

Technical Report

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Agricultural Experiment Station

College of
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Department of
Soil and Crop Sciences

Extension



MAKING BETTER DECISIONS

2007 Dry Bean Variety
Performance Trials

Acknowledgments

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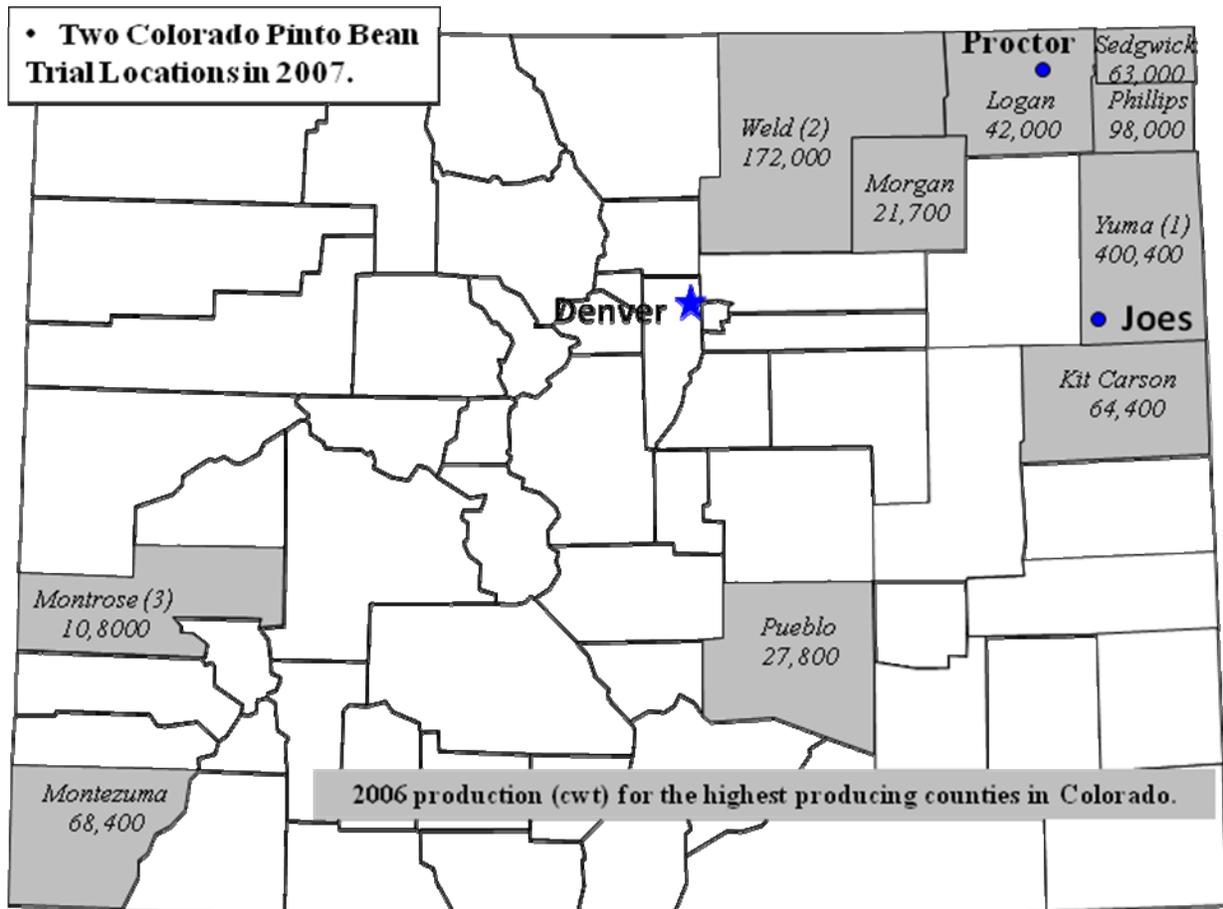
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2007 COLORADO DRY BEAN PERFORMANCE TRIAL

Introduction

Colorado producers annually spend millions of dollars on pinto bean seed. Variety decisions can have a big effect on yields. The bean breeding program, and the bean pathology research program at Colorado State University 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 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 2007, two eastern Colorado trials were funded and planted at Joes and Proctor. Varieties tested in 2007 are described in the following tables. Seed yields, in pounds per acre, are adjusted to 14% moisture content.



Pinto Bean Varietal Descriptions:

- 01223** An experimental pinto line from Ron Shellenberger, ProVita, Inc. P.O. Box 628, Kuna, ID 83634.
- 03261** An experimental pinto line from Ron Shellenberger, ProVita, Inc. P.O. Box 628, Kuna, ID 83634.
- 05200** An experimental pinto line from Ron Shellenberger, ProVita, Inc. P.O. Box 628, Kuna, ID 83634.
- 06185** An experimental pinto line from Ron Shellenberger, ProVita, Inc. P.O. Box 628, Kuna, ID 83634.
- 06206** An experimental pinto line from Ron Shellenberger, ProVita, Inc. P.O. Box 628, Kuna, ID 83634.
- 99195 MR** An experimental pinto line from Ron Shellenberger, ProVita, Inc. P.O. Box 628, Kuna, ID 83634.
- 99217** An experimental pinto line from Ron Shellenberger, ProVita, Inc. P.O. Box 628, Kuna, ID 83634.
- Baja** A pinto variety released by Ron Shellenberger, ProVita, Inc. P.O. Box 628, Kuna, ID 83634. It has not been extensively tested in Colorado.
- 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.
- CO23428** An experimental pinto line from Colorado State University.
- CO23704** An experimental pinto line from Colorado State University that will likely be released in 2008. It has semi-upright plant growth habit, bright pinto seed color, resistance to rust, common bacterial blight and some strains of bean common mosaic virus, and tolerance to root rot.
- CO24601** An experimental pinto line from Colorado State University.
- CO33309** An experimental pinto line from Colorado State University.
- CO33887** An experimental pinto line from Colorado State University.
- CO33911** An experimental pinto line from Colorado State University.
- CO34142** An experimental pinto line from Colorado State University.
- CO54150** An experimental pinto line from Colorado State University.
- Durango** A pinto variety released by Ron Shellenberger, ProVita, Inc. P.O. Box 628, Kuna, ID 83634. It has not been extensively tested in Colorado.
- 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.
- GTS-904** An experimental pinto line from Gentec, Incorporated.
- GTS-905** An experimental pinto line from Gentec, Incorporated.
- GTS-906** An experimental pinto line from Gentec, Incorporated.

- La Paz** A pinto variety released by Ron Shellenberger, ProVita, Inc. P.O. Box 628, Kuna, ID 83634. It has upright Type II architecture and medium (95-97 d) maturity.
- 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.
- Stampede (ND020351)** A pinto line that was recently released by the North Dakota Agricultural Experiment Station as the variety “Stampede”. It is well adapted to the northern Plains where it has medium maturing, high yield capacity and excellent seed size, shape, and appearance. Stampede is an erect (Type II upright, short vine) variety, with very good lodging resistance. In the northern Plains the improved plant structure, combined with its synchronous drydown, suggests that this line may be suitable for direct combining, given appropriate equipment and operator care. It is resistant to rust and *Bean common mosaic virus*.
- Lariat (ND020069)** A pinto line that was recently released by the North Dakota Agricultural Experiment Station as the variety “Lariat”. It is well adapted to the northern Plains where it has Type II upright, short vine, with good lodging resistance. Lariat exhibits very good synchronous plant drydown prior to harvest and may be suitable for direct combining, given appropriate equipment and operator care. It is resistant to rust and *Bean common mosaic virus*.
- P250215** A medium season (maturity 96-97 d) pinto variety tested by ADM Edible Beans Specialties Research for 3 years. It has a Type II semi-erect growth habit. It shows white mold avoidance, tolerance to root rot and is resistant to rust.
- P251215** A full season (maturity 98-99 d) pinto variety tested by ADM Edible Beans Specialties Research for 3 years. It has a Type II semi-erect growth habit. It shows white mold avoidance and tolerance to root rot.
- P131423** A full season (maturity 99-100 d) pinto variety tested by ADM Edible Beans Specialties Research for 4 years. It has a Type III prostrate growth habit. It demonstrates drought tolerance. It shows tolerance to root rot and is resistant to rust.
- P223217** A medium season (maturity 95-97 d) pinto variety tested by ADM Edible Beans Specialties Research for 3 years. It has a Type II semi-erect growth habit and demonstrates tolerance to common blight, tolerance to root rot, resistance to rust and white mold avoidance. It carries dominant resistance to most biotypes of *Bean common mosaic virus* found in North America.
- 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.
- Sonora** A pinto variety released by Ron Shellenberger, ProVita, Inc. P.O. Box 628, Kuna, ID 83634. It has not been extensively tested in Colorado.

Table 1. Average pinto bean performance over two eastern Colorado locations in 2007.

Variety*	Location		Average
	Joes	Proctor	
		Yield (lb/ac)	
Poncho	3128	3230	3179
GTS-904	2972	3264	3118
Bill Z	2522	3070	2796
Buckskin	2439	3068	2754
05200	2457	2869	2663
P131423	2204	3010	2607
06206	2312	2889	2601
Montrose	2552	2622	2587
La Paz	2289	2883	2586
P223217	1869	3286	2578
GTS-905	2115	3037	2576
GTS-906	1962	3178	2570
06185	2329	2793	2561
P251215	2124	2975	2549
CO23704	2205	2869	2537
Lariat	2296	2760	2528
01223	2276	2751	2513
99195 MR	2081	2935	2508
Stampede	2023	2981	2502
P250215	1930	3000	2465
CO54150	2374	2534	2454
Grand Mesa	2373	2486	2429
03261	1799	3056	2428
Sonora	2188	2653	2421
99217	2200	2611	2406
CO23428	2293	2502	2397
CO24601	1858	2924	2391
Durango	2038	2741	2390
CO33309	2117	2572	2345
Baja	1977	2679	2328
CO33887	1924	2285	2104
CO34142	2187	1890	2038
CO33911	1807	2173	1990
Average	2219	2805	2512

*Varieties ranked by the average yield over two locations in 2007.

Summary of Pinto Bean Variety Performance in Colorado Variety Trials from 1998-2007

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.

Fifty-six 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. 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. 10-Year Summary of Pinto Bean Variety Performance in Colorado Variety Trials from 1998-2007.

Variety	1998 Yield		1999 Yield		2000 Yield		2001 Yield		2002 Yield		2003 Yield		2004 Yield		2005 Yield		2006 Yield		2007 Yield		Long Term Ave Yield	
	lb/ac	% ave	lb/ac	% ave																		
00218															2557	103	2868	90			2713	97
01223															2388	97	3384	106	2513	97	2762	100
Baja															2629	106	2963	93	2328	90	2640	96
99217																	3080	97	2406	93	2743	95
Durango																	3170	99	2390	92	2780	96
99195 MR															2374	96	3437	108	2508	97	2773	100
Bill Z	2167	93	2617	103	3212	106	2621	101	2613	110	2463	95	2253	106	2454	99	3689	116	2796	108	2689	104
Buckskin			2475	97	2769	91			2184	92	2382	92	2090	98	2428	98	3090	97	2754	106	2522	97
Burke	2066	89	2464	97	2713	90	2426	93													2417	92
Buster			2672	105	3087	102	2654	102					2185	102			3286	103			2777	103
Chase	2628	113	2584	101	3049	101															2754	105
Cisco			2775	109	3280	108															3028	109
Elizabeth	2281	98	2178	86	2780	92															2413	92
Grand Mesa			2631	103	2902	96	2458	95	2329	98	2283	88	1865	87	2265	92	2944	92	2429	94	2456	94
GTS-900							2339	90					1989	93							2164	92
Kodiak	2066	89	2542	100	2749	91															2452	93
La Paz															2490	101	3164	99	2586	100	2747	100
Montrose	2708	117	2821	111	3213	106	2705	104	2586	109	2956	114	2562	120	2449	99	3466	109	2587	100	2805	109
Othello			2265	89	3044	101							1936	91			3033	95			2570	94
Poncho			2613	103	3332	110	2862	110	2371	100	2826	109	2398	112	2676	108	3033	95	3179	123	2810	108
Rally							2312	89	2134	90			1935	91							2127	90
USPT-73	2217	96	2418	95	3230	107	2825	109	2374	100											2613	101
Vision	2421	104	2604	102			2790	107													2605	105
Trial Average	2319		2547		3028		2599		2370		2582		2135		2471		3186		2589		2624	

*These varieties were each only tested for one year during the ten year period and are not included in this performance summary: 01242, 03250, Sonora, 06185, 06206, 03261, 05200, 6I13, 6I15, 6I7, 6I9, Apache, Canyon, COB-2576-99, COB-2585-99, Frontier, GTS Cob 502-94, Maverick, ROG 214, ROG 261, UI 320, USPT 72, USPT 74, Winchester, P250215, P251215, P131423, P223217, GTS-904, GTS-905, GTS-906, Stampede (ND020351), Lariat (ND020069).

Table 3. 2007 Pinto Bean Variety Performance Trial at Joes¹.

Variety	Source	Yield	Moisture	Test	Seed/lb	Disease
				Weight		Observation ²
		lb/ac	%	lb/bu	No.	
Poncho	ProVita, Inc.	3128	10.9	60.1	1302	Mod BBS
GTS-904	Gentec, Inc.	2972	11.2	58.8	1412	Lt-Mod BBS
Montrose	Colorado State University	2552	10.1	59.7	1447	Lt-Mod BBS
Bill Z	Colorado State University	2522	10.4	58.8	1515	Lt-Mod BBS
05200	ProVita, Inc.	2457	11.1	60.1	1612	Mod-Sev BBS
Buckskin	ProVita, Inc.	2439	10.2	58.4	1464	Mod BBS
CO54150	Colorado State University	2374	11.7	58.5	1435	Lt BBS
Grand Mesa	Colorado State University	2373	10.4	59.2	1620	Lt BBS
06185	ProVita, Inc.	2329	11.1	61.0	1508	Lt BBS
06206	ProVita, Inc.	2312	10.7	60.9	1440	Mod BBS
Lariat	North Dakota State University	2296	11.1	58.1	1604	Lt BBS
CO23428	Colorado State University	2293	10.4	58.4	1596	Lt BBS
La Paz	ProVita, Inc.	2289	10.9	60.8	1494	Lt-Mod BBS
01223	ProVita, Inc.	2276	10.8	60.2	1796	Mod BBS
CO23704	Colorado State University	2205	10.4	60.5	1435	Lt BBS
P131423	ADM Seedwest	2204	11.0	59.1	1489	Lt BBS
99217	ProVita, Inc.	2200	10.6	60.6	1462	Lt-Mod BBS
Sonora	ProVita, Inc.	2188	10.4	59.8	1706	Mod BBS
CO34142	Colorado State University	2187	11.6	60.0	1456	Lt BBS
P251215	ADM Seedwest	2124	11.3	60.3	1456	Lt BBS
CO33309	Colorado State University	2117	10.9	59.1	1429	Lt-Mod BBS
GTS-905	Gentec, Inc.	2115	11.4	60.0	1552	Lt BBS
99195 MR	ProVita, Inc.	2081	10.8	60.8	1725	Mod BBS
Durango	ProVita, Inc.	2038	10.5	60.6	1480	Mod BBS
Stampede	North Dakota State University	2023	10.4	58.4	1437	Lt BBS
Baja	ProVita, Inc.	1977	10.6	60.7	1525	Mod BBS
GTS-906	Gentec, Inc.	1962	11.2	59.3	1779	Lt-Mod BBS
P250215	ADM Seedwest	1930	10.6	58.5	1405	Lt BBS
CO33887	Colorado State University	1924	11.7	58.6	1470	Lt BBS
P223217	ADM Seedwest	1869	10.7	57.4	1577	Lt BBS
CO24601	Colorado State University	1858	10.5	58.0	1495	Lt BBS
CO33911	Colorado State University	1807	10.9	57.8	1655	Lt-Mod BBS
03261	ProVita, Inc.	1799	11.3	59.7	1505	Lt-Mod BBS
	Average	2219	10.8	59.5	1524	
	LSD _(0.30)	340				

¹Trial conducted on the Richard Wacker farm; seeded 6/4 and harvested 9/12.

²Disease Notes: The following diseases were present in the variety plots at that site, and were indicative of a susceptible-type reaction. BBS = Bacterial Brown Spot, CBB = Common Bacterial Blight, MBB = Mexican Bean Beetle evaluation on August 21, 2007; trace to light infection observed two weeks earlier from BBS and/or CBB. Notes taken by Dr. H. F. Schwartz, Colorado State University.

Previous Crop: Corn

Fertilizer: 20 gal 8-20-5-5-.5

Herbicide: Sonalan, Eptam, Basagram and Raptor

Insecticide: Asana

Copper: None

Plot Size: 10' x 31'

Seeding Rate: Approximately 85,000 seeds/acre

Table 4. 2007 Pinto Bean Variety Performance Trial at Proctor¹.

Variety	Source	Yield	Moisture	Test Weight	Seed/ lb	Disease Observation ²
		lb/ac	%	lb/bu	No.	
P223217	ADM Seedwest	3286	11.1	57.7	1349	Mod-Sev BBS
GTS-904	Gentec, Inc.	3264	11.7	58.5	1259	Mod BBS
Poncho	ProVita, Inc.	3230	11.0	59.8	1327	Mod BBS
GTS-906	Gentec, Inc.	3178	11.5	60.3	1337	Lt-Mod BBS
Bill Z	Colorado State University	3070	10.7	58.5	1539	Mod BBS
Buckskin	ProVita, Inc.	3068	10.2	58.8	1336	Mod-Sev BBS
03261	ProVita, Inc.	3056	12.2	59.5	1372	Mod BBS
GTS-905	Gentec, Inc.	3037	11.8	60.6	1362	Mod-Sev BBS
P131423	ADM Seedwest	3010	11.0	59.7	1440	Lt-Mod BBS
P250215	ADM Seedwest	3000	11.4	58.9	1140	Lt-Mod BBS
Stampede	North Dakota State University	2981	10.7	57.6	1339	Lt-Mod BBS
P251215	ADM Seedwest	2975	11.4	59.3	1295	Lt-Mod BBS
99195 MR	ProVita, Inc.	2935	11.5	60.4	1549	Mod BBS
CO24601	Colorado State University	2924	10.8	57.6	1233	Lt-Mod BBS
06206	ProVita, Inc.	2889	11.2	59.6	1297	Sev BBS
La Paz	ProVita, Inc.	2883	10.9	59.6	1417	Sev BBS
CO23704	Colorado State University	2869	10.9	60.0	1382	Lt BBS
05200	ProVita, Inc.	2869	11.5	59.0	1348	Mod BBS
06185	ProVita, Inc.	2793	11.3	59.8	1472	Sev BBS
Lariat	North Dakota State University	2760	11.5	59.7	1253	Lt BBS
01223	ProVita, Inc.	2751	11.2	59.1	1572	Sev BBS
Durango	ProVita, Inc.	2741	10.6	59.8	1292	Mod BBS, Mod MBB
Baja	ProVita, Inc.	2679	10.7	59.2	1331	Mod BBS
Sonora	ProVita, Inc.	2653	10.8	59.4	1592	Mod BBS
Montrose	Colorado State University	2622	10.6	59.1	1359	Lt BBS
99217	ProVita, Inc.	2611	10.7	60.1	1279	Mod BBS
CO33309	Colorado State University	2572	11.0	59.3	1275	Mod BBS
CO54150	Colorado State University	2534	13.4	58.5	1449	Lt-Mod BBS
CO23428	Colorado State University	2502	11.1	58.9	1537	Lt-Mod BBS
Grand Mesa	Colorado State University	2486	10.5	58.6	1524	Mod BBS
CO33887	Colorado State University	2285	14.8	60.3	1547	Lt-Mod BBS
CO33911	Colorado State University	2173	12.3	58.9	1503	Lt BBS
CO34142	Colorado State University	1890	14.7	59.6	1681	Tr BBS
	Average	2805	11.4	59.3	1394	
	LSD _(0.30)	301				

¹Trial conducted on the Bob Duncan farm; seeded 5/28 and harvested 9/20.

²Disease Notes: The following diseases were present in the variety plots at that site, and were indicative of a susceptible-type reaction. BBS = Bacterial Brown Spot, CBB = Common Bacterial Blight, MBB = Mexican Bean Beetle evaluation on August 21, 2007; trace to light infection observed two weeks earlier from BBS and/or CBB. Notes taken by Dr. H. F. Schwartz, Colorado State University.

Previous Crop: Corn

Fertilizer: None

Herbicide: Cinch, Basagram and Raptor

Insecticide: None

Copper: Kocide

Plot Size: 10' x 31'

Seeding Rate: Approximately 85,000 seeds/acre

COAGMET Monthly Summaries from 2005-2007

Compiled by H. F. Schwartz, Colorado State University
www.coagmet.com

Monthly Daily High Temperature (F)

	2005				2006				2007			
	Holyoke	Burlington	Rocky Ford	Olathe	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	85.3	73.5	77.1	74.6
June	83.4	83.5	89.1	81.3	87.7	87.9	91.8	87.9	88.6	83.4	85.5	87.2
July	92.3	92.6	95.5	92.2	91.9	90.9	92.6	89.0	88.7	91.1	91.7	92.1
Aug	85.6	85.9	88.8	84.2	84.7	87.4	87.9	85.9	89.7	88.8	94.0	88.7
Sept	84.6	83.8	86.6	79.1	71.9	72.8	75.3	72.3	81.7	81.1	85.0	80.5
average	83.7	83.8	87.4	82.4	82.8	83.4	85.7	82.6	86.8	83.6	86.7	84.6

Number of Days Above 95 F

	2005				2006				2007			
	Holyoke	Burlington	Rocky Ford	Olathe	Holyoke	Burlington	Rocky Ford	Olathe	Holyoke	Burlington	Rocky Ford	Olathe
May	1	1	2	0	0	2	1	0	0	0	0	0
June	3	0	0	0	5	6	12	1	4	3	2	4
July	10	10	17	9	11	10	13	4	5	8	8	0
Aug	4	4	7	0	5	8	6	0	6	5	16	0
Sept	2	1	2	0	0	0	0	0	0	0	1	0
total	20	16	28	9	21	26	32	5	15	16	27	4

Monthly Rainfall (inches)

	2005				2006				2007			
	Holyoke	Burlington	Rocky Ford	Olathe	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	0.2	1.6	1.4	1.2
June	2.4	0.0	0.8	0.8	2.3	3.1	0.2	0.1	0.2	0.9	3.0	0.3
July	3.9	2.8	0.4	0.8	1.8	3.7	2.8	1.3	2.9	3.0	0.3	1.6
Aug	4.0	4.8	2.0	0.6	4.9	3.8	3.6	1.2	1.4	4.4	1.9	1.6
Sept	0.0	0.3	1.1	2.2	2.2	1.4	2.6	1.8	1.2	0.5	0.5	2.0
total	12.6	9.9	4.6	4.5	11.8	13.5	10.6	4.4	5.9	10.4	7.1	6.7

Summary: 2007 had higher daily temperatures in southern and western Colorado during July and August
Days above 95 F were greater during July, and could have affected flowering and pod set
Rainfall patterns during 2007 were comparable to 2006. // **CSU Veg Path Web Site:**



<http://www.colostate.edu/Orgs/VegNet/>

Special Market Class

The special market class results will be reported at a later date.

Entry Forms for 2008 Trials

Entry forms for 2008 trials may be obtained from the Department of Soil and Crop Sciences, Colorado State University, Alicia Davisson, C03 Plant Science Building, Fort Collins, CO 80523-1170; telephone 970-491-1914; fax 970-491-2758; e-mail cas_csucroptesting@mail.colostate.edu or web site <http://www.csucrops.com>.



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