES. SCORE
G10409	G05220/X07810	7	18.5	35.0	40.0	85.0	1.5	48.5	4.5
G10413	G05220/G04207	11	14.2	36.2	41.0	85.5	2.0	49.0	4.0
G08263	G98601/G04514	19	14.2	35.3	36.0	81.5	1.0	48.0	5.0
G10411	G05220/X07810	9	14.1	36.6	36.0	85.0	1.5	48.5	5.0
G08254	G04514/G93414	20	11.5	33.9	35.5	81.0	1.0	46.0	5.0
G10410	G05220/X07810	8	11.3	37.3	36.5	84.5	1.5	48.5	4.5
G93414	**MATTERHORN**	18	11.2	32.9	35.5	81.0	1.0	48.0	5.5
G10407	G04207/X07807	5	10.6	29.6	43.0	85.5	1.0	52.5	5.5
G10412	G05220/G04207	10	10.1	35.5	40.5	83.5	1.5	47.0	4.5
G10406	G04207/X07806	4	9.7	32.6	40.5	85.5	1.0	49.5	5.0
G10403	MATTERHORN//G04207/P05437	1	9.5	35.6	36.0	81.5	2.0	45.5	3.0
G10416	G07317/X07808	14	8.9	31.6	40.0	85.5	1.0	50.0	4.5
G10408	G04207/X07807	6	8.1	28.2	37.5	84.0	1.0	49.5	5.0
G10405	G04207/X07806	3	8.1	36.4	40.0	84.5	1.5	48.5	5.0
G10404	G04207/X07806	2	7.0	32.9	42.0	85.0	1.0	49.0	4.5
G10415	G07317/X07808	13	6.6	39.3	37.5	85.0	1.5	49.0	4.5
G10414	G07317/X07808	12	6.2	31.0	37.5	84.5	1.0	48.5	4.5
G10417	G07317/X07808	15	5.1	32.6	36.0	82.0	1.0	45.0	4.5
AVERAGE OF PRECEDING 18 MEANS			10.3	34.0	38.4	83.9	1.3	48.4	4.7
LSD (P=.05)			4.3	3.1	3.2	2.2	0.8	3.1	1.2
LSD (P=.01)			5.6	4.0	4.2	2.8	1.1	4.0	1.6
COEFFICIENT OF VARIATION (%)			23.5	5.0	4.2	1.3	31.3	3.2	13.2

EXPERIMENT 0117 CONAGRA NAVY BEAN QUALITY TRIAL **PLANTING DATE 06/11/10**

ENTRY	NAMES	NO.	YIELD CWT /ACRE	100 SEED WT.	DAYS TO FLOWER	DAYS TO MATURITY	LODGING	HEIGHT	DES. SCORE
I91112	**SCHOONER**	7	19.1	18.0	37.0	86.5	2.0	47.0	4.0
I92002	C-20*6/CN49-242 NAVY GENTEC, **VISTA**	5	15.1	21.9	40.0	89.5	2.0	49.5	4.5
I06271	ND012103,**AVALANCHE**	6	13.4	20.6	40.0	88.0	2.0	48.5	5.5
I10108	**ENSIGN**	2	12.2	19.9	39.0	84.0	2.0	49.0	5.0
I95401	**NAVIGATOR**	1	11.9	21.0	41.0	86.5	1.0	49.0	4.0
I08902	**HYLAND T9905**	4	11.6	23.9	40.5	89.0	1.5	47.5	4.5
I08958	**MEDALIST**	8	10.1	20.6	40.5	91.0	2.0	50.5	5.0
I88106	C-20/FLW,NX041, **NORSTAR**	3	7.6	20.2	36.0	88.0	2.0	46.0	4.0
AVERAGE OF PRECEDING 8 MEANS			12.6	20.8	39.3	87.8	1.8	48.4	4.6
LSD (P=.05)			3.2	1.5	0.5	1.7	0.2	0.5	0.3
LSD (P=.01)			4.2	2.0	0.7	2.2	0.3	0.7	0.4
COEFFICIENT OF VARIATION (%)			18.1	5.3	1.0	1.4	8.0	0.8	4.6

EXPERIMENT 0118 CONAGRA PINTO BEAN QUALITY TRIAL **PLANTING DATE 06/11/10**

ENTRY	NAMES	NO.	YIELD CWT /ACRE	100 SEED WT.	DAYS TO FLOWER	DAYS TO MATURITY	LODGING	HEIGHT	DES. SCORE
P07863	P07863	14	17.8	43.6	38.0	84.5	1.0	49.5	5.0
I07113	**LAPAZ**	6	17.0	43.9	41.0	84.0	1.5	48.5	5.0
I05834	ND020351,**STAMPEDE**	5	16.9	44.8	37.5	85.5	1.5	49.0	5.0
I99193	**PONCHO**	8	16.4	40.8	34.0	82.0	2.5	45.0	3.5
I84002	NW410//VICTOR/AURORA,GH215, **OTHELLO**	12	16.1	37.0	34.0	81.0	2.0	44.5	4.0
I09101	**ND307**	7	16.0	39.2	35.0	83.5	1.5	47.5	4.5
I95310	88-048-03 NDSU, **MAVERICK**	4	15.4	41.6	34.5	82.0	1.5	47.0	4.5
I00657	**BUCKSKIN**	10	15.3	37.7	34.0	81.0	3.0	43.0	4.0
I06249	ND020069,**LARIAT**	1	15.0	44.9	36.5	86.0	2.0	51.5	5.0
I99117	ASG85-5051-7, **BUSTER**	3	14.5	44.8	35.5	82.5	2.0	45.5	3.5
I98313	CO 51715, **MONTROSE**	13	14.1	38.8	35.5	82.0	3.0	43.0	3.5
I99540	**Bill Z**	9	13.8	38.4	35.0	83.5	3.0	43.5	3.5
I10109	**WINDBREAKER**	2	13.5	42.3	37.0	81.0	1.5	45.0	4.0
I91119	WM2-89-5 NE, **CHASE**	11	12.6	40.4	38.0	82.0	3.0	42.5	3.0
P04205	P99119/G99750, **SANTA FE**	14	12.1	44.8	35.5	82.5	1.0	48.5	5.0
AVERAGE OF PRECEDING 14 MEANS			14.9	41.4	35.9	82.8	2.1	46.0	4.1
LSD (P=.05)			3.3	3.0	0.6	0.4	0.4	1.1	0.4
LSD (P=.01)			4.3	3.9	0.8	0.6	0.5	1.5	0.5
COEFFICIENT OF VARIATION (%)			15.7	5.1	1.2	0.4	13.1	1.8	6.5

ENTRY	NAMES	NO.	YIELD CWT /ACRE	100 SEED WT.	DAYS TO FLOWER	DES. SCORE	CBB SCORE
EXPERIMENT 0915 STANDARD ORGANIC YIELD TRIAL				**PLANTING DATE 06/17/10**			
B09199	B05055/B04587	32	23.0	21.1	40.5	4.0	0.50
B09204	B05054/B04588	25	22.3	19.0	42.0	4.0	0.67
B09102	N05311/X06121	30	22.0	16.7	39.0	5.0	4.33
N09034	B05055/B05070	11	20.8	18.8	40.5	4.5	1.13
B09197	B05055/B04588	24	20.7	19.2	40.0	3.0	0.67
N09178	B04554/N05357	9	20.6	17.6	39.5	5.0	1.13
N09020	N05319/B04316	18	20.5	17.6	41.5	4.5	0.88
B09196	B05055/B04588	31	19.5	18.6	42.5	3.0	0.45
B09175	N05311/B05055	28	19.4	22.1	41.0	4.5	3.83
N09035	B05055/B05070	17	18.9	19.8	40.0	4.0	1.38
N09041	B05070/B05044	15	18.3	19.5	40.5	4.0	1.50
N09056	N04152/N05346	12	17.8	19.6	39.5	5.0	1.88
N09017	N04109/N04120	10	17.8	17.0	39.0	3.5	3.67
B09135	B04316/B05040	23	17.1	19.8	43.0	4.0	1.00
I81066	SEL-BTS,**T39**	19	16.5	18.1	42.0	3.0	3.17
N09046	B04554/N05357	13	16.1	17.4	40.5	5.5	1.50
B09201	B04444/B05044	35	16.0	14.8	42.5	4.0	0.63
B09101	N05311/X06121	27	15.2	16.4	40.0	4.5	4.00
N05311	N03611/B01749	7	14.6	17.1	40.0	4.0	3.63
B04554	B00103* / X00822, **ZORRO**	20	14.3	18.3	42.5	4.0	3.67
N09175	N05311/B05055	14	14.0	20.3	43.0	3.0	3.38
N09053	N04154/I04101	16	13.9	17.3	40.0	4.0	3.50
B95556	B90211/N90616,**JAGUAR**	21	13.7	16.2	42.0	4.5	3.75
I92002	C-20*6/CN49-242, **VISTA**	8	13.4	16.9	39.5	3.0	3.25
N56001	X-RAY MUT/MIC,**SANILAC**	3	12.7	18.5	34.5	2.5	4.17
I07112	R99 (NO-NOD.)	4	12.4	15.8	41.0	2.5	4.00
I82054	PUEBLA 152 MX	22	11.7	25.3	52.0	2.0	2.75
B09211	B04644/B04588	34	11.6	19.1	40.5	3.5	4.13
I08958	**MEDALIST**	5	11.2	17.0	38.0	4.0	4.17
B09212	B04644/B04588	33	10.9	19.7	43.0	3.0	4.38
B09174	N05311/B05055	29	10.1	20.5	43.0	4.0	3.88
B09210	B04644/B04588	36	9.7	18.3	43.5	3.0	4.13
B09209	B04644/B04588	26	8.5	17.6	42.5	4.0	3.83
I92001	**ALBION**	1	7.9	16.3	40.0	2.0	4.50
I94240	**VOYAGER**	2	6.2	18.1	36.0	1.0	4.75
N67001	**SEAFARER**	6	6.1	16.1	39.5	2.0	4.85
AVERAGE OF PRECEDING 36 MEANS			15.1	18.4	40.9	3.6	2.65
LSD (P=.05)			7.9	1.2	1.4	0.7	0.97
LSD (P=.01)			10.3	1.5	1.8	0.9	
COEFFICIENT OF VARIATION (%)			37.1	4.5	2.4	13.3	

EXPERIMENT 0420 PLH TRIAL **PLANTING DATE 06/18/10**

ENTRY	NAMES	NO.	YIELD CWT /ACRE	100 SEED WT.	DAYS TO FLOWER	LODGING	HEIGHT	PLH COUNT	LEAF CURL
10T9118	MATTERHORN*/EMP507	18	36.6	33.6	44.7	3.3	14.3	3.0	2.0
10T9136	MATTERHORN*/EMP507	36	36.5	32.2	37.3	3.7	15.0	1.3	2.0
10T9119	MATTERHORN*/EMP507	19	35.3	32.1	45.3	3.3	17.7	1.5	2.0
10T9166	MATTERHORN*/EMP507	66	34.9	37.1	41.7	3.3	14.7	1.7	1.3
10T9114	MATTERHORN*/EMP507	14	34.3	32.5	43.0	2.7	21.3	3.0	2.0
10T9162	MATTERHORN*/EMP507	62	33.2	32.0	37.3	3.3	14.7	1.5	2.0
10T9138	MATTERHORN*/EMP507	38	33.0	31.4	37.7	3.0	17.3	2.8	2.7
10T9161	MATTERHORN*/EMP507	61	32.6	35.0	40.3	3.0	17.7	2.5	2.0
10T9146	MATTERHORN*/EMP507	46	32.4	32.7	37.7	1.7	21.3	1.6	2.3
10T9121	MATTERHORN*/EMP507	21	32.0	30.1	46.3	2.5	19.3	2.8	2.3
10T9128	MATTERHORN*/EMP507	28	31.2	35.1	37.3	2.7	25.7	3.5	1.7
I07152	**E 507**	77	31.2	27.2	42.7	3.7	15.3	3.3	1.7
10T9153	MATTERHORN*/EMP507	53	31.0	29.0	40.7	1.7	20.0	0.9	1.7
10T9141	MATTERHORN*/EMP507	41	30.9	32.9	36.7	1.7	21.7	2.7	2.0
10T9157	MATTERHORN*/EMP507	57	30.7	31.6	39.7	2.7	16.7	2.9	2.7
10T9131	MATTERHORN*/EMP507	31	30.5	33.3	45.7	3.0	17.7	1.5	2.7
10T9132	MATTERHORN*/EMP507	32	29.6	30.4	41.3	2.3	20.0	3.4	2.0
10T9170	MATTERHORN*/EMP507	70	29.6	31.9	36.7	1.7	18.7	1.7	3.0
10T9151	MATTERHORN*/EMP507	51	29.5	32.7	41.3	2.3	20.0	2.1	1.7
10T9164	MATTERHORN*/EMP507	64	29.0	29.5	36.0	3.0	14.7	3.7	2.0
10T9112	MATTERHORN*/EMP507	12	28.9	32.0	37.0	2.3	17.7	2.1	2.7
10T9107	MATTERHORN*/EMP507	7	28.8	32.1	37.7	2.0	19.3	2.2	3.0
10T9156	MATTERHORN*/EMP507	56	28.7	31.8	37.7	2.3	18.3	1.4	2.0
10T9163	MATTERHORN*/EMP507	63	28.6	33.8	36.7	1.3	20.7	3.9	2.7
10T9117	MATTERHORN*/EMP507	17	28.6	32.6	42.7	3.0	15.3	1.7	2.3

EXPERIMENT 0420 PLH TRIAL **PLANTING DATE 06/18/10**

ENTRY	NAMES	NO.	YIELD CWT /ACRE	100 SEED WT.	DAYS TO FLOWER	LODGING	HEIGHT	PLH COUNT	LEAF CURL
10T9173	MATTERHORN*/EMP507	73	28.5	31.3	36.7	3.0	13.0	1.8	2.0
10T9135	MATTERHORN*/EMP507	35	28.5	28.1	43.0	2.3	19.0	1.1	2.0
10T9115	MATTERHORN*/EMP507	15	28.4	35.2	37.3	2.7	19.3	2.7	2.0
10T9155	MATTERHORN*/EMP507	55	28.4	32.5	36.3	2.0	19.0	1.4	2.3
10T9174	MATTERHORN*/EMP507	74	28.4	30.1	36.7	3.7	12.0	3.1	2.7
10T9116	MATTERHORN*/EMP507	16	28.1	29.2	37.3	1.3	24.3	2.7	2.3
10T9111	MATTERHORN*/EMP507	11	28.0	30.8	44.3	3.0	16.0	6.0	2.0
10T9169	MATTERHORN*/EMP507	69	27.8	29.2	36.0	2.7	17.7	1.2	1.7
I07153	**E 509**	78	27.4	25.2	40.7	2.7	16.3	2.8	2.3
10T9165	MATTERHORN*/EMP507	65	27.2	31.7	36.7	3.0	16.0	4.6	2.7
10T9126	MATTERHORN*/EMP507	26	27.2	29.5	40.0	2.7	18.0	1.7	2.0
10T9172	MATTERHORN*/EMP507	72	27.0	30.5	36.3	3.0	18.7	1.7	2.0
10T9113	MATTERHORN*/EMP507	13	26.9	28.7	41.7	3.7	12.0	2.1	3.3
10T9167	MATTERHORN*/EMP507	67	26.6	28.4	36.7	2.0	16.0	2.1	2.7
10T9108	MATTERHORN*/EMP507	8	26.5	28.1	40.0	1.0	25.0	4.2	2.3
10T9104	MATTERHORN*/EMP507	4	26.4	30.8	43.7	3.3	18.7	1.2	1.7
10T9120	MATTERHORN*/EMP507	20	26.4	30.5	37.0	2.0	18.7	2.7	2.3
10T9145	MATTERHORN*/EMP507	45	26.2	27.1	38.3	2.3	19.0	3.4	2.3
10T9109	MATTERHORN*/EMP507	9	26.1	32.1	42.7	3.0	16.7	3.5	2.7
10T9158	MATTERHORN*/EMP507	58	26.0	31.7	43.7	3.0	18.3	3.0	2.3
10T9160	MATTERHORN*/EMP507	60	26.0	30.9	40.0	2.0	20.3	4.1	1.7
10T9149	MATTERHORN*/EMP507	49	26.0	31.3	44.0	3.7	17.0	0.9	2.3
G93414	**MATTERHORN**	76	25.9	32.7	36.3	1.7	21.0	3.0	2.3
10T9134	MATTERHORN*/EMP507	34	25.8	33.9	37.0	3.0	16.7	2.1	2.3
10T9150	MATTERHORN*/EMP507	50	25.8	34.2	37.0	2.0	22.7	3.3	1.7
10T9129	MATTERHORN*/EMP507	29	25.4	27.3	45.3	4.0	10.7	3.3	2.3
10T9171	MATTERHORN*/EMP507	71	25.4	27.1	42.0	3.0	19.0	3.1	2.0
10T9127	MATTERHORN*/EMP507	27	25.3	28.7	37.0	3.0	16.7	4.8	3.3
10T9159	MATTERHORN*/EMP507	59	25.2	31.7	43.7	3.0	17.0	3.0	2.3
10T9130	MATTERHORN*/EMP507	30	25.2	30.3	37.3	1.3	22.0	2.3	2.0

EXPERIMENT 0420 PLH TRIAL **PLANTING DATE 06/18/10**

ENTRY	NAMES	NO.	YIELD CWT /ACRE	100 SEED WT.	DAYS TO FLOWER	LODGING	HEIGHT	PLH COUNT	LEAF CURL
10T9147	MATTERHORN*/EMP507	47	25.1	30.6	36.7	3.0	15.3	1.1	2.0
10T9168	MATTERHORN*/EMP507	68	24.6	31.9	37.7	2.0	18.7	4.3	3.0
10T9152	MATTERHORN*/EMP507	52	24.6	28.2	36.7	3.0	15.3	2.0	2.0
10T9139	MATTERHORN*/EMP507	39	24.5	29.8	38.0	3.0	17.0	1.0	2.0
10T9175	MATTERHORN*/EMP507	75	24.3	30.1	38.7	1.0	22.7	4.0	2.0
10T9137	MATTERHORN*/EMP507	37	24.2	28.7	36.0	1.7	18.0	2.2	3.0
10T9133	MATTERHORN*/EMP507	33	24.2	34.4	37.7	3.0	16.7	3.3	2.7
10T9124	MATTERHORN*/EMP507	24	23.9	30.5	37.7	3.0	17.3	2.5	2.7
10T9106	MATTERHORN*/EMP507	6	23.4	34.1	38.3	3.3	15.3	2.8	2.3
10T9142	MATTERHORN*/EMP507	42	23.2	28.8	39.3	4.0	15.7	2.7	2.0
10T9110	MATTERHORN*/EMP507	10	23.2	32.1	37.3	1.0	20.3	2.0	2.0
10T9101	MATTERHORN*/EMP507	1	22.9	29.3	42.3	3.0	16.3	1.3	2.7
10T9122	MATTERHORN*/EMP507	22	22.6	27.5	36.3	2.3	15.0	1.3	2.7
10T9144	MATTERHORN*/EMP507	44	22.6	29.7	36.3	2.0	16.7	2.3	3.0
10T9148	MATTERHORN*/EMP507	48	22.5	30.8	37.0	1.3	20.3	3.6	2.3
10T9143	MATTERHORN*/EMP507	43	22.2	32.4	37.0	2.7	16.3	2.1	2.3
P86299	PRS- C3S3,**SIERRA**	80	21.7	34.6	42.7	4.3	8.7	1.0	1.7
10T9102	MATTERHORN*/EMP507	2	20.9	29.2	36.7	2.3	18.7	3.2	3.3
10T9125	MATTERHORN*/EMP507	25	20.8	32.0	41.7	3.3	14.7	3.0	2.0
10T9140	MATTERHORN*/EMP507	40	20.6	31.6	39.7	3.0	15.0	2.6	2.7
10T9103	MATTERHORN*/EMP507	3	19.0	26.1	36.7	3.0	17.3	1.8	2.7
10T9105	MATTERHORN*/EMP507	5	18.0	28.7	36.3	2.7	16.3	1.6	2.3
I10130	**SWEDISH BROWN**	79	15.5	39.3	35.3	1.3	15.0	3.8	4.3
10T9154	MATTERHORN*/EMP507	54	15.3	29.7	40.0	2.7	19.7	1.0	1.7
10T9123	MATTERHORN*/EMP507	23	14.4	30.0	37.0	1.7	19.7	2.3	3.0
AVERAGE OF PRECEDING 80 MEANS			26.7	31.0	39.2	2.6	17.7	2.5	2.3
LSD (P=.05)			9.9	3.9	3.8	1.1	5.0	2.5	0.9
LSD (P=.01)			12.9	5.0	4.9	1.5	6.5	3.3	1.1
COEFFICIENT OF VARIATION (%)			22.8	7.6	5.9	26.3	17.2	62.2	22.6

Variability for Biological Nitrogen Fixation Capacity in Beans

Karen Cichy, Tim Duckert, and Scott Shaw

USDA-ARS, Sugarbeet and Bean Research Unit; Crop and Soil Sciences Dept, MSU, East Lansing, MI

As legumes, common beans have the capacity to form a symbiotic relationship with rhizobia and fix nitrogen from the atmosphere. Common beans however are considered to be poor N fixers as compared to other legumes. Identification of genetic variability for N fixation capacity is an important step to breed beans that need less N fertilizer. In this study dry bean lines of diverse origin and market classes were evaluated for their ability to fix nitrogen (Table1).

Sixteen dry bean lines were planted on June 18, 2010 at the Saginaw Valley Research Farm in 7 ft wide 4 row plots. Rows were 20 inches wide and 20 inches long and a single seed was planted per foot. The outer 2 rows of each plot were planted to a uniform variety, Jaguar. The inner two rows were the experimental material, where one row was planted with seed treated with Becker Underwood 'Nodulator' inoculants at the rate suggested on the package. The second row was planted with non treated seed. There were three replicates in the experiment. Fertilization at planting was with Agro-culture Liquid Fertilizer in St. Johns, MI. This is a slow release fertilizer containing nitrogen, P_2O_5, K_20, and micronutrients. In this experiment fertilizer was applied at ¼ rate, which was equivalent to 6.6 lbs N per acre. This lower N rate was used to promote N fixation. The full rate was 26.5 lbs per acre. A soil test at planting indicated the soil contained 6.5 ppm nitrate N and 3.5 ppm ammonium N.

Plants reached mid pod fill in mid August 2010. At this developmental stage the above ground biomass of two plants for each entry were harvested. Samples were oven dried and ground to a fine powder. These samples were analyzed for total nitrogen content and the ratio of $^{15}N/^{14}N$ at the UC Davis Stable Isotope Facility. Since the $^{15}N/^{14}N$ ratio of nitrogen from the atmosphere (fixed) is lower than the ratio of N mineralized in the soil it is possible to use this method to determine the amount of nitrogen in a sample that originated from N fixation. One requirement to do this analysis is to include a plant that does not fix nitrogen in the experiment. In common beans, mutants have been identified which do not nodulate and therefore do not fix nitrogen. One such mutant was included in this experiment. It is R99, which is a mutant identified in the navy bean cv. OAC Rico.

Variability for concentration of nitrogen in the shoot was observed among the cultivars. The average percent N of the shoot was similar (2.3%) under both the seed inoculated with rhizobium and the non inoculated seed. Puebla 152 had the highest % N in the shoot in the non inoculated treatment. The R99 plant was defined as not containing N derived from fixation and was used to calculate the N from fixation of the other cultivars. The average % N derived from fixation was higher in inoculated seed (39%) as compared to non inoculated seed (29%) (Fig.1; Fig. 2). Puebla 152 has been described previously as an efficient N fixer. The root system of this line is very fibrous, and as compared to Eagle, has a large surface area (Figure 3).

To determine if the reduced fertilizer level impacted seed yield, Jaguar was grown under the full rate at ¼ rate of fertilizer with the same plot size as described above, but with 4 seeds per foot. Jaguar under the full rate of fertilizer yielded 1445 (+/-380) lbs per acre and with the ¼ rate fertilizer yield was 1045 (+/- 42) lbs per acre.

Table 1: Common bean materials planted in a biological nitrogen fixation trial at Saginaw Valley Research Farm in June, 2010.

Cultivar	Market class	Growth habit	Days to Flower
Albion	Navy	Type I	38
Black Magic	Black	Type II	41
Eagle	Snap	Type I	33
Jacob’s Cattle	Heirloom	Type I	33
Jaguar	Black	Type II	40
L88-45	Black	Type II	38
L88-63	Black	Type II	38
Medalist	Navy	Type II	37
Puebla 152	Black	Type III	52
R99 (no nod)	Navy	Type I	40
Sanilac	Navy	Type I	38
Shiny Crow	Black	Type III	38
TARS SR05	Small red	Type II	38
Vista	Navy	Type II	39
Voyager	Black	Type II	38
Zorro	Black	Type II	39

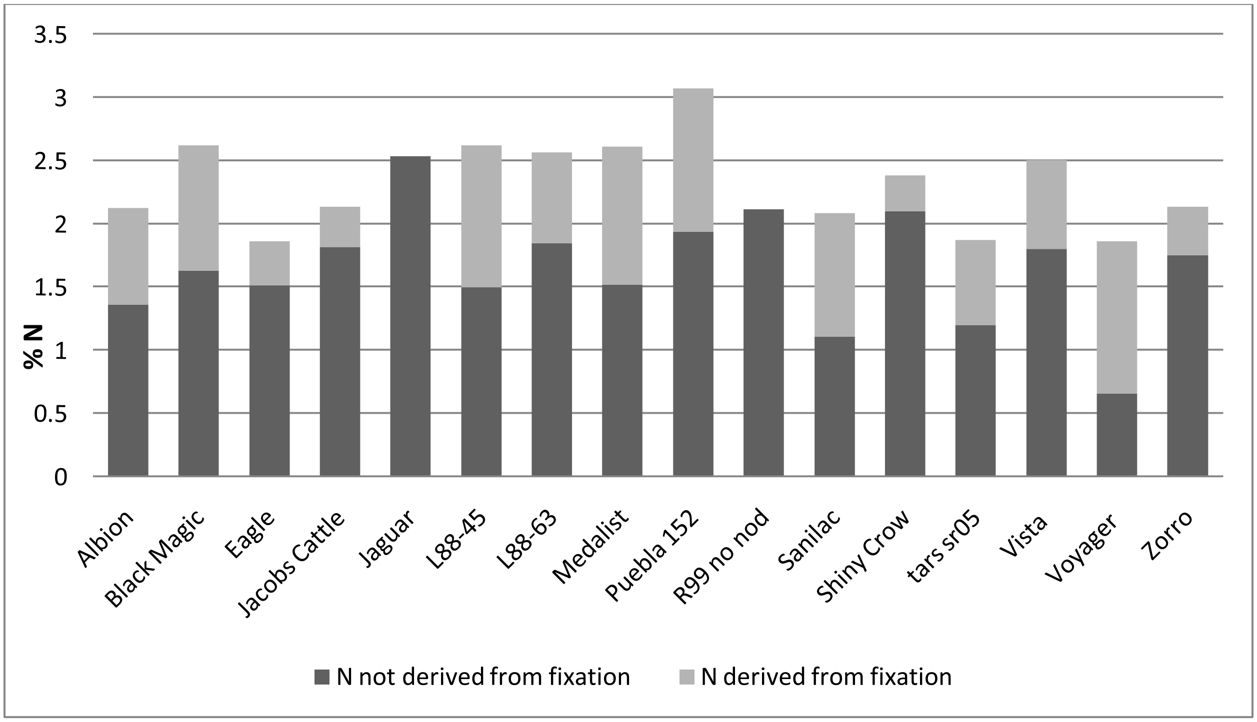


Figure 1: Percent nitrogen in the shoot of bean plants at 60 days after planting and the fraction of nitrogen derived from fixation and N derived from soil N. Seed were not inoculated with rhizobia.

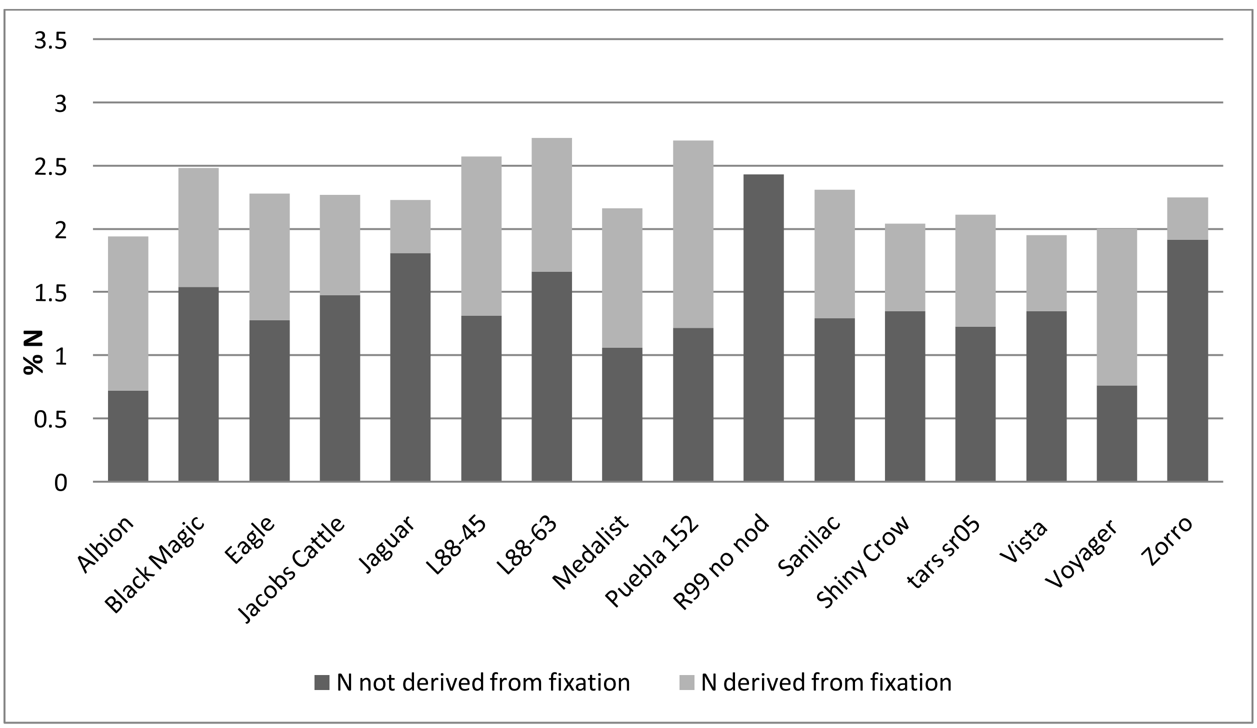


Figure 2: Percent nitrogen in the shoot of bean plants at 60 days after planting and the fraction of nitrogen derived from fixation and N derived from soil N. Seed were treated with rhizobia prior to planting.

A) Puebla 152 root system B) Eagle root system

Figure 3: A) Image of root system of Puebla 152, a tropical black bean, considered to be efficient at biological nitrogen fixation. B) Image of root system of Eagle, a snap bean cultivar. Both plants were grown at the Saginaw Valley Research Farm.

Michigan 2010 Seed Treatment Potato Leafhopper Trial

Michigan Dry Edible Bean Production Research Advisory Board

Gregory Varner and Randy Laurenz

	Treatment Product	Rate		Plants/foot	Variety-Class		YIELD pounds/Ac
1	MAXIM 4 FS	2.5	GA/100KG	4.4	Othello-Pinto		1977
	APRON XL 3 LS	7.5	GA/100KG				
	STREPTOMYCIN	2	%V/V				
2	MAXIM 4 FS	2.5	GA/100KG	4.4	Othello-Pinto		2031
	APRON XL 3 LS	7.5	GA/100KG				
	STREPTOMYCIN	2	%V/V				
	CRUISER 5 FS	0.19	mgai/seed				
3	A14374	0.21	mgai/seed	4.3	Othello-Pinto		1843
	STREPTOMYCIN	2	%V/V			C.V. VALUE	9.50%
						LSD @ .05	322
4	MAXIM 4 FS	2.5	GA/100KG	4.3	UI 425-GN		1532
	APRON XL 3 LS	7.5	GA/100KG				
	STREPTOMYCIN	2	%V/V				
5	MAXIM 4 FS	2.5	GA/100KG	4.2	UI 425-GN		1575
	APRON XL 3 LS	7.5	GA/100KG				
	STREPTOMYCIN	2	%V/V				
	CRUISER 5 FS	0.19	mgai/seed				
6	A14374	0.21	mgai/seed	4.4	UI 425-GN		1662
	STREPTOMYCIN	2	%V/V			C.V. VALUE	16.90%
						LSD @ .05	464
7	MAXIM 4 FS	2.5	GA/100KG				
	APRON XL 3 LS	7.5	GA/100KG	7.7	Navigator-Navy		1612
	STREPTOMYCIN	2	%V/V				
8	MAXIM 4 FS	2.5	GA/100KG	7.6	Navigator-Navy		1672
	APRON XL 3 LS	7.5	GA/100KG				
	STREPTOMYCIN	2	%V/V				
	CRUISER 5 FS	0.19	mgai/seed				
9	A14374	0.21	mgai/seed	7.8	Navigator-Navy		1768
	STREPTOMYCIN	2	%V/V				
						C.V. VALUE	9.20%
						LSD @ .05	267

Planted: June 11 Emerged: June 18
Harvested:
Pinto and GN on August 27
Navy on September 3

The Cruiser wore out on or close to July 20. The nymphs were very small in the Cruiser treatments when the July 23 counts were taken.
Pinto did not show the yellowing as much as the GN and Navy beans.
Gn showed the most yellowing and damage and nymph numbers were at Threshold on July 23.

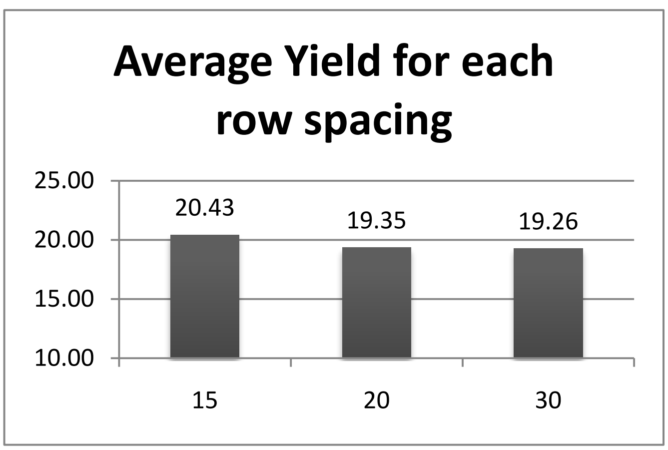
Michigan 2010 Dry Bean Row Width and Population Trials

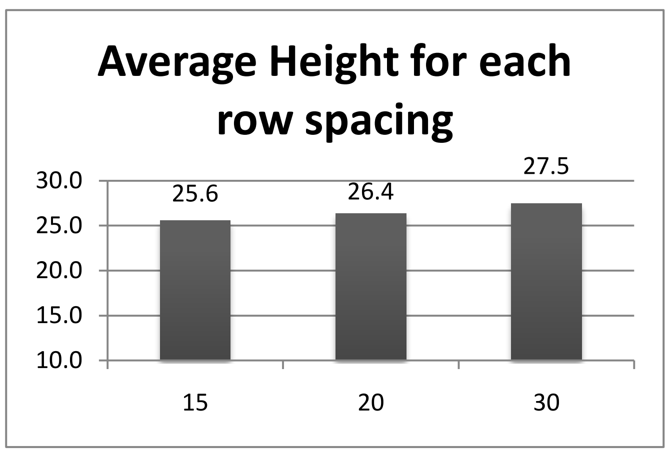
Michigan Dry Edible Bean Production Research Advisory Board
Gregory Varner and Randy Laurenz

Summary page for Saginaw Valley Research and Extension Center (SVREC) Trials
Soil Type: Tappan-Londo loam
Previous Crop: Corn 2009
Planted: June 10
Harvested: September 10, 92 days after planting
Fertilization: 400 pounds of 15-5-13 with S, Zn, Mn and Cu
Herbicides: 1.33 pints Dual plus 1.5 quarts Eptam
Rainfall: planting-harvest=4.4"
Planting -September 1=3.27”

Small Red Row Width
MSU Saginaw Valley Research, Extension, and Education Station
Frankenmuth, MI

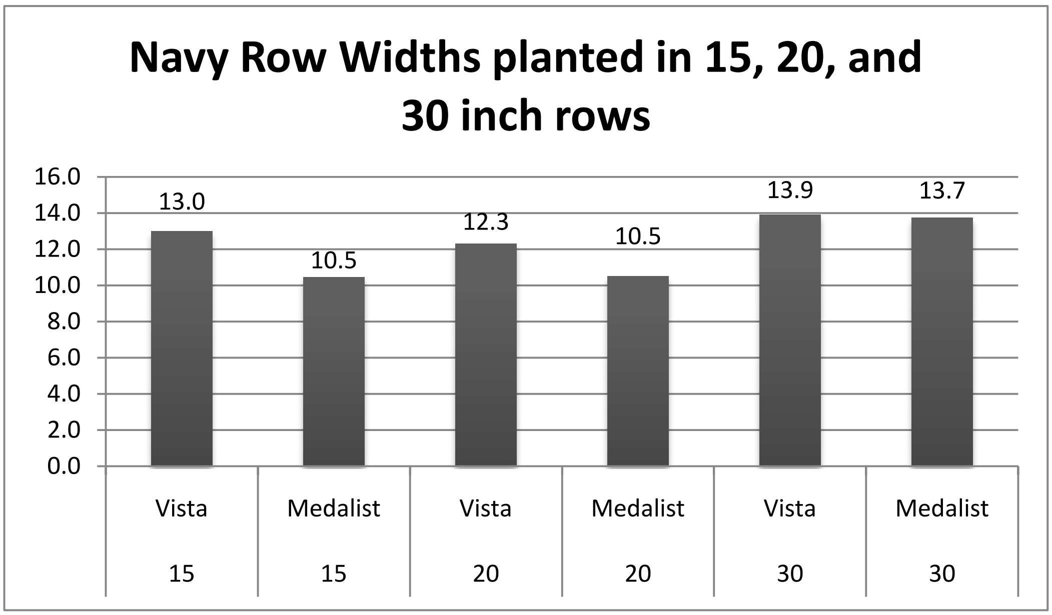
Row width	Variety	Yield	Moisture	Height	Population
15	Merlot	20.43	15.0	25.6	100,188
20	Merlot	19.35	15.0	26.4	92,456
30	Merlot	19.26	14.8	27.5	71,438
		LSD=3.48			
		C.V.=10%			

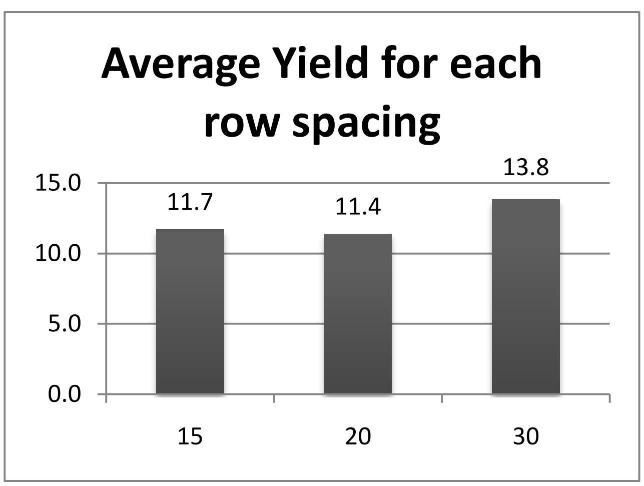


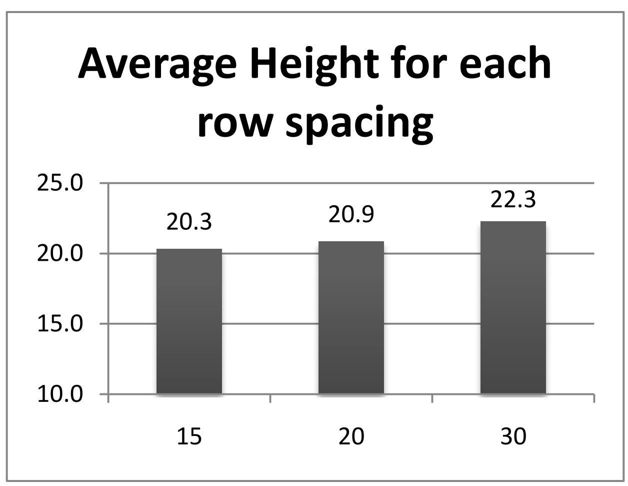


Navy Row Width
MSU Saginaw Valley Research, Extension, and Education Station
Frankenmuth, MI

Row width	Variety	Yield	Moisture	Height	Population
15	Vista	13.0	15.9	20.1	118,919
15	Medalist	10.5	15.8	20.6	125,888
20	Vista	12.3	16.0	20.6	100,297
20	Medalist	10.5	15.9	21.1	114,998
30	Vista	13.9	15.6	22.4	85,595
30	Medalist	13.7	15.2	22.2	92,565
		LSD=2.38			
		C.V.= 12%			

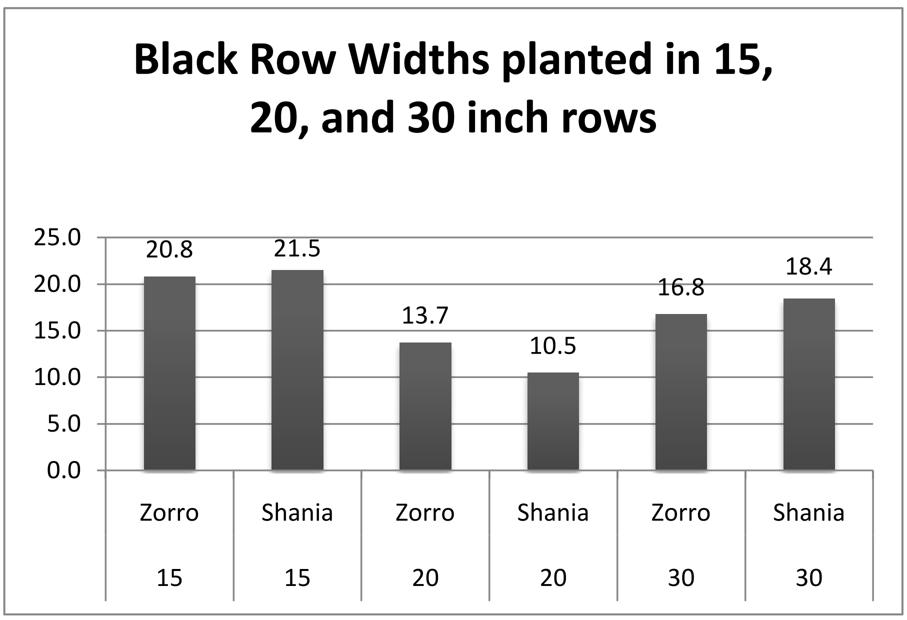


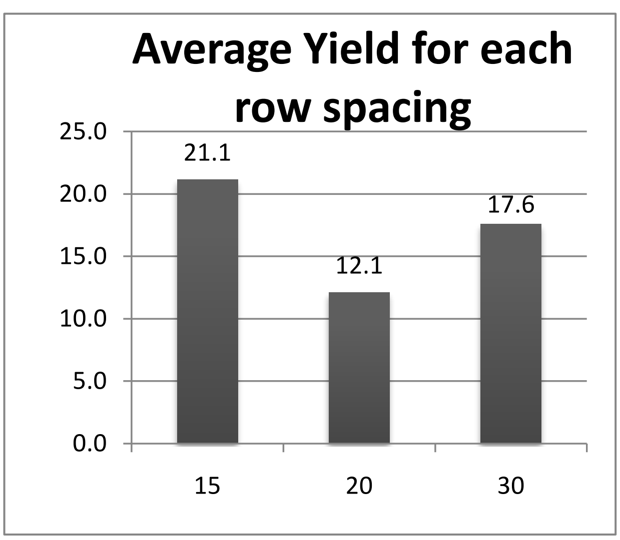


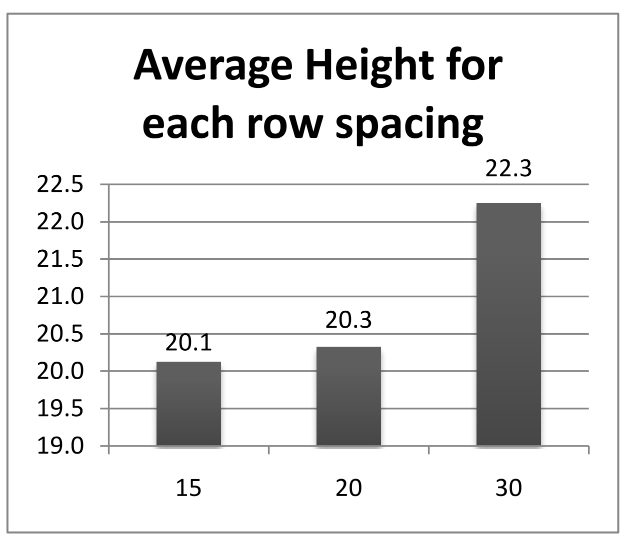


Black Row Width
MSU Saginaw Valley Research, Extension, and Education Station
Frankenmuth, MI

Row width	Variety	Yield	Moisture	Height	Population
15	Zorro	20.8	15.2	21.1	118,483
15	Shania	21.5	15.4	19.2	121,968
20	Zorro	13.7	15.3	21.3	107,811
20	Shania	10.5	15.1	19.4	108,464
30	Zorro	16.8	14.8	22.2	85,595
30	Shania	18.4	14.5	22.3	85,378
		LSD=4.01			
		C.V.=16%			

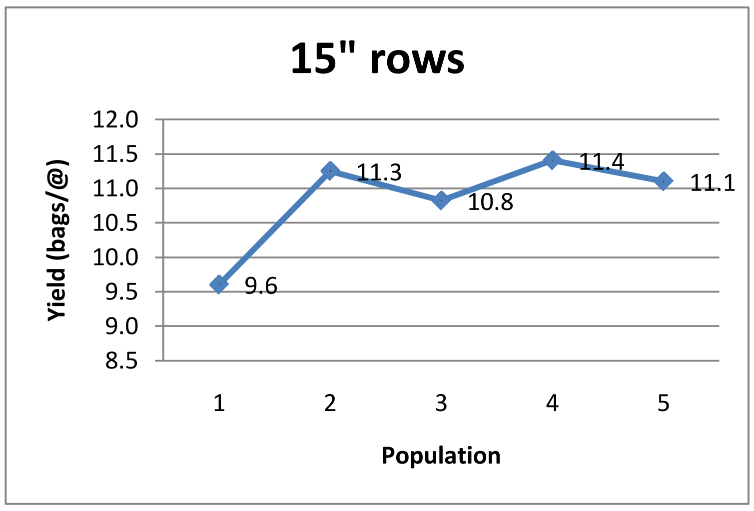


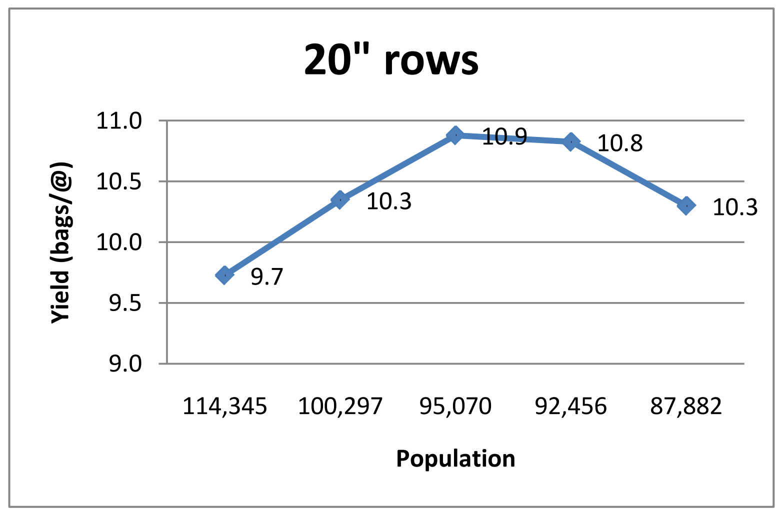


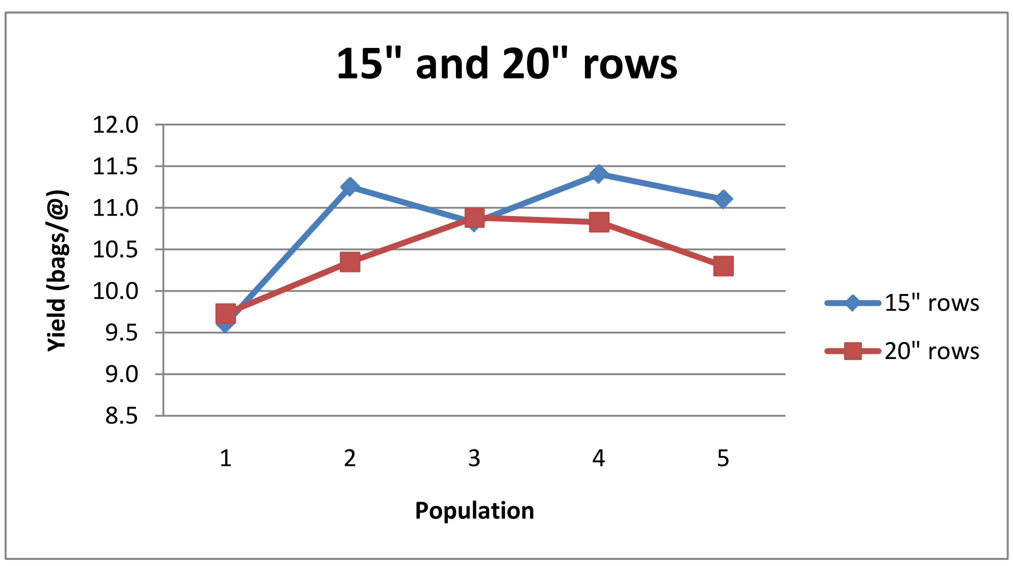


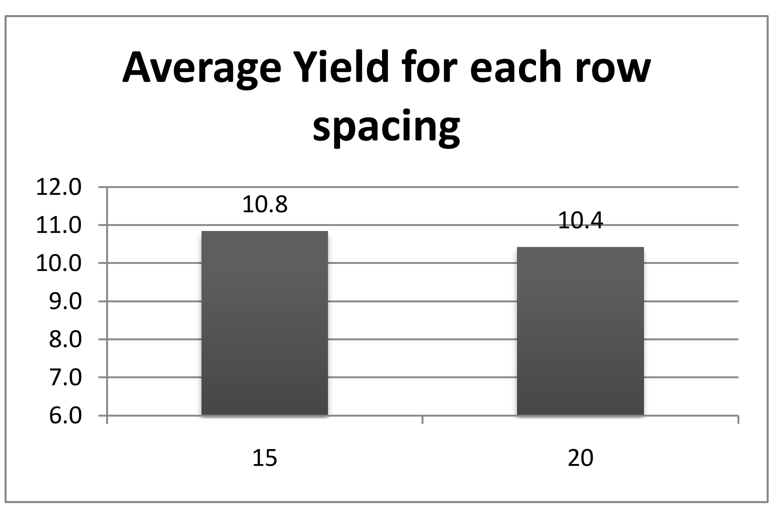
Black Row Width
MSU Saginaw Valley Research, Extension, and Education Station
Frankenmuth, MI

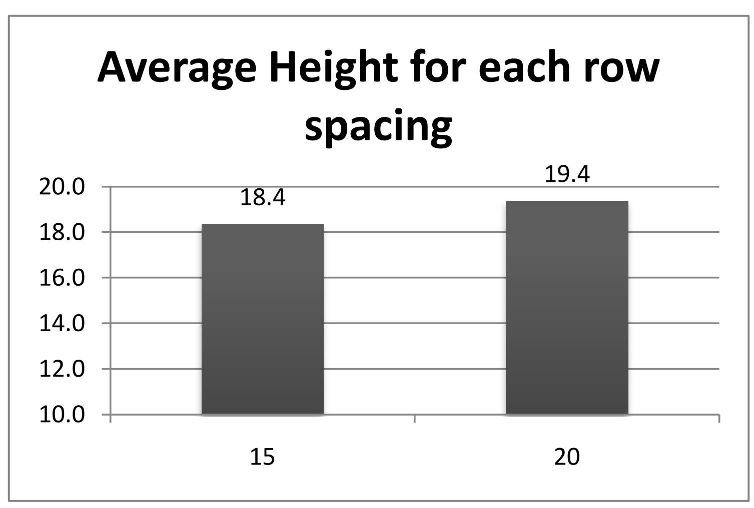
Row width	Variety	Yield	Moisture	Height	Population
15	Zorro	9.6	15.9	17.9	125,453
15	Zorro	11.3	15.8	18.1	112,820
15	Zorro	10.8	16.0	18.4	109,771
15	Zorro	11.4	15.9	18.8	104,544
15	Zorro	11.1	16.0	18.6	107,158
20	Zorro	9.7	15.9	18.3	114,345
20	Zorro	10.3	16.0	19.4	100,297
20	Zorro	10.9	16.0	19.7	95,070
20	Zorro	10.8	15.8	19.9	92,456
20	Zorro	10.3	15.9	19.7	87,882
		LSD=1.52			
		C.V.=10%			





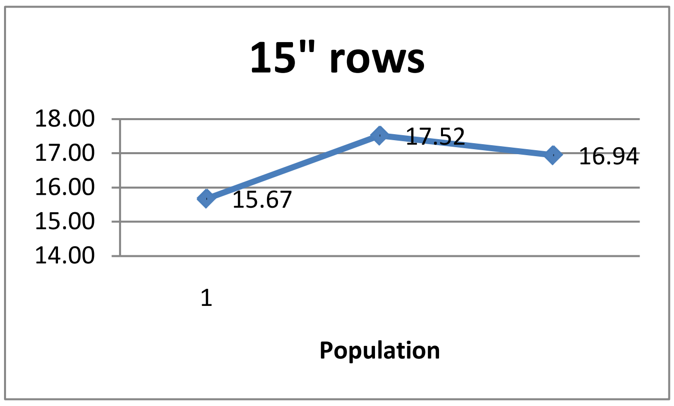


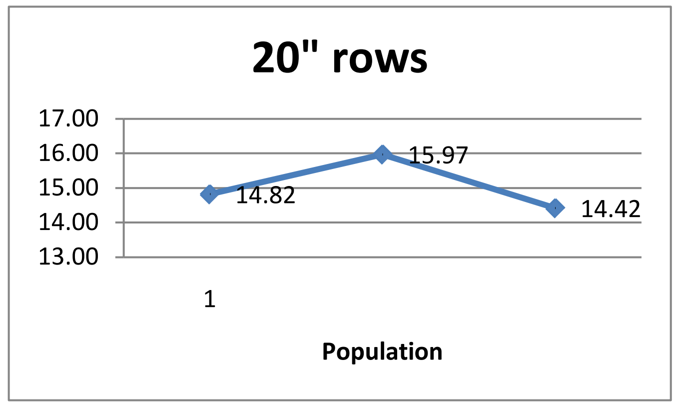


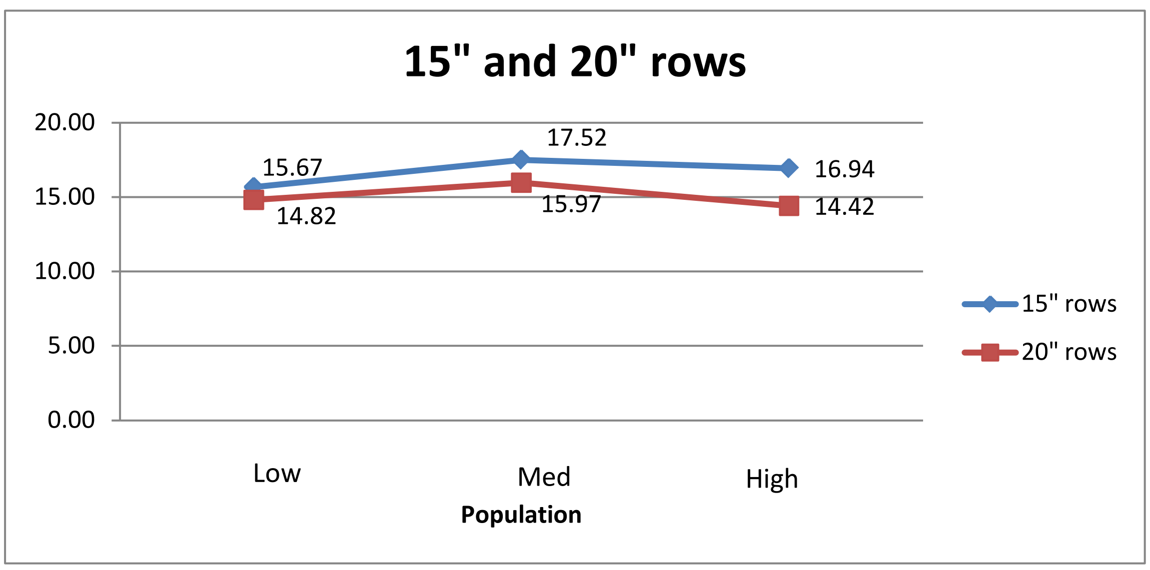


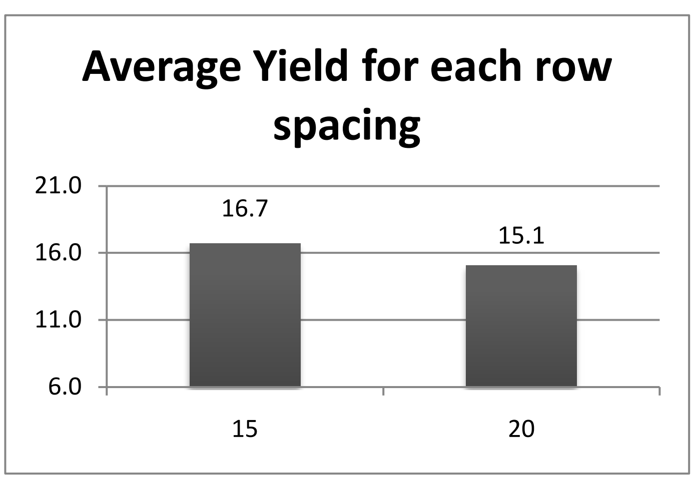
Small Red Row Width/Population
MSU Saginaw Valley Research, Extension, and Education Station
Frankenmuth, MI

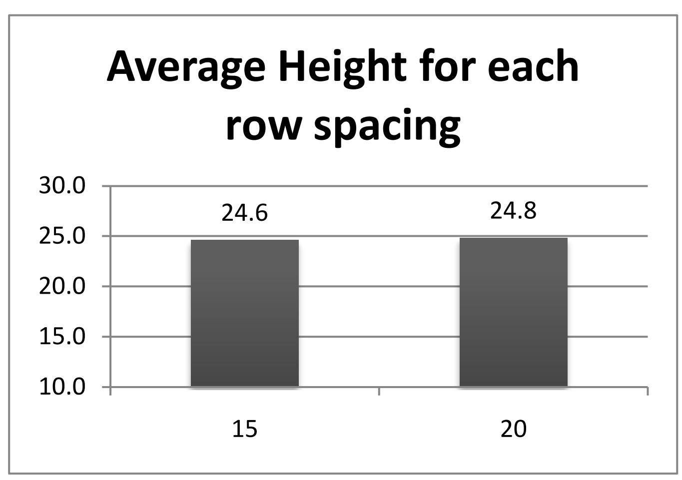
Row width	Variety	Yield	Moisture	Height	Population
15	Merlot	15.67	15.3	24.6	97,574
15	Merlot	17.52	14.9	24.9	97,139
15	Merlot	16.94	15.1	24.5	84,942
20	Merlot	14.82	15.2	24.6	97,030
20	Merlot	15.97	15.3	25.2	92,456
20	Merlot	14.42	15.0	24.8	83,962
		LSD=4.14			
		C.V.=17%			











Nitrogen and weed control timing influences on Roundup Ready sugarbeet quality and yield

Alicia Spangler, Christy Sprague and Darryl Warncke, Michigan State University

Location: Saginaw Valley Research & Extension Center	**Weed Removal:** 1, 3, 6, & 12" weeds
Planting Date: March 31, 2010 - SVREC	**Nitrogen Rates:** 0, 60, 90, 120 and 60:60 lb/A
Soil Type: Clay, OM 3.4%, pH 6.1 - SVREC	**Tillage:** Conventional
Herbicides: Roundup PowerMax (22 fl oz/A) + AMS	**Population:** 4 ¼" spacing
Variety: Hilleshog 9042, Roundup Ready	**Replicated:** 4 times

Table 1. Effect of weed removal timings on sugarbeet yield and quality averaged across nitrogen rates.

	SAGINAW	
WEED REMOVAL[a]	Yield	RWSA[b]
	—— tons/A ——	—— lbs/A ——
<1 inch	28.6 a	7359 a
3 inches	24.6 b	6236 b
6 inches	24.6 b	6216 b
12 inches	22.6 c	5878 b

[a] Weeds were removed at heights using Roundup PowerMax (22 fl oz/A) + AMS (17 lb/100 gal)
[b] RWSA = Recoverable white sugar per acre.

Table 2. Effect of nitrogen on sugarbeet yield and quality averaged across weed removal timings.

	SAGINAW	
NITROGEN RATE	Yield	RWSA[c]
	—— tons/A ——	—— lbs/A ——
0 lb/A[a]	22.1 c	5845 b
60 lb/A[a]	25.4 ab	6610 a
90 lb/A[a]	24.6 b	6313 ab
120 lb/A[a]	26.5 a	6617 a
60:60 lb/A[b]	26.8 a	6727 a

[a] Nitrogen applied pre-plant.
[b] First application applied pre-plant; second application applied sugarbeet 4-6 leaf stage.
[c] RWSA = Recoverable white sugar per acre.

Summary: This trial was conducted to determine what effect weed removal time and nitrogen rate had on sugarbeet yield and quality. Weed removal timing had the greatest impact on yield and quality. The highest yield and recoverable white sugar was observed when weeds were removed prior to 3-inches. Nitrogen rate had little effect on yield and RWS. Yield was similar at nitrogen rates of 120 and 60:60 lb/A, while RWS was similar at 90, 120 and 60:60 lb/A. Poor response to nitrogen may have been influenced by below normal precipitation, which was observed during the latter part of the growing season. This experiment will be repeated during the 2011 growing season.

Control of volunteer Roundup Ready soybean in Roundup Ready sugarbeet (2009 & 2010)

Christy Sprague and Gary Powell, Michigan State University

Location: Saginaw Valley Research and Extension Center	**Tillage:** Conventional
Planting Date: April 16, 2009 & March 31, 2010	**Herbicides:** see treatments
Soil Type: Silty clay loam; 2.4 OM; pH 7.9 ('09) Clay; 3.0 OM; pH 6.8 ('10)	**Variety:** Hilleshog 9042
Replicated: 4 times	**Population:** 4 1/4-inch spacing

Table 1. Control of volunteer Roundup Ready soybean in Roundup Ready sugarbeet (mid-August) and recoverable white sugar yields for the various treatments. Data are combined for 2009 & 2010.

	VOLUNTEER RR SOYBEAN CONTROL		RECOVERABLE WHITE SUGAR PER ACRE	
Herbicide treatments	V2 soybean	V4-V6 soybean	V2 soybean	V4-V6 soybean
	——— % control ———		——— lb/A ———	
Roundup PowerMax (22 fl oz) + AMS[a] alone	0		5119	
+ UpBeet (0.5 oz)	15	12	5736	5453
+ UpBeet (0.5 oz) + COC	25	35	6073	6118
+ UpBeet (0.5 oz) + MSO	28	45	6068	7286
+ UpBeet (1 fl oz)	21	19	6278	5612
+ Stinger (1 fl oz)	92	91	7370	6279
+ Stinger (2 fl oz)	99	99	6953	6502
+ Stinger (4 fl oz)	99	99	7255	7181
$LSD_{0.05}$[b]	10		974	

[a] Abbreviations: AMS = ammonium sulfate; COC = crop oil concentrate; MSO = methylated seed oil
[b] Means within a column greater than least significant difference (LSD) value are different from each other

Summary: This trial was conducted to examine different control strategies for volunteer Roundup Ready soybean. While this may not be a wide-spread problem volunteer soybean has shown up on occasion in grower's fields. There were 15 different treatments that looked at two different application timings with UpBeet and Stinger combinations. The control treatment was two applications of Roundup PowerMax applied at 2-inch followed by 4-inch weeds. These application timings corresponded with V2 and V4 volunteer Roundup Ready soybean. Roundup PowerMax was applied alone and in combination with the treatments that are listed in Table 1 in either the first or second application timing. Results indicated that the greatest volunteer Roundup Ready soybean control that UpBeet provided was 45%. This treatment included methylated seed oil (MSO) at 1% v/v at the later application timing. All treatments that contained Stinger provided greater volunteer Roundup Ready soybean control than treatments with UpBeet. Volunteer Roundup Ready soybean control was complete with 2 to 4 oz of Stinger. All Stinger treatments, except the later application of Stinger at 1 oz, and UpBeet applied at the later timing with MSO protected sugarbeet yield from volunteer soybean competition.

Evaluation of Sequence for weed control in Roundup Ready sugarbeet

Christy Sprague and Gary Powell, Michigan State University

Location:	Saginaw Valley Research and Extension Center	**Tillage:**	Conventional
Planting Date:	March 31, 2010	**Herbicides:**	see treatments
Soil Type:	Clay; 3.0 OM; pH 6.8	**Variety:**	Hilleshog 9042
Replicated:	4 times	**Population:**	4 1/4-inch spacing

Table 1. Weed control and sugarbeet yield and recoverable white sugar for various treatments containing Sequence.

	WEED CONTROL (at Harvest)			**SUGARBEET**	
Herbicide treatments[a] (application timing beet stage)	C. lambsquarters	Pennsylvania smartweed	Pigweed spp.	Yield	RWSA
	— % control —			— ton/A —	— lb/A —
Touchdown + AMS[b] (2-, 6-, 8-lf)	99	99	95	23.9	6291
Touchdown + AMS (2-, 6-lf) Sequence + AMS (8-lf)	98	99	99	24.7	6673
Touchdown + AMS (2-, 8-lf) Sequence + AMS (6-lf)	99	99	99	23.9	6443
Sequence + AMS (2-lf) Touchdown + AMS (6-, 8-lf)	99	99	99	23.5	6442
Sequence + AMS (2-, 6-lf) Touchdown + AMS (8-lf)	99	99	99	24.2	6475
Sequence + AMS (2-lf)	40	73	95	18.6	5094
Touchdown + AMS (2-lf) Sequence + AMS (6-lf)	98	98	89	24.5	6742
$LSD_{0.05}$[b]	5	5	5	3.9	1077

[a] Herbicide rates: Touchdown Total (24 fl oz), Sequence (2.5 pt), and AMS (17 lb/100 gal)
[b] Abbreviations: AMS = ammonium sulfate; RWSA = recoverable white sugar per acre
[c] Means within a column greater than least significant difference (LSD) value are different from each other

Summary: This trial was conducted to examine different weed control strategies using the newly registered premixture Sequence (s-metolachlor + glyphosate). The rate of Sequence used in this trial was 2.5 pt/A. This use rate is equivalent to 0.98 pt/A of Dual Magnum and 22 oz of Touchdown Total. Crop safety was excellent with the different herbicide treatments, even Sequence applied twice at the 2- and 6-leaf sugarbeet stages. At harvest, control of common lambsquarters, Pennsylvania smartweed, and pigweed spp. (Powell amaranth and redroot pigweed) was excellent with all treatments that were applied three times (Table 1). Applying Sequence once at 2-leaf sugarbeet did not provide season-long control of common lambsquarters or Pennsylvania smartweed. Weed control was good to excellent when two herbicide applications were made Touchdown Total at 2-leaf sugarbeet and Sequence at 6-leaf sugarbeet. Sugarbeet yield and RWSA was similar for all treatments except for the one application of Sequence at 2-leaf sugarbeet. However, this was higher than the untreated control which yielded 5.7 tons/A.

Warrant (MON 63410) a potential new herbicide in sugarbeet

Christy Sprague and Gary Powell, Michigan State University

Location: Saginaw Valley Research and Extension Center	**Tillage:** Conventional
Planting Date: March 31, 2010	**Herbicides:** see treatments
Soil Type: Clay; 3.0 OM; pH 6.8	**Variety:** Hilleshog 9042
Replicated: 4 times	**Population:** 4 1/4-inch spacing

Table 1. Weed control and sugarbeet yield and recoverable white sugar for various treatments containing Warrant.

	WEED CONTROL (at Harvest)			**SUGARBEET**	
Herbicide treatments[a] (application timing beet stage)	C. lambsquarters	Pennsylvania smartweed	Pigweed spp.	Yield	RWSA
	% control			ton/A	lb/A
Roundup PMax + AMS[b] (2-, 6-lf)	97	94	93	23.2	6251
Warrant + Roundup + AMS (2-lf) Roundup + AMS (6-lf)	98	96	96	23.3	6094
Outlook + Roundup + AMS (2-lf) Roundup + AMS (6-lf)	99	99	99	23.3	6043
Dual + Roundup + AMS (2-lf) Roundup + AMS (6-lf)	99	98	98	23.4	6290
Roundup + AMS (2-lf) Warrant + Roundup + AMS (6-lf)	98	96	96	24.8	6622
Roundup + AMS (2-lf) Outlook + Roundup + AMS (6-lf)	98	98	98	23.0	6204
Roundup + AMS (2-lf) Dual + Roundup + AMS (6-lf)	99	97	97	22.1	5783
$LSD_{0.05}$[b]	n.s.	n.s.	4	n.s.	n.s.

[a] Herbicide rates: Roundup PowerMax (22 fl oz), Warrant (3 pt), Dual Magnum (1.33 pt), Outlook (22 fl oz) and AMS (17 lb/100 gal)

[b] Abbreviations: AMS = ammonium sulfate; RWSA = recoverable white sugar per acre

[c] Means within a column greater than least significant difference (LSD) value are different from each other

Summary: Warrant (MON 63410) is a new encapsulated acetochlor product that is being examined as a potential tank-mix partner with Roundup (glyphosate) in Roundup Ready sugarbeet. This trial compares crop tolerance, weed control and sugarbeet yield of two different application timings of Warrant with the current standards of Dual Magnum and Outlook. Sugarbeet tolerated applications of Warrant, Outlook, and Dual Magnum that were tank-mixed with Roundup at either 2- or 6-leaf sugarbeet. All herbicide treatments provided excellent control of common lambsquarters and Pennsylvania smartweed. There were some minor differences in control of late-season pigweed spp. (Powell amaranth and redroot pigweed). However, all treatments provided greater than 90% control. There were no herbicide treatment differences in sugarbeet yield or recoverable white sugar. However, the untreated control yielded only 6.5 tons/A.

Effect of row width, population, and herbicide treatment on dry bean yield (Saginaw Valley Research and Extension Center – 2010)

Christy Sprague, Ryan Holmes, and Gary Powell, Michigan State University

Location:	Richville (SVREC)	**Tillage:**	Conventional
Planting Date:	June 10, 2010	**Herbicides:**	see treatments
Soil Type:	Clay	**Replicated:**	4 times

Table 1. The main-effects of row-width and herbicide treatment affected black bean yield. Black bean population did not significantly affect yield.

'ZORRO' BLACK BEANS					
ROW-WIDTH EFFECT		**POPULATION EFFECT**		**HERBICIDE EFFECT**	
	— cwt/A —	— seeds/A —	— cwt/A —		— cwt/A —
15-inch	14.3 B[b]	**79,500**	15.0	**Weed-free**	14.4 B
20-inch	14.9 AB	**106,000**	14.8	**POST[a]**	15.8 A
30-inch	16.0 A	**132,500**	15.5		
$LSD_{0.05}$	1.4		N.S.		1.14

[a] Raptor (4 fl oz) + Basagran (8 fl oz) + COC (1%) + AMS (2.5 lb) applied to 2-4" weeds.
[b] Means in each column followed by the same letter are not significantly different at $P \leq 0.05$, N.S. = not significant.

Table 2. Small red bean yield was affected by row-width, population, and herbicide treatment.

'MERLOT' SMALL RED BEANS						
	WEED-FREE			**POST[a]**		
Population	**15-inch**	**20-inch**	**30-inch**	**15-inch**	**20-inch**	**30-inch**
		cwt/A			cwt/A	
60,000	15.3 ABC	15.1 ABC	15.3 ABC	15.8 ABC	14.5 ABC	14.3 BCD
79,500	17.2 A	13.7 CD	16.7 AB	16.3 ABC	16.0 ABC	14.9 ABC
106,000	13.9 BCD	15.6 ABC	13.8 BCD	14.5 ABC	11.8 D	14.9 ABC
$LSD_{0.05}$			2.9			

[a] Raptor (4 fl oz) + Basagran (8 fl oz) + COC (1%) + AMS (2.5 lb) applied to 2-4" weeds.
[b] Means followed by the same letter are not significantly different at $P \leq 0.05$.

Summary: This trial was conducted to determine the effect of row width and population on yield of two classes of dry bean. This trial was conducted at two different locations, this location the Saginaw Valley location suffered from drought, resulting in average yields of 15 cwt/A for both black and small red beans. Black bean population did not have a significant affect yield; however row width had a major impact (Table 1). The main effect of row width indicated that black beans planted in wide rows (30 inches) benefited under drought conditions compared with black beans planted in 15 inch rows. However, yield of black beans planted in 20 inch rows were not different from black bean planted in 30 or 15 inch rows. There was a three-way interaction for yield of the small red beans (Table 2). With small red beans, yield was generally higher either at lower populations or narrower row-widths. Due to lower weed populations at this location we did not observe any differences in weed suppression for any of the treatments. Black and small red beans reacted differently to row-width and population under these drought conditions. This research was funded by Project GREEEN and the Michigan Dry Bean Commission grant from the Michigan Department of Agriculture Specialty Crops.

Preharvest treatments for dry edible beans
(Saginaw Valley Research and Extension Center – 2010)

Christy Sprague and Gary Powell, Michigan State University

Location:	Richville (SVREC)	**Tillage:**	Conventional
Planting Date:	June 10, 2010	**Variety:**	'Zorro' black bean
Population:	106,000 seeds/A	**Row width:**	20-inches,
Soil Type:	Clay	**Replicated:**	4 times

Table 1. Dry bean desiccation and corresponding yield of various desiccation treatments.

HERBICIDE	DRY BEAN DESICCATION (%)			YIELD
	4 DAT	8 DAT	12 DAT	cwt/A
Gramoxone Inteon (1.2 pt) + NIS	79	97	99	18.2
Gramoxone Inteon (2 pt) + NIS	86	98	99	18.2
Roundup PowerMax (22 fl oz) +AMS	70	96	99	20.1
Valor (1.5 oz) + MSO	85	97	99	18.2
Valor (2 oz) + MSO	86	99	99	18.4
Aim (2 fl oz) + MSO	78	92	99	19.2
Sharpen 2 (fl oz) + MSO + AMS	90	99	99	15.5
Gramoxone Inteon (1.2 pt) + Aim (1 fl oz) + MSO	83	96	99	19.4
Croptimal D (1.6 pt/gal)	60	83	97	20.9
Croptimal D (3.2 pt/gal)	60	85	97	20.5
Untreated	60	86	97	19.7
$LSD_{0.05}$	3.5	4.7	1	2.93

Summary: Even dry down of dry edible beans is important for direct cut harvest operations. These harvest operations often favor planting dry beans in narrow row widths. Growers often need to apply a preharvest herbicide application help aid in desiccation of dry edible beans. Currently, there are four herbicide options labeled for preharvest application in dry edible beans. The current options aren't always 100% effective and there are potential issues with herbicide residues found in the harvested crop if applications are not made at the appropriate time. In late-summer of 2010, 17 potential preharvest treatments were evaluated for the speed and effectiveness of desiccation of dry beans planted in narrow rows. These treatments included the current standards of Gramoxone and glyphosate (Roundup) and also newer registered compounds of Aim and Valor. The treatments also included various tank-mixtures of registered products and three non-labeled potential products. One of the newer products Sharpen (saflufenacil) provided the quickest most complete control. This was reflected in yield, since desiccation treatments stopped dry bean maturity immediately. The other two products were natural products that did not dry down any different than the non-treated control. We will be working with the manufacturer of Sharpen for registration, potentially offering Michigan dry bean producers a more effective, potentially safer dry bean desiccation option.