

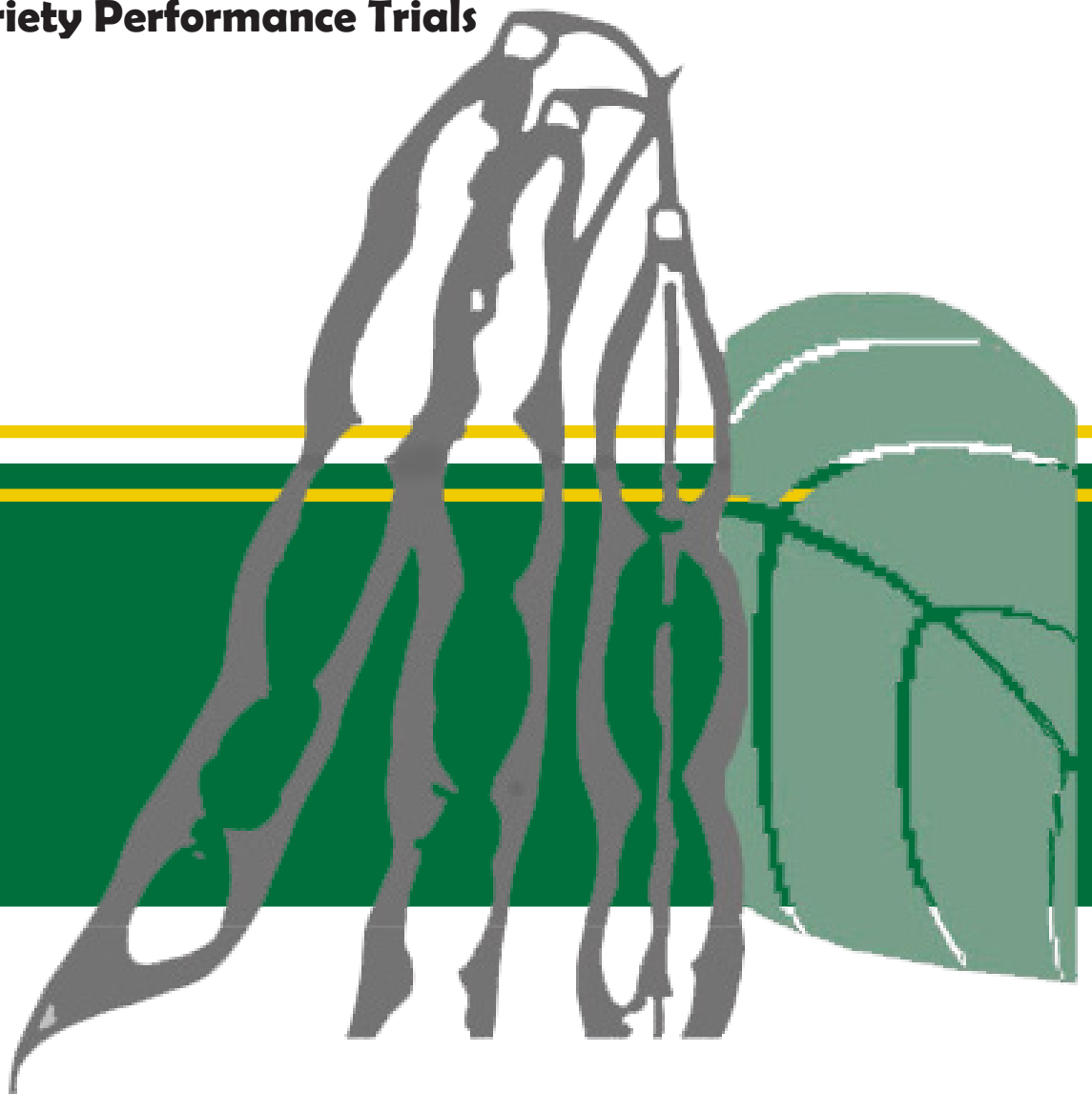
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Colorado State University

Crops 
Testing

Making Better Decisions

**2011 Colorado Dry Bean
Variety Performance Trials**



Agricultural
Experiment Station

Department of
Soil & Crop Sciences

Extension

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Trials conducted by Colorado State University Crops Testing, funded by the Colorado Dry Bean Administrative Committee and reported by the Colorado Bean Network

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2010 Colorado Dry Bean Performance Trial

Introduction

Colorado producers annually spend millions of dollars on pinto bean seed. Variety decisions can have a big effect on yields. Colorado State University Crops Testing, the bean breeding program, and the bean pathology research program collaborate to conduct uniform variety trials annually to provide unbiased and reliable performance results to help Colorado dry bean producers make more informed variety decisions. Our uniform variety trial serves a dual purpose of screening experimental lines from CSU's bean breeding program and to evaluate commercial variety performance for making variety recommendations to Colorado bean producers. The uniform variety trial is made possible by funding received from Colorado dry bean producers and handlers via the Colorado Dry Bean Administrative Committee. In 2011, three eastern Colorado trials were planted at Yuma, Lucerne, and Rocky Ford. Trial results for Lucerne and Rocky Ford are presented below. The Yuma trial suffered from poor emergence and loss of stands for a significant number of plots and the results could not be reported. A wide range of varieties were tested in 2011 as described below with regard to origin, maturity, disease resistance, growth type and adaptability. Seed yields and seed size for all trial varieties are reported in the tables below. Yields are adjusted to 14% seed moisture content.

2011 Colorado Dry Bean Trial Locations



2011 Pinto Bean Variety Performance Trial at Lucerne

Variety	Source	Yield ^a	Test Weight	Moisture	Seeds/Pound
		lb/ac	lb/bu	percent	count
La Paz	ProVita, Inc.	3561	60.1	14.1	1261
06185	ProVita, Inc.	3387	60.5	12.6	1260
Sinaloa	ProVita, Inc.	3339	58.9	11.7	1361
ND-307	North Dakota State University	3270	57.0	11.7	1196
07167 (LP-7)	ProVita, Inc.	3262	59.9	12.0	1293
Bill Z	Colorado State University	3255	58.7	9.7	1353
Croissant	Colorado State University	3230	59.6	10.4	1275
Montrose	Colorado State University	3181	58.5	10.5	1276
COB-2824-99	Gentec Inc.	3154	58.1	11.2	1209
CO 54912-7-6	Colorado State University	3118	58.2	19.1	1229
06187	ProVita, Inc.	3097	59.3	12.4	1191
Durango	ProVita, Inc.	3067	59.4	10.7	1213
CO 91216-15	Colorado State University	3019	56.9	12.9	1121
Lariat	North Dakota State University	3011	57.9	15.2	1137
CO 55024-4	Colorado State University	3003	58.8	13.8	1169
CO 93195-17	Colorado State University	2970	56.7	12.7	1325
99217	ProVita, Inc.	2876	59.9	11.4	1193
CO 24972	Colorado State University	2869	59.8	15.3	1279
Stampede	North Dakota State University	2841	58.4	11.0	1232
Galeena	ProVita, Inc.	2807	59.6	11.4	1321
GTS-904	Gentec Inc.	2800	58.5	12.3	1116
CO 54912-7-14	Colorado State University	2789	57.9	21.0	1223
Grand Mesa	Colorado State University	2775	58.3	10.1	1312
CO 54912-7-3	Colorado State University	2690	56.9	22.5	1242
06189	ProVita, Inc.	2689	59.7	13.6	1288
Long's Peak	Colorado State University	2684	57.7	14.0	1227
CO 55024-11	Colorado State University	2675	58.8	13.3	1171
CO 92838-11	Colorado State University	2651	57.8	13.1	1125
CO 54912-7-7	Colorado State University	2584	58.8	18.8	1253
GTS-903	Gentec Inc.	2568	58.7	16.9	1231
CO 54912-7-12	Colorado State University	2441	58.4	19.1	1231
Average		2957	58.6	13.7	1236

LSD_(0.30)

222

^aYields corrected to 14% moisture

Experimental Design: Randomized complete block with three replications

Plot Size: 10' x 30'

Site Information

Cooperator: Brian Leafgren
 Harvest Date: 9/11/2011
 Planting Date: 6/3/2011
 Seeding Rate: 85,000 seeds per acre
 Irrigation: Furrow

2011 Pinto Bean Variety Performance Trial at Rocky Ford

Variety	Source	Yield ^a lb/ac	Test Weight lb/bu	Moisture percent	Seeds/Pound count
CO 54912-7-3	Colorado State University	2806	59.3	11.4	1190
CO 54912-7-7	Colorado State University	2331	60.0	11.7	1133
CO 54912-7-12	Colorado State University	2288	60.8	10.5	1162
Sinaloa	ProVita, Inc.	2260	57.7	9.7	1214
06185	ProVita, Inc.	2250	58.3	9.8	1192
Montrose	Colorado State University	2139	57.5	9.5	1218
GTS-904	Gentec Inc.	2137	56.6	10.2	1123
Galeena	ProVita, Inc.	2056	59.2	9.3	1366
GTS-903	Gentec Inc.	2052	58.2	12.5	1061
06189	ProVita, Inc.	2027	56.9	9.7	1177
CO 55024-4	Colorado State University	1968	58.5	10.6	1088
CO 24972	Colorado State University	1888	59.5	9.9	1344
CO 54912-7-14	Colorado State University	1867	59.5	11.0	1198
La Paz	ProVita, Inc.	1839	57.8	9.5	1234
06187	ProVita, Inc.	1834	56.2	9.0	1180
CO 55024-11	Colorado State University	1782	54.5	9.8	1189
CO 54912-7-6	Colorado State University	1739	59.4	11.7	1172
Croissant	Colorado State University	1727	58.7	9.4	1216
Stampede	North Dakota State University	1718	55.9	9.3	1156
Grand Mesa	Colorado State University	1633	55.9	9.3	1404
COB-2824-99	Gentec Inc.	1602	55.5	9.3	1130
07167 (LP-7)	ProVita, Inc.	1566	60.2	9.6	1360
Durango	ProVita, Inc.	1535	57.8	9.4	1117
CO 92838-11	Colorado State University	1487	55.5	10.1	1043
99217	ProVita, Inc.	1419	58.0	9.3	1151
Lariat	North Dakota State University	1398	55.5	11.3	1075
Bill Z	Colorado State University	1354	55.6	9.2	1421
ND-307	North Dakota State University	1326	53.2	9.4	1213
Average		1858	57.6	10.1	1197

LSD_(0.30)

248

^aYields corrected to 14% moisture

Experimental Design: Randomized complete block with three replications

Plot Size: 10' x 30'

Site Information

Cooperator: Arkansas Valley Research Center

Harvest date: 10/4/2011

Planting date: 6/9/2011

Seeding Rate: 85,000 seeds/acre

Fertilizer applied: 200 lb/acre of 11-52-0 (dry, broadcast in the fall of 2010)

Soil Type: Rocky Ford Silty Clay Loam

Tillage: Conventional

Irrigation: Furrow

Comments: Infestations of common bacterial blight, fusarium wilt, and Mexican bean beetle occurred during the growing season. High temperatures and irrigation timing also had a negative effect on yield.

Long Term Summary of Pinto Bean Variety Performance in Colorado

Every year CSU personnel conduct pinto bean variety performance trials in different locations. Both varieties and locations change from year to year so this table summarizes varieties that have been tested over the years. In the table, yield performance by variety has been averaged over locations within each of ten years. Entries reported are public and commercial named varieties common to all trials for a year. Experimental lines are not included in this summary. The number of locations per year varied from two to six. The trial average at the bottom of each year's yield column is a simple average of the yields of reported varieties for that year. Average yield over years is shown in the column at the extreme right.

10-Year Summary of Pinto Bean Variety Performance in Colorado Variety Trials from 2002-2011.

Variety ^a	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Long Term Average	
						lb/ac						% of avg.
Windbreaker								3415	3316		3366	114
99195 MR				2374	3437	2508	5046	2390	3330		3181	108
Durango					3170	2390	4457	3136	3244	2301	3116	106
Montrose	2586	2956	2562	2449	3466	2587	4854	3569	3261	2660	3095	105
99217					3080	2406	4482	3296	3082	2148	3082	105
Mariah								3033	3105		3069	104
Lariat						2528	4472	3010	3123	2204	3067	104
Bill Z	2613	2463	2253	2454	3689	2796	4910	3273	3418	2305	3017	102
Poncho	2371	2826	2398	2676	3033	3179	4432		3144		3007	102
Stampede						2502	4015	3100	3081	2280	2996	102
GTS-904						3118	3513	2634	3091	2468	2965	101
Baja				2629	2963	2328	3730				2912	99
Medicine Hat								2902	2877		2890	98
La Paz				2490	3164	2586	3804	2177	2917	2700	2834	96
Croissant								2855	2792	2479	2709	92
Buckskin	2184	2382	2090	2428	3090	2754	4024				2707	92
Grand Mesa	2329	2283	1865	2265	2944	2429	4450	3132	2864	2204	2677	91
Othello			1936		3033				3020		2663	90
ND-307								2735	2949	2298	2661	90
Average	2417	2582	2184	2471	3188	2624	4322	2977	3095	2368	2948	

^aThe following varieties were only tested for few years during the ten year period and are not included in this performance summary: Buster, COB-2576-99, Kimberley, Rally, Shoshone, Sonora, and USPT-73.

Pinto Bean Variety Descriptions:

- 99217 An AmeriSeed Inc. variety from ProVita, Inc. with intermediate resistance to rust and BCMV. It is a late maturing variety with a 2B plant type.
- Bill Z A medium maturity (95-96 days) pinto variety released by Colorado State University in 1985. It has a vine Type III growth habit with resistance to BCMV and moderate tolerance to bacterial brown spot. It is a very productive variety with good seed color. It is susceptible to white mold, common bacterial blight and strains of rust in the Hi-Plains region.
- Croissant A new release from Colorado State University. It was formerly tested as CO23704 and Foundation seed was sold in 2008. It has semi-upright plant growth habit in most environments, bright pinto seed color, resistance to rust, field tolerance to common bacterial blight and resistance some strains of BCMV. Maturity is somewhat similar to Bill Z at 94-98 days.
- Durango An AmeriSeed Inc. variety from ProVita, Inc. with intermediate resistance to rust and BCMV. It is a full season maturing variety with a 2B plant type.
- Grand Mesa A medium maturity (94-96 day) pinto variety from Colorado State University released in 2001. Grand Mesa combines resistance to rust, BCMV, semi-upright Type II plant architecture and field tolerance to white mold, but is susceptible to common bacterial blight and bacterial brown spot. It has moderate yield potential, good seed color, and has shown field tolerance to white mold.
- La Paz An AmeriSeed Inc. variety from ProVita, Inc. with intermediate resistance to rust and BCMV. It is a full season maturing variety with a 2B plant type.
- Lariat A pinto line, tested as ND020069, was recently released by the North Dakota Agricultural Experiment Station in 2008. It has Type II upright, short vine, with good lodging resistance. In Colorado, it is a full season variety at approximately 99-100 days. It is resistant to rust and BCMV.
- Mariah A variety released by Seminis. It is a full season (96- 98 day) pinto bean with an erect, short vine growth habit and resistance to BCMV.
- Medicine Hat A variety released by Seminis. Medicine Hat is a medium to full season variety (94 – 96 day) with short-vine growth habit. It is resistant to BCMV.
- Montrose A medium maturity (96-97 day) pinto variety released by Colorado State University in 1999. It has resistance to rust and BCMV. It has high yield potential and excellent seed quality. It is highly susceptible to white mold.
- ND-307 Developed by North Dakota State University. It is a late season (>100 day) high yielding variety with upright short-vine growth habit and has resistance to rust, and BCMV.

- Othello Othello was released by the USDA in 1987. It is an early (84 to 87 d) variety with resistance to Bean common mosaic virus, some root rot pathogens, and curly top virus. It is susceptible to local strains of rust, common bacterial blight and white mold. It has good seed quality.
- Poncho A medium maturity (97 d) pinto variety released by Rogers/Syngenta Seeds, Inc. in 1998 with resistance to Bean common mosaic virus, has high yield potential and excellent seed quality. It has Type III growth habit. It is susceptible to rust and bacterial brown spot.
- Stampede A pinto line, tested as ND0203 51, was recently released by the North Dakota Agricultural Experiment Station in 2008. It has full season maturity in the Hi-Plains (96-99 days), high yield capacity and excellent seed size, shape, and appearance. Stampede is an erect variety, with very good lodging resistance. It is resistant to rust and BCMV.

Pinto Bean Experimental lines:

- 06185 An AmeriSeed Inc. experimental line from ProVita, Inc.
 06187 An AmeriSeed Inc. experimental line from ProVita, Inc.
 06189 An AmeriSeed Inc. experimental line from ProVita, Inc.
 07167 (LP-7) An AmeriSeed Inc. experimental line from ProVita, Inc.
 CO24972 An experimental pinto line from Colorado State University.
 CO54912-7-12 An experimental pinto line from Colorado State University.
 CO54912-7-14 An experimental pinto line from Colorado State University.
 CO54912-7-3 An experimental pinto line from Colorado State University.
 CO54912-7-6 An experimental pinto line from Colorado State University.
 CO54912-7-7 An experimental pinto line from Colorado State University.
 CO55024-11 An experimental pinto line from Colorado State University.
 CO55024-4 An experimental pinto line from Colorado State University.
 CO91216-15 An experimental pinto line from Colorado State University.
 CO92838-11 An experimental pinto line from Colorado State University.
 CO93195-17 An experimental pinto line from Colorado State University.
 COB-2824-99 An experimental pinto line from Gentec, Inc.
 GTS-903 An experimental pinto line from Gentec, Inc.
 GTS-904 An experimental pinto line from Gentec, Inc.
 Long's Peak An experimental pinto line from Colorado State University.

2011 Bean Scouting Summary

[Excerpts from the Legume ipmPIPE Report @ <http://legume.ipmpipe.org/cgi-bin/sbr/public.cgi>]

Crop Growth Stage and Status

Beetles :

Light feeding by Mexican bean beetles in some fields.

Insecticide recommendations available at: http://wiki.bugwood.org/HPIPM:Dry_Beans

Other

Some grasshopper feeding along field margins

Insecticide recommendations available at: http://wiki.bugwood.org/HPIPM:Dry_Beans

Disease Scouting, Outlook and Management

Rusts (soybean, common)

Common rust detected in a few fields in northern Colorado; no other reports, however, conditions have been favorable. Closely follow pre-harvest intervals on pesticide labels.

Rust management video available at <http://www.colostate.edu/Orgs/VegNet/vegnet/beans.html>

Fungicide recommendations available at: http://wiki.bugwood.org/HPIPM:Dry_Beans

Other Fungal Diseases (white mold, ascochyta, downy mildew)

Early infection by white mold observed in scattered fields in eastern Colorado; management options included timely fungicides and irrigation scheduling.

White Mold management video available at: <http://www.colostate.edu/Orgs/VegNet/vegnet/beans.html>

Fungicide recommendations available at: http://wiki.bugwood.org/HPIPM:Dry_Beans

Bacterial Diseases (common blight, halo blight, brown spot, wilt)

Scattered reports of halo blight, bacterial brown spot and common bacterial blight in numerous fields in northeastern Colorado; and common bacterial blight reported in southern Colorado.

Management options included timely applications of copper-based bactericides.

Bacterial Disease management video available at: <http://www.colostate.edu/Orgs/VegNet/vegnet/beans.html>

Bactericide recommendations available at: http://wiki.bugwood.org/HPIPM:Dry_Beans

Virus Diseases (AMV, BCTV, BCMV, BYMV, CMV, other)

BCMV observed in some susceptible bean types (yellow beans) in northern Colorado.

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Plant Arrangement Enhances Dry Bean Production for Some Varieties

H. F. Schwartz, M. A. Brick, J. B. Ogg and M. S. McMillan. Colorado State University

A two-year study at two locations compared the performance of pinto bean varieties with more upright growth habits when grown at closer plant spacing to improve production efficiency and return to growers. Upright type II varieties Croissant and Stampede were compared to more prostrate type III varieties Othello and Montrose grown as 1 or 2 rows (6 inches apart) per 30 inch wide bed at 70,000 or 84,000 plants/acre under furrow or drip irrigated conditions in Colorado. Yields varied from less than 2225 lb to 4450 lb/acre, depending on the entry and spacing arrangement when data were averaged for 2010 and 2011. Significant effects included varietal response to spacing (1 vs. 2 rows / bed) when grown in low (drip, limited water and fertility, soil compaction) versus high (furrow irrigated with adequate water, good fertility, no compaction) yield systems. Growers must carefully choose the varieties suited for their environment, production system, and pest management strategy.

Highlights of results are as follows:

- Plant Population interacted with entries and row spacing, however, main effects were not significant.
- Traditional vine type varieties (e.g., Montrose, Othello) had higher mean yield with double compared to single rows/bed under both Low (+ 130 lb A-1) and High (+ 28 lb A-1) Yield Systems.
- Upright type varieties (e.g., Croissant, Stampede) had lower mean yield with double compared to single rows/bed under Low Yield System (- 39 lb A-1), and higher mean yield under the High Yield System (+ 302 lb A-1).
- Within growth habits, there were also interactions with the Yield System and row spacing:
 - Double row increased yield for Croissant in both systems, and for Stampede only in the High Yield System.
 - Double row increased yield for Othello in both systems, whereas Montrose had no response.

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