Technical Report TR06-12 October 2006

Agricultural Experiment Station

Colorado State University
Knowledge to Go Places

College of Agricultural Sciences

Department of Soil and Crop Sciences

Cooperative Extension

MAKING BETTER DECISIONS

2006 Dry Bean Variety Performance Trials

Acknowledgments

The authors wish to express their gratitude to the Colorado farmers who generously contributed the use of their land, equipment, and time to facilitate these trials for the benefit of all. Colorado dry bean producers and bean dealers: Burlington – Don Sircy and Haxtun – Steve Smith. We also acknowledge the participation of the Agricultural Research, Development and Education Center - Fort Collins. The success of the 2006 season is due in part to efforts of Colorado Cooperative Extension agent, Ron Meyer (Golden Plains) and Alan Helm (Golden Plains), with research support provided by The Colorado Dry Bean Administrative Committee, and publication by The Colorado Bean Network. We are also grateful for the assistance of Dave Green, Regional Manager, Servi-Tech, Inc.

Funded by the Colorado State University Crops Testing Program, Colorado Dry Bean Administrative Committee, and Colorado Bean Network

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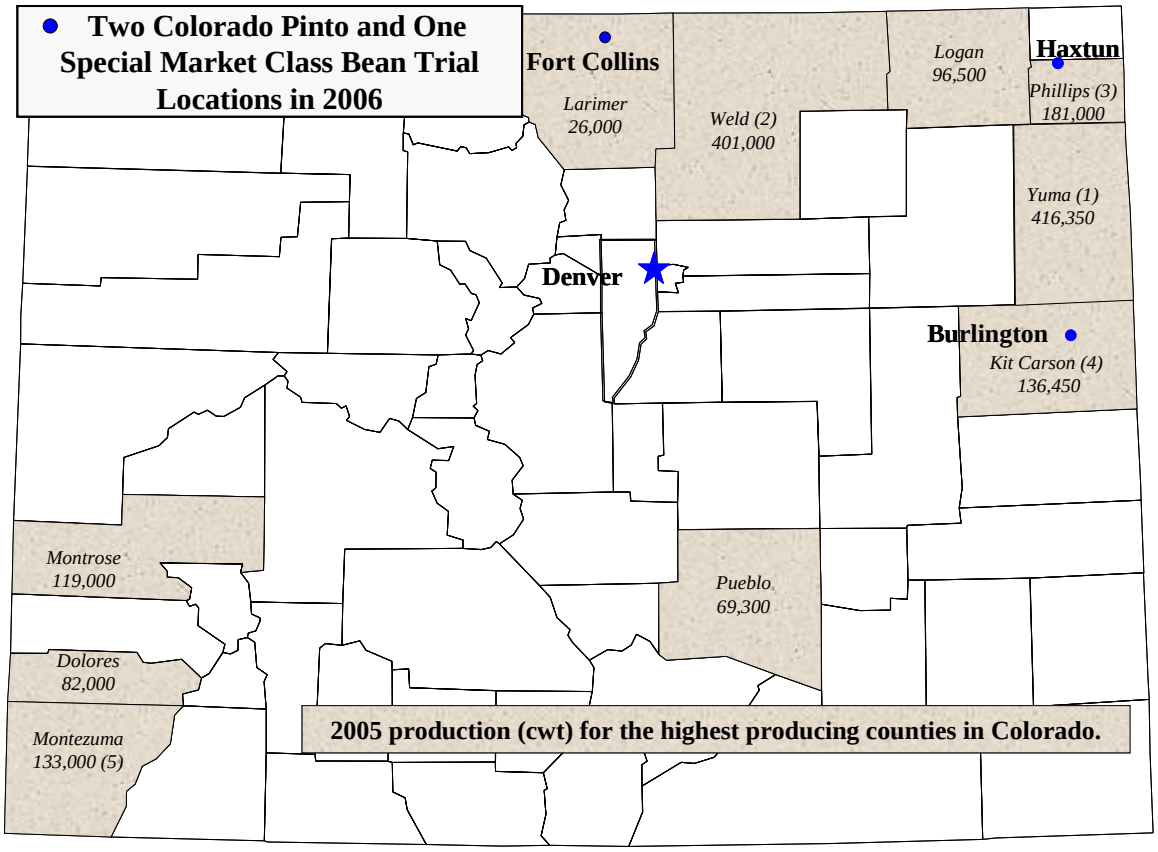
2006 COLORADO DRY BEAN PERFORMANCE TRIAL

Introduction

Colorado producers annually spend millions of dollars on pinto bean seed. Producers' variety decisions can have a big effect on yields. Colorado State University's Crops Testing program, the CSU bean breeding program, and the CSU bean pathology research program collaborate to conduct uniform variety trials annually to provide unbiased and reliable performance results from uniform variety trials to help Colorado dry bean producers' make more informed variety decisions. The uniform variety trial serves a dual purpose of screening experimental lines from CSU's bean breeding program or from bean seed companies, and to compare 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 2006, only two eastern Colorado trials were funded so no variety trials were conducted at Fruita, Yellow Jacket or Rocky Ford. Trials were planted at Haxtun and Burlington. Varieties tested in 2006 are described in the following tables. Seed yields, in pounds per acre, are adjusted to 14% moisture content.



Pinto Bean Varietal Descriptions:

00218 An experimental pinto line from ProVita, Inc. (a private bean seed company in Idaho).

01223 An experimental pinto line from ProVita, Inc. (a private bean seed company in Idaho).

01242 An experimental pinto line from ProVita, Inc. (a private bean seed company in Idaho).

03250 An experimental pinto line from ProVita, Inc. (a private bean seed company in Idaho).

6I13 An experimental pinto line from University of Idaho.

6I15 An experimental pinto line from University of Idaho.

6I7 An experimental pinto line from University of Idaho.

6I9 An experimental pinto line from University of Idaho.

99195 MR An experimental pinto line from ProVita, Inc. (a private bean seed company in Idaho).

99204 An experimental pinto line from ProVita, Inc. (a private bean seed company in Idaho).

99217 An experimental pinto line from ProVita, Inc. (a private bean seed company in Idaho).

99230 An experimental pinto line from ProVita, Inc. (a private bean seed company in Idaho).

Bill Z A medium maturity (95-97 d) pinto variety released by Colorado State University in 1985. It has a vine Type III growth habit with resistance to bean common mosaic virus and moderate tolerance to bacterial brown spot. It is a very productive variety with good seed quality. However, it is susceptible to white mold, common bacterial blight and rust.

Buckskin An early season (87-91 d) pinto variety released by Rogers/ Syngenta Seeds, Inc. (RNK101). It is a vine Type III growth habit with resistance to bean common mosaic virus, but susceptible to white mold, rust, and bacterial brown spot.

Buster A medium maturity (97 d) pinto variety from Seminis Seed Co. released in 1999. It is a semi-erect variety with resistance to rust.

CO12632 An experimental pinto line from Colorado State University.

CO15882 An experimental pinto line from Colorado State University.

CO16219 An experimental pinto line from Colorado State University.

CO23985 An experimental pinto line from Colorado State University.

CO24311 An experimental pinto line from Colorado State University.

CO33309 An experimental pinto line from Colorado State University.

COB-2576-99 An experimental pinto from Gentec, Inc.

COB-2585-99 An experimental pinto from Gentec, Inc.

Grand Mesa A medium maturity (96 d) pinto variety from Colorado State University released in 2001. Grand Mesa combines resistance to rust, bean common mosaic virus, 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 and good seed quality.

La Paz A pinto variety released in 2006 from ProVita, Inc. (a private bean seed company in Idaho).

Montrose A medium maturity (97 d) pinto variety released by Colorado State University in 1999. It has resistance to rust and bean common mosaic virus. It has high yield potential and excellent seed quality. Because it has very prostrate vine Type III growth habit, it is highly susceptible to white mold.

Othello A short season (90 d) pinto variety released by the USDA in 1986 with semi-upright growth habit. It is highly susceptible to rust and bacterial diseases, and moderately susceptible to white mold.

Poncho A medium maturity (97 d) pinto variety released by Rogers/Syngenta Seeds, Inc. in 1998 with resistance to bean common mosaic, high yield potential and excellent seed quality. It has Type III growth habit. It is susceptible to rust and bacterial brown spot.

Winchester A medium maturity (97 d), pinto variety released by Rogers/Syngenta Seeds, Inc. in 1995 with excellent seed quality. It has Type III growth habit with resistance to bean common mosaic and rust, tolerance to Fusarium root rot. It is susceptible to rust and bacterial brown spot.

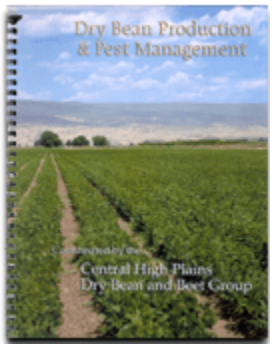
Table 1. Average pinto bean performance over two eastern Colorado locations - 2006.

	Location		
Variety*	Burlington	Haxtun	Average
	Yield (lb/ac)		
Bill Z	3964	3415	3689
6I15	3938	3271	3605
COB-2576-99	3753	3249	3501
Montrose	3804	3128	3466
99195 MR	3679	3195	3437
COB-2585-99	3849	2970	3409
01223	4067	2702	3384
CO33309	3823	2768	3295
Buster	3832	2741	3286
99230	3637	2703	3170
La Paz	3802	2526	3164
Buckskin	3314	2866	3090
01242	3371	2805	3088
99217	3252	2909	3080
Poncho	3431	2636	3033
Othello	3246	2821	3033
03250	3334	2598	2966
99204	3235	2690	2963
6I7	3303	2623	2963
Grand Mesa	3279	2610	2944
6I13	2766	2982	2874
00218	2952	2784	2868
6I9	2842	2894	2868
CO12632	3246	2472	2859
CO15882	3110	2490	2800
Winchester	3107	2391	2749
CO24311	3203	2261	2732
CO16219	3249	2209	2729
CO23985	3187	2223	2705
Average	**3434**	**2756**	**3095**

Summary of Pinto Bean Variety Performance in Colorado Variety Trials from 1997-2006

Every year CSU personnel conduct pinto bean variety performance trials in different locations. Both varieties and locations change from year to year, so a straight-forward, statistical comparison of variety performance is not possible. However, it is useful to summarize yield performance over years to take stock of what we have learned over the last ten years. In the following 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. Public and private experimental lines were not included in this summary. The number of locations per year varied from two to six. The trial average at bottom of each year's yield column is a simple average of the yields of reported varieties for that year. The second column is the yield for each reported variety expressed as a percent of the trial average for each year. Average yield over years and average percent of trial average are shown in the columns at the extreme right.

Forty-five public and commercial named pinto bean varieties have been tested during this ten year period. Some varieties were only tested for one year, while Bill Z and Montrose were tested in all ten years. Buckskin, Grand Mesa and Poncho were each tested for eight years. Even though rigorous comparisons of performance cannot be made for varieties tested in different years and locations, the Colorado dry bean industry can use the table to gain insight into relative performance of a large number of varieties. Varieties that perform well in one part of the state and not so well in another part would be expected to show up in the middle of the table along with varieties that had mediocre performance over all locations.



http: //www.csuag.com

Table 2. Summary of Pinto Bean Variety Performance in Colorado Variety Trials from 1997-2006.

Variety	1997 Yield		1998 Yield		1999 Yield		2000 Yield		2001 Yield		2002 Yield		2003 Yield		2004 Yield		2005 Yield		2006 Yield		Long Term Ave Yield	
	lb/ac	% ave	lb/ac	% ave	lb/ac	% ave	lb/ac	% ave	lb/ac	% ave	lb/ac	% ave	lb/ac	% ave	lb/ac	% ave	lb/ac	% ave	lb/ac	% ave	lb/ac	% ave
00218																	2557	103	2868	90	2713	97
01223																	2388	97	3384	106	2886	101
99204																	2629	106	2963	93	2796	100
99195 MR																	2374	96	3437	108	2905	102
Apache	2107	100	2166	93																	2137	97
Bill Z	2101	99	2167	93	2617	103	3212	106	2621	101	2613	110	2463	95	2253	106	2454	99	3689	115	2619	103
Buckskin	2008	95			2475	97	2769	91			2184	92	2382	92	2090	98	2428	98	3090	97	2428	95
Burke	2113	100	2066	89	2464	97	2713	90	2426	93											2356	94
Buster					2672	105	3087	102	2654	102					2185	102			3286	103	2777	103
Chase	2417	114	2628	113	2584	101	3049	101													2670	107
Cisco					2775	109	3280	108													3028	109
Elizabeth	2367	112	2281	98	2178	86	2780	92													2402	97
Grand Mesa					2631	103	2902	96	2458	95	2329	98	2283	88	1865	87	2265	92	2944	92	2460	94
GTS-900	1610	76							2339	90					1989	93					1979	86
Kodiak			2066	89	2542	100	2749	91													2452	93
La Paz																	2490	101	3164	99	2827	100
Maverick	1911	90	2434	105																	2173	98
Montrose	2830	134	2708	117	2821	111	3213	106	2705	104	2586	109	2956	114	2562	120	2449	99	3466	108	2830	112
Othello	2158	102			2265	89	3044	101							1936	91			3033	95	2487	95
Poncho					2613	103	3332	110	2862	110	2371	100	2826	109	2398	112	2676	108	3033	95	2764	106
Rally									2312	89	2134	90			1935	91					2127	90
ROG 261	2116	100	2368	102																	2242	101
USPT-73			2217	96	2418	95	3230	107	2825	109	2374	100									2613	101
Vision	1624	77	2421	104	2604	102			2790	107											2360	98
Trial Average	**2114**		**2320**		**2547**		**3028**		**2599**		**2370**		**2582**		**2135**		**2471**		**3197**		**2543**	

*These varieties were each only tested for one year during the ten year period: '01242, 03250, '99217, '99230, '6I13, '6I15, '6I7, '6I9, Canyon, COB-2576-99, 'COB-2585-99, GTS Cob 502-94, Frontier, ROG 117, ROG 179, ROG 214, ROG 299, UI 320, USPT 72, USPT 74, 'Winchester.

Table 3. Pinto Bean Variety Performance Trial at Burlington[1].

Variety	Source	Yield	Moisture	Test Weight	Seed/lb	Disease Observation[2]
		lb/ac	%	lb/bu	No.	
01223	ProVita, Inc.	4067	15.8	61.0	1203	
Bill Z	Colorado State University	3964	13.7	61.2	1112	Tr Rust
6I15	University of Idaho	3938	19.3	61.8	1197	
COB-2585-99	Gentec, Inc.	3849	18.0	61.7	1100	
Buster	Seminis	3832	16.0	60.2	1038	
CO33309	Colorado State University	3823	13.6	60.6	1065	
Montrose	Colorado State University	3804	14.0	62.3	1040	
La Paz	ProVita, Inc.	3802	15.8	61.6	1065	
COB-2576-99	Gentec, Inc.	3753	19.3	61.4	1029	
99195 MR	ProVita, Inc.	3679	17.6	62.1	1144	
99230	ProVita, Inc.	3637	14.5	60.9	987	Lt CBB
Poncho	ProVita, Inc.	3431	15.8	61.5	991	
01242	ProVita, Inc.	3371	15.8	61.7	1182	
03250	ProVita, Inc.	3334	18.6	62.9	1025	
Buckskin	ProVita, Inc.	3314	13.0	60.5	1091	
6I7	University of Idaho	3303	17.0	61.2	1147	
Grand Mesa	Colorado State University	3279	12.9	59.8	1137	
99217	ProVita, Inc.	3252	15.8	61.3	975	
CO16219	Colorado State University	3249	13.7	59.5	1132	
CO12632	Colorado State University	3246	13.3	58.9	1126	
Othello	Colorado State University	3246	14.9	61.6	1038	Tr CBB
99204	ProVita, Inc.	3235	15.2	60.8	1084	
CO24311	Colorado State University	3203	16.5	58.4	1200	
CO23985	Colorado State University	3187	14.2	60.7	1009	
CO15882	Colorado State University	3110	16.5	61.6	1217	
Winchester	ProVita, Inc.	3107	14.5	62.0	1109	
00218	ProVita, Inc.	2952	15.9	62.8	1141	
6I9	University of Idaho	2842	20.1	62.2	1206	
6I13	University of Idaho	2766	20.8	60.5	1170	
Average		**3434**	**15.9**	**61.1**	**1102**	
$LSD_{(0.30)}$		269				

[1]Trial conducted on the Don Sircy farm; seeded 6/9 and harvested 9/26.
[2] CBB = Common Bacterial Blight and rust (evaluation August 17, 2006) were present in the trial and observations indicate the degree of varietal susceptibility.

Previous Crop: Corn
Soil Type: Keith Silt Loam
Fertilization: 60 lbs N $acre^{-1}$ and 35 lbs P_2O_5 $acre^{-1}$
Herbicide: Dual II Magnum and Treflan
Bactericide: Nucop Fix 20
Insecticide: None
Irrigation: Sprinkler
Plot Size: 10' x 31'
Seeding Rate: approximately 85,000 seeds/acre

Table 4. Pinto Bean Variety Performance Trial at Haxtun[1].

Variety	Source	Yield	Moisture	Test Weight	Seed/lb	Disease Observation[2]
		lb/ac	%	lb/bu	No.	
Bill Z	Colorado State University	3415	14.8	57.5	1117	Lt CBB
6I15	University of Idaho	3271	22.4	56.3	1029	Tr CBB
COB-2576-99	Gentec, Inc.	3249	14.9	58.2	999	Lt CBB
99195 MR	ProVita, Inc.	3195	14.1	59.5	1152	Lt CBB
Montrose	Colorado State University	3128	15.3	59.0	1079	Lt CBB
6I13	University of Idaho	2982	16.4	56.7	991	Tr CBB
COB-2585-99	Gentec, Inc.	2970	14.4	58.9	1050	Lt CBB
99217	ProVita, Inc.	2909	15.5	58.0	1020	Lt CBB
6I9	University of Idaho	2894	17.7	58.1	1061	Tr CBB
Buckskin	ProVita, Inc.	2866	14.7	57.0	1115	Mod CBB
Othello	Colorado State University	2821	14.4	58.1	1038	Mod CBB
01242	ProVita, Inc.	2805	15.3	59.7	1097	Lt CBB
00218	ProVita, Inc.	2784	16.6	60.0	1081	Mod CBB
CO33309	Colorado State University	2768	15.0	58.4	1047	Lt CBB
Buster	Seminis	2741	15.7	55.7	1008	Lt CBB
99230	ProVita, Inc.	2703	14.5	58.9	1052	Mod CBB
01223	ProVita, Inc.	2702	13.5	57.1	1081	Tr CBB
99204	ProVita, Inc.	2690	15.2	57.4	1037	Lt CBB
Poncho	ProVita, Inc.	2636	15.1	58.9	1055	Lt CBB
6I7	University of Idaho	2623	15.4	58.6	1032	Mod CBB
Grand Mesa	Colorado State University	2610	14.3	56.8	1143	Lt CBB
03250	ProVita, Inc.	2598	16.9	59.5	1012	Mod CBB
La Paz	ProVita, Inc.	2526	15.2	59.1	1170	Mod CBB
CO15882	Colorado State University	2490	14.7	57.7	1235	Mod CBB
CO12632	Colorado State University	2472	14.1	56.2	1076	Tr CBB
Winchester	ProVita, Inc.	2391	14.6	60.2	1114	Mod CBB
CO24311	Colorado State University	2261	17.8	54.8	1117	Tr CBB
CO23985	Colorado State University	2223	14.9	57.3	991	Lt CBB
CO16219	Colorado State University	2209	13.7	54.6	1093	Lt CBB
Average		**2756**	**15.4**	**57.9**	**1072**	
$LSD_{(0.30)}$		246				

[1]Trial conducted on the Steve Smith farm; seeded 5/30 and harvested 9/14.
[2] CBB = Common Bacterial Blight (evaluation August 17, 2006) was present in the trial and observations indicate the degree of varietal susceptibility.
*Trial was hailed Sunday PM (8/29/06). Yields will partially be related to maturity and shatter. Approximately 30% loss to hail in surrounding field of Poncho pinto beans.
**Seed moisture was influenced by presence of green pods in some plots. Harvest moisture on the combine was averaged with seed moisture from a clean post harvest sample to obtain % moisture in the table above and to compute yields corrected to 14% moisture.

Previous Crop: Corn
Soil Type: Haxtun Sandy Loam
Fertilization: 60 lbs N $acre^{-1}$, 20 lbs P_2O_5 $acre^{-1}$, and 12 lbs S $acre^{-1}$
Herbicide: Dual Magnum, Raptor, Basagram, and Outlook
Bactericide: Cupro Fix 20
Insecticide: Asana
Irrigation: Sprinkler
Plot Size: 10' x 31'
Seeding Rate: approximately 85,000 seeds/acre

COAGMET Monthly Summaries from 2005-2006 www.coagmet.com

Compiled by H. F. Schwartz, Colorado State University

Monthly Daily High Temperature (F)

	2005				2006			
	Holyoke	Burlington	Rocky Ford	Olathe	Holyoke	Burlington	Rocky Ford	Olathe
May	72.7	73.1	77.0	75.4	77.7	78.2	81.1	77.9
June	83.4	83.5	89.1	81.3	87.7	87.9	91.8	87.9
July	92.3	92.6	95.5	92.2	91.9	90.9	92.6	89.0
Aug	85.6	85.9	88.8	84.2	84.7	87.4	87.9	85.9
Sept	84.6	83.8	86.6	79.1	71.9	72.8	75.3	72.3
average	83.7	83.8	87.4	82.4	82.8	83.4	85.7	82.6

Number of Days Above 95 F

	2005				2006			
	Holyoke	Burlington	Rocky Ford	Olathe	Holyoke	Burlington	Rocky Ford	Olathe
May	1	1	2	0	0	2	1	0
June	3	0	0	0	5	6	12	1
July	10	10	17	9	11	10	13	4
Aug	4	4	7	0	5	8	6	0
Sept	2	1	2	0	0	0	0	0
total	20	16	28	9	21	26	32	5

Monthly Rainfall (inches)

	2005				2006			
	Holyoke	Burlington	Rocky Ford	Olathe	Holyoke	Burlington	Rocky Ford	Olathe
May	2.3	1.9	0.3	0.2	0.7	1.6	1.3	0.0
June	2.4	0.0	0.8	0.8	2.3	3.1	0.2	0.1
July	3.9	2.8	0.4	0.8	1.8	3.7	2.8	1.3
Aug	4.0	4.8	2.0	0.6	4.9	3.8	3.6	1.2
Sept	0.0	0.3	1.1	2.2	2.2	1.4	2.6	1.8
total	12.6	9.9	4.6	4.5	11.8	13.5	10.6	4.4

Summary: 2006 had higher daily temperatures at most bean growing areas during May to August. Days above 95 F were also greater during this period, and could have reduced pod set and fill. The exception is Olathe, which had lower temperatures during July and September in 2006 than 2005. Rainfall was equal to or greater than that recorded in 2005 at these locations.

Special Market Class Varietal Descriptions:

CO26240 A great northern seeded experimental line from Colorado State University.
CO26342 A great northern seeded experimental line from Colorado State University.
CO26439 A great northern seeded experimental line from Colorado State University.
CO26440 A great northern seeded experimental line from Colorado State University.
CO26461 A great northern seeded experimental line from Colorado State University.
CO28850 A light red kidney bean seeded experimental line from Colorado State University.
CO28851 A light red kidney bean seeded experimental line from Colorado State University.
CO36039 A great northern seeded experimental line from Colorado State University.
CO36268 A great northern seeded experimental line from Colorado State University.
CO36827 A great northern seeded experimental line from Colorado State University.
GTS-104 A dark red kidney bean from Gentec, Inc.
GTS-105 A dark red kidney bean from Gentec, Inc.
Matterhorn A medium maturity (97 d) great northern variety released by Michigan State University in 1998. It has high yield potential but has poor seed quality.
Weihing A great northern variety released by the University of Nebraska in 1998. It has upright Type II growth habit and resistance to rust and common bacterial blight. Seed quality is excellent and it has full season maturity (97-99 d) in Colorado.

Table 5. Light Red Kidney Bean Variety Performance Trial at Fort Collins[1].

Variety	Yield	Seed/lb
	lb/ac	No.
GTS-105	1921	1032
CO28851	1919	941
CO28850	1861	1191
GTS-104	1854	1062
Average	**1889**	**1057**

[1]Trial conducted at the Agricultural Research, Development and Educational Center; seeded 5/30 and harvested 10/4.
*Due to high variability, the results could not be statistically interpreted.

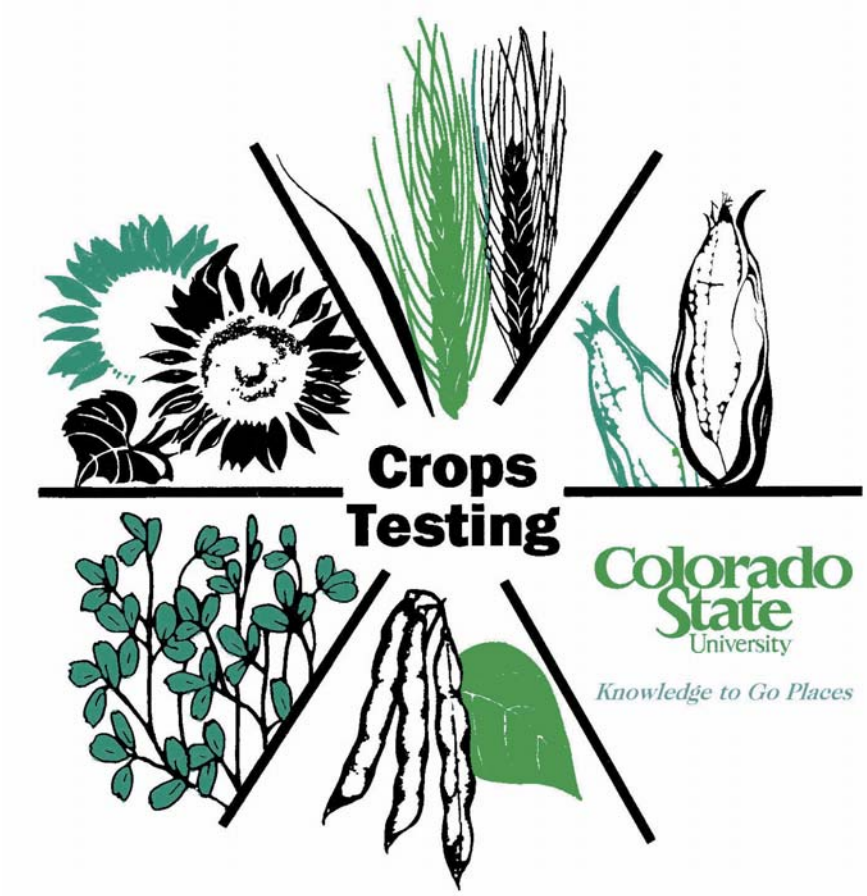
Table 6. Great Northern Bean Variety Performance Trial at Fort Collins[1].

Variety	Yield	Seed/lb
	lb/ac	No.
CO26342	2806	1444
CO26827	2557	1256
CO26439	2502	1429
CO26461	2318	1258
CO26440	2291	1401
CO26420	2001	1247
CO36268	1932	1242
Matterhorn	1902	1509
CO36039	1855	1438
Weihing	1429	1227
Average	**2159**	**1345**
$LSD_{(0.30)}$	267	

[1]Trial conducted at the Agricultural Research, Development and Educational Center; seeded 5/30 and harvested 10/4.

Entry Forms for 2007 Trials

Entry forms for 2007 trials may be obtained from the Department of Soil and Crop Sciences, Colorado State University, Cynthia Johnson, C03 Plant Science Building, Fort Collins, CO 80523-1170; telephone (970) 491-1914; fax (970) 491-2758; e-mail *cynthia.johnson@colostate.edu* or web site *http://www.csucrops.com*.



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Putting Knowledge to Work

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