Colorado Bean News

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SPECIAL REPORT DIRECT-HARVEST DRY BEANS ARE WE READY ?

Excerpts Presented by H. F. Schwartz & M. A. Brick to the RMBDA on January 14, 2006

Central High Plains Dry Bean & Beet Group Special Report from Colorado State University, the University of Nebraska, the University of Wyoming, and the USDA-ARS. The report was prepared by Mark Brick, Howard Schwartz, John Smith, Gary Franc, Carlos Urrea, Andrew Kniss, Steve Miller, Linda Hansen, and Jack Cecil. The objective is to focus attention on this critical issue and to coordinate ongoing and future efforts in the research community and the bean industry to improve the competitiveness of our region and its ability to compete in the dynamic dry bean marketplace in the 21st Century.

Production Challenges

Increasing dry bean production costs and market competition in the High Plains has contributed to the long term erosion in profitability of the crop. Competition from US production has primarily come from the Northern Plains states, while production in the High Plains has declined. These changes, coupled with increased production and export of inexpensive beans from Canada, China and elsewhere, have altered the landscape of the bean industry and economic viability of the crop in our region. If our industry is to prosper and increase production efficiency, we must consider alternative production systems.

Production systems in the Northern Plains and Canada are based primarily on fewer inputs, such as reduced or no irrigation, minimum tillage, local seed production, reduced herbicide use, and direct-harvest systems. The Canadian provinces (Alberta, Saskatchewan, Ontario) are committed to an aggressive program and long-term investment in the development of high quality pulse crops such as dry bean, field pea, and lentil for their growers. They have focused on reduced inputs and direct-harvested beans to provide their growers with an economic advantage over production systems in the US that are heavily dependent upon irrigation and traditional harvest systems. Direct-harvest, solid-seeded planting systems have also been adapted in the Northern Plains to reduce expenses and increase yield. Reduced cost of production allows these regions to ship beans to domestic and foreign markets at a competitive disadvantage to the High Plains bean industry. More recently, China has invested in production systems to improve bean quality and to secure future export markets to demanding consumers in Central and South America.

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In this Issue

CDBAC - December 2005 Board Meeting

Excerpts from Minutes Recorded by Bob Schork, Administrator

The meeting was called to order by Steve Brown, president, at 9:55 am at the Department of Agriculture's crop soil testing conference room. Directors present were Harvey Colglazier, Randy Kramer, Larry Lande, Bud Pekarek and Troy Seaworth. Six of the Committee's eight active directors being present constituted a quorum. Visitors present were: Bob Schork, CDBAC administrator; Wendy White, Colo. Dept. of Agr.; Steve Anderson, Colo. Dept. of Agr. Statistics; Tim Courneya, Bean Futures Committee member

Steve Brown introduced Tim Courneya, an officer of the Northarvest Bean Growers and a member of the Future's Committee that is exploring the possibility of merging the USDBC, ADBB and the Bean Health Alliance. Tim discussed in depth the benefits of the merger and how the new organization would be structured. The proposed budget for the merged organization is $600,000 for 2006. Dues would be adjusted annually based on each state's crop production. He said that Colorado's dues would be increased from $18,512 in 2005 to $28,526 in 2006. He also discussed the dues that dealer organizations and corporate members would pay. Voting would be proportional to dues paid with no organization having more than a 49% vote. There was a detailed discussion between the directors and Tim about the pluses and minuses of the merger for Colorado. Wendy asked what the domestic agenda would be. Tim said the "nutritional marketing" through "influencers" would continue. These include American Diabetic, American Cancer and other similar societies. He said there will be a scientific advisory committee to help direct and influence future research.

Steve asked Wendy White to discuss the failed referendum to increase the Colorado assessment rate from $0.06 per cwt to $0.10. Wendy said the referendum failed by a vote of 35 to 14. She said it was determined at the last minute the handlers were not allowed to vote. There was a general discussion that more information and meetings would be required in order to get more producers to vote in favor of an increase. Steve Brown said Jim Rubingh had suggested waiting a least one year before considering another referendum.

Wendy and Steve then discussed assessing bean handlers in other states. They said there had been discussions with Nebraska that concluded that an assessment for beans needs to be paid to the state in which they are grown, regardless of where the beans are sold. Bud Pekarek made a motion that Bob Schork be given a list of bean handlers near the Colorado border in

CDBAC Budget as of September 30, 2005

	BUDGET	YTD ACTUAL	BUDGET vs ACTUAL
Assessments	60,000	38,344	(21,656)
Interest	400	444	44
Total Income	60,400	38,788	(21,612)
Research	38,000	38,000	0
Administrative	4,800	3,600	1,200
Promotional	5,500	5,569	(69)
Meetings & Travel	3,500	1,635	1,865
Dues	19,800	17,539	2,261
Magazine	10,000	7,500	2,500
Accounting and legal fees	2,000	1,183	817
Refund of assessments	2,500	615	1,885
Telephone, postage, supplies	0	0	0
Total Expenses	86,100	75,641	10,459
Excess (Shortage)	(25,700)	(36,853)	(11,153)

[Dues include membership in the National Dry Bean Council & American Dry Bean Board]

Nebraska, Kansas and Wyoming and that he send them a letter about Colorado's assessment rate and where to mail assessments for beans that were grown in Colorado. Larry Lande seconded the motion and it was unanimously approved. Steve Brown said he could get a list of the handlers.

Wendy and Steve also discussed that there were apparently no garbanzo beans grown in the state last year so the question of assessing them was moot. They also discussed the success of the Nebraska trade mission to Cuba and that there was no legislative support in Colorado for a similar mission. Wendy discussed the Department's strategic plan, projects for the Colorado Proud campaign and the Colorado Vine magazine.

Steve Brown said that a meeting has been scheduled with the BNSF railroad for next Monday at the Embassy Suites hotel. The purpose of the meeting is to let the railroad know the problems their proposed changes to railcar allocations would have for bean dealers.

Steve Andersen presented the crop report for 2005. Production of Colorado beans is forecasted to be 1,980,000 cwt. This is a 941,000 cwt increase over 2004's production. There was a discussion of the accuracy of previous year's forecasts. Bud Pekarek asked about error rates. Steve said the volatility between original forecasts and actual results has decreased over the years. He said he would forward a report showing this to the directors. He also noted that farm storage was excluded from the statistics.

There was a general discussion about bean issues. Larry Lande was asked by Steve Brown to coordinate a meeting with state legislators. Wendy said she takes Colorado Proud products to the legislature once a month and offered to help with the meetings. Steve Brown said that Bud Pekarek had arranged a meeting with the Secretary of Agriculture on January 31st. Steve and Bud will be in Washington at that time for the USDBC and ADBB's annual meetings.

There was a discussion about including beans in the federal farm program. LDP's and fruit and vegetable status were also discussed. Bud talked about problems with the WTO. Larry talked about loan payments versus crop prices. Steve said that the farm program is a plus to handlers. Randy said West Slope bean producers were against all farm programs and they do not want any subsidies for beans.

Steve Brown then discussed that the US Department of Agriculture has decided to start publishing dealer stock reports. He said the USDBC has requested that all states comply with the request in order to increase the accuracy of the report. So far North Dakota, Michigan and California have agreed to provide reports. He also said the RMDBA has asked Colorado dealers to provide stock reports. Harvey Colglazier made a motion that Colorado Department of Ag Inspection should start reporting dealer stock positions. Bud Pekarek seconded the motion. The motion was approved with Harvey, Bud, Troy Seaworth, Larry Lande and Steve Brown voting in favor of the motion. Randy Kramer voted against it.

Steve Brown then discussed the desirability of having more producer participation in national meetings. He suggested that the travel budget be increased in 2006 to help reimburse directors that attend these meetings. He suggested that a flat rate per day and having two people to a hotel room would help contain travel costs. Wendy said she would get the Committee a copy of the Colorado's travel policy for state employees. Steve said that he and Bud had volunteered to attend a national check off meeting to be held in Fargo, ND on January 19th. He asked if anyone else would like to attend this meeting or the annual meeting at the end of January. Larry Lande said he would attend if his schedule permitted it.

Bob Schork presented the Committee's financial reports as of November 30, 2005. He estimated that the cash on hand at 12/31/2005 would be $87,000. There were no questions about the financial statements as presented. Bud Pekarek made a motion to accept them as an accurate record of the Committee's financial position. Troy Seaworth seconded the motion and it was unanimously approved.

Bob then presented the minutes from the board's March 24th, 2005 meeting. Steve Brown stated these were the same minutes mailed to directors in April. There were no corrections offered to the minutes. Troy Seaworth made a motion to accept the minutes as an accurate record of the board's meeting. Harvey Colglazier seconded the motion and it was unanimously approved. [***Editor Note:*** Excerpts of these minutes were published in the Summer 2005 Vol. 18 - Issue 3 of Colorado Bean News.]

Steve Brown then presented a budget for discussion. He said that he had asked Bud Pekarek and Harvey Colglazier to help prepare a preliminary budget for discussion. It was agreed that based on NAS crop forecast, the budgeted revenue for 2006 would be $106,000. Next there was a detailed discussion about approving $29,000 in dues to be a member of the merged bean organizations. Harvey Colglazier made a motion to approve $29,000 in dues for 2006. Bud Pekarek seconded the motion. It was approved with Larry Lande, Troy Seaworth and Steve Brown also voting in favor of the motion. Randy Kramer abstained from voting.

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BEAN BYTES

New Kidney Bean Germplasm Line

Excerpt from Plant Health Progress, 23 Sept. 2005

A new germplasm line dubbed "USDK-CBB-15" is now available for breeding new varieties of dark red kidney beans that can resist common bacterial blight. Caused by the pathogen Xanthomonas axonopodis pv. phaseoli, bacterial blight is an endemic disease affecting bean crops east of the U.S. Continental Divide. Antibiotic treatment, clean-seed programs and sanitation are standard control measures. However, resistant crops are the key defense, according to Phil Miklas, a plant geneticist in the Agricultural Research Service's (ARS) Vegetable and Forage Crops Production Research Unit in Prosser, Wash. Miklas developed USDK-CBB-15 using marker-assisted selection, a method of detecting inherited genes that speeds the screening of plants for desired traits such as disease resistance. USDK-CBB-15 is the product of kidney bean crosses that Miklas made to incorporate resistance genes from the Great Northern bean cultivar "Montana Number 5" and the breeding germplasm line XAN 159. James Smith, in ARS' Crop Genetics and Products Research Unit at Stoneville, Miss., and Shree Singh, with the University of Idaho at Kimberly, collaborated with Miklas on the new kidney bean's development, testing and evaluation. They will post a registration notice with detailed information on USDK-CBB-15 in an upcoming issue of the journal Crop Science. Miklas is handling seed requests.

National Soybean Rust Symposium

The first-of-its-kind National Soybean Rust Symposium, organized by The American Phytopathological Society, attracted a diverse audience of more than 350 attendees. A total of 43 presentations, three breakout sessions, and 53 posters comprised the two-day event which was designed to:
o Provide the best research and latest information on soybean rust acquired during North America's first crop season with the disease.
o Identify national priorities for strategic response and research planning on soybean rust.

The proceedings are now posted on the PLANT MANAGEMENT NETWORK'S publicly available Soybean Rust Information Center at www.plantmanagementnetwork.org/infocenter. According to Gary Bergstrom, symposium coordinator, "The symposium successfully met its purpose. We have a wealth of information that we've compiled and are making available to all the key

Colorado Dry Bean Administrative Committee Variety/Crop Year CWT Summary (10/23/05)

	1988-92	1993-97	1998-02	2003	2004	2005	2006	Total
Pinto	12,913,340	10,670,370	8,920,632	1,075,657	797,945	NA	NA	34,377,944
LRK	240,180	733,012	581,394	106,478	24,091	NA	NA	1,685,155
GN	41,740	80,955	6,275	5,038	0	NA	NA	134,008
Navy	53,731	25,000	11,293	0	0	NA	NA	90,024
Blacks	17,028	32,953	13,653	0	0	NA	NA	63,634
Pinks	39,182	7,453	0	0	0	NA	NA	46,635
Anasazi	9,034	16,071	5,441	0	0	NA	NA	30,546
Sm White	19,629	0	0	0	0	NA	NA	19,629
Reds	13,972	7,159	10,426	0	0	NA	NA	31,557
Cranberry	0	798	0	0	0	NA	NA	798
Yellow	0	275	240,551	47,029	22,901	NA	NA	310,756
Total Assessments	13,347,836	11,574,046	9,789,665	1,234,202	844,937	NA	NA	36,790,686
Crop Estimate	15,849,000	12,837,000	10,907,000	1,168,000	1,039,000	NA	NA	
% of Estimate	84.22%	90.16%	89.76%	105.67%	81.32%	NA	NA	

stakeholders dealing with soybean rust. Attendees were also able to walk away from the meeting with the latest information available on the disease. We anticipate the findings will play a significant role in plans for 2006."

$ 5 Million Grant for Legume Genomic Research

Excerpt from Northarvest Bean Grower, Nov/Dec 2005 Issue

The USDA recently announced up to $ 5 million in research funding for functional genomics and bioinformatics research on legume crops, available through the USDA National Research Initiative (NRI) Competitive Grants Program. This announcement is the culmination of a 4-year cooperative effort by the American Soybean Association and the American Alfalfa Alliance, National Dry Bean Council, Peanut Foundation, United Soybean Board, and USA Dry Pea and Lentil Council. Research on legume plants (Fabaceae) offers unique opportunities for basic gene and genomics studies to improve the nutrition, yield and disease-resistance of legume crops. This will provide more knowledge about the genomics of all the legumes, which will lead to the identification of genes with desirable characteristics that can be more easily transferred into legume plants through either biotechnology or traditional breeding methods.

"*One Roof, One Voice*"

Excerpt from Northarvest Bean Grower, Nov/Dec 2005 Issue

It's a matter of the dry bean industry working together under one roof and speaking with one voice. As Northarvest Bean executive vice president Tim Courneya sees it, that's the key advantage of a proposed merger of the nation's three dry bean groups: Bean Health Alliance (www.beansforhealth.org), American Dry Bean Board (www.americanbean.org), and U.S. Dry Bean Council (www.usdrybeans.com). All three national organizations do good work - they promote the consumption of beans. But one can see where media, consumers, end users and policy makers might get confused as to who to turn to for dry bean information. "one go-to organization would give us a unified response to key food industry trends," says Courneya, "from promoting beans to consumers and the media, to addressing competition from imports and from other foods, and in addressing regulatory issues as well. In promoting the consumption of beans and the health benefits of beans, it just seems to make sense to have everyone on the same page."

Last July, boards of the three national groups approved the merger concept. Each organization is currently reviewing a drafted set of bylaws. If a merger is approved, a transition period of several months would follow to ensure the continuity of program and budget commitments, and to allow new managerial and organizational structures to take shape. Courneya points out that there may be initial costs upfront in merging the organizations, but in the long run, there would be business and cost efficiencies of one national organization, and ultimately, a more effective investment of checkoff dollars and industry funding of bean promotion programs.

BEANS MAKE BIG NEWS - FOOD PYRAMID

The USDA recently introduced a new food pyramid called "My Pyramid." The Food Guidance System is an interactive version of the old pyramid and is based on the 2005 U.S. Dietary Guidelines that were announced in January. With the food pyramid came great news for beans, as they are the only food included in two separate food groups. As a meat equivalency (meats & beans) and as a vegetable (vegetables), beans are an easy way for Americans to start taking small steps to a healthier diet and lifestyle. For more information on the new food pyramid, visit www.mypyramid.gov.

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Colorado State University

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Barry Ogg	Plant Breeding	970-491-6354
Jerry Johnson	Variety Testing	970-491-1454
Cynthia Johnson	Variety Testing	970-491-1914
Jim Hain	Variety Testing	970-345-2259
Jessica Davis	Soil Science	970-491-1913
Scott Nissen	Weed Science	970-491-3489
Frank Peairs	Entomology	970-491-5945
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Reg Koll	ARDEC Station	970-491-2405
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Wayne Cooley	Montrose Cnty.	970-249-3935
Dan Fernandez	Dolores Cnty.	970-677-2283
Fred Peterson	Weld Cnty.	970-304-6535 x 2073
Assefa Gebre - Amlak	Phillips Cnty.	970-854-3616
Bill Hancock	Otero Cnty.	719-254-7608
Ernie Marx	Larimer Cnty.	970-498-6003
Tom McBride	Adams Cnty.	303-637-8100
Ron Meyer	Kit Carson Cnty.	719-346-5571
Frank Sobolik	Pueblo Cnty.	719-583-6566

Websites of interest to bean growers

www.csuag.com

www.coagmet.com

www.colostate.edu/Orgs/VegNet/beanlinks

www.csuag.com/cbn
(for back issues of Colorado Bean News)

BEAN BREEDING HISTORY at Colorado State University

Excerpts from the Dept. of Soil & Crop Sciences Publication

COLORADO DRY BEANS CDBAC Sponsored Program

Dry Bean Production

Dry beans have been grown commercially in Colorado for more than 100 years. The primary market class has been pinto bean, usually comprising more than 90 % of the total crop. Other market classes produced, include small red, Anasazi, pink, light red kidney, small white, and others.

Pinto beans have been an important crop in Colorado agriculture since production statistics were first compiled in 1909. At that time, 5000 acres were planted that had an average yield of 580 pounds per acre at a price of $3.60 per cwt. Pinto bean production increased to 20000 acres by 1914 and 243000 acres by 1917; of which only 40000 acres were under irrigation. The industry enjoyed steady growth throughout the 20s and 30s, and saw a record high in 1943 with 460000 harvested acres. Average yield at that time was 525 lb/A at $5.70 per cwt. From 1970 to the mid 1990's, acreage fluctuated between 120000 to 225000 acres annually, and average yields steadily increased to more than 1800 lb/A. Prices during this period varied from $8.60 to $31.20 per cwt. Acreage since the mid-90s has steadily declined due to low prices and irrigation water competition. In 2003, the area planted to bean was the lowest since the early 1900s at 69000 acres. Prices currently vary between $14 to $18 per cwt. Given that the current cost of production is estimated at $15 per cwt, it is clear that the profit margin for the bean crop is minimal and lower prices have reduced the number of acres to historic lows.

Dry Bean Improvement and Breeding

Alvin Kezer and Walter Sackett were among the first scientists in Colorado to work with dry beans. In 1918, they reported on dry bean production practices in Colorado. Early bean varieties were derived from land races grown by Native Americans or imported from other regions, including Mexico. The market class that we recognize today as pinto bean was known by several names during the early years of cultivation including: Mexican, Mexican bean, Mexican tick bean, Colorado bean, army bean, and others.

Dry bean breeding activities in Colorado during the early 20th century were primarily focused on single-plant selections by Kezer and Sackett. Selection criteria included high individual plant yield, early maturity, uniform ripening of pods, and freedom from disease. The selections were planted in rows, and the highest-yielding rows that had desirable agronomic characteristics were saved for future planting stock. During the 1930s, Dwight Koonce, who worked on beans for Colorado A&M at Hesperus, cooperated with a local bean grower, Homer Norton, to identify and select disease-free plants in the field in the San Juan Basin of south-central Colorado. Their work led to the release of the variety 'San Jan Select', a virus-resistant variety that was the most widely grown pinto in the region until the early 1980s, when the pinto variety 'Cahone' was released by CSU.

Origin of the Breeding Program

The first formal breeding program at CSU was first proposed in 1948 by Donald Wood, who was hired as an Assistant Professor to help Dr. Warren (Red) Leonard with barley breeding and to help

See HISTORY on page 14

Pinto Bean Seed Quality Decline ??

Summary by Howard F. Schwartz, Colorado State University

Recently, some bean processors have expressed concerns about increasing difficulties in obtaining high quality pinto bean seed (good size, shape and color) from some irrigated regions of Colorado and elsewhere. They feel that overall quality has declined in recent years, and they speculate that part of the problem could be due to irrigation scheduling and the planting of different varieties. So I have reviewed some of the literature (Colorado, North Dakota, Nebraska) for reports on seed quality and any relation to varieties and production / storage factors (moisture, relative humidity, temperature, light exposure).

Harvest and Storage Summary:

Variety-wise, there have been studies to show that there can be a genetic pre-disposition to darkening, especially when high moisture, sunlight exposure and high temperature conditions favor this process in the field and/or in storage. I did find some reports that show that the CSU-released varieties 'Bill Z' and 'Montrose' exhibit acceptable seed color and quality in comparison to other varieties such as 'Apache', 'Vision', 'Winchester', and 'Chase' exposed to the same conditions (temperature, moisture post-harvest).

- Delayed harvest has a negative effect on seed coat color across varieties
- Seed exposed to sunlight darkened more quickly than seed kept out of the sunlight
- Seed from plants grown under higher relative humidity (in growth chambers) was darker
- As seed storage temperature and/or humidity increase, seed quality and color decrease, hard seed coat increases, and cooking time increases

For more detailed information on these reports, consult http://www.csuag.com/cbn/

- Vol. 11 - Issue 4,"It's a Keeper - CO 51715 (Montrose)
- Vol. 12 - Issue 1, "Pinto Bean Seed Color"And www.northarvestbean.org/html/grower.cfm
- April 2001 Article, "Post Harvest Management to Maintain Bean Quality"
- April 2002 Article, "Pinto Bean Storage to Maintain Quality"
- April 2005 Article, "Studies to Minimize Seed Coat Color Darkening in Pinto Beans"

Irrigation Summary:

The following addresses concerns about the effects of late-season irrigation practices upon the wide-spread deterioration of pinto bean seed quality in many varieties across the region, which give North Dakota and southwest Colorado producers a price advantage for their higher-quality dryland-produced product. I could not find any reports or work on the effects of late-season irrigation practices directly upon seed quality, but as noted above one North Dakota study reported that higher relative humidity exposure to plants (and harvested seed) in a growth chamber and seed after harvest increased seed coat darkening; especially when seed was exposed to higher temperatures and sunlight.

Our regional bean publication, *Dry Bean Production and Pest Management - 2nd Edition*, contains an excellent section on irrigation management (Pages 41-49). There is a good data base that shows dry beans (with healthy root systems, good drainage, etc) require very little water late in the season after flowering and pod set/fill. The Nebraska group compared late-season water stress (none vs limited vs high) effects over a 3-year period, and documented that limited water stress (1 - 2 fewer irrigations late in the season) had minimal effect on yield under sprinkler and furrow irrigation. This type of data could be very helpful in a campaign that urges growers to **avoid over-irrigating their sprinkler-grown beans especially late in the season which will reduce pod and seed wetting, and presumably seed coat darkening.** *Saving money on fewer irrigations while maintaining yield potential, and making more money on incentives for higher quality seed should convince growers that they need to pay more attention to their irrigation schedules and impacts on the crop and late-season diseases (white mold) and their pocketbook.*

SPECIAL REPORT from page 1

Economic Reality

In 1990, production costs for pinto beans grown under irrigation in northeastern Colorado were estimated at $ 285 per acre, with an additional $ 70 per acre for property and ownership, resulting in total costs of $ 355 per acre. More recently, Burgener (2004) estimated total cost of bean production in the High Plains to be $ 322 and $ 346 per acre under furrow and sprinkler irrigations systems, respectively. Colorado State University Agriculture Economist, Dennis Kaan, estimated that a pinto grower needs to achieve yield levels of 30 cwt per acre at $ 15 per cwt or 25 cwt per acre at $ 18 per cwt to break even. These figures do not leave a large margin for profitability of the bean crop, and sometimes mean that growers will lose money. Because growers and processors cannot control prices or the fluctuation in prices, their only recourse for survival is to reduce production costs and/or to increase yield in an increasingly competitive market. Based on production trends outside Colorado during the last 10 years, it is unlikely that bean prices for pinto and great northern will often exceed $ 20 to 22 per cwt. Furthermore, due to the recent sharp rise in energy costs, we can count on higher total production costs than in the recent past. Survival of the bean industry will depend on whether we are willing to change our production systems to meet the competition. Doing so will require an immediate investment in research and resources to adapt to new production systems as quickly as possible. Throughout the evolution in modern farming, change has required producers to become more efficient and competitive, while meeting the evolving needs of buyers and consumers. Those that remain static will not survive the ever-changing global economy, and we have already seen many bean acres phased out in the High Plains states as evidenced in Colorado during the last decade (Table 1).

Dry bean production systems that utilize narrow-rows (NR), or a combination of narrow bed spacing and multiple rows per bed, in combination with direct-harvest (DH) systems have been shown to reduce the cost of production and increase yield compared to conventional

Table 1. Dry Bean Production in Colorado, 1996 to 2005.

CO Acreage	**Northeast**	**East Central**	**Southwest**	**Southeast**	**STATE**
1996	52,000	62,100	26,600	4,300	145,000
1997	43,500	52,000	35,000	4,500	135,000
1998	49,000	67,000	48,500	5,500	170,000
1999	46,700	50,000	52,000	6,300	155,000
2000	38,500	33,500	43,100	4,900	120,000
2001	32,600	33,700	44,400	4,300	115,000
2002	36,500	26,000	26,200	3,300	92,000
2003	22,500	24,600	30,900	2,000	80,000
2004	18,000	20,000	34,000	3,000	75,000
2005	Not Available	Not available	Not available	Not available	130,000

Source: Colorado Agricultural Statistics

Table 2. Pinto bean seed yield under narrow (22 in) and wide (30 in) bed spacing with single and double rows/bed at Ft. Collins and Fruita,CO in 1989 and 1990.

		Fort Collins		Fruita	
		1989	1990	1989	1990
Bed Width	Rows/bed	---------- lbs/acre ----------			
22 inch	Single row	2522 b†	1311 b	3575 a	3893 a†
	Double row	2860 a	1709 a	3490 a	3761 a
	Mean	**2691 A**	**1510 A**	**3532 A**	**3827 A**
30 inch	Single row	2320 c	1024 c	3426 a	3316 b
	Double row	2701 ab	1575 a	3528 a	3355 b
	Mean	**2511 B**	**1300 B**	**3477 A**	**3336** B

†Means within a column followed by the same letter are not significantly different at $p < 0.05$.

production systems. Research on pinto bean production systems with older varieties in Colorado (Mehraj et al., 1996) revealed that reducing the bed width from 30 to 22 in. increased yield by 9 % when averaged over two years and two locations (Table 2). They reported that planting double rows on 22 or 30 in. beds also increased yield by 7 % over single row arrangements, and concluded that yield increased in proportion to increased uniformity of plant-to-plant spacing. The results from this research indicate that techniques that distribute plant spacing more uniformly have a positive influence on yield potential, independent of disease responses to varying plant densities. Producers in the High Plains currently depend on single rows on 30 in. beds. Smith (2004) stated that, "Choice of row width for dry edible bean production is usually a compromise of issues including maximum yield potential, row spacing for other crops sharing the same tractors and implements, disease potential, method and scheduling of irrigation, and harvest options." We must look at each of these issues to enable producers to adapt to NR/DH systems.

Disease Issues

Diseases such as white mold, bacterial bean blights, (bacterial brown spot, common bacterial blight, halo blight), and perhaps root rots are expected to increase with the move to narrow row bean culture. Increased disease risk would primarily result from closer plant/root proximity, increased relative humidity, and/or more moderate temperatures in the plant canopy and soil surface compared to a traditional row spacing. To reduce plant-to-plant competition and reduce canopy humidity, varieties with upright plant architecture and disease resistance are needed. Upright plant architecture with high pod set also will reduce the risk of direct pod infection by Pythium, Rhizoctonia, and white mold due to pod contact with the soil surface. Because white mold is the disease most likely to increase with narrow-row culture, fields with a history of the disease should integrate upright varieties with proven tolerance or partial resistance to white mold, effective root rot seed treatments and additional white mold suppression using properly-timed fungicide applications. Other foliar disease threats can be dealt with by implementing components of an effective integrated pest management strategy as needed.

Variety Issues

At this time, a major obstacle to adoption of NR/DH systems is the lack of adapted dry bean varieties that have upright architecture, acceptable seed quality, and uniform maturity and "dry-down". Breeding programs will certainly need to address white mold tolerance during selection and development of varieties suitable for narrow-rows, while maintaining adequate resistance to other sporadic and serious diseases such as rust and bacterial blights. It is anticipated that the availability of suitable varieties, as well as educational programs on disease management, can reduce disease risk to acceptable levels under NR/DH systems. Recently, plant breeders have placed greater emphasis on breeding for upright architecture, and new narrow profile upright bean cultivars have become available. In general, these varieties have not had competitive yield potential when compared with conventional vine and semi-vine varieties in conventional plant spacing systems. Therefore, there is a need to test these newer varieties for yield potential in NR/DH systems with appropriate pest management programs. Presently there is no single parameter that can be used to evaluate varieties for adaptation to direct-harvest systems. We know that varieties adapted to DH systems must have erect architecture, mature uniformly, and set pods above the soil surface. Observations in NE, CO, and WY suggest plant architecture response for a given variety can be variable in different production regions and systems in different years. We need to better understand the cause of environmental variability and how varieties respond to changes in production systems.

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Tillage and Planting Systems

Tillage and planting systems must be developed which complement direct-harvest, while still supporting high yield, minimizing soil compaction, and reducing input cost. Recent innovations in planters that can accommodate large seeded crops to plant in narrow rows may allow us to plant in solid stands that can be irrigated with overhead irrigation systems. These planters have been adopted in the Northern Plains and Canada, where narrow row spacing (6 to 15 in.) is relatively common (Smith, 2004). Narrow-row cropping systems in these regions have been shown to increase yield, as well as reduce weed competition and production costs. Production under furrow irrigation will be limited to reduced bed width and/or multiple rows per bed.

Direct-harvest systems will be a natural progression in management for those using no-till as a means to reduce input costs, conserve soil moisture, or improve soil health. For those using conventional or minimum tillage systems, management practices will be needed to conserve soil moisture, reduce input cost, and minimize soil compaction. Direct-harvest systems must leave the soil surface level for harvest operations to proceed efficiently because combine headers must be positioned close to the soil surface to prevent pod loss. Soil ridges or undulations in the soil surface at harvest effectively raise the combine header and cause yield loss due to the inability to collect pods in the lower canopy. If row cultivation is used, soil cannot be thrown into the plant row as with current tillage systems. The ridge formed around the base of the plant by cultivation is very effective for weed control, but substantially increases direct-harvest field loss. A primary goal for direct-harvest systems is to maintain level soil surface conditions throughout the season until harvest.

A wide spectrum of planting equipment is available today to plant any desired row spacing. However, we still must achieve accurate seed spacing, plant population, seed depth, and minimize seed damage during planting. Grain drills with roller or seed cup metering systems are usually not good choices because of inaccurate seed metering and potential seed damage. Air drills which convey seed from a central metering system to individual openers have been used for dry bean planting, but seed damage in the central metering system and in the air distribution system have been problems with some models. Uniformity of seed depth also has been a concern with some grain and air drill models. Row crop planters remain the preferred choice for planting edible beans, even narrow-row beans, because of their accurate seed metering, seed spacing, and seed depth control. Row crop planter models are available to plant rows as narrow as 10 inches.

Direct-Harvest Equipment

Direct-harvest of dry beans is not new to our region, but equipment options and their operation must be matched to our varieties and growing conditions to achieve the highest seed quality and lowest harvest loss. Two basic combine header types have been used for dry edible beans including, the flex head and Deere Row Crop head. The row crop head is generally limited to row widths of 30 or 22 in. By far the most popular header for dry beans in other growing areas has been the flex head and is available in widths up to 36 ft. Flex head options that must be evaluated in our region include air systems (air reels), rock dams for fields with rocks, lifter guards, automatic header height control, heavy duty cutter bar systems, "fast cut" sickle systems, and controls for synchronizing reel speed with field speed.

Research on direct-harvest equipment at the University of Nebraska over the last five years, and measurements in several growers' fields, found direct-harvest field loss to be generally in the 4 to 6 bu. (2.4 to 3.6 cwt) per acre range, with losses as high as 15 bu. (9 cwt) per acre. With a level field, an upright variety with high pod set, good growing conditions during the season, and the right header equipment, field losses as low as 2 bu. (1 to 2 cwt) per acre have been measured. Achieving acceptable yield loss consistently from field-to-field and year-to-year will entail more than just selecting an upright variety, or just changing the header on the combine. It will require the development of an entire production system. Decades of University and industry research and grower innovation and implementation have brought us to where we now are with conventional harvest dry bean production systems. A similar effort will be necessary to achieve the same level of success with direct-harvest for the next decade.

Can We Reduce Production Cost?

The largest portions of the production cost for dry beans in the High Plains are for planting, cultivation, pesticides, and irrigation (Burgener, 2004). Unfortunately, in the High Plains it may be difficult to reduce irrigation costs because we live in an arid climate with low rainfall and relative humidity during the peak growth period. However, systems that involve narrow-rows will provide canopy cover earlier in the season resulting in reduced soil moisture loss, and more uniform plant distribution that will enhance water extraction efficiency, especially if combined with soil compaction alleviation and enhanced root health. Another area of cost reduction that has been adopted in the Northern Plains and Canada has been the use of farmer-saved or locally-grown seed. We do not advocate these practices in the High Plains due to the prevalence and threat of seed-borne transmission of bacterial pathogens, such as common bacterial blight, halo blight, bacterial brown spot and others. Our systems

must continue to use high quality Certified seed produced in the arid western U.S.

Reduced Harvest Cost

With NR/DH systems, the most obvious reduction in cost would be in the harvest operation. Direct-harvest beans would eliminate at least one, and in some cases two field harvest operations. It also would reduce the risk of weather damage to seed during the critical time the crop is in the windrow. This alone was a major factor that led the Northern Plains and Canadian growers to adopt DH systems. A major drawback to DH systems is the delay in harvest because the seed pods must dry adequately on the plant prior to threshing. This may delay harvest for 1 to 2 weeks for many pinto and great northern varieties. Alternatively, growers may apply a desiccant to ensure more uniform and rapid crop dry-down. There are several concerns with the use of desiccants that need to be explored before the practice becomes widely used in the High Plains. First, approved desiccants have not been consistently effective because plant dry down has been slow and inconsistent due to weed infestation and/or soil moisture stress. Application timing; coverage, penetration, and rates; as well as new desiccants should be evaluated. Application of desiccants can also be problematic. Ground application is difficult even in 30 in. rows with a heavy canopy. However, ground rigs with spray boom widths now exceed 100 ft., and aerial application may be possible, in addition to low-volume chemigation.

Reduced Weed Pressure Under Narrow Row Culture
Dry bean variety and plant spacing are important factors in determining the amount of mid to late-season weed pressure. Canopy cover determines the amount of sunlight that reaches the soil surface. Under dense canopies, the soil surface receives limited light that suppresses weed growth and weed seed germination. Late-season weed density increases as row spacing increases. In western Nebraska, there were 38 % more weeds in late September in dry beans planted to 30 in. rows compared to 10 in. rows (Wilson et al., 2004). Solid stands may reduce the need for post-emergence herbicide application. In Wyoming during 2004, weed biomass was reduced by 70% when row spacing was reduced from 30 to 22 in., and reduced 89% when row spacing was reduced to 15 in. In that study, dry bean yield was 9 % higher under 15 in. rows compared to 22 or 30 in. row spacings.

Reduced Soil Erosion

The bean industry and producers are interested in reducing the cost of production and increasing sustainability of cropping systems. Direct-harvest systems provide the opportunity to both reduce production costs and soil erosion. Soil erosion is one of the most important environmental problems affecting dry edible bean production in the High plains. Soil erosion occurs primarily from March to May after soil thawing because the soil surface is exposed to wind erosion and there is limited residue to protect the loose soil. Direct-harvest of dry edible beans has the potential to greatly reduce soil erosion because of lack of soil disturbance (no undercutting), higher plant populations, and the maintenance of crop residue once dry beans are harvested. Minimum tillage practices for planting can also be implemented to provide residue cover and further reduce erosion potential. Direct-harvest should also lead to improved seed quality because of less soil contamination.

Development of DH/NR Cropping Systems for the High Plains

The development of NR/DH cropping systems for the High Plains should involve collaborative research among scientists in CO, NE and WY. The Central High Plains Dry Bean and Beet Group (CHPDBBG), a group of scientists from Colorado, Nebraska and Wyoming, meet annually to discuss dry bean and sugar beet research, extension, and production activities in our region. In October, 2005, this group agreed that research efforts are needed on the adaptation of NR/DH systems for our region. The group acknowledged that the scientific personnel to address the research challenges are in place at Land Grant Universities in our region. It was further agreed that it would take the combined support of the bean industry, university administration, producers and processors to be successful. Therefore, the CHPDBBG decided to launch an effort to obtain both the community and financial support for a new initiative to develop NR/DH systems for our region.

We propose to initiate dialogue between the dry bean industry and scientists in the CHPDBBG to plan, fund and implement the pressing research needs for DH/NR systems. The primary objectives of this research are to determine the most economical and efficient plant population, in-row plant spacing, bed and row width, as well as irrigation practices, fertility, pest management, and variety needs in response to variable plant populations. A major issue will be the breeding and/or selection of varieties adapted to NR/DH systems. Planting and harvest dates will need special attention as well as methods to desiccate the crop for harvest. The greatest immediate need will be the development of planting and harvest equipment to conduct NR/DH systems. At the outset we can test systems being used in the Northern Plains and Canada, however, these systems are designed for rain-fed agriculture and will have to be modified for our environment and cropping systems. Ultimately, we must design systems that can be implemented by producers that reduce input costs, and increase yield and

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product quality to enhance our industry's competitiveness in this dynamic global market. We need your help to advance this concept for the dry bean industry and growers in our region.

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The directors approved the following CSU proposals for 2006: Dr. Schwartz's $10,000 proposal for Dry Bean Integrated Pest Management was unanimously approved. Dr. Nissen's $5,000 proposal for New Weed Management Options for Dry Beans was also unanimously approved. Dr. Johnson's proposal for Dry Bean Variety Testing was approved for $6,000 with the following conditions attached: one of the trials needs to be held in eastern Colorado and one in northeastern Colorado. The directors would also like to see a list of the varieties to be tested before the plots are planted. They might want to ask for some different varieties to be tested. Steve Brown, Harvey Colglazier, Larry Lande and Troy Seaworth were in favor of this project. Randy Kramer abstained from voting. Mark Stack's proposal for variety testing at the Southwestern Research Center was not approved. Dr. Pearson's proposal for performance tests at Fruita was not approved. The directors generally commented that the performance trials have been too repetitive over the years and had not produced new data. The directors also noted the lack of new cultivars that could be tested. Troy Seaworth seconded the motion. The research budget was unanimously approved.

There was a long discussion about Dr. Brick's $14,000 proposal for Dry Bean Breeding. It was noted that Dr. Brick said there was not much in the "pipeline" at the March, 2005 research meeting and that he would be retiring within five years. The directors wondered what new varieties could be developed during this short period. They noted that Bill Z was the last commercially successful variety developed by CSU. [***Editor's Note:*** other successful CSU varieties include 'Cahone', 'Fisher', 'Montrose', Grand Mesa' and 'Shiny Crow'.] They felt that regenerating Bill Z back to its original version would be a good use of funds. They also would like to know what CSU's exit strategy is for Dr. Brick and what will happen to the existing germplasm. Harvey Colglazier made a motion that $14,000 be included in the Committee's budget but that new proposals be requested for use of the funds. Bud Pekarek seconded the motion. There was a discussion that proposals for organic products, improving color, best planting and irrigation practices and how to compete with North Dakota beans would be welcomed. It was noted that the quality of eastern Colorado pintos has declined significantly in recent years. Larry Lande said that his company was paying $1.00 to $1.50 more for better colored beans in the Greeley area as compared to eastern Colorado beans. The directors thought that perhaps beans were being over watered and thereby reducing the color quality of them.

The directors then discussed the remaining budget items. It was noted that the budget for the Colorado Bean News newsletter was being reduced from $10,000

to $5,000. The directors noted that there are less than 800 bean producers in Colorado and the newsletter circulation was almost 3,000. The directors thought that mailing costs could be significantly reduced by getting a smaller more accurate list of Colorado producers. [***Editor's Note:*** One of the long-standing goals of the newsletter since its inception in 1988 by the Colorado Bean Network has been to provide the newsletter to our Colorado bean growers, landlords and dealers in addition to those from neighboring states, some of whom market beans in Colorado and have interest in our activities. In addition we send copies to others that are involved with the dry bean industry such as crop consultants, pesticide and seed company reps, extension agents, etc to keep them informed regarding issues affecting the industry. Therefore, our mailing list does exceed 2500 individuals, many of whom are not Colorado bean growers, but all recipients are impacted by and/or work with the Colorado dry bean industry in some capacity.]

Bud Pekarek made a motion to approve the following budget for 2006:

Bean assessments	$106,000
Interest income	500
Research	35,000
Dues	29,000
Travel	15,000
Administration, postage, copying, supplies	6,000
Colorado Bean News	5,000
Refund of assessments	2,500
Audit and legal	2,000
Promotion	2,000
Excess of revenues of expenses	10,000

2005 COLORADO PINTO BEAN PERFORMANCE TRIAL RESULTS

Dr. Jerry Johnson - Research Scientist/Extension Specialist/Crop Production, Dr. Mark A. Brick - Professor/Plant Breeding Program, Dr. Howard F. Schwartz - Professor/Extension Specialist, Jim Hain - Research Associate/Crops Testing Program, Cynthia Johnson - Research Associate/Crops Testing Program, Mark M. McMillan - Research Associate/Plant Pathology, J. Barry Ogg - Research Associate/Plant Breeding Program, Kris Otto - Research Associate/Plant Pathology, Dr. Calvin Pearson - Professor/Extension Specialist/New Alternative Crops, Mark Stack - Manager/Research Associate,

Colorado State University, Department of Soil and Crop Sciences, C11 Plant Science Building, Fort Collins, CO 80523-1170; telephone 970-491-1454; fax 970-491-2758; e-mail jerry.johnson@colostate.edu.

COLORADO DRY BEANS CDBAC Sponsored Program

Introduction

Colorado producers annually spend millions of dollars on pinto bean seed which makes variety selection important. Making better variety decisions can increase dry bean yields by 10 to 20%. Colorado State University's Crops Testing program, bean breeding program, bean pathology research, and agricultural research stations 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.

The 2005 uniform variety trials were planted at four locations. The two eastern Colorado locations were Haxtun (Platte River Valley), and Idalia (Golden Plains). The two western Colorado locations were Montrose and Yellow Jacket. Varieties tested in 2005 are described in the following tables. A randomized complete block field design with three replicates was used in all trials. The seeding rate was approximately 85,120 seeds per acre with plots consisting of four 30-inch rows and 36 feet long. Trials were in commercial bean fields or on CSU research stations. Seed yields, in pounds per acre, are adjusted to 14% moisture content.

Summary of the 2005 Dry Bean Growing Season

The hot, dry period during July affected plant and disease development in much of the state. Some areas and fields with other stresses (soil compaction, insufficient moisture) sustained significant loss of blossoms and pods, resulting in average to below average yields. Other fields that flowered before or after this period, generally yielded average to above average. Soilborne disease pressure (root rots) was severe in many stressed

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teach a genetics course in the department. The objectives of his program were to: 1) Study the bacterial blight organism, 2) Develop and maintain a Colorado pinto bean seed industry, 3) Breed for resistance to the rust pathogen, 4) Study improved cultural practices, and 5) Breed for improved resistance to bean common mosaic virus and curly top virus. During the following years, Don finished his PhD at the University of Wisconsin and teamed up with local USDA researchers Dr. William (Bill) Zaumeyer and H. Rex Thomas to improve pinto bean varieties for resistance to rust. Don also worked with another USDA bean scientist, Doug Burke, while at Colorado and later in Idaho on bean improvement for rust, root rot and virus resistance.

Breeding activities during the 1970s and 80s focused on incorporation of multiple disease resistance in pinto beans. In 1979, the first full-time Research Associate was assigned to assist Dr. Wood with the Dry Bean Breeding Project. Marco Ballarin joined the team, and helped computerize the program and increase efficiency; the nursery size increased from 5 acres in the early 1980s to more than 12 acres by 1989. At that time, J. Barry Ogg replaced Marco, and has helped the program double the number of crosses made each year, increase nursery size to 18 acres, and take advantage of field nurseries at 3 research station sites in Colorado.

Dr. Wood released three important pinto varieties that were widely grown under irrigation in the High Plains and western U.S; 'Ouray' in 1975 as the first upright growth habit pinto, 'Olathe' in 1981 as the first rust resistant pinto, and 'Bill Z' in 1985 as the most widely grown pinto in the U.S. throughout the 80s and early 90s. Don also released dryland pinto varieties for the southwestern part of the state, with the release of 'Cahone' in 1982 and 'Fisher' in 1995. These varieties continue to encompass essentially 100 % of the pinto acreage in the San Juan Basin.

Current Program Activities

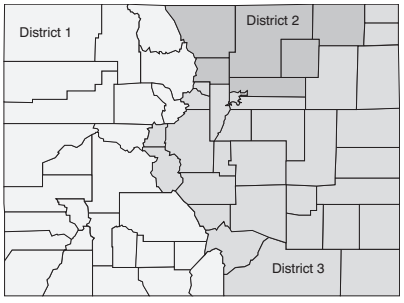
In 1986, Dr. Wood retired as the leader of the Dry Bean Breeding Project at CSU and Dr. Mark Brick became the project leader. The program has continued emphasis on the improvement of pinto bean varieties that possess multiple pest resistance for the High Plains and western U.S. The program initiated crosses for improved varieties in market classes in addition to pinto bean, specifically black and great northern beans in 1990. To date, the program released 'Fisher' in 1995, 'Montrose' in 1999, 'Shiny Crow' in 2000, and 'Grand Mesa' in 2001. Montrose was the first pinto in the region with high yield and a new gene for resistance to the rust pathogen, Shiny Crow was the first black with a shiny seed coat, and Grand Mesa is a semi-upright pest-resistant and white mold-avoiding pinto.

A major influence on the Dry Bean Breeding Program in the 1990s and later was the organization of the dry bean industry to provide funding for research programs. In 1986, certified seed producers in western Colorado through the Colorado Seed Growers Association agreed to provide a voluntary contribution to the bean research programs at CSU based on certified seed tag sales. These funds enabled the breeding and plant pathology programs to enhance breeding efforts, especially for greenhouse and field screening efforts to improve and broaden resistance to rust and other diseases. Further, in 1991, the Colorado Dry Bean Administrative Committee formed, based upon a statewide commodity "check-off" on the commercial sale of dry beans. Research funds from this source enabled the dry bean programs at CSU to improve research efforts in breeding, variety testing, pathology, and Integrated Pest Management.

Today, the dry bean research programs at CSU have activities in breeding, variety testing, pathology, seed production, weed science, and entomology that take place on campus, at three Agricultural Research Centers throughout Colorado, and in grower cooperator fields. The research team includes Mark Brick (breeder), Jerry Johnson (variety testing), Howard Schwartz (plant pathology & IPM), Scott Nissen (weed science), Frank Peairs (entomology), Calvin Pearson and Fred Judson (agronomy and foundation seed), Mark Stack (agronomy), and Abdel Berrada (agronomy). Colorado dry bean producers benefit significantly from one of the most diverse and productive dry bean research programs in the U.S. today, as the CSU Team continues to focus its resources on improving the economic competitiveness of Colorado growers and the industry.

Very recently the Dry Bean Breeding Project initiated research on the chemical and nutritional composition of dry bean cultivars. Dr. Henry Thompson of the CSU Cancer Prevention Laboratory is collaborating with Dr. Brick to identify bean varieties and market classes that have maximal health benefits. The research includes laboratory and pre-clinical trials regarding the ability of beans in the diet to influence the development of cancer, diabetes, and other diseases. Future work will focus on the identification of the genetic control of the factors that relate to health benefits of bean.

CDBAC Membership



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MarketNews Update

Excerpt from Northarvest Bean Grower, Nov/Dec 2005 Issue

The first estimate of dry bean production by class was released by USDA on December 9. With improved yields and increased acreage, national output for all major classes increased from a year ago, with strong increases noted for pinto, navy, and Great Northern beans. Output of pinto beans, which accounts for the largest share (48 percent) of U.S. dry bean production, rose 68 percent to 13.1 million cwt - rebuilding stocks depleted by last year's small crop.

The estimate of 2005 U.S. dry edible bean production was increased this month to 27.2 million cwt - 53 percent above the small crop of a year ago. Harvested area was up 29 percent from a year ago while per-acre yield was 19 percent higher than the weather-reduced low of a year earlier. The national average yield of 17.31 cwt per acre exceeded the 35-year (1970-2004) trend by 24 pounds. Carryover stocks of quality beans at the start of the marketing season on September 1 were reportedly light-being low or nearly exhausted for several classes. Now that the 2005 crop is larger than earlier estimates, U.S. dry bean supplies are expected to be more than adequate to satisfy average domestic and international demand this season. Despite this, with low beginning stocks, available supply across all bean classes is still estimated to be the second lowest in the past 16 years.

The larger crop this year reflects double-digit increases in most dry bean-producing States, with the greatest improvement from a year earlier in Colorado (up 84 percent), Texas (up 83 percent), and Minnesota (up 81 percent). Despite attractive dry bean prices this spring, North Dakota growers only increased planted area 11 percent. However, most of the increase in production within this top dry bean State came from a 50-percent increase in yields - fully recovering from the frost-reduced yields of 2004.

Northarvest Research Investments

Excerpt from Northarvest Bean Grower, Jan-Feb 2006 Issue

Northarvest continues its commitment to research. Between fiscal years 1999-2000 and 2004-2005, Northarvest dedicated 23.5% of the total budget of a total of over 1.72 million dollars, to research aimed at more productive dry bean yields. The 2005-2006 budget allocates 28.6% of the total budget to research. The NBGA approved $219,725 for the following research projects.

- Dry Bean Improvement for the Northern Plains (K. Grafton - $127,500)
- Field Evaluations for White Mold Resistance (J. Rasmussen - $10,500)
- Evaluation for Fusarium Root Rot Resistance (C. Bradley - $11,901)
- Evaluating Nitrogen Fertilizer Rates and Diseases (J. Percich - $33,399)
- Improving Nitrogen Fixation of Beans (P. Graham - $12,506)
- High Selenium Pinto Beans as Value-Added Product (J. Finley - $19,869)
- Grower Survey of Pest Problems, Pesticide Uses & Varieties (C. Bradley - $4,000)

Kelley Bean Acquisition

Excerpt from Northarvest Bean Grower, Jan-Feb 2006 Issue

Kelley Bean Co., headquartered in Scottsbluff, Nebraska recently announced the acquisition of the current dry bean operations assets of KBC Trading and Processing. Specifically, the purchase includes plants in Othello, Washington; Brush, Colorado; Perham, Minnesota; and four plants in North Dakota. No changes in the operations or personnel are anticipated. Kelley Bean Co. will bring 78 years of family ownership values and management style of these facilities in order to provide growers with the best quality seed, additional receiving and processing facilities and new marketing opportunities. It will also provide their end-users and customers in the package, canning, food service and export market segments with continuous quality, greater selection and value, and diversification of regional growing risk.

Northarvest Bean Priorities for 2006

Excerpt from Northarvest Bean Grower, Jan-Feb 2006 Issue

1. The New Farm Bill - planting flexibility provisions, export programs, crop insurance. Growers are urged to contact their bean board members for more information on and input to these issues.
2. New Plant Breeder, Pathologist - there is a search on for a new bean breeder and a new bean pathologist for the North Dakota State University programs.
3. National Organization Consolidation - Northarvest is part of an effort to consolidate Bean Health Alliance, the American Dry Bean Board, and the U. S. Dry Bean Council into one national organization.
4. Exports / Food Aid - Northarvest wants to increase dry beans included in U.S. food aid programs.
5. Domestic Promotion - the NBGA wants to see a stronger emphasis on getting the story about the health benefits of beans to consumers, by educating health and nutrition opinion leaders and influencers.
6. Communications With Growers & Industry Members - key means of communicating NBGA efforts include the annual Bean Day, publication of the Northarvest Bean Grower, and the web site www.northarvestbean.org.

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fields throughout the state. White mold was sporadic, and did cause some losses to fields with a history of the disease, and good canopy cover and adequate moisture. The bacterial blight disease complex (halo blight, bacterial brown spot, common bacterial blight) was also sporadic, especially in eastern Colorado. Common bacterial blight was probably the most severe bacterial disease observed, especially in fields with some storm damage and in response to the warmer temperatures during 2005. There were also some scattered reports of bacterial wilt in some irrigated regions of Colorado and western Nebraska. Rust occurred late in western Nebraska on susceptible varieties, but did not cause any significant damage; and the disease was not detected in eastern Colorado.

Pinto Bean Varietal Descriptions:

00185 An experimental line from ProVita, Inc. (a private bean seed company in Idaho).

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

00211 An experimental line from ProVita, Inc. (a private bean seed company in Idaho).

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

03222 An experimental line from ProVita, Inc. (a private bean seed company in Idaho).

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

99236 An experimental line from ProVita, Inc. (a private bean seed company in Idaho).

Bill Z A medium maturity (95-97 d) 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) 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.

Canyon ADM Edible Bean Specialties, Inc.

CO12531 An experimental pinto line from Colorado State University.

CO12613 An experimental pinto line from Colorado State University.

Grand Mesa A medium maturity (96 d) 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.

Montrose A medium maturity (97 d) 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.

Poncho A medium maturity (97 d) 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.

Average pinto bean performance over two eastern Colorado locations.

	Locations		
Variety*	Burlington	Haxtun	Average
	------- Yield (lb/ac) -------		
Poncho	2940	3272	3106
99236	2756	2983	2870
01223	2528	3202	2865
00211	2669	3049	2859
Bill Z	2603	3103	2853
00218	2850	2704	2777
Montrose	2958	2509	2734
Grand Mesa	2457	2987	2722
Myconate-Non-Treated	3197	2069	2633
CO12531	2595	2664	2629
00185	2434	2822	2628
Canyon	2466	2701	2583
Buckskin	2374	2790	2582
99195 MR	2694	2257	2476
CO12613	2006	2782	2394
Myconate-Treated	2552	2198	2375
03222	2239	2505	2372
Average	**2607**	**2741**	**2674**

*Varieties ranked by the average yield over two locations in 2005.

Summary of Pinto Bean Variety Performance in Colorado Variety Trials from 1996-2005

Every year CSU personnel conduct pinto bean variety performance trials in different locations. Both varieties and locations change from year to year so a straightforward, 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 three 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.

Thirty-one 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 was tested in all ten years. Montrose, Grand Mesa and Poncho were tested for nine, seven, and seven years, respectively. 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

Variety	1996	% ave	1997	% ave	1998	% ave	1999	% ave	2000	% ave	2001	% ave	2002	% ave	2003	% ave	2004	% ave	2005	% ave	Long Term Ave	% ave
	Yield (lb/ac)																					
Apache			2107	100	2166	95															2137	97
Bill Z	2459	112	2101	99	2167	95	2617	103	3212	106	2621	101	2613	112	2463	95	2253	106	2454	100	2496	103
Buckskin			2008	95			2475	97	2769	91			2184	93	2382	92	2090	98	2428	99	2334	95
Burke	2329	106	2113	100	2066	90	2464	97	2713	89	2426	93									2352	96
Buster							2672	105	3087	102	2654	102					2185	102			2649	103
Canyon																			2417	99	2417	99
Chase	2260	103	2417	114	2628	115	2584	101	3049	100											2588	107
Cisco							2775	109	3280	108											3028	109
Elizabeth			2367	112	2281	100	2178	86	2780	92											2402	97
Frontier							2542	100													2542	100
Grand Mesa							2631	103	2902	96	2458	95	2329	100	2283	88	1865	87	2265	93	2390	94
GTS Cob 502-94									3139	103											3139	103
GTS-900			1610	76							2339	90					1989	93			1979	86
Hatton	1930	88																			1930	88
Kodiak					2066	90	2542	100	2749	91											2452	94
Maverick	2021	92	1911	90	2434	106															2122	96
Montrose			2830	134	2708	118	2821	111	3213	106	2705	104	2586	111	2956	114	2562	120	2449	100	2759	113
Olathe	2174	99																			2174	99
Othello			2158	102			2265	89	3044	100							1936	91			2351	96
Poncho							2613	103	3332	110	2862	110	2371	101	2826	109	2398	112	2676	109	2725	108
Rally											2312	89	2134	91			1935	91			2127	90
ROG 117			2137	101																	2137	101
ROG 179			2396	113																	2396	113
ROG 214					2259	99															2259	99
ROG 261			2116	100	2368	103															2242	102
ROG 299			1808	86																	1808	86
UI 320					2000	87															2000	87
USPT 72													2559	109							2559	109
USPT 73					2217	97	2418	95	3230	106	2825	109	2374	102							2613	102
USPT 74													1887	81							1887	81
Vision			1624	77	2421	106	2604	102			2790	107									2360	98
Trial Average	**2196**		**2114**		**2291**		**2547**		**3036**		**2599**		**2337**		**2582**		**2135**		**2448**		**2428**	

Pinto Bean Variety Performance Test at Montrose, Colorado 2005

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2 Respectively, Professor/Research Agronomist, Professor - Plant Breeding, Research Scientist/Extension Crop Specialist, Research Associate, and Research Associate; all Department of Soil and Crop Sciences, Colorado State University, Ft. Collins, CO.

Summary

A pinto bean variety performance test was conducted at the Keith Catlin Farm in Montrose, Colorado during the 2005 growing season. Similar studies were conducted at the Keith Catlin Farm in 2003 and 2004. Seed yields in the 2005 trial averaged 1340 lbs/acre and yields ranged from 1737 lbs/acre for 00218 to a low of 677 lbs/acre for 03222. Average seed yield in 2003 was 2878 lbs/acre and in 2004 yields averaged 1673 lbs/acre. A powerful hailstorm damaged the plot area on 16 Aug 2005 and significantly reduced plot yields.

Introduction

Data obtained from dry bean variety performance tests are important to provide Colorado farmers and others with information that has been obtained under local conditions in the dry-bean producing areas of the state. It is also important to test yield performance of dry bean varieties in the seed-producing areas of Colorado. Seed growers must know if yields of popular dry bean varieties will be profitable for seed production.

Variety yield performance data can be used by various people- farmers when selecting varieties to plant on their farms, seedsmen in knowing which varieties to grow for seed production, companies to determine which varieties to market and the locations where varieties are best adapted, and university personnel in developing new dry bean varieties and in educating people about them. Dry bean variety performance trials conducted at several locations around the state are also important because data can be obtained from several environments in a single year. This provides considerable information in a short amount of time about the performance of dry bean lines and varieties in diverse environments.

Materials and Methods

A pinto bean variety performance test was conducted at the Keith Catlin Farm in Montrose, Colorado during 2005. The trial location was at N 38° 29.035' W 107° 54.865' and at an elevation of 5868 feet. The experiment was a randomized complete block with three replications. Seventeen entries were included in the 2005 trial. Plot size was 5-feet wide by 35-feet long (2, 30-inch rows). The previous crop was pinto bean. Fertilizer banded at planting time was 22 gallons/acre of 10.7-30-0-2.5S.

Dry bean harvest at Fruita, Colorado. Sept 28, 2000.

Lasso MicroTech herbicide at 2 qt/acre and Sonalan at 1 pt/acre as a tank mix was applied preplant broadcast and incorporated. Planting occurred on 3 June 2005 with an air planter modified for planting plots. Seeding rate was

approximately 89,302 seeds/acre. Dimethoate (1pt/acre) was applied sidedress at planting to control insects.

The experiment was furrow-irrigated with siphon tubes approximately ten times during the growing season. Plots were cut with a Pickett One-StepTM rod cutter windrower on 14 Sept. 2005 and threshed on 3 Oct. 2005 using a Hege small plot combine equipped to harvest dry beans.

Results and Discussion

Weed control across the plot area was good. The 2005 cropping season in western Colorado was mild and longer compared to many other years. Adequate irrigation water was available during the growing season and, thus, was not a limiting factor for crop production. A severe thunderstorm with nickel-sized hail occurred on 16 Aug 2005 and severely damaged bean plants in the plots.

Average seed yield in 2005 was 1340 lbs/acre and yields ranged from 1737 lbs/acre for 00218 to a low of 677 lbs/acre for 03222 (Table 1). Six entries yielded more than the other eleven entries. Two entries were particularly low yielding. CO12613 yielded only 815 lbs/acre and 03222 yielded 677 lbs/acre. These two varieties may have been particularly more vulnerable to the hailstorm that occurred on 16 August.

Average seed size in the 2005 trial was 1315 seeds/lb (Table 1). Average seed size in 2003 and 2004 was 1393 and 1190 seeds/lb, respectively. Seeds/lb in 2005 ranged from a large seed size of 1180 seeds/lb for Poncho to a small seed size of 1432 seeds/lb for Grand Mesa.

For more information and results on dry bean testing in Colorado visit the web site at: http:www.csucrops.com.

Acknowledgments

We thank Keith Catlin for allowing us to conduct this study on his farm. Appreciation is also extended to Lot Robinson (formerly CSU) and Fred Judson (Western Colorado Research Center staff), and Daniel Dawson (part-time hourly employee) who assisted with this research. We express appreciation to the Colorado Dry Bean Administrative Committee for the funding they provided to support this research.

Table 1. Pinto Bean Variety Performance Trial at Montrose1 in 2005.

Variety	Yield	Seed/lb
	lb/ac	No.
00218	1737	1271
99195 MR	1716	1356
Buckskin	1697	1330
Myconate - Treated	1665	1230
00211	1605	1211
Canyon	1554	1336
Myconate - Non-Treated	1509	1320
Montrose	1484	1323
99236	1401	1395
01223	1266	1369
00185	1253	1327
Bill Z	1195	1300
Poncho	1146	1180
CO12531	1059	1228
Grand Mesa	1002	1432
CO12613	815	1243
03222	677	1510
Average	**1340**	**1315**
$LSD_{(0.30)}$	220	

1Trial conducted on the Keith Catlin farm; seeded 6/3 and harvested 10/3.

NUTRIENT MANAGEMENT GUIDELINES FOR DRY BEANS

Univ. of Wyoming Coop. Ext. Service Bull. B-1016R, June 2005

Bart Stevens - UW extension soil fertility specialist and Kelli Belden - UW Soil Testing Lab Director recently published a bulletin entitled, Nutrient Management Guidelines for Dry Beans. The 6-page bulletin is available on-line at http://www.uwyo.edu/ces/PUBS/B1016R.pdf. Sound nutrient management is one of several important components of a profitable dry bean production system. A good soil fertility program enhances the benefits of other cultural practices, but it cannot compensate for poor management of other inputs and variables. Including soil testing and research-based fertilizer guidelines in the planning process can help achieve an efficient fertilizer program that will maintain profitable yields, improve crop quality, and promote early maturity. The bulletin discusses fertilizer guidelines based on Wyoming research as well as guidelines and research from neighboring states. It also discusses how to properly take soil samples to determine optimum fertilizer application rates.

COLORADO AGRICULTURE BIBLIOGRAPHY - ONLINE

Excerpt from Library Connection, Vol. 19, No. 1 / 2, Fall 2005, CSU Libraries

The Colorado Agriculture and Rural Life Web site and online bibliography now puts information at your fingertips. All of us that are interested in ranching, farming, education, water, mining, recreation, transportation, Colorado history, and other topics will want to take advantage of this new information resource. The Web site is at http://lib.colostate.edu/research/agbib/index.html This site contains references to books, journals, dissertations, theses, archival collections, maps, photos, pamphlets, and other materials published from 1820 to 1945. The project was spearheaded by Allison Level, Research and Instruction Services Librarian, and Sierra Standish, Project Specialist. The online searchable bibliography was created at the CSU Libraries and reflects Colorado's contribution to The Preserving the History of United States Agriculture and Rural Life Project. Funded by the National Endowment for the Humanities (NEH), this nationwide effort aims to identify and preserve state and locally significant literature related to agricultural life. This project involves the NEH, Cornell University, the U.S. Agricultural Information Network, the National Agricultural Library, and other land-grant universities like CSU. For more information, contact Allison.Level@ColoState.EDU or 970-491-3918.

SURVEY OF IRRIGATION, NUTRIENT AND PESTICIDE MANAGEMENT PRACTICES IN COLORADO

Colorado State University Tech. Report TR05-07, November 2005

Troy Bauder and Reagan Waskom - extension specialists in the Dept. of Soil and Crop Sciences at CSU, recently published a technical report entitled, Survey of Irrigation, Nutrient and Pesticide Management Practices in Colorado. The 80-page report is available on-line at the CSU Agriculture Experiment Station web site: http://www.colostate.edu/Depts/AES/Pubs/pdf/tr05-07.pdf

Understanding currently used farming practices, information needs, management constraints, and water concerns of irrigating producers in Colorado is essential for conducting relevant research and outreach. To update our knowledge, we conducted a survey of irrigation, nutrient, and pest management practices adopted by producers. This survey was also intended as a five year follow-up to an irrigation management survey conducted in 1997. The survey was mailed in late 2001 to 3,268 irrigators identified through the Colorado Agricultural Statistics annual crop production survey. Approximately 40% of the surveys were returned with 37% being useable responses. This survey report provides insight into how Colorado producers are managing their irrigation water, nutrients and pesticides. As these inputs become increasingly scarce and expensive, Colorado producers look to a variety of information sources, including their land grant university to help them improve their efficiency. This report provides information on the practices and areas of Colorado with research and extension needs and can be used to focus efforts to best serve Colorado producers.

Baked Bean Stew

Makes 8 servings (1 cup each)
Preparation Time: 20 to 25 minutes

1 cup . . . .chopped onion
1 cup . . . .chopped green pepper
1 tbsp . . . .vegetable oil
12 oz . . . .boneless skinless chicken breast or tenders, cut into 1/2-inch pieces
2 cans . . . .(15 ounces each) baked beans or pork and beans
1 can . . . .(15 ounces) Garbanzo beans or Blackeyes or 1 1/2 cups cooked dry-packaged Garbanzo beans or Blackeyes, rinsed, drained
1 can . . . .(14 1/2 ounces) diced tomatoes with roasted garlic, undrained
3/4 tsp . . .dried sage leaves
1/2 tsp . . .ground cumin
Salt and pepper, to taste

Preparation

Sauté onion and green pepper in oil in large saucepan until tender, 3 to 4 minutes. Add chicken and cook over medium heat until browned, 3 to 4 minutes.
Add beans, tomatoes, and herbs to saucepan; heat to boiling. Reduce heat and simmer, uncovered, 8 to 10 minutes. Season to taste with salt and pepper.

TIPS: Frozen chopped onion and green pepper can be used. Stew can be prepared 1 to 2 days in advance; refrigerate, covered. Stew can also be frozen up to 2 months.

NOTE: Although B.E.A.N. recipes usually call for a specific variety, any canned or dry-packaged bean variety can be easily substituted for another.

Starting with dry-packaged beans and need soaking information? Click here.
Nutrient Information

Per serving: Calories 305; Fat 5g; % Calories from Fat 14; Carbohydrate 48g; Folate 128mcg; Sodium 1212mg; Protein 21g; Dietary Fiber 11g; Cholesterol 26mg

UPDATED REGIONAL BEAN PUBLICATION

Free Copy Available to Colorado Growers

The Colorado Dry Bean Administrative Committee would like to help sponsor the distribution of the new bean publication to Colorado check-off supporters. The CDBAC provided CSU with a $5000 grant to purchase and mail as many copies as possible of the bulletin (valued at $19.50 + p/h) to Colorado check-off supporters that return the following coupon to H. F. Schwartz at Colorado State University.

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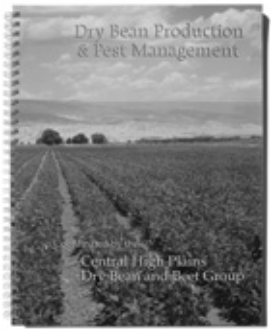
C205 Pl Sci Bldg - BSPM
Colorado State University
Fort Collins, CO 80523-1177

Dry Bean Production and Pest Management Bulletin 562A

by H.F. Schwartz and M. A. Brick, Colorado State Uni, R.M. Harverson, Univ of Nebraska, G.D. Franc, Univ of Wyoming; and the Central High Plains Dry Bean and Beet Group; Bull 562A, 2004, 8 x 11" spiral bound, 167 pages



Book Review Comments by Dr. John Rayapati – ADM Research Manager: "This bulletin is the equivalent of everything you wanted to know about dry beans but were afraid to ask….. I was so captivated by my copy, that I got in trouble for reading it at the dinner table. This book has already helped us to optimize our irrigation scheduling. It has enabled me to identify aspects of our research program that are on track and target other areas for more work. Dry Bean Production and Pest Management is the premier synopsis of information needed by North American dry bean researchers and producers to participate in and advance the dry bean industry."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WATCH
By Steve Newman
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