

Colorado Bean News

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PUBLIC NOTICE

On February 21, 2003, the Colorado Department of Agriculture heard and recorded testimony regarding a proposed amendment to the Marketing Order Regulating the Handling of Dry Beans Grown in the State of Colorado. The proposed amendment will eliminate the limitation on terms of office for the Colorado Dry Bean Administrative Committee.



If you are a producer or handler of dry edible beans in Colorado, please remove the ballot from the last page of this issue of Colorado Bean News, record your vote, insert the ballot in the enclosed postage-paid envelope, seal and complete in full the Certification Statement on the back of the envelope, and mail by May 23, 2003 to the Colorado Department of Agriculture, Markets Division, 700 Kipling, #4000, Lakewood, CO 80215.

Thank you for your participation and continued support of the Colorado Dry Bean Marketing Order and Colorado Dry Bean Administrative Committee.



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Colorado State University
Fort Collins, CO 80523-1177



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CDBAC Highlights



At their February 22, 2003 meeting at CSU-ARDEC near Fort Collins, the Colorado Dry Bean Administrative Committee reviewed various issues and approved financial statements and minutes of the November 2002 meeting. Steve Brown discussed the upcoming (March 8) U.S. dry bean grower's summit in Fargo, North Dakota. CDBAC members discussed this meeting objective and issues that were being raised by national bean organizations such as the National Dry Bean Council and American Dry Bean Board. There was a detailed discussion about whether bean should be part of the national farm program and the related issue of double dipping. It was discussed that all of our representatives to the NDBC are in favor of beans being part of the farm program, but it is the bean handlers nationwide that are against it. Steve thought this was because historically dealers like to speculate on bean prices and the less information about the size and quality of the crop the better for speculation. It was also decided that states, like Colorado, that are losing bean production are in favor of beans being in the farm program. Rick Johnson said that he was in favor of it. He noted that acreage is dropping, but because beans require less water than other crops, the acreage may increase during the drought.

Steve Brown then discussed the problem with the mislabeling of beans to be discussed at the grower's summit. He said it was this issue that was the primary cause for closing the Mexican border for beans. The border has been closed for several weeks. Foreign beans brought into this country that are rebagged and sold as United States' beans are at issue. Gary Mulch talked about crop insurance for beans. One of the problems that he noted is that the insurance is always a year behind in pricing. Brad Taylor discussed that the ADBB is close to getting permission to say that the Cancer Prevention Lab has determined that using beans directly reduces the chance of getting certain types of cancer.

CDBAC Budget as of February 28, 2003

	BUDGET		
	YTD	vs	
	BUDGET	ACTUAL	ACTUAL
Assessments	85,000	19,907	(65,093)
Interest	1,000	141	(859)
Total Income	86,000	20,048	(65,952)
Research	41,500	0	41,500
Administrative	6,000	1,000	5,000
Promotional	1,000	225	775
Meetings & Travel	12,500	450	12,050
Dues	16,000	0	16,000
Magazine	10,000	2,500	7,500
Accounting and legal fees	2,500	0	2,500
Refund of assessments	1,000	822	178
Telephone, postage, supplies	3,000	468	2,532
Total Expenses	93,500	5,465	88,035
Excess (Shortage)	(8,500)	14,583	22,083

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

Steve noted that Colorado has the lowest checkoff amount of any state; \$0.04 by growers and \$0.02 per cwt by dealers. North Dakota amount is \$0.10 per cwt that is paid for by the growers. Michigan is \$0.12 per cwt paid \$0.11 by the growers and \$0.01 by the dealers. As the CDBAC's budget continues to decline, we risk the chance of losing membership in the NDBC and properly funding CSU research. He said maybe we should consider asking growers to increase the checkoff amount at some point. Jim Rubingh noted it would require a referendum to make the change. Gary Mulch said that if we did request an increase in the checkoff amount, it should be enough so that it would not have to be raised again. It was noted that Nebraska's checkoff was \$0.75 per cwt and is the second lowest amount of states with a checkoff program.

Bob Schork then asked the directors if they wanted to nominate new officers or to ask the existing officers to continue in 2003. Rick Johnson made a motion asking Brad Taylor to continue as president, Gary Mulch as vice-president, and Steve Brown as secretary/treasurer. Steve Mosher seconded the motion and it was unanimously approved.

Jim Rubingh then commented about the Department of Agriculture's activities. He said the Department had a \$2,000,000 fund available for the promotion of Colorado crops. These funds could be used for value-added program grants or for market access program funds. The Department will also be hosting meetings around the state about the potential of pharmaceuticals in crops.

Footnote: Howard Schwartz shared some information on a claim by Mexico that a new bacterial disease had contaminated a shipment of beans from Central America (Nicaragua) apparently sent via the U.S., and was being used as part of the phytosanitary excuse to stop shipment of beans from the U.S. "I explained to a reporter that the pathogen, *Xanthomonas axonopodis* pv. *phaseoli*, is not a new pathogen or disease, but rather a synonymous name that has been proposed by bacterial taxonomists in recent years; the accepted name is still *Xanthomonas campestris* pv. *phaseoli*. So this is the same pathogen that caused common bacterial blight of beans, and is not a "new" pathogen or disease in the Americas."

National Dry Bean Council Highlights

Origin Mislabeling

It shall be the policy of the National Dry Bean Council that mislabeling is condemned, and that those who have intentionally engaged in such actions should face the full force of appropriate laws and regulations, and in



addition we urge NDBC members to strongly consider the following:

1. Aggressively pursue companies and/or individuals that have engaged in such activity and refer them to proper authorities for thorough investigation and enforcement to the fullest extent possible.
2. Not allow those companies or individuals that have been proven to engage in such activity to be active or associate members of the NDBC, participate in any NDBC member activities or NDBC activities for a period of no less than 5 years.

Further, it shall be the policy of the NDBC that our organization and members shall adhere to the highest standards of ethical and business practices pursuant to the best interest of the entire dry bean industry; growers, handlers, shippers, processors, end users and countries that buy beans from the United States.

It shall also be the responsibility of every NDBC member and members of NDBC organizations to monitor their own activities to ensure that these standards are met, and when aware of untoward actions of others, to advise proper authorities for investigation and enforcement as appropriate.

Reference Pricing System

The National Dry Bean Council is opposed to a Reference Price System based on Bean Market News as proposed by Mexico for the following reasons:

1. A reference price system is managed trade, not free trade.
2. A reference price does not take into account deferred shipments (i.e., contract prices set today, but shipped in 6 months).
3. A reference price does not take into account the differences in state and regional costs (more than 15 states from Minnesota to Texas and New York to California grow dry beans, one price could not capture all of the cost variables for each origin).
4. Bean Market News only lists prices for US NO 1 grade, and it is a fact that beans of lesser grades and even splits are commonly shipped to Mexico. These beans would naturally be priced lower, even significantly lower, than what is listed in the Bean Market News.
5. Bean Market News only lists current crop. Bean Market News does not take into account past crop years (i.e., beans bought from the grower last year and sold into the market at another price this year).
6. Prices change weekly and even daily; multiple prices are listed in Bean Market News for each bean class. A price reference would not reflect these market dynamics.
7. Reference prices are often used to punish the loser of an anti-dumping case and the industry does not want to be viewed in this way.



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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 Mark McMillan at (970) 491-7846. Although the content of articles and information published in *Colorado Bean News* is true to the best of our knowledge, the Colorado Bean Network and its personnel accept no responsibility for its accuracy. No endorsement of products mentioned is intended nor is criticism implied of products not mentioned. Check pest management and agronomic advice with local sources, and always read and follow product labels.

Advertising Material Deadlines and Rates for the Colorado Bean News

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Publication Material Due Dates:

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

Advertising Rates:

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Full Page (7.0"x9.0")	B/W	\$350*
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BEAN BYTES

Colorado Bean Crop

The April 1, 2003 Issue of AG UPDATE from the Colorado Agricultural Statistics Service reported that dry bean planting intentions for 2003 are 85,000 acres in Colorado (compared to 92,000 acres in 2002); and 1.52 million acres in the United States (compared to 1.92 million acres in 2002).

Average prices received by Colorado bean farmers was \$27.30 cwt in March of 2002 versus \$18.20 in March of 2003. United States averages were \$27.10 per cwt in 2002 versus \$15.50 per cwt in 2003.

California Bean Crop

The January 2003 Bean Marketer Newsletter from California reviewed California's recent bean statistics. Before the "el nino" year of 1998, California's dry bean crop had averaged 2.68 million sacks for the previous five years, and a "normal" crop size was considered to be anywhere between 2.5 - 3.2 million. However, in the el nino year, the crop was reduced to 1.74 million sacks by a combination of late rains that slowed planting in the spring, and a harvest that was pushed back into mid-December.

At the time, that 1.74 million sacks was the lowest recorded crop in the 28-year history of the Advisory Board. Since then, the average crop size has been dwindling rapidly, with an even lower count in 2001, when only 1.48 million sacks were produced. In fact, since the el nino year, only in 1999, when the state hit 2.55 million sacks, did it reach what used to be called a normal year.

With the reports apparently all in and recorded for the 2002 crop, we show that 1.77 million sacks were produced. Including that 1.77 million in the latest 5-year average brings "normal" down to around 1.94 million sacks. That is a far cry from the days of the late eighties and early nineties, when in a stretch of eight years from 1984 to 1991, the lowest bean crop size in California was 2.91 million sacks. The average for that eight-year stretch stood at 3.27 million sacks. That means the average for the latest five years, compared to the above 8-year period, represents a reduction of almost a million sacks per year - a 33 % drop-off from the "good old days."

Colorado Dry Bean Administrative Committee Variety/Crop Year CWT Summary

	1988-92	1993-97	1998	1999	2000	2001	2002	Total
Pinto	12,913,340	10,669,721	2,438,676	2,187,853	1,489,225	1,509,272	700,566	31,908,653
LRK	240,180	733,012	109,946	122,223	123,057	99,518	13,413	1,441,349
GN	41,740	80,955	0	0	6,275	0	0	128,970
Navy	53,731	25,000	3,089	8,204	0	0	0	90,024
Blacks	17,028	32,953	0	2,328	6,842	2,274	0	61,425
Pinks	39,182	7,453	0	0	0	0	0	46,635
Anasazi	9,034	16,071	0	5,441	0	0	0	30,546
Sm White	19,629	0	0	0	0	0	0	19,629
Reds	13,972	7,159	0	0	2,478	453	0	24,062
Cranberry	0	798	0	0	0	0	0	798
Yellow	0	275	770	45,417	39,443	2,310	0	88,215
Total Assessments	13,347,836	11,573,397	2,552,481	2,371,466	1,667,320	1,613,827	713,979	33,840,306
Crop Estimate	15,849,000	12,837,000	2,868,000	2,755,000	1,980,000	1,785,000	1,700,000	
% of Estimate	84.22%	90.16%	89.00%	86.08%	84.21%	90.41%	42.00%	

There are several reasons for this rather dramatic decline in dry bean production in California, including the higher cost of production as compared to other bean-growing states, the demise of Tri-Valley Growers and the closing of its bean cannery in Modesto, and the competing black-eye production in Texas. California has always been considered a specialty bean producing state, and the fact is that while some of the other varieties of beans, especially those used in Mexican cuisine, have enjoyed a new popularity over the past few years, none of our California varieties has yet been able to take advantage of the "bean renaissance."

2003 Bean Acreage Estimates

WASHINGTON - Mar 31/03 -- Dry edible bean growers in the United States intend to slash dry edible bean seedings more than expected, seeding 1.52 million acres, down 21% from last year but 6% above two years ago. In releasing this year's seeding intentions estimate, the USDA said low prices for the 2002 crop pushed planting intentions down in 11 of the 18 major producing States. Six States expect to plant more dry bean acres than a year ago, while acreage is intended to be the same in Wyoming. If yields are at their recent five year average, production would end up at 1,021,059 metric tons (MT), down 25% from last year's 1,359,584 MT harvest. The biggest decline would occur in Michigan, where dry edible bean seedings are expected to plunge 44% from 270,000 to 150,000 acres. That is the smallest seeded

area for the state since the USDA started recording dry edible bean production in the state in 1942.

The biggest decline in raw acreage is in North Dakota, where growers intend to plant 600,000 acres, down from last year's 790,000 acres, but well above the 440,000 acres sown in 2001. Washington's prospective acreage is down 39%. North Dakota growers expect a 24% decline, Minnesota dry bean acreage is expected to decline 18%, and Nebraska growers expect a 14% downturn if current plans are carried out. California, Colorado, Kansas, Montana, South Dakota, and Texas also expect their dry bean acreage to be down. The States that expect planting increases from a year ago are: Idaho, up 5%; New Mexico, up 19%; Utah, up nearly triple from last year's drought affected crop; Oregon, up 2%; Wisconsin, up 3%; and New York, up 20%. Planting is ready to go for California's early classes. Most States, however, will wait until late April through June for dry bean planting. Dryland areas of Colorado and Utah are looking for a return of their acreage after last year's drought. A heavy snow storm across Colorado's Rockies should help provide irrigation water but normal supplies are still short. Drought conditions also remain in Montana, Wyoming, and Oregon.

Mexico Monthly Report - March of 2003


Sinaloa officials inform that they have 85% progress in the bean harvesting; 178,000 MT to date, of which 93% are Peruanos and Mayocobas, and 3% blacks beans. Nayarit has harvested 80% of their planted area, and expect a total production of 64,000 MT of which nearly 40,000 MT are blacks and the rest are clear beans.

In Zacatecas, there are still 70 - 80,000 MT of beans (mostly blacks) in the warehouses of Rio Grande bean producers. This means that all of the production of a "normal year" has been traded already, and the surplus production is still pending to be traded. Durango still has around 50,000 MT (80% pintos, 20% clear beans) that growers and traders have been holding until there are better prices.

Mexico -- Dry Edible Bean Supply-Demand Forecast

	1999-00	2000-01	2001-02	2002-03	2003-04 estimates
Area (Ha)	1,708,688	1,650,000	1,788,000	1,987,000	1,852,000
Yield (kg/Ha)	661	561	706	635	?
Production (MT)	1,130,000	925,000	1,263,000	1,450,000	1,190,000
Opening Stocks	280,267	291,821	68,821	92,821	300,821
Imports	106,000	108,000	80,000	75,000	60,000
Supply	1,516,267	1,324,821	1,411,821	1,617,821	1,550,821
<i>Disappearance</i>					
Exports	8,446	3,000	3,000	3,000	3,000
Domestic Use	1,216,000	1,253,000	1,316,000	1,314,000	1,358,000
Total Usage	1,224,446	1,256,000	1,319,000	1,317,000	1,361,000
Ending Stocks	291,821	68,821	92,821	300,821	189,821
Stocks/Use (%)	23.8	5.5	7.0	22.8	13.9

Hectares, metric tons; BASED on information from Mexico's Department of Agriculture and the USDA. Created Mar 13, 2003; provided by S. Brown - Jacks Bean Co. of Holyoke.



**WESTERN
INTERNATIONAL
GRAIN**

**DRY BEAN RECEIVING &
PROCESSING**

Burlington: 1-800-827-9559
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Gary Lancaster	Sedgwick Cnty.	970-474-3479
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Ron Meyer	Kit Carson Cnty.	719-346-5571
Ken Smith	Montezuma Cnty.	970-565-3123
Frank Sobolik	Pueblo Cnty.	719-583-6566
David Peebles	Delta Cnty.	970-874-2195

Drought Effects Upon Plant Disease Potential

By Howard F. Schwartz, Professor of Plant Pathology, Colorado State University

Plants and plant pathogens respond differently to environmental conditions and variations that occur throughout their life cycles. Extremes of temperature and moisture create stress on plants, and in some cases predispose plants to greater loss from specific types of plant pathogens. On the other hand, temperature and moisture extremes can negatively impact specific types of plant pathogens, and reduce their ability to survive and cause plant diseases in stressed plants.

Moisture Effects on Plant Pathogens

Moisture is indispensable for the germination of fungal spores and penetration of host tissues, and for the activation of bacterial and nematode pathogens before they can infect a plant. Moisture (especially in the form of rain or irrigation water) is critical for the distribution and spread of pathogens from plant to plant, and field to field. Access to abundant moisture increases the succulence of host plants and thus their susceptibility to certain pathogens, which in turn affects the extent and severity of diseases. The occurrence of many diseases in a particular region is often closely correlated with the amount and distribution of rainfall or other sources of moisture (irrigation water, dew period, relative humidity) during the plant and pathogen cycles. Indeed, rainfall and other moisture sources such as irrigation water may determine not only the severity of the disease, but also whether the disease will even occur in a given season.

Some foliar-infecting pathogens, such as those causing rust or common bacterial blight of bean must have high relative humidity or free moisture in the environment throughout their development. Other foliar-infecting pathogens, such as that causing powdery mildew, are actually favored by lower moisture (especially relative humidity less than 70%) and are inhibited by high moisture conditions. Some soil-borne pathogens such as *Pythium* damping-off of seedlings are favored by high moisture, and the severity of the disease is proportional to the amount of soil moisture. The increased moisture favors movement of spores in soil water films, and plant roots may be more stressed for oxygen due to waterlogged and cooler soils. Other soil-borne pathogens such as *Rhizoctonia* or *Sclerotinia* cause the most damage on wet, but not flooded or dry soils. Other soil-borne pathogens such as *Fusarium* grow fairly well in dry soil environments on plants that are stressed by insufficient water and/or high temperature.

Temperature Effects on Plant Pathogens

Most plants grow best within a temperature range of 60 - 86 F (15 - 30 C), as do most plant pathogens. Pathogens are less active and cause less disease during prolonged periods of extreme temperatures; that is less than 60 F or greater than 86 F. Plants are generally injured faster and to a greater extent when temperatures become higher than the maximum for growth than when they are lower than the minimum. High temperature often causes its effects on the plant in conjunction with the effects of other environmental factors, particularly excessive light, drought, lack of oxygen, or high winds accompanied by low relative humidity. High temperature can be responsible for sunscald injuries on the exposed side of plant tissues. High soil temperature at the soil line sometimes kills young seedlings, or causes cankers at the crown on stems of older plants.

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)**

Drought Effects on Plant Diseases

Drought conditions usually involve multiple stresses of insufficient moisture and high temperature which negatively affect plant survival, growth and reproduction. Abiotic disease responses in stressed plants can include stunting, light color (pale green to light yellow), few and small leaves, few and small pods or fruits, wilting and death. Plants weakened by drought are also more susceptible to some plant pathogens and insect pests.

Soil-borne pathogens such as *Fusarium* (*Fusarium* root rot and *Fusarium* wilt of dry bean) and *Macrophomina* (ashy stem blight of dry bean, charcoal rot of corn) are usually favored by drought conditions that stress plant roots and predispose them to colonization and infection. Foliar pathogens such as powdery mildew (of sugar beet, pumpkin) are also favored by extended periods of low moisture and relative humidity. Drought conditions discourage the survival and activity of other soil-borne pathogens and most foliar-infecting pathogens that require high moisture conditions for survival, infection and disease development.

So, continued drought conditions in Colorado and the surrounding region will discourage the survival and outbreaks of most foliar-infecting pathogens such as rust or bacterial blight. However, soil-borne pathogens such as *Fusarium* and *Macrophomina* will be favored by these types of conditions that stress the plant. So, disease management should target any cultural practice that reduces stress to the roots such as planting during recommended periods when soil temperatures and moisture are adequate for emergence, and early-season tillage to remove soil compaction and permit more vigorous root development. And, always follow an integrated pest management approach that targets all pests (abiotic or biotic) that can threaten plants and their productivity. The following dry bean IPM strategy can be adapted to other crops and plant species grown in our region.

SUMMARY OF Dry Bean Disease IPM STRATEGY for 2003:

1. Rotate out of dry beans for at least 2 years to reduce survival of soil-borne and foliar-infecting pathogens and other pests.
2. Eliminate bean debris and sources of volunteer beans during the fall of 2002 and spring of 2003.
3. Plant high quality, certified, treated seed of disease resistant varieties, if available and suitable for your market needs, when soil moisture is adequate and soil temperatures are greater than 60 F at the seeding depth.
4. Follow recommended production practices to avoid stress from extremes of moisture, temperature, and soil compaction.

5. Manage water and fertilizer inputs to provide adequate, but not elevated components to avoid excess canopy development.
6. Carefully scout fields to detect foliar infection as early as possible, get confirmation of disease diagnosis from appropriate experts in your area.
7. Monitor reports on weather patterns, disease forecasts, and confirmed pest sightings in your region via the CSU VegNet at www.colostate.edu/Orgs/VegNet/
8. When and if infection is confirmed in or near your field, implement a timely program of fungicides and bactericides with protectant and systemic modes of action. Rotate appropriate fungicide chemistry, apply labeled rates, use an adjuvant, and stay within recommended spray intervals.
9. Adjust combine at harvest to maximize seed quality, and reduce loss of seed which can germinate next spring to produce volunteer plants.
10. Thoroughly incorporate each season's crop debris + pathogens to reduce carryover and potential disease pressure the following season. Rely upon cultivation and herbicide in next year's rotation crop to reduce volunteer bean emergence and possible infection by foliar-infecting pathogens which can then be spread to next year's host crop.

More information and Colorado drought links are available at:

<http://drought.colostate.edu/>

<http://climate.atmos.colostate.edu>

2002 Colorado State University Research Reports

Funding provided in part by the Colorado Dry Bean Administrative Committee, Colorado Seed Growers Association, CSU Agricultural Experiment Station, CSU Cooperative Extension, seed companies, pesticide companies, USDA and IPM regional and national grants



Southwestern Colorado Research Center at Yellow Jacket

(Abdel Berrada & Mark Stack)

SW Colorado received below average precipitation for the third consecutive year. The total precipitation for 2000 and 2001 was 11.3 and 10 inches, respectively. By comparison, the long-term average is 16 inches. Precipitation finally came in late summer (2.9 inches in late August and early September), but was too late for the bean crop.

In 2002, very few acres of dryland beans (1200 acres) were planted in SW Colorado due to the lack of soil moisture at planting time. In recent years, 30000 acres have been planted to dry beans in Dolores and

YELLOW JACKET from page 7

Montezuma counties. Planting time is usually the first 10 days of June. Irrigated pinto beans (500 acres) did not fare much better than the dryland beans in 2002.

The uniform pinto bean variety trial was conducted in 2002, in spite of the environmental challenges. Rally, GTS-900 and CO 83777 were very late maturing entries, and there was some damage to green pods from the freezes on October 3 and 4. The trial averaged 1963 lbs/A. Montrose was the best yielding entry at 2352 lbs/A. Poncho (2225), Bill Z (2125) and Grand Mesa (2073 lbs/A) performed well. Two breeding lines, CO 77380 and CO 77364, showed good adaptation to southwestern Colorado; both have upright architecture and relative early maturity. The upright habit could help reduce losses from white mold. No experimental line yielded better than released varieties that are available to the public.

The dryland nursery did receive some supplemental irrigation, but maturity was delayed too much by the drought and high temperature conditions. Yields were not taken, but 80 entries were evaluated for adaptation; entries will be evaluated again in 2003.

CSU Bean Breeding Project

(Mark Brick & Barry Ogg)

The CSU dry bean breeding project conducted activities at Fort Collins, Fruita and Yellow Jacket during 2002. Fort Collins was the primary site for plant selection, Fruita for seed increase, and Yellow Jacket for evaluation of lines adapted to the nonirrigated region of the San Juan Basin in southwestern Colorado. At Fort Collins, approximately 740 F1's and 12,400 lines composed of early generation material and elite lines were evaluated for root rot, rust, growth habit and adaptation. Yield tests and rust resistance evaluations were planted for advanced material in the pinto, black, great northern, and light red kidney market classes. Unfortunately, due to herbicide damage all replicated test plots of our own material was lost.

Activities at Fruita involved seed increases of 4 black lines and 14 pinto lines. Activities at Yellow Jacket evaluated breeding lines under dryland conditions and in replicated plots. The dryland plots were abandoned due to lack of rainfall and soil moisture to allow germination. The dryland trial was planted on minimal irrigated soil and a seed increase will be used to evaluate in 2003. Breeding efforts at Yellow Jacket continue to focus on broadening the genetic base and improving drought tolerance.

Variety trials conducted by the CSU Crops Testing Program evaluated 12 CSU advanced lines in five of the six test locations. Bill Z and Montrose performed well

across locations, with Grand Mesa in the upper third of most trials.

Breeding strategies continue to concentrate on broadening the genetic base of pinto bean varieties and incorporation of new genes that confer resistance to rust and Fusarium wilt. Research on Fusarium wilt resistance continues. Several promising lines possess resistance to FW based on greenhouse evaluations are being increased at Fruita for field testing. Incorporating better resistance to Bean Common Mosaic Virus and White Mold also continues. We initiated a research project on breeding for white mold that was funded by the National Sclerotinia Initiative.

Dry Bean Variety Performance Trials

(Jerry Johnson, Jim Hain & Cynthia Johnson)

In 2002, the uniform trial was planted in commercial bean fields or on CSU Research Stations at four eastern Colorado sites: Proctor (Platte River Valley), Fort Collins (Front Range), Burlington (Golden Plains), and Rocky Ford (Arkansas River Valley), and it was also planted at two western Colorado locations: Fruita and Yellow Jacket. The uniform variety trial serves a dual purpose of screening new CO lines emerging from CSU's pinto bean breeding program, allowing fast and reliable selection of promising new, high yielding and disease resistant lines.



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The Fort Collins trial was planted late, had poor emergence, and suffered from soil compaction and high temperatures which resulted in low and variable yields; the results are not reported. The Burlington trial was affected by stunted plant growth due to a combination of soil compaction, residual herbicide effects, and severe high temperature stress.

Average pinto bean performance (lbs/A) for selected entries over 4 Colorado locations (Fruita, Proctor, Rocky Ford, Yellow Jacket) in 2002 were: Bill Z - 2613, Montrose - 2586, Poncho - 2371, Grand Mesa - 2329, Buckskin - 2184, and Rally - 2134. High yielding experimental lines included: USPT 72 - 2559, USPT 73 - 2374, CO 83783 - 2342, CO 83778 - 2273, CO 96753 - 2243, and CO 75965 - 2224.

Complete reports from 2002 and earlier years are available on-line at:
<http://www.colostate.edu/Depts/SoilCrop/extension/CropVar/index.html>

PrePlant Spartan for Weed Control

(Scott Nissen)

Traditional weed management programs in dry beans rely on pre-plant incorporated (PPI) or pre-emergence (PRE) herbicides used in combination with several cultivations. The incorporation process tends to reduce soil moisture and can stimulate weed seed germination. Designing a weed management program that reduces pre-plant tillage and still provides season-long weed control would provide some advantages.

Spartan is a relatively new herbicide that controls a number of broadleaf weeds of interest to dry bean growers. Herbicide-resistant kochia and hairy nightshade are very sensitive to Spartan. Spartan has become the herbicide of choice for sunflower growers and is applied a week or more before sunflower planting. Applying the herbicide before planting increases crop safety, while still providing excellent broadleaf weed control. In 2002, we evaluated the use of Spartan for weed control in dry beans.

Results showed that Spartan: is very active on all nightshade species and would provide an additional mode of action for control of ALS and triazine-resistant kochia; applied as a pre-plant treatment 7 to 10 days before planting should provide additional crop safety and would reduce tillage operations and subsequent moisture loss; when mixed with Outlook or Dual provides good grass control.

FMC is working with IR-4 to label Spartan on dry beans, and this product would fit well in Colorado dry bean production provided that growers are willing to move away from pre-plant incorporated treatments. Spartan

will be cost-effective because excellent weed control was achieved at a rate of 2.5 lb product/A, which would cost approximately \$10.

Cooperative & Uniform Performance Trials at Fruita

(Calvin Pearson & Fred Judson)

The Cooperative Dry Bean Nursery (CDBN) and the Uniform State Dry Bean Variety Performance Test (USDBVPT) were conducted at the Western Colorado Research Center at Fruita during the 2002 growing season. Yields in the CDBN averaged 3160 lb/A and ranged from a high of 3734 lb/A for 93:208G (great northern) to a low of 2465 lb/A for CPC 99814 (cranberry). Seventeen of the 29 entries were high yielding.

Yields in the USDBVPT averaged 2011 lb/A and ranged from a high of 2468 lb/A for USPT 73 to a low of 1513 lb/A for CO 75563. Nine of the 24 entries were high yielding.

Plant Pathology & Colorado Bean News Publication

(Howard Schwartz, Mark McMillan & Kris Otto)

The CSU bean pathology program continued to provide support for the bean breeding program with inoculum maintenance, production and application to greenhouse and field nurseries during 2002. Disease pressure was light in most areas of the state due to the drought and high temperature conditions. Soil-borne problems from root rots (*Rhizoctonia*, *Fusarium* root rot & wilt) were most wide-spread, and in some cases damage was aggravated by environmental conditions, soil compaction and herbicide carryover. Foliar disease pressure was light in most areas, but some fields were affected by severe outbreaks of common bacterial blight, especially after storm damage to yellow beans in eastern Colorado. White mold research is continuing in laboratory, greenhouse and field experiments in cooperation with state and regional plant breeding and agronomy personnel as we investigate the role of Integrated Pest Management strategies to improve the performance of dry beans against white mold in Colorado and the region.

Our VegNet and CSUAG web sites provide access to a wide range of weather and bean resources at:
<http://www.colostate.edu/Orgs/VegNet/>

Weather summaries for bean production regions in 2002 are available at the following site:
http://www.colostate.edu/Orgs/VegNet/ppt/vegnetCO/index_files/frame.htm

On-line copies of Colorado Bean News are available for back issues from 1996 - 2003 at:
<http://www.csuag.com/cbn/>

American Dry Bean Board Highlights

The Bean Education & Awareness Network (B.E.A.N.) is pleased to report that they provided media mailings that give a fresh look to classic recipes through "makeovers" of popular bean dishes, complete with photos and captions. They added different bean varieties, unique flavors and ethnic twists to give bean recipes a new taste and renewed appeal:

- 3 + 3 Bean Salad
- Beans and Franks Tuscan-Style
- Dressed Up Red Beans and Rice
- Greek Chili
- Mediterranean Delight Dip
- U.S. Senate Special Session Bean Soup



Check out www.americanbean.org today!!

The 2002 - 2003 promotions by Manning, Selvage & Lee (MS&L) have generated 332 stories, with 37 million impressions, including exposure in *Better Home & Gardens*. The strategy is to focus on the nutrition and health aspects of dry beans, and vary the key communication points to target audiences. Several members

commented that the program should promote the "sizzle", and value-added aspect of dry beans, that actual preparation time is only five minutes. The value-added comes from promoting a "bag full of nutrition" and a "bag full of health".

Dr. Irvin Widders, Director of the Bean/Cowpea Collaborative Research Support Program at Michigan State University, informed the ADBB of its multi-state and university research effort funded by the U.S. Agency for International Development (USAID). The USAID views dry beans as an extremely important commodity for human consumption because it contains protein and other nutrients important for human development. USAID is willing to fund a public-private partnership with a shared commitment to common goals, with a shared commitment of resources.

Editor's Note: The Colorado State University Bean Program and Cancer Prevention Lab at CSU may have an opportunity to be involved with this new alliance with help from our CDBAC members on the ADBB and NDBC.

Colorado's New Pinto Bean: Grand Mesa

Mark A. Brick, Professor, Dep. Soil and Crop Sciences, Colorado State University.

Grand Mesa, a new disease-resistant pinto bean variety was released by the Colorado Agricultural Experiment Station. Grand Mesa was developed at Colorado State University and tested in the Cooperative Dry Bean Nursery, Western Regional Bean Trial and by the Colorado Crop Testing Program during recent years as CO 75511.



Grand Mesa was released to provide pinto bean growers in the High Plains with a high yielding variety that combines resistance to rust, bean common mosaic virus, semi-upright architecture and avoidance to the white mold pathogen. Grand Mesa has mid-season maturity (95-98 d) similar to Bill Z. Mean seed weight of Grand Mesa is similar to Bill Z, but somewhat smaller than Montrose. Grand Mesa had approximately 1300 seeds/lb. when averaged over 19 locations in the U.S. in the 2001 Cooperative Dry Bean Nursery. In the same trials, time to flower was 51 days and time to harvest maturity was 92 days across locations. Yield potential of Grand Mesa is somewhat lower than Bill Z and Montrose in Colorado. When averaged over 13 locations during three years of testing in Colorado, Grand Mesa had approximately 10% lower yield levels than Montrose or Bill Z (Table 1). However, when grown under white mold pressure, Grand Mesa is much better than Bill Z or Montrose. At the Julesburg test site in 2001, severe white mold disease occurred. In those plots, Grand Mesa, Bill Z and

Montrose had 22, 61 and 72 % white mold disease intensity (% of plants in the row that were infected with white mold mycelium), respectively. Yield levels were 2019, 1551 and 1522 lbs/acre, respectively. The upright architecture of Grand Mesa provides the tolerance mechanism to white mold. Upright architecture is also desirable for growers that use furrow irrigation and have problems getting irrigation water to flow to the end of long runs due to vines and trash on the furrows. It can also be more compatible with narrow row spacing and high plant populations than the traditional semi-vine type.

Grand Mesa was developed by the dry bean improvement program at CSU consisting of team members Mark A. Brick, Howard Schwartz, J. Barry Ogg, Jerry J. Johnson, and Fred Judson. Funding was provided by the Colorado Agricultural Experiment Station, Colorado Dry Bean Administrative Committee, Colorado Seed Growers Association, and federal and state tax dollars.

Certified and Registered seed are available from certified seed growers in western Colorado. Consult the Colorado Seed Growers Spring Seed Directory, or call the Colorado Seed Growers (970-491-6202) for a list of bean seed distributors in Colorado. Grand Mesa is protected by the Plant Variety Protection Act under Title V, and propagation and/or sale of uncertified seed is not permitted. Foundation seed is available from the Colorado State University Foundation Bean Seed Project, Fruita Colorado.

Table 1. Mean seed yield (lbs./acre) for the varieties Grand Mesa, Bill Z, Montrose and Buster tested by the Colorado Crops Testing Program during 2000, 2001 and 2002.

Variety	Year (No. of Locations)			Weighted Mean
	2000 (4)	2001 (5)	2002 (4)	
Grand Mesa	2825	2458	2329	2532
Bill Z	3208	2621	2613	2799
Montrose	3213	2705	2586	2825
Buster	3087	2654	NT	NA

NT = Not tested

NA= Not an appropriate comparison

Dry Bean Production Under Limited Irrigation

Mark A. Brick, Professor in the Dept. of Soil & Crop Sciences, Colorado State University, Fort Collins, CO


Production practices that maximize economic return for the dry bean crop recommend irrigation when the available soil moisture reaches approximately 50%. In our region, this equates to approximately 16 to 20 inches of water during the growing season. During peak water use periods, dry beans require approximately 0.30 inches of water per day, similar to corn, sugar beets and alfalfa. However, because dry beans are a short season crop they result in a shorter water demand period (Yonts, 1996). The question many bean producers are asking is how to reduce season water requirements.

Further, can the bean crop withstand lower soil moisture conditions during a portion of the growing season, and what cultural practices can be implemented to reduce the effects of limited soil moisture. From a management perspective, the question becomes, can irrigation be limited without jeopardizing yield potential and net return? The answer to this question is related to many factors in the production system including, crop rooting depth, timing of soil moisture stress, soil texture, density and depth, quality of the irrigation water, the variety of bean, severity of root diseases, and rate of evapotranspiration during the growing season.


The rooting depth of a crop greatly influences the ability to extract soil moisture. The maximum rooting depth for dry beans is 24 to 30 inches (Yonts, 1996). On most soils, bean roots in the upper 18 inches of the soil profile extracted 85% of the total crop needs. Therefore, beans have a shallow rooting system compared to other crops such as corn, wheat, sunflower or small grains and require more frequent watering, especially during the reproductive stage of growth (pod set and fill) when the air temperature is high.

The reproductive stage is the most critical time during the life cycle of the bean crop to limit or prevent soil moisture deficits. Research at Colorado State University studied the effects irrigation level and timing have on pinto bean production (Bandaranayake, 1990). In that study, the crop was watered at 30, 50 and 70 % available soil moisture during the vegetative and reproductive

See IRRIGATION on page 12



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<p>Montrose Potato Growers Steve Mosher 38 West Main, P.O. Box 65 Montrose, CO 81402 Ph 970-249-6623 Fax 970-249-0426</p>	<p>Thunder Mountain Bean Co. Robert Proctor 1888 B Road Delta, CO 81416 Ph 970-874-7737 Fax 970-874-1462</p>

Yield Performance

Montrose has performed well in replicated trials in Colorado during years of evaluation by the Colorado Crops Testing Program. The table below shows the average seed yields of the four highest yielding varieties tested in 1997, 1998, 1999 and 2000.

Cultivar	4 Yr. Average*
Montrose	2698
Bill Z	2624
Chase	2670
Vision	2216 (3 yr.)

*Average of 17 locations-years

IRRIGATION from page 11

stages of growth to simulate high, medium and low soil moisture stress levels, respectively. A non-irrigated check treatment was included that had a yield of 1726 lbs/acre. This yield was higher than expected because timely and excessive rain occurred during the growing season. Mean yield for treatments that had high and low stress during the reproductive stage of growth with no stress during the vegetative stage was 2443 and 3335 lbs/acre, respectively. Mean yield for treatments that had high and low stress levels during the vegetative stage of growth with no stress during the reproductive period were not statistically different (3535 vs 3220 lbs/acre). These results clearly demonstrated that stress during the reproductive stage was more critical than during the vegetative stage. Caution should be taken when making conclusions from this data because the research was only conducted in one site-year. However, the trend was very clear, limited available soil moisture during the vegetative stage had little effect on seed yield, but during reproductive growth it reduced seed yield by almost 900 lbs/acre.

A method to estimate yield losses due to limited soil moisture, termed the FAO method, was reported by Allen, Yonts and Wright (2000). That method estimates yield based on limiting evapotranspiration due to soil moisture stress during the growing season. They reported that when seasonal ET was limited by 30 % during the vegetative period, yield was predicted to decline 6 %. However the same reduction in ET during flowering would reduce yield 33 %. The authors reaffirmed that flowering and pod fill periods were the most sensitive periods for the bean crop.

Irrigation water should be limited during late season. Irrigation should be terminated when 20% of the lower leaves and pods have turned yellow due to physiological maturity (Yonts, 1996). Irrigating late in the season can delay maturity and increase disease potential by saturating the root zone when the plant only requires minimal water.

Monitor soil moisture every week during June, then twice a week or more during July and early August. Always try to apply sufficient water to refill the root zone plus a small margin to account for root growth that will occur before the next irrigation. Irrigation water applied beyond the root zone is wasted. During the reproductive stage, try to irrigate when the air temperature is less than 70 to 80 to prevent temperature shock to the plant that can cause floral abortion.

Soil structure and till play important roles to determine the depth of root penetration, efficiency of soil moisture extraction, and amount of water the soil can hold. The presence of layers that restrict root

growth, such as hard pans, will reduce the rooting depth, consequently the ability of the plant to extract soil moisture. Soil compaction can significantly reduce bean yields by limiting root growth, preventing water from infiltrating through the soil profile, and increasing the incidence of root rot disease. If a compacted layer occurs, the field should be deep chiseled and/or planted to a crop that is less sensitive to compaction, such as corn, sunflower or wheat. Deep chiseling should only be done when the soil is relatively dry, because the chisel points do not break up or fracture the compacted layer in wet soil.

Poor soils, such as those that have salinity problems or low organic matter, do not hold soil moisture or respond to fertilization. Because beans are extremely sensitive to soil salinity (Blaylock, 1996), production of beans on fields that have a history of salinity problems should be avoided, especially if irrigation water is reduced. Since most crops are more tolerant than beans, fields that have a history of salt problems should be planted to an alternative crop such as barley, sugar beet or sorghum.

Varieties differ in their response to drought stress. Research at Colorado State University has shown that

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varieties in the pink market class, such as Rosa and Viva, are among the most tolerant of drought stress. In general, varieties in the pinto market class that have a vigorous vine growth habit and full season maturity are more tolerant to drought stress than upright short season varieties. The ability to withstand low soil moisture is related to a variety's ability to produce vegetative growth to shade the soil surface and have an extended period of pod set and fill to maximize the opportunity to produce seed. Alternatively, varieties with early season maturity can reduce total seasonal water needs, and a variety such as Othello may be a good choice if irrigation water will be available during the critical flower and pod fill stages.

Dryland varieties, developed by the breeding program at Colorado State University for the nonirrigated regions of the San Juan Basin in SW Colorado and NW New Mexico, are not adapted to the High Plains. The most recent releases, Fisher and Cahone, were developed for dryland systems in this region, however, they are not recommended for the High Plains because neither has resistance to pathogens in the High Plains, such as rust and common bacterial blight, and they are very long season (> 105 days) when grown outside of their region of adaptation.

Management with limited irrigation is more critical than with full irrigation. Scout bean fields twice weekly. Carefully observe both upper and lower leaf surfaces for

disease or insect pests, dig plants to inspect rooting patterns, soil moisture, nodulation and the general health of the root system. Be especially aware of patterns in the field that could indicate early disease infection, poor water distribution, or other problems that can be addressed in a management program, including the timely application of pesticides. Production systems under limited irrigation are much more sensitive to attack by biotic pests, especially foliar and root pathogens. Early detection can make the difference between financial profit and loss.

In summary, management of the bean crop is more difficult under limited irrigation. Conserve irrigation water for the critical growth periods of flowering and pod fill. Monitor every aspect of the crop to limit or reduce damage by pathogens, especially root pathogens. For further information, contact the author by phone at 970-491-6501 or via e-mail at mbrick@lamar.colostate.edu.

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***Phytosanitary Inspection
in Colorado***

On March 12, 2003 Mitch Yergert sent the following information to Colorado exporters of grain to Mexico. The Colorado Department of Agriculture (CDA) is changing the procedure for inspection of grain being exported to Mexico to meet the Mexican government's new requirements. **All grain shipments to Mexico must be physically inspected not more than thirty (30) calendar days before the shipping date.**

These physical inspections must be conducted by CDA or USDA, Animal Plant Health Inspection Service (APHIS), personnel for phytosanitary certification, unless an "acceptable substitute" is provided. The only "acceptable substitutes" available are certain Federal Grain Inspection Service (FGIS) certificates. These certificates are listed by the USDA and can be substituted for the official phytosanitary inspection. Routine survey or laboratory analysis conducted for specific pests cannot



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INSPECTION from page 13
be substituted for the phytosanitary inspection.

Please note that although mandatory inspection requirements by the FGIS have been waived for grain being exported via rail or truck to Mexico, phytosanitary export certification still requires a physical inspection. Beginning immediately, the above-stated procedures will go into effect. Also, since Mexico's definition of grain includes pulses, dry bean shipments will need to meet this inspection requirement.

CDA will be setting up a procedure to inspect facilities that ship grain to Mexico on a regular basis. WE are planning monthly inspections at all facilities to meet the 30-day timeline. CDA has limited resources to conduct these inspections and would not be able to react quickly enough to conduct inspections only when we receive a phytosanitary certificate application.

In addition, CDA must charge for the travel time, time to conduct inspections, and mileage \$32/hour and \$0.28/mile for inspection. For more information or if you have questions, please call Mitch at (303) 239-4142 or Jerry Cochran at (303) 239-4153.

APHIS also charges for inspections and certification. You may call the Colorado APHIS office at (303) 371-3355 to obtain their rates. An additional option for certification may be to get the phytosanitary certificate at the border from the USDA. Call the state APHIS office to see how this option works or if it is feasible for your company.

Market View

Excerpts from Northarvest Bean Grower, March/April 2003
Bean Day Presentations

Pinto Market: Export and domestic consumption news will likely dominate the pinto bean market this year, according to Paul Montgomery, president of P.W. Montgomery, Inc. North America has a large crop - the largest since 1998. As with all large crops in the past, prices will hinge on how well the industry can move the beans. Here are some numbers Montgomery says are key to the market:

- Per capita consumption - 3.6 pounds
- U.S. population - 280,000,000
- Per capita consumption x U.S. population = 10,080,000 cwt consumption
- Exports = 2,005,000 cwt
- Total disappearance (consumption + exports) = 12,085,000 cwt

Mexico Market Outlook: Don't look for Mexico to significantly increase its imports of U.S. dry beans this year. Mexico has had one of its best crops of dry beans in years, reports Judd Keller, Trinidad Benham

Corporation. He toured Mexico in the fall of 2002 as part of a National Dry Bean Council trade team. Each year, NDBC sends members to Mexico to assess the size and quality of the country's crop.

In fact, the Mexican government has temporarily stopped bean imports that would normally enter Mexico through payment of the tariff. The Mexican government has also delayed the announcement of the auction for the tariff-free bean import permits under the NAFTA Agreement Quota. These actions are to allow Mexican growers more time to market this year's large crop without competition from U.S. bean imports.

Also, pressure by Mexican growers is mounting to renegotiate parts of NAFTA. Critics in Mexico claim that NAFTA is hurting its small-plot farmers. They argue that under NAFTA, the U.S. is increasing subsidies on commodities that compete with Mexican growers. The Mexican small plot growers feel that they cannot compete with the efficiencies of the U.S. bean producer.

NAFTA calls for the reduction of Mexico's tariff on dry beans to decline to 0 % in 2008. Prior to NAFTA, the

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- Brule, NE308-287-2304
- Hemingford, NE308-487-3325
- Greeley, CO970-352-0346
- Sterling, CO970-522-3595
- Wheatland, WY307-322-2550

import tariff was 139%. NAFTA also calls for an increase in the import quota, or the amount Mexican companies can import tariff-free between now and 2008.

\$ 65 / cwt Pintos

Reprinted from Northharvest Bean Grower, March/April 2003

In a grocery store in Albuquerque, N.M., Montelores Pinto Beans were selling this winter for the equivalent of approximately \$65 per cwt. But Rod Tanner, whose family has processed, packaged and sold Montelores Pinto Beans throughout the southwest for 60 years, says the business isn't as good as it seems. His Midland Bean Company, of Dove Creek, Colorado, sells 100,000 to 150,000 cwt of Montelores annually in 1, 2, 4, 8, 20 and 100 pound bags. He says his company received approximately half of the \$12.99 that grocers were charging this winter for a 20-pound bag.

Midland Bean Co. is a small player in the southwest market, according to Tanner. Several other companies have the lion's share of the market and sell through chains such as Wal-Mart and Safeway. Pintos that qualify for Midland Montelores brand are hard to come by, too, Tanner says.

Montelores are grown in southwest Colorado in fields at an elevation of 7,000 feet. The beans are exceptionally high quality with a bright colored seed coat. But the dryland fields average only 400 pounds per acre. Many of the dry bean farms have been idled in the Conservation Reserve Program. In 2002, drought wiped out the southwestern Colorado crop and Midland had to buy beans from other parts of the state to supply customers. But Tanner hasn't found beans from other sources that equal Montelores quality.

"We have such a dry climate that the beans don't darken after harvest," he says. Southwest demand remains strong for packaged beans due to immigration from Mexico. But the younger generation isn't willing to spend several hours cooking a pot of beans, he says. It may seem as if there is plenty of room for grower and processor profits in pintos that grocers sell for \$65 per cwt, but Midland Bean company's margins are small. "I don't see anybody beating down my door wanting this business," Tanner says.

AUXIGRO® - Enhances Nutrient Use & Yield

Research during recent years by the bean industry and researchers in North Dakota, Minnesota, Nebraska and Colorado has shown that timely application of 'Auxigro' can increase yield and economic returns of dry beans. Auxigro improves overall plant health, and enhances nutrient utilization and uptake of foliar applied fertilizers. Auxigro, from Emerald BioAgriculture is labeled for various crops such as dry bean, sugar beet, onion and potato by the US EPA as a biopesticide, with active ingredients (29.2% each) of gamma aminobutyric and L-Glutamic acid.

Auxigro application timing studies at universities show that optimum yield responses to Auxigro are at bud (< 10% bloom) and initial pod fill (about 3 weeks after bud). Joel Poore, Simplot - Scottsbluff, found that whenever he applied Auxigro with Folospray, a foliar fertilizer containing micronutrients, a greater dry bean yield increase occurred when compared to either Auxigro alone, or the Folospray alone. Based on these studies and grower use evaluations, Emerald Bio recommends that Auxigro be applied to dry beans in conjunction with a foliar fertilizer containing micronutrients.

Apply 4 oz of Auxigro in at least 20 gallons of water per acre at bud stage or initial pod fill, adjust the pH of the final spray solution to 6 - 7.5 (add a pH buffer if needed). Use a silicone-based surfactant at the lowest recommended label rate for plant growth regulators unless tank mix combinations prohibit their use or crop injury

is likely to occur. Refer to the surfactant label for appropriate rates.

To reduce unnecessary trips across the field, consider tank-mixing Auxigro with a foliar fertilizer containing micronutrients and/or fungicide program; i.e., for bacterial diseases (copper-based bactericide such as Champ, Kocide, NuCop), white mold (Topsin) or rust (maneb, Bravo or Equus, Tilt, Quadris) if recommended by your local integrated pest management specialists.

University and grower research during the last 4 years in Nebraska/Colorado has documented an average 3.3 bushel (200 pound) increase in yield from Auxigro applications in pinto, great northern and black beans. In addition, private research and grower trials in North Dakota determined that Auxigro alone increased yield by 273 lbs on average (4 trials) and Auxigro + Foliar Fertilizers containing Micronutrients increased yield by 411 lbs (2 trials). At an average cost of \$4/oz (\$16 total) + \$6 application cost, \$0.15/cwt beans would result in a net return of \$8/acre for a 200# yield increase for Auxigro alone; and \$38/acre return (less the cost of the foliar fertilizer containing micronutrients) for a 400 pound increase in yield.

For more information on Auxigro and availability in your area, contact:

Tom Gardner
Emerald Bio
tele: 701-866-2525
email: gardner@emeraldbio.com

Colorado Dry Bean Administrative Committee Official Ballot for Amending the Colorado Dry Bean Marketing Order

VOTING INSTRUCTIONS

1. Read definition of “producer or handler of edible dry beans*.” If you are a “producer or handler of edible dry beans” in the State of Colorado and eligible to vote, mark your vote, seal inside the envelope provided and complete in full the certification statement on the back of the envelope. False certification constitutes an act of perjury as defined in Colorado Statute, Title 18, Article 8, C.R.S.
2. Ballots must be postmarked no later than 11:59 p.m. on May 23, 2003.
3. Producers or handlers not receiving a ballot, or persons having questions regarding eligibility to vote, should contact Wendy White at the Colorado Department of Agriculture at (303) 239-4114 during the voting period.

* Producer of dry edible beans: you must have been engaged in the business of producing or causing to be produced for market dry edible beans in Colorado during the last twelve months.

* Handler of dry edible beans: you must have been engaged in the business of selling, shipping, cleaning, packaging, and/or distributing dry edible beans which you have purchased or acquired from a producer, or which you are shipping on behalf of a producer.

**Colorado Department of Agriculture
Official Colorado Dry Bean Administrative Ballot**

Do you favor an amendment to the Colorado Dry Bean Marketing Order for the State of Colorado, that will eliminate the limitation on terms of office for the Colorado Dry Bean Administrative Committee?

YES

NO

Mailing instructions:

1. Insert ballot into envelope provided. **Seal and complete in full the certification statement on the back of the envelope.**
2. Ballots must be post-marked no later than **May 23, 2003.**

If you have any questions, please call the Colorado Department of Agriculture at (303) 239-4114, or write to: Colorado Department of Agriculture, Division of Markets, Attention: Market Orders, 700 Kipling St., Suite 4000, Lakewood, CO 80215-8000.