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1998 DISEASE MANAGEMENT STRATEGY

Howard F. Schwartz, CSU Bean Pathologist

The following Integrated Pest Management strategy is recommended during 1998 for priority diseases such as bacterial blights, rust, and white mold of dry beans in Colorado and other regions of the High Plains.

- Rotate out of dry beans for at least 2 years.
- Eliminate bean debris and sources of volunteer beans during the spring. plant high quality, certified, treated seed of disease resistant varieties, if available.
- Plant when soil temperatures exceed 60 F and favor bean germination (May 25 to June 15).
- Follow recommended production practices to avoid stress from extremes of moisture and/or fertilizer.
- Carefully & periodically scout fields to detect infection as early as possible, get confirmation of disease diagnosis from appropriate experts.
- Monitor reports on weather patterns, disease forecasts, and confirmed sightings in your region via CSU VegNet and other university and industry resources.
- When infection or the threat of disease is confirmed in your field or region, implement a timely program of fungicides/bactericides with protectant and systemic modes of action.
- Apply labeled rates, and follow recommended spray intervals.
- The bacterial blight program with Copper products generally coincides with the mid vegetative to mid pod stages; the rust program with Maneb, Bravo or Tilt coincides with the early flowering to late pod stages; and the white mold program with Topsin or Benlate coincides with the 100 % to full flowering stage for susceptible varieties and/or fields with a history of the disease.
- Critically review harvest and handling procedures to maximize seed quality from the field to the elevator to the consumer.

MAILING LABEL UPDATE
Please send changes to:
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**Colorado Dry Bean
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The **Colorado Bean News** is supported in part by your voluntary check-off dollars administered by the **Colorado Dry Bean Administrative Committee** with headquarters at 1155 So. Havana Street - Suite 11-368, Aurora, CO 80012 (303-639-9600) (800-318-8049)

Colorado Dry Bean Administrative Committee Update

CDBAC HIGHLIGHTS

Provided by Robert Schork, CDBAC Manager

- American Dry Bean Board (ADBB) membership was approved by the CDBAC at its January 1998 meeting. As a nonvoting associate member (\$ 5000), the CDBAC will be able to obtain some excellent promotional pamphlets for groups that are putting on shows or demonstrations in Colorado. The pamphlets focus on the Value of Folate and Its Bean Healthy; each contains nutritional information as well as recipes. Other promotional output from the ADBB include a national Associated Press release 'Tuscan Bean, Tomato and Bread Salad' recipe, and adaptations of ADBB recipes in Better Homes & Gardens. The BEAN 1997 public relations program received a Golden ARC Merit Award for the Fall Recipe Release.
- The CDBAC will help sponsor the 1998 U.S. Dry Bean Convention to be held in late July in Albuquerque, NM.
- The CDBAC has agreed to renew their participation (\$ 1500) in the 1998 'A Match Made in Colorado', with Chef Robert Sherlock continuing as our signature chef. He has already started developing new ideas and recipes to continue promoting dry beans to our Colorado chefs. This successful program is coordinated by Joan Brewster (ACF Culinarians of Colorado), with participation by Laura Beauchamp of the Colorado Department of Agriculture. During 1997, Chef Sherlock created several new recipes using dry beans, was featured in the business section of the Denver Post focusing on the many uses of dry beans, conducted seminars at the Colorado Restaurant Association trade show, and presented seminars at the membership meeting of the Culinarians Association.
- Check out the new CDBAC logo developed by the executive committee to help promote dry beans and program activities on behalf of the Colorado dry bean producers and handlers.

CDBAC Budget (as of April 30):	1998	YTD Actual
Income:		
Assessments	125,000	45,517
Interest 2,000	548	
TOTAL Income:	127,000	46,065
Expenses:		
Promotional	7,500	6,630
Administrative	20,000	7,365
CSU Research & Education	49,000	49,000
Refunds 1,200	51	
Meetings/Travel	10,000	2,830
Legal/Audit	1,000	75
Colorado Bean Newsletter	8,000	4,000
National Dry Bean Council	25,000	12,500
TOTAL Expenses	121,700	82,451
Excess (Shortage)	5,300	(36,386)
Reserve (Money Mkt)	75,878	
TOTAL Surplus	39,492	

[Note: Budget year = January 1 to December 31]

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Colorado Checkoff Summary - CDBAC Report of 04/19/98

Market Class/Crop Year - CWT (\$ 0.04/cwt grower + \$ 0.02/cwt processor)

	PINTO	Lt Red Kid	Gr. North.	OTHER*	TOTAL
1988	1,966,727	38,113	785	46,148	2,051,773
1989	2,524,825	72,934	3,722	28,921	2,630,402
1990	3,580,157	16,475	4,648	26,041	3,627,321
1991	2,494,438	41,874	2,415	18,901	2,557,628
1992	2,346,493	70,784	30,170	32,565	2,480,012
1993	2,386,989	63,776	320	40,193	2,491,278
1994	2,482,984	123,064	3,228	11,688	2,620,964
1995	2,164,990	232,610	36,260	27,577	2,461,437
1996	1,613,205	79,360	40,762	6,271	1,739,598
1997	1,024,633	77,878	0	1,483	1,103,994
TOTAL:	22,585,441	816,868	122,310	239,788	23,764,407

* Other = total of navy, black, pink, Anasazi, small white, small red, and Mayocoba beans

* Based on the \$ 0.04 + \$ 0.02 assessment on 23.7 million cwt since 1988, Colorado growers and handlers have invested over 1.4 million dollars in the future of their dry bean industry.

CDBAC-SPONSORED PROJECTS for 1998

The Colorado Dry Bean Administrative Committee approved the following education (\$ 8000) and research (\$ 49,000) projects with Colorado State University specialists for 1998:

- **COLORADO BEAN NEWS** newsletter which is distributed to 3800 recipients on a quarterly basis (\$ 8000); Howard Schwartz - editor and Mark McMillan - production design and layout.
- **Survey of Colorado Soils for Alkalinity** (\$ 4,200); Jessica Davis.
- **Genetic Improvement of Beans** (\$ 8,000); Mark Brick and Barry Ogg.
- **Purchase/lease of Hunter Colorimeter** (\$ 3,400); Mark Brick.
- **Seed Quality Project** (\$ 5,000); Mark Brick, Jerry Johnson, and Howard Schwartz.
- **Bean Variety Testing** at 4 locations in eastern Colorado (\$ 10,500); Jerry Johnson.
- **Bean Germplasm Nursery in SW Colorado** (\$ 2,000); Abdel Berrada at Yellow Jacket.
- **Bean Agronomic Research in Western Colorado** (\$ 1,900); Calvin Pearson at Fruita.
- **Bean Variety Testing in Southern Colorado** (\$ 1,000); Frank Schweissing at Rocky Ford.
- **Bean Technology Transfer -VegNet** (\$ 5,000); Howard Schwartz and Mark McMillan.
- **Bean Disease Management** (\$ 5,000); Howard Schwartz and Kris Otto.
- **Weed Management Project** (\$ 3,000); Scott Nissen.

[Look elsewhere in this issue of COLORADO BEAN NEWS for summaries of Research Results from the 1997 projects that were supported in part by the Colorado Dry Bean Administrative Committee and your bean checkoff program.]

CSGA 1/4 page Green



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COLORADO BEAN NEWS is published quarterly by the Colorado Bean Network, a non-profit organization which supports the dry bean industry in Colorado. Address all editorial, advertising and mailing materials to: H.F. Schwartz, Dept of Bioag. Sci. & Pest Mgmt. Colorado State University, Fort Collins, CO 80523-1177, or call (970) 491-7846.

Advertising Material Deadlines and Rates for the Colorado Bean News

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Publication Material Due Dates:

Fall Issue	[Market Emphasis]	Sep. 7
Winter Issue	[Promotion, Nutrition Emphasis]	Dec. 7
Spring Issue	[Planting, Production Emphasis]	Apr. 7
Summer Issue	[Pest Mgmt., Harvest Emphasis]	June 7

Advertising Rates:

1/4 Page (3.5"x4.5")	B/W	\$100*
1/2 Page (7.0"x4.5")	B/W	\$180*
Full Page (7.0"x9.0")	B/W	\$350*
Back Page	B/W	\$400*
	Each Additional Color	\$75

Art Work Specifications:

*PMT's - 85 lines preferred
*Negatives to be stripped in 100 lines

Colorado Dry Bean Administrative Committee Supporters Qualify of Discounted Rates, Contact Editor for Details.

Terms of payment are U.S. Currency, Net in 30 days.

Please provide Camera-ready Copy. Make check payable to the Colorado Bean News. Send to Howard F. Schwartz, Colorado Bean News, E207 Plant Sciences Building, Colorado State University, Fort Collins, CO 80523-1177

Colorado Bean Network Update

DRY BEAN PLANTING STATISTICS

Excerpts from Bean Market News, March, 1998 Issue

State	Area Planted (000 acres)		
	1996	1997	1998
California	128.0	135.0	120.0
Colorado	145.0	135.0	130.0
Idaho	95.0	105.0	100.0
Kansas	28.0	22.0	20.0
Michigan	340.0	315.0	300.0
Minnesota	160.0	170.0	200.0
Montana	10.5	12.2	10.0
Nebraska	205.0	190.0	200.0
New Mexico	12.0	12.0	10.0
New York	30.0	40.0	40.0
North Dakota	580.0	600.0	700.0
Oregon	9.2	11.0	8.5
Texas	13.0	15.0	15.0
Utah	5.0	5.8	6.0
Washington	37.0	38.0	38.0
Wisconsin	8.3	8.8	8.8
Wyoming	37.0	37.0	34.0
USA Totals	1843.0	1851.8	1940.3

Growers in North Dakota and Minnesota may increase bean acreage by 17 - 18 %, primarily to replace small grains affected by scab. Nebraska growers may increase bean acreage by 5 % to replace sugarbeets. Michigan growers may switch to black beans to help reduce the surplus of navy beans.

INTERNATIONAL BEAN MARKET HIGHLIGHTS

Excerpts from Bean Market News, Winter/Spring Issues

Argentina's dry bean production for 1997/98 is expected to increase due to expanded area in response to good markets and favorable prices. The Secretariat of Agriculture has put expected production at 362,000 MT, in comparison to 281,000 MT in 1996/97. This increase of nearly 30% is primarily due to expanded black bean area.

India is a large pulse crop consumer, with emphasis upon pea, garbanzo, lentil and bean. The 1996/97 imports were a near record 700,000 MT which included 355,000 MT of various beans. Major suppliers of pulses to India are Australia, Canada, Turkey, Iran and Syria.

Japan produces azuki (adzuki) beans and kidney beans for their consumers. Kidney production is estimated at 32 - 33,000 MT on 16 - 19,000 Ha annually for 1996 - 1998. Bean consumption has been lower lately due to a stagnant domestic economy which negatively affected demand for traditional Japanese confection, a major user of beans. { MT = 2,205 pounds; Ha = 2.47 acres }

[Call 970-353-9750 to subscribe to the USDA Bean Market News with weekly information on domestic and international bean markets]

BEAN INDUSTRY NOTES**Northarvest Bean Growers Increase Checkoff**

The Bean Bag, Spring 1998 Issue, reports that in 1997 the North Dakota legislature approved the request of the North Dakota bean producers for an increase in the dry bean checkoff from 5 to 10 cents per cwt. It was the first increase since the checkoff was established 20 years ago. The Minnesota Dry Bean Research and Promotion Council also approved the increase. The increase will put more money into research to maintain their dry bean breeding programs and help researchers screen lines for genetic resistance to white mold and other diseases. They also increased spending on domestic promotion, launching a special national program aimed at increasing dry bean usage in school and university food services and professional chefs.

[Editor's Note: The Colorado bean industry currently promotes a voluntary checkoff of 4 cents per cwt from growers and 2 cents per cwt from handlers for bean promotion, education and research programs. Nebraska has a comparable checkoff, while Kansas and Wyoming do not offer this type of program.]

National Dry Bean Council Actions

The Northarvest Bean Grower, March-April 1998 Issue reports that the National Dry Bean Council (NDBC) urges full support of the Market Access (MAP) and the Foreign Market

Development (FMD) programs. These USDA/Foreign Agricultural Service programs represent initiatives where the U. S. government and industry work closely together to achieve strategic gains in foreign markets, often in the face of unfair competition.

The NDBC considers these programs to be vital components to keep the U.S. dry bean industry competitive in overseas markets and urges Congress to vote for full funding for MAP and FMD at \$ 90 million and \$ 30.5 million, respectively, in fiscal year 1999.

The NDBC announced recently that it emphatically opposes any legislation, administrative change or any other action which would allow producers who receive government subsidies for program crops on contract acres from receiving their subsidy when they also compete in the open market with non-program crops, such as dry beans.

Presently, there is no legislative or administrative proposals for these changes. But during previous congressional sessions, such changes were introduced. Also, there have been efforts to reclassify garbanzo and black-eye beans as peas so that they could be planted as shadow crops on cotton acres.

[Editor's Note: Colorado checkoff dollars help your Colorado Dry Bean Administrative Committee representatives participate on these types of NDBC initiatives to represent your interests at the national and international levels.]

NORDOX

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Colorado State University

COLORADO STATE UNIVERSITY provides comprehensive support for production, pest management and processing of dry beans in Colorado.

Research Personnel:

Howard Schwartz	Plant Pathology
Mark McMillan	Plant Pathology
Kris Otto	Plant Pathology
Mark Brick	Plant Breeding
Barry Ogg	Plant Breeding
Jerry Johnson	Variety Testing
Jim Hain	Variety Testing
John Shanahan	Agronomy
Jessica Davis	Agronomy
Scott Nissen	Weed Science
Frank Peairs	Entomology
Stan Pilcher	Entomology
Pat Kendall	Food Science & Nutrition
Frank Schweissing	Arkansas Valley
Mike Bartolo	Arkansas Valley
Abdel Berrada	Southwest
Mark Stack	Southwest
Calvin Pearson	West Slope
Fred Judson	West Slope

Extension Personnel:

Jerry Alldredge, Paul Aravis, Bruce Bosley, Randy Buhler, Wayne Cooley, Dan Fernandez, Bob Hamblen, Charles Hart, Bill Hancock, Ron Jepson, Gary Lancaster, Ron Meyer, Ken Smith, Brent Young,

Websites of interest to bean growers

CSU VegNet

www.colostate.edu/Orgs/VegNet

CSU Variety Trial Results

www.colostate.edu/Depts/SoilCrop/extens.html

American Dry Bean Board

www.prairieweb.com/bean/bean_beans.htm

Nutrient Data Lab

www.nal.usda.gov/fnic/foodcomp

Ag Stats

www.usda.gov/nass/

Colorado Bean Company

www.info2000.net/~colobean/contus.htm

Colorado Department of Agriculture

www.ag.state.co.us/DPI

BEAN BYTES

RETIREMENT OF NEBRASKA BEAN SPECIALIST

After 30 years of dedicated service to clientele in western Nebraska and surrounding region, Dr. Eric Kerr from the University of Nebraska Panhandle Research & Extension Center at Scottsbluff announced his retirement effective this spring. Eric has specialized in disease diagnosis of and disease management for dry beans, sugarbeets, corn, wheat and potatoes. His contributions to area agriculture have been a great asset to the farm community. Eric indicated to reporter Brad Staman for The Business Farmer that, "I want to maintain an interest in agricultural activities in the area. I'm even planning on starting a small, in home, diagnostic service." Eric's many friends, colleagues and appreciative clientele from the region wish him well as he enjoys the new challenges and rewards that retirement brings his way.

1999 BEAN MANAGEMENT CLINIC

The next Dry Bean Management Clinic at Colorado State University is being planned for January 5 to 7, 1999 in Fort Collins. This popular series of 5-year crop clinics has rotated back to dry beans, and 1999 will provide plenty of new information and opportunities for bean crop production and pest management. Stay tuned for more details later this summer and fall, but reserve space on your calendar to attend this comprehensive clinic with bean production and pest management experts from around the region. The planning committee is being chaired by Ron Jepson from Adams County Extension; other members include Jerry Alldredge - Weld County Extension, Bruce Bosley - Morgan County Extension, Bob Hamblen - Larimer County Extension, Mark Brick - CSU Breeding, Frank Peairs & Stan Pilcher - CSU Entomology, Howard Schwartz - CSU Plant Pathology, Kent Davis - Crop Quest, Bart Ginther - Crop Quest, Randy Haarberg - Haarberg Consulting, Steve Krosky - Colorado Bean, John Pearson - FMC & CAAA, Harley Ross - Kelley Bean & CBN Chairman.

VEGNET - 1998

Colorado State University is pleased to announce that this exciting Technology Transfer project will be continued and enhanced during 1998 for the dry bean (onion, potato) industry in Colorado and surrounding region. The project is coordinated by Dr. Howard Schwartz and Research Associate Mark McMillan of CSU. Support is being provided by the Colorado Dry Bean Administrative Committee, Colorado Potato Administrative Committee - Area III, Colorado Onion Association, Arkansas Valley Growers & Shipper Association, CSU Agr. Exp. Station and Coop. Ext., Aero Applicators - Sterling, Novartis, and Elf Atochem; additional support is still pending from the Nebraska Dry Bean Commission and others.

The 1998 project will emphasize the following components:

COAGMET - network of remote electronic weather stations providing data from key production sites. Data will include hourly temperature, moisture and wind data transmitted by cellular telephone to CSU for editing and formatting in cooperation with the Colorado Climate Center.

DISEASE ALERTS - forecasts and local scouting reports of bean rust and other crop diseases (e.g., potato late blight, early blight; onion purple blotch).

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DTN Updates - daily to biweekly updates in text and graphic formats on Data Transmission Network regarding weather summaries, ET rates, crop status, pest status and Integrated Pest Management strategies, including the timely application of labeled pesticides.

INTERNET - direct line to this information via the following interactive web site at CSU:

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

TELEPHONE HOTLINE/FAXBACK - short oral or printed messages can be accessed via telephone or fax by calling 970-491-4278 (4 C S U) from your telephone or fax, respectively, and following the menu choices: dry bean, potato, onion, etc.

WORLD WIDE WEB RESOURCES

Agricultural resources on the Internet include the following:

<http://www.ag.state.co.us/DPI> = Colorado Department of Agriculture's Division of Plant Industry for download forms, rules and regulations, search of Colorado statutes, publications, and program information. For more information call 303-239-4140.

<http://www.e-answers.org> = publications (bulletins, fact sheets, newsletters, etc) from Cooperative Extension in 21 states. Full text with graphics is available for most of the publications, which recently included 124 "hits" for beans. You can search by subject, institution, region, keyword or type of publication. This project was made

possible by participating universities and Agricultural Communicators in Education (ACE) through a grant from the USDA-CSREES. Universities include those from the following states: Alaska, California, Florida, Kansas, Illinois, Maryland, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, New Jersey, Ohio, Oklahoma, Oregon, Pennsylvania, Texas, Washington, West Virginia, and Wisconsin.

DEPARTURE OF BEAN EXTENSION AGENT

Jim Zizz, extension agent at Wray, CO for the Golden Plains Region, has resigned from Colorado State University Cooperative Extension and returned to southern Arizona. On behalf of the bean specialists at CSU and the northeastern bean growers and industry, we would like to thank Jim for his support and leadership since 1991.

CHANGE IN BIC LEADERSHIP

After 10 years of service as president of the Bean Improvement Cooperative, an international organization of 350 members from the academic and private sectors dedicated to the exchange of bean information and materials, Dr. Howard F. Schwartz from Colorado State University has passed the "bean baton" on to his successor, Dr. James D. Kelly from Michigan State University. Those interested in joining this dynamic organization can contact Howard at 970-491-6987 or Jim at 517-355-0205 for details.

SUMMARY OF 1997 RESEARCH PROJECTS

Sponsored in Part by the CDBAC & Colorado State University

Southwestern Colorado - Yellow Jacket



Abdel Berrada and associates conducted research on dryland and irrigated beans at the Colorado State University Research Center in Yellow Jacket. Advanced breeding lines entered in the dryland trial (which benefited from extra rain) averaged 1553 lb/A compared

to 500 lb/A in a normal year. Several lines show good promise (90432 and 90436 were 5 - 10% higher yielding than Cahone), will be increased in 1998, and will be tested in multiple locations to shorten the development time of a new release.

Single seed descent selection procedure was used on the earliest generation material. Selections of individual plants were also made from later generations for lines that appear adapted to southwestern Colorado. Plants were also selected that have desirable traits which can be used as parents in future crosses by Dr. Brick. Bulk selections of six lines were also made for future variety trial testing.

The irrigated variety trial averaged 2197 lb/A with Bill Z still one of the best yielding varieties available; Winchester, RNK 179, Othello and Burke also yielded well under these conditions. It appears that white mold is becoming established under irrigation in southwestern Colorado which calls for management strategies to be

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implemented to reduce its impact. Advanced lines from the Fort Collins program were again tested at the Research Center for possible release as an irrigated variety for southwestern Colorado. In addition, four entries were increased to obtain enough seed to test in 1998 under field conditions.

Genetic Improvement - Fort Collins



The activities of Mark Brick and Barry Ogg during 1997 yielded 10,000 lines composed of early generation material and elite lines. Yield tests and rust resistance evaluations were conducted on advanced material in the pinto, black and light red kidney market classes. Breeding activities at Fruita involved seed increases on 450 F1 and 60 advanced populations and lines, while breeding activities at Yellow Jacket evaluated 150 breeding lines and 32 advanced pinto lines under irrigation and 65 lines under dryland. Research at Fort Collins and Yellow Jacket retested 124 broad-based recombinant lines to evaluate the influence of environment on progress from selection in diverse environments. Several of these appear to have potential as a new dryland pinto variety.

The mixed market class Cooperative Dry Bean Nursery was planted at Fort Collins and Fruita. The Midwest Regional Performance Nursery, with advanced pinto and great northern lines submitted by breeders from Colorado, Nebraska, North Dakota and Michigan, was planted at Fort Collins. Collaborative efforts between Wisconsin and Colorado continued to evaluate advanced pop bean lines developed at Wisconsin for popping ability when grown in different environments. In collaboration with Calvin Pearson, selections from Maverick, a pinto variety released by North Dakota, will be increased for breeder seed in 1998. Ten new rust resistant pinto lines and three new black lines were increased at Fruita for testing in eastern Colorado in 1998.

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Based on results from the Crops Testing Program, CO 96902 will be released in 1998 as a shiny black variety called 'Shiny Crow', with excellent canning properties. It will be released as an exclusive to an organization made up of Certified seed producers in western Colorado. Two pinto lines were increased as breeder seed for release in 1998. One line, CO 51715, is planned for release in the fall of 1998 as a high-yielding, rust-resistant pinto bean with the proposed name of 'Montrose'.

Breeding strategies for the future will concentrate on introgressing genes that condition broad resistance to the rust races on the High Plains, and will rely upon different genes than those present in virtually all resistant varieties (e.g., Chase, Vision, Apache) today. Work on Fusarium Wilt and incorporating better resistance to Bean Common Mosaic Virus continues. Dr. Schwartz and I plan to develop a new white mold screening nursery at the CSU - ARDEC facility north of Fort Collins for future resistance and pesticide screening efforts.

Eastern Colorado Variety Performance Trials



Jerry Johnson and associates conducted replicated variety evaluation trials on cooperating grower fields near Holyoke, Ovid and Atwood; in addition, a subset of entries was planted by Frank Schweissing at the Rocky Ford Experiment Station. Cooperating growers and bean dealers included Jim Hendrix & Jerry Haynes - KBC Trading at Holyoke, Joe Shank Jr. & Jim Fender - Kelley Bean at Ovid, and Howard Hettinger & Brett Nelson/Bill Newth - Trinidad Bean at Sterling; In addition, CSU Extension Agents Jim Zizz - Yuma, Gary Lancaster - Julesburg, and Randy Buhler - Sterling helped coordinate field day visits.

Twenty varieties were entered in the irrigated trials, including 12 private and 8 public varieties or experimental lines. CSU entered its first two rust-resistant

lines in recent years since the decision to release no new lines susceptible to rust. Other market classes were tested at Fort Collins. Results of these trials were printed in the Winter 1998 Issue (Volume 10, Issue 4, Page 16) of Colorado Bean News. There were various experimental lines from CSU and Asgrow Seed Company that appear quite promising for the future, if they exhibit acceptable seed quality during additional testing. The top commercial pinto varieties with overall average yields greater than 24 cwt/A included Othello, ROG 117, ROG 179, ROG 261, Chase, Bill Z, Burke, Buckskin, and Apache.

Agronomic Research in Western Colorado



Calvin Pearson and personnel cooperated with the Fort Collins project by evaluating the Cooperative Uniform Dry Bean Nursery and increasing clean seed of promising breeding lines for future testing and eventual release. Twenty-four varieties of beans were evaluated on the John Case farm at Delta. The highest yielding varieties that exceeded 2000 lb/A included pintos Fisher and UI 196, black UI 911, pink Viva, and small red NW 63.

Development of new production systems that are profitable and environmentally safe requires evaluation of novel practices. Early-maturing varieties of winter barley were planted in the fall of 1996 for harvest in late July of 1997, and allow pinto beans to be planted as a double-crop by late June to early July. The barley variety Shorty had a good yield of 136 bu or 6500 lb/A, the highest harvest index and acceptable maturity. Yields of the double-cropped beans (Arapaho, Bill Z, Olathe, Othello) were similar, averaging 2150 lb/A. A dry bean yield of 2150 lb/A @ \$ 20/cwt and a winter barley yield of 6500 lb/A @ \$ 6/cwt grosses more than \$ 800 per acre. Growing an early-maturing winter barley and double cropping pinto beans under a clean-till system appears to be a profitable, exciting cropping alternative.

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Variety Testing in Southern Colorado



Frank Schweissing evaluated 20 pinto varieties and breeding lines at the Rocky Ford Experiment Station in the Arkansas Valley. With the exception of Burke (USWA 19), all entries yielded more than 20 cwt/A. The most promising commercial varieties included UI 196, Bill Z, UI 126, Chase, Olathe, and Cahone which all yielded more than 25 cwt/A. Rust pressure was light and appeared late at this site, but resistant reactions were noted by Howard Schwartz for the experimental lines CO51713 and CO51715, Chase, Vision, Apache, Frontier, ROG 178 and Burke.

Seed Quality Project



Howard Schwartz, Mark Brick, Jerry Johnson and Barry Ogg are involved with a long-term project to evaluate cultural and varietal effects upon bean seed quality to learn more about environmental and physical effects upon seed discoloration and aging phenomena. The project is currently comparing the efficiency, reliability and cost of seed color testing equipment such as that available from Minolta and Hunter Labs. Seed harvested from the 1997 CSU Variety Trials at various locations in Colorado are being used for comparisons between

locations and varieties (Bill Z, Chase, Arapaho, Apache, Othello).

Three readings are being collected on each sample and consist of: the L, a and b values. L values correspond to lightness, where an L value of 100 is white and an L value of 0 is black; pintos have L values near the middle of the scale, between 50 to 65. The a and b values correspond to chromaticity; a values are positive for reflected light that is more red than green, and b values are positive for reflected light that is more yellow than blue.

Preliminary evaluations reveal that the L values for Chase and Apache were lower than other varieties, and suggests that their seed color is less reflective and appears darker than the other varieties at most of the harvested sites. The darker appearance was also confirmed by our visual analysis. In addition, the variety Chase had a higher b value which suggests that the seed color is more yellow relative to the other varieties. Chase and Othello had higher a values which suggest that their color is more red than other varieties; this may be related to the brown portion of the seed pattern, and may be important for judging the pattern color.

Breeding/parental materials from the main genetic improvement program at ARDEC in Fort Collins have also been evaluated for color to determine if they meet minimum standards for color. At this point, all lines in

See summary on page 12



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the advanced trials have excellent seed color, which reflects the high priority for quality selection that the CSU program has emphasized over the years. Additional research with seed quality will continue to integrate this component across other agronomic and pest management research projects and provide guidance for the establishment of color and quality standards to help the Colorado bean industry market this vital commodity.

Disease Management



Howard Schwartz, Mark McMillan and Kris Otto provided plant pathology support to the bean improvement and agronomy projects at Colorado State University by

screening thousands of parents, breeding lines and varieties for their disease reactions in laboratory, greenhouse and field nurseries to priority plant diseases, with primary emphasis upon rust and Fusarium wilt, and secondary emphasis upon white mold and bacterial blights. This information was generated cooperatively with the plant breeder to help in the selection of promising lines for further breeding efforts or release to the seed and commercial industries. This screening also provided information regarding the strengths (intermediate to resistant reactions) and weaknesses (susceptible reactions) of each parent and breeding line to priority pathogens. We provided the bean industry with a more complete recommendation on strategies to most effectively and economically produce a variety under our local conditions and disease spectra.

In addition, many of these promising lines and lines/varieties from other public and private programs were further evaluated for their responses in field nurseries (infested with white mold) or other naturally-occurring pathogens in out-state yield trials conducted by plant breeding and agronomy. Our program personnel periodically visited these trials and recorded disease reactions of the entries whenever possible. This information was provided to the plant breeder and agronomist for inclusion in annual reports, as well at field day visits and grower meetings sponsored by the industry, Cooperative Extension, and the CDBAC.

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HiStick
1/2 page b/w

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Weed Management



Scott Nissen studied pre-emergence herbicides like Frontier and Dual which can be used without the need for mechanical incorporation, thereby allowing surface residues to be maintained and reducing or eliminating tillage before planting and conserving soil moisture. In addition, these herbicides can be applied as a band over the row in combination with planting operations, reducing the number of trips across the field. Banded herbicide treatments combined with cultivation were considered low input, while combinations of pre-emergence, post-emergence and layby treatments were considered high herbicide input.

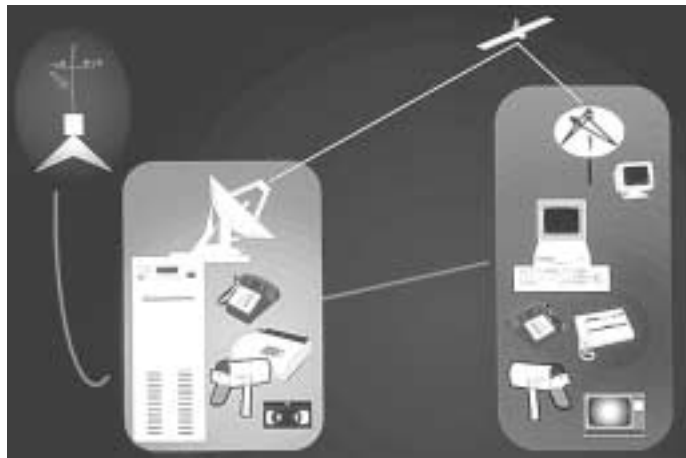
Results at ARDEC during 1996 and 1997 showed that on average, the amount of yield returned from weed control inputs was 1964 and 1571 lb/A in 1996 and 1997, respectively. The highest yield being from Frontier (PRE) plus Pursuit/Basagran (POST) in 1996, and Dual (PRE) plus Pursuit/Basagran (POST) in 1997. All weed management strategies returned at least \$ 8 per dollar spent on weed control. Band applications of Frontier and Dual combined with a single tillage operation had the highest return for each dollar spent on weed control. The next highest return was from band applications of Frontier and Dual combined with cultivation and layby applications to control late-germinating weeds.

The lowest return was from strategies that combined POST applications of Pursuit and Basagran with layby applications of Frontier. Grass control with these treatments can be poor because emerged grasses are not controlled by tillage or layby herbicide applications. Including a POST emergence grass herbicide such as POAST or Assure II could be used in that situation.

In conclusion, most weed management strategies provided good to excellent weed control provided annual grasses had not emerged prior to POST plus layby treatments. The return for dollar invested in weed control


was fairly consistent over both years with banded herbicide applications combined with tillage providing the greatest return.

Technology Transfer - VegNet



Funding for Howard Schwartz and Mark McMillan was provided by the CDBAC, Nebraska Dry Bean Commission, CSU Agr. Exp. Station and Coop. Extension, Griffin Corporation, and Novartis. The information included weather summaries from the COAGMET program; hourly data on time-sensitive temperature, rainfall, and humidity are transmitted on 24-hour

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intervals via cellular and land-based telephone + modem from each station to a central computer at the Colorado Climate Center at Colorado State University in Fort Collins for processing, archiving and modeling.

Getting accurate and timely information to more than 4000 producers in Colorado and Nebraska is the primary objective and key to the success of this program. Besides the usual newsletters, press releases, radio messages, telephone hotline, field days and meetings, our production and pest management personnel deliver weekly to bi-weekly information on vegetable pest sightings, Integrated Pest Management recommendations (scouting, sanitation, irrigation scheduling, fungicide programs for susceptible varieties), and Best Management Practice guidelines to a national satellite service called Data Transmission Network (DTN, with headquarters in Omaha, Nebraska).

Several thousand producers in Colorado and Nebraska and neighboring states subscribe to this service that allows them to access and download information instantly through their own satellite receivers. Colorado State University (Bob Hamblen - Larimer County Extension) coordinates 20 pages (screens) of information updated daily (weather summaries provided by Jim Wirshborn of Mountain States Weather Services) to 1 - 3 times weekly for marketing, production and pest management information provided by CSU agronomy and pest management specialists; i.e., John Shanahan, Jessica Davis, Jerry Johnson, Mark Brick, Howard Schwartz, Bill Brown, Frank Peairs, Scott Nissen, Phil Westra, George Beck. Five of the pages are in color, and during the growing season of May to September they are

devoted to time-sensitive graphics of pest diagnostics, pest sightings, Integrated Pest Management recommendations, and Best Management Practice highlights such as irrigation scheduling and various cultural practices.

Other communication methods include a web page on the Internet which can be accessed at: <http://www.colostate.edu/Orgs/VegNet>. This resource is designed to facilitate access by the user to diverse sources of information including:

- CoAgMet - including daily and monthly data sets from each recording station in Colorado during the current or previous seasons (1997 back to 1992 at many irrigated vegetable production locations throughout the state).
 - Disease forecast models - we are testing a prototype of a model for bean rust development on volunteer and new crop plants that is based on rainfall, hours of relative humidity greater than 85 %, and temperature patterns at the specific location or station closest to the production area of the user.
 - Cooperator sightings of diseases on volunteer and new crop vegetables plus Integrated Pest Management and Best Management Practice recommendations are readily accessible to help alert users to potential problems and to help fine tune or prioritize scouting calendars in and management strategies for their local area.
- Access to research/extension scientists via email, telephone and fax communications.
- Availability of other crop and pest resources, including the regional Dry Bean Production and Pest Management Bulletin 562A and CD-ROM XCM09 from the Colorado Extension Resource Center at Colorado State University (telephone: 970-491-6198), and other universities and institutions.

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BEAN RECIPES

By Anna Aughenbaugh - Starlite Publications, Fort Collins, CO

Springtime in the Rockies Can Still be a Hot Meal Time:

The wind is blowing, snow is piling up in drifts, sending shivers down your spine and chilling you to the bone. You have the feeling that winter will never give up and quit glazing the roads with ice. It is time to go to the kitchen, stir up some taste tempting hearty dishes that will warm you from the inside out.

In today's busy world, it is so easy to just use mixes, or to pop some ready-made meal into the microwave, but they are usually filled with additives, salt and sugar. With a little practice, you can get a meal on the table quicker than going out for fast food. This puts you in charge of the ingredients and lets your creativity shine.

Some of the preparation can be done the night before, or in the morning before your schedule shouts for you to meet the day's demands. The time and effort you put forth will be met with rave reviews. The aroma of good food cooking can chase the blues away.

Cornbread Chili Pie

1	cup	kidney beans, cooked
1		medium onion, chopped
1	lb	hamburger, browned & drained
1	cup	tomatoes
1	t	chili powder
1	t	Worcestershire sauce

Mix all together and simmer 15 minutes. Pour into a greased 9-inch square casserole. Top with cornbread batter. Bake at 425 o for 20 minutes, or until cornbread tests done.

Cornbread Batter

½	cup	flour
¾	cup	yellow cornmeal
2	t	baking powder
1		egg
½	cup	milk
2	T	salad oil

Mix all ingredients; stir just to moisten well. Serves 6.

See recipes on page 16

Quick Bean Soup

- 1/2 cup onion, chopped
- 1 medium carrot, chopped
- 1 piece celery, chopped
- 2 cups water
- 1 can 15 oz of pinto beans (or great northern)
- 1 can 15 oz of tomatoes
- 1/2 lb cooked turkey bacon (or vegetarian sausage)
- 1/4 t garlic powder
- 1/4 t paprika
- 1/4 t marjoram
- 1/4 t thyme
- 1/4 t pepper

Spicy Bean Cake

- 1/4 cup margarine
- 2 eggs
- 2 cups pintos, cooked, mashed
- 1 cup flour
- 1 t cinnamon
- 1/4 t nutmeg
- 1/2 t cloves
- 1 t baking soda
- 4 T cocoa
- 1 cup sugar
- 1 1/2 t vanilla
- 1/4 cup nuts, chopped
- 3/4 cup raisins
- 2 cups apples, peeled, diced

In a 2-qt pan, mix onion, carrot, celery and water. Bring to a boil; boil for 10 minutes. Drain and rinse beans; add with remaining ingredients to the vegetables in pan. Heat through. Serves 3 to 4.

Cream margarine; add eggs, one at a time. Beat well after each addition. Add dry ingredients; beat well. Fold in apples, raisins, nuts and vanilla. Pour into a greased 9 x 13" cake pan. Bake at 375 o for 45 to 50 minutes.

*Easy Recipes for 1, 2 or a Few (\$ 12.95)
More than Soup - Bean Cookbook (\$ 7.95)*

*Starlite Publications, 2100 W. Drake # 295, Fort Collins, CO 80526
Tele. 970-493-7969; Mention Colorado Bean News and we will pay the postage!*

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