

# Colorado Bean News

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## GROWING SEASON TRENDS

Excerpts from an article by R. A. Pielke Sr. and N. Doesken, Atmospheric Science Dept., Colorado State University, Colorado Climate - Vol. 1, Spring 2000

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There is considerable interest in trends in climate across Colorado. Is our climate warming or cooling, for example. We have developed several figures from a recent study for several observation sites in eastern Colorado. We chose sites with the longest set of data to see if long-term trends exist. The concept of statistical testing was used to estimate whether the trends are likely to be real or not.

The results show large variability in time and in space across eastern Colorado. No one station could possibly capture this variability. The trend in growing season length, for example, for the period 1940-1996 lengthened by 43 days according to this analysis, at one of the Agricultural Research Station's sites at the Central Plains Exp. Res. Station near Akron (CPER), while it decreased by two days at Rocky Ford. After the CPER site, the greatest increase in number of growing season days was Fort Collins with 24 days. For their period of record, Wray had an increase of 14 days, while Las Animas increased by 11 days.

We think we understand the lengthening of growing season at Fort Collins since the city has grown substantially, resulting in an urban heat island effect. The reason for the increase at the other locations is unknown. Over the century since 1917, however, the figures show considerable differences in trends between the sites. There is a tendency, if you clump the stations together, to conclude that growing season has lengthened, but the stations at Akron and Rocky Ford show a shortening of growing season.

What can we conclude from such studies? First, no single station can indicate what the trends are, even in a relatively homogeneous landscape such as eastern Colorado. Secondly, there are significant variations in the trends over time, as well as differences across the region. This variability suggests that the climate in Colorado is strongly influenced by local effects, as well as from any larger-scale climate effects. Finally, trend analyses cannot be used to extrapolate expected climate in the future. If you started in 1940, for example, and tried to predict the climate from 1940-1950 based on the trends prior to 1940, you would be off target! It would be better to assume the variability observed in the previous decades will persist into the future.

Of more concern are climate anomalies that fall outside of the existing climate record. Recent tree core observations from northern Wyoming suggest there was a major drought in that region in the 1700s that lasted for 100 years!



MAILING LABEL UPDATE  
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[ Note: To subscribe (\$ 15.00) to the quarterly issue of Colorado Climate, contact the Colorado Climate Center, Atmospheric Science Department, Colorado State University, Fort Collins, CO 80523-1371 ]



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**COLORADO DRY BEAN ADMINIS-  
TRATIVE COMMITTEE UPDATE**



**Board Meeting**

The next regularly scheduled meeting of the CDBAC will be November 6, 2000. Agenda items will include a review of the 2000 financial statements, development of the 2001 budget, reports on the US Dry Bean Convention, and discussion of director term limits.

If you have any issues or concerns, please contact your regional representative, or Robert Schork - Manager (see CDBAC Executive Board listing on Page 2)

**2000 Variety Trials:**

The CDBAC, Colorado Bean Network, and Colorado State University hosted the Colorado Dry Bean Field Days at Idalia, Snyder and Berthoud in mid-August. Participants were able to view promising varieties under grower conditions, and discuss production and pest management issues with bean experts from CSU. Research data from these trials and others supported in part by the CDBAC will be reported in future issues of Colorado Bean News.

**NATIONAL DRY BEAN COUNCIL**

Excerpts from the NDBC News, June 2000



NDBC has sent a strongly-worded letter to Dr. Israel Gutierrez, Undersecretary of Interior Commerce at SECOLFI, pressing the Mexican government to announce the second auction of dry bean import permits without delay.

This year got off to a promising start, with the Mexican government in January announcing a three-part auction of import licenses. In 2000, 59,702 metric tons (MT) of U.S. dry beans are allowed to be imported into Mexico under the tariff rate quota (TRQ) system established by NAFTA.

Mexico held its first auction on time on February 14. TRQ permits for 19,901 MT were auctioned. Permits for the remaining 39,801 MT are supposed to be auctioned before the end of the year. The second auction was scheduled for mid-April, but had not even been announced by mid-June.

NDBC staff in Washington, DC, continues to work closely with John Melle, Director for Mexican Affairs at the U.S. Office of the Trade Representative (USTR) and the staff of USDA Undersecretary Gus Schumacher.

NDBC is covering its bases in Mexico with its representative Raul Caballero, who has met with SECOLFI and U.S. embassy officials to stress the need for the auctions to take place as promised by Mexico in January.

**CDBAC Budget as of July 31, 2000**

	BUDGET	YTD ACTUAL	BUDGET vs ACTUAL
Assessments	145,000	75,496	(69,504)
Interest	3,000	2,234	(766)
Total Income	148,000	77,730	(70,270)
Research	39,400	39,400	0
Administrative	8,400	4,900	3,500
Promotional	20,600	15,300	5,300
Meetings & Travel	10,000	5,999	4,001
Dues	50,000	25,000	25,000
Magazine	8,000	4,000	4,000
Accounting and legal fees	2,400	2,100	300
Refund of assessments	5,000	289	4,711
Telephone, postage, supplies	3,500	905	2,595
Total Expenses	147,300	97,893	49,407
Excess (Shortage) of revenue over expenses	700	(20,163)	(20,863)

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

**AMERICAN DRY BEAN BOARD**

**Mission:**

American Dry Bean Board's mission is to promote increased consumption of bean products by Americans of all ages through programs of public relations, advertising, research, or any other method determined appropriate by the Board. The specific products promoted by the Board will include dry packaged beans; canned or jarred bean products; and any other categories or classification elected by the Board.

**Objectives:**

- The American Dry Bean Board functions with multiple facets of a highly diversified industry involving many areas of expertise, the Board must maintain effective membership services programs in correlation to its promotional activities. Representation is selected by the members at their discretion, thus providing an ever evolving pool of capabilities on which the board is fortunate to rely for leadership. The Board desires and seeks new members to provide this leadership in addition to financial support.
- Implement national promotional programs to continually strive to increase per capita consumption in America
- Serve as a resource for Americans in the areas of nutrition and recipes for bean products
- Form strategic alliances with related organizations to encourage partnering and to expand knowledge base
- Increase involvement of all facets of the bean industry in the Board to ensure program relevancy to consumers
- Educate all levels of the industry about the Board's programs
- Maintain financial stability to ensure program productivity and continuity



**Strategies:**

- Promote bean products to families to develop the next generation of consumers
- Expand materials redemption and information distribution activities to provide recipes and nutritional information in response to consumer requests
- Expand logo usage to build recognition
- Identify developing product niches
- Implement effective member services programs
- Circulate BEAN Update following meetings
- Distribute regular updates throughout the year
- Implement an investment program to maximize fund growth

**BEANS IN THE AMERICAN DIET**

By Frances K.A. Carlson, R.D., Michigan Bean Commission and ADBB

Recommendations for the 2000 Dietary Guidelines for Americans

The Dietary Guidelines for Americans is a valuable source of information for consumers to promote and maintain healthy eating habits. These guidelines, which promote healthy eating using the recommendations of nutrition authorities, are being updated to help today's consumer make wise choices. These proposed changes reflect additional information that has been generated through years of research on many of these foods, and from increased awareness of value added foods. One such change that should be seriously considered is the reassignment of the nutritional value of dry beans in these guidelines and eventually the placement of dry beans on the food pyramid.

Dry beans, the almost perfect food, are unique in that they would be comfortable in the majority of the base level classifications on the food pyramid. Dry beans are currently classified in the Meat, Poultry, Fish, Dry Beans, Eggs, and Nuts grouping due to their excellent source of protein, iron, zinc, B-vitamins, and calcium. They also have other nutritional attributes that would warrant their presence in the



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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

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

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**BRINGING YOU BETTER BEANS**

Excerpts from article by Don Comis, USDA/ARS, Agr. Research, Sept. 2000

Beans and cornbread – a Saturday night staple in many parts of the country. But who really cares beans about this homely, low-cost food? Well, many of us do. As Americans have become more health conscious, we've consumed more beans. Today, we eat almost 8 pounds per person each year. Pinto and navy beans account for 5 of those pounds, eaten mostly as refried beans (pintos) or as canned pork and beans (navy).

In all, U.S. growers harvested over 3 billion pounds of edible dried beans in 1998, worth over \$600 million. But despite beans' familiarity and popularity, few of us are aware of the surprising amount of science to be found in an inexpensive can full of convenience and nutrition.

Key players in this science are the plant breeders who painstakingly work at developing new varieties with characteristics important to growers, processors, and consumers. North Dakota State and Michigan State universities have the two largest such programs in the country, both breeding varieties in all market classes of U.S. beans. But they are two of just a few bean breeding programs. "We're lucky if there are a half-dozen centers in the United States," says Ken Grafton, a breeder at North Dakota State.

Nevertheless, in any large supermarket, shoppers should be able to count at least 10 different kinds of beans – known in the bean world as market classes because each has its own distinct market and uses – small white, black, cranberry, dark-red kidney, great northern, light-red kidney, navy, pinto, small red, and yellow eye. Even smaller supermarkets will have close to 10 – some of them in packaged mixtures, like a colorful, dry minestrone soup mix with small reds, great northern, and light-red kidney beans.

**A Quarter Century of Research**

At the Bean and Beet Research Unit's Quality Laboratory in East Lansing, Michigan, Agricultural Research Service geneticist and breeder George L. Hosfield has been upgrading the color, canning quality, and other quality characteristics of beans, - as well as their nutritional value – for the past 24 years.

If the small reds in that bag of minestrone mix are LeBaron Red, a variety recently released for the Pacific Northwest, they are the first upright small reds bred for superb canning quality and resistance to bean common mosaic virus, a major bean disease. Hosfield transferred the genes for erectness, canning quality, and virus resistance into red bean germplasm, which Phil Miklas, an ARS geneticist in Prosser, Washington, then used to create LeBaron.

LeBaron also has other desirable and unique characteristics for red beans. For one, it grows so quickly that farmers in certain areas can plant it after early-grown vegetables like peas for a second crop in the same season. "LeBaron is part of the first wave of red beans emerging from Hosfield's germplasm," Miklas says. "Because of its unique disease resistance, exceptional seed appearance, and canning quality, I'll probably never release another small red variety without using germplasm that Hosfield

See Research on page 5

## Colorado Dry Bean Administrative Committee Variety/Crop Year CWT Summary

	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	Total
Pinto	1,966,727	2,524,825	3,580,857	2,494,438	2,346,493	2,387,224	2,487,128	2,227,981	1,689,470	1,868,112	2,400,824	1,720,441	27,694,520
LRK	38,113	72,934	16,475	41,874	70,784	63,776	129,064	232,610	79,360	228,202	109,946	69,809	1,152,947
GN	785	3,722	4,648	2,415	30,170	320	3,228	36,645	40,762	0	0	0	122,695
Navy	8,529	3,467	25,454	12,948	3,333	12,929	1,686	8,153	344	1,888	3,089	8,204	90,024
Blacks	0	0	0	394	16,634	17,830	5,998	9,125	0	0	0	2,328	52,309
Pinks	21,783	13,495	435	2,484	985	4,873	388	1,287	0	905	0	0	46,635
Anasazi	3,879	762	14	1,222	3,157	4,531	3,616	7,906	18	0	0	5,441	30,546
Sm White	11,957	7,672	0	0	0	0	0	0	0	0	0	0	19,629
Reds	0	3,525	138	1,853	8,456	30	0	308	5,909	912	0	0	21,131
Cranberry	0	0	0	0	0	0	0	798	0	0	0	0	798
Mayo Cuba	0	0	0	0	0	0	0	0	0	275	770	38,387	39,432
Total Assessments	2,051,773	2,630,402	3,628,021	2,557,628	2,480,012	2,491,513	2,631,108	2,524,813	1,815,863	2,100,294	2,514,629	1,844,610	29,270,666
Crop Estimate	2,558,000	3,108,000	4,275,000	3,300,000	2,608,000	2,609,000	3,140,000	2,558,000	2,250,000	2,280,000	2,868,000	2,755,000	
% of Estimate	80.21%	84.63%	84.87%	77.50%	95.09%	95.50%	83.79%	98.70%	80.71%	92.12%	87.68%	66.95%	

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developed,” says Miklas. Smaller than kidney beans and shaped like pintos, 90 percent of red beans come from Washington and Idaho.

Shree Singh, a breeder who operates a bean nursery in red bean country at the University of Idaho, says that Hosfield’s work is “of immense value to us. Hosfield is the only person working on bean quality, and he and Miklas are the only geneticists working on small red

bean improvement – a neglected market class.”

“Each of the four ARS geneticists does something very different,” Singh says. “Their work is very complementary to ours, and they give us free germplasm that is not readily available, like that for improved small red beans.” “Private and public breeders throughout the United States and Canada send seeds of potential new varieties to my nursery for field-testing,” says Singh. “I harvest new seed and send it to Hosfield, who then tests its canning qualities for me. Then I publish the results and share the information with public and private breeders. We are very fortunate to have this ARS support.”

### *But Can They Take the Heat?*

One of the most important attributes of any new bean variety is its suitability for processing. “No one wants to open a can and find the beans mushy or split open, with starch leaching into the brine or tomato broth that they’re packed in,” Hosfield notes.

So in the 1980s, he and Mark A. Uebersax, of Michigan State University’s Department of Food Science and Human Nutrition, devised a series of tests for beans. Now standard, the tests determine whether a potential new bean variety can keep its good qualities while being cooked, soaked in brine or broth, sealed in a can, and stored on grocery shelves. The tests simulate the exact conditions under which the bean must be cooked and canned to ensure consistent quality.

Breeders like Ken Grafton at North Dakota State University nervously await word from Hosfield about how a new bean holds up under high heat. He says the canning test is very important to breeders around the

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## BEAN BYTES

### Meet Your Researcher

The Fall 2000 Issue of The Bean Bag introduced Dr. Bob Harveson, the new plant pathologist for the University of Nebraska's Panhandle Research & Extension Center. He has a 50% extension and 50% research appointment with responsibility for diseases of specialty crops in western Nebraska. Harveson completed his PhD in plant pathology from the University of Florida in 1999, and his MS degree in plant pathology from Texas A & M in 1989.

His primary interests will be on the management of root diseases of sugar beets and dry edible beans. He wants to pursue this angle of disease control through an integrated approach using all available methods, including cultural practices and genetic resistance. This includes collaboration with other disciplines such as irrigation and machinery engineering, weed science, entomology, and plant nutrition and soil fertility. An approach such as this will help to reduce the dependency upon chemical pesticides, and attempt to lessen the impact of disease and pest problems to agriculture in western Nebraska through the use of alternative production measures.

### Meritorious Service Award - Bill Dean

On August 3, 2000 Dr. Leslie L. "Bill" Dean was presented the Lifetime Meritorious Service Award at the Idaho Bean Workshop hosted by the Idaho Bean Commission, Western Bean Dealers Association and the University of Idaho. Bill was recognized for his dedication and outstanding accomplishments in the development, production, and marketing of dry and garden bean varieties, and for his service to the bean industry in Idaho and North America.

Bill has spent 60 years working on beans with the University of Idaho until 1975 and since then with Idaho Seed Bean Company which he founded. He has released many varieties of different market classes of dry beans and snap beans; notable releases include Pinto UI 111, UI 114, Fiesta, and Apache. The roots of all modern pinto varieties grown in the United States and Canada trace back to UI 111, which is among the very first varieties developed by hybridization in its market class worldwide. Bill successfully led the campaign for zero tolerance of bean bacterial diseases in Idaho's seed production fields. This established the solid foundation for, and promotion of, Idaho's garden and dry bean seeds, world renowned for their best quality.

### Loss of a Bean Colleague

Robert L. "Bob" Croissant, age 66, died August 12, 2000 after a lengthy illness. Bob was born in Kuner, CO in 1934. He graduated from Colorado A & M in 1957, and obtained his MS degree in crop science from Colorado State University in 1969. Bob was an extension agent and area agronomist in northeastern Colorado since 1957, and spent his last years as an extension agronomist in Fort Collins at CSU until his retirement in 1995 with more than 37 years of service. Dry bean variety testing and other agronomic research were interwoven throughout his productive career, and team support of many university and private industry personnel throughout eastern Colorado and the surrounding region. Bob is survived by his wife, Leona, two sons and one daughter.

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### Websites of interest to bean growers

[www.csuag.com](http://www.csuag.com)

[www.colostate.edu/Orgs/VegNet/beanlinks](http://www.colostate.edu/Orgs/VegNet/beanlinks)

### **Pulse Industry Website**

Check out AGEX.com (Agricultural Exchanges Online) for current information on the pulse industry. The web site includes regional market analyses, statistical reports, standards and grades, field reports, trading exchange and much more.

## **RELEVANCE OF SOIL TESTING TO AGRICULTURE AND THE ENVIRONMENT**

Excerpts from CAST Issue Paper, No. 15, June 2000

Soil tests are widely used to predict the probability of crop responses to application of fertilizers, particularly phosphorus (P), potassium (K), and in some instances manganese (Mn), copper (Cu), zinc (Zn) and iron (Fe), and application of lime. Soil-test levels at which no response is obtained are defined as critical soil-test levels that have been determined by greenhouse and field experiments.

The commonly used soil-test extractants for P in the United States are the Bray-1 (Midwest), Mehlich 1 and 3 extractants (southeastern United States), and the Olsen extractant (calcareous soils). The Mehlich 3 extractant is being used by many laboratories because it is suitable for measuring soil-test P over a wide range of soil



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properties and also is a multi-element extractant.

Because nitrogen (N) can be a very mobile element, most laboratories do not routinely run a N soil test. Nitrogen recommendations are made on the basis of yield goals for a given crop. Where nitrate-leaching potential is at a minimum, the amount of residual nitrate in the soil profile before planting has been related to the need for fertilizer N. In certain humid regions, nitrate levels of the soil have been measured before N side dressing of corn, and the values interpreted as to the amount of fertilizer N to apply.

There is interest at present as to whether soil tests can be used to determine if application of fertilizers and/or waste materials will result in pollution of surface and ground waters. Using soil testing to identify the potential for an environmental impact may have value, but only if a comprehensive approach is taken. Response parameters for other uses of soil testing have not been so well defined, and linkages often remain intuitive or based on the best professional judgment of a team of scientists. Although agronomic responses have been used as surrogates for other secondary effects, including water-quality degradation, this approach is conservative and does not consider adequately the existence of in-field soil processes, multiple loss-pathways, and nutrient retaining processes beyond the field's edge and in streams.

Progress in soil testing is facilitating assessment of soils likely to act as sources of nutrients for surface and ground water. Extractable soil concentrations of nutrients (or of nonessential elements, organics, etc.) are only a few of the many factors, including transport phenomena, management practice effects, and adjacent water sensitivity to an increase in nutrient concentration that must be considered in determination of an appropriate loading rate for nutrient sources potentially affecting water quality.

[ Note: Copies of this issue paper are available for \$ 3.00 at [www.cast-science.org](http://www.cast-science.org) ]

### **CDBAC Membership**



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world. "We can't tell by the plant's performance in the field how it's going to survive the process," Grafton says. "It's only at the canning stage that we find that out." By then, breeders have invested at least 3 years of work.

Now Hosfield has found molecular markers for some of the canning characteristics of navy beans. And he's searching for more markers that could help breeders eliminate some of the guesswork from the canning test – as well as improve beans' already high nutrient content and the plants' resistance to diseases.

### Flavonoids: The Unexpected Bean Ingredient

People who pay attention to the colors of the foods they cook and serve are enhancing not only visual and gustatory pleasure, but nutritional punch as well.

Red grapes, oranges, pink grapefruit, strawberries, blueberries – all these foods contain colored pigments with nutritious cancer- and heart-disease-fighting compounds called flavonoids. These are the anti-aging antioxidants that may be responsible for the so-called "French paradox" – how the French tend to have fewer heart attacks and cancers, despite consuming high-fat diets. It's believed that the protective factor could be


flavonoids in the skins of red grapes or the wine made from them. Flavonoids are also known to be in many other fruits and vegetables, as well as green and black teas and soy protein.

Now, Agricultural Research Service food quality geneticist and plant breeder George L. Hosfield has found these flavonoids in bean seed coats, which is where bean colors are also found. Certainly beans come in a mosaic of colors that can rival those of fruits and vegetables – from the plain white great northern and navy beans, to the mottled brownish pink pintos, to the cranberry bean's cream color with red streaks and flecks, the light and dark reds of kidney beans, the maroon-red adzuki, all the way to the black bean.

The bean industry has exacting standards for maintaining these colors. "It's so strict," says Hosfield, "that pinto beans, for example, have to not only have just the right brown mottling and shades of pink, but also show a yellow rim around the 'belly button,' or scar, where the bean was once attached to the pod.

"We know all eight genes that code for bean color, but we don't know how they work," Hosfield says. "Now we're trying to figure that out, as well as identify and learn the function of the genes for canning quality, disease resistance, and nutrition. And we're searching

See Flavonoids on page 9



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Flavonoids from page 8

for links between these qualities and bean color." The seed coat, which is 10 percent of the bean, is not only high in antioxidants for some beans, but is also where the high fiber content of beans comes into play.

It was Hosfield who found the antioxidants in the bean coat. He and colleagues removed the coating and made it into an extract, which they freeze-dried. Then they analyzed the constituents. They found eight flavonoids, six of which were particularly strong antioxidants. They also found a genetic link between bean color and the flavonoids. And they found a link between one flavonoid and resistance to bean mosaic disease. This is the first time a specific flavonoid association has been found with a bean color gene.

Using modern molecular genetic technology, pharmaceutical firms could mass-produce these flavonoids if they choose, adding beans to the growing list of foods used to make flavonoid supplements, now that Hosfield and colleagues have begun to break their genetic codes. Breeders could increase the amount of flavonoids in beans through traditional breeding or genetic engineering, or a combination.

Hosfield's work is inspiring other scientists to find ways to boost the high nutritional value of beans, possibly leading to even more iron, other vitamins and minerals, and antioxidants in the legumes. That's why Hosfield is excited about the high levels of antioxidants he's found in small red, red kidney, black beans, and pintos. And it's why he's passionate about the health benefits of eating beans and getting them the respect they deserve.

## DRY BEAN STATISTICS

Excerpts from Bean Market News, August - 2000

State	Area Harvested (000 acres)		Yield (lbs/acre)		Production (000 cwt)	
	1999	2000*	1999	2000*	1999	2000*
California	132.0	112.0	1970	2000	2600	2240
<b>Colorado</b>	145.0	110.0	1900	1850	2755	2035
Idaho	103.0	88.0	2050	2000	2112	1760
Kansas	20.9	17.0	1850	1800	387	306
Michigan	350.0	295.0	2100	1700	7350	5015
Minnesota	165.0	135.0	1550	1450	2558	1958
Montana	25.5	28.0	1730	1700	441	476
Nebraska	187.0	160.0	2000	1900	3740	3040
New York	30.2	24.0	1370	1550	414	372
North Dakota	570.0	490.0	1450	1280	8265	6272
Oregon	10.8	11.8	1610	1950	174	230
Texas	47.0	17.4	1490	1300	701	226
Utah	6.6	5.1	800	160	53	8
Washington	36.0	32.0	2080	2200	750	704
Wisconsin	8.0	8.3	1550	1800	124	149
Wyoming	39.0	37.0	2020	2170	788	803
USA Totals	1877.0	1580.6	1770	1630	33,230	25,764

\* Harvest estimates for the 2000 crop

## NAFTA AGRICULTURE FACT SHEET: DRY BEANS

Excerpts from article by Steve Brown, KBC Bean Talk, July 2000 Issue

It was six years ago, on Jan. 1, 1994, that implementation of the North American Free Trade Agreement (NAFTA) between the United States, Canada and Mexico began. Since then, we've often heard the question, "Where do you stand on NAFTA?" The treaty elicits a whole range of responses – positive, negative and mixed – from everyone from factory workers to corporate executives. Those of us who work in the agricultural exporting community like to think that we can speak with one voice. After all, taken together, Canada and Mexico make up our largest market, accounting for nearly one-quarter of all U.S. agricultural, fish and forest product exports – a total of nearly \$67 billion in 1997.

Yet, so often when we sit down and compare our thoughts, we discover that we have different perspectives – the products of our varying areas of expertise, experience and knowledge. One thing we all agree upon. Canada and Mexico are two completely different markets. More than 70 percent of U.S. agricultural exports to Canada in 1997 were consumer-oriented products, while more than 40 percent of our sales to Mexico in 1997 were bulk commodities.

But while three times as many people lived in Mexico in 1997 than in Canada (95.4 million versus 30.3 million), Canadians and Mexicans spend about the same amount of money per year on food, \$1,155 compared to \$1,100, although the difference in per capita incomes is substantial: In Canada it's \$19,028, in Mexico \$4,801.

To briefly recap, NAFTA mandates the eventual elimination of all nontariff barriers to agricultural trade between the United States and Mexico. Many tariffs were eliminated immediately, while others are phased out over periods of five to 15 years. All agricultural provisions will be implemented by 2008. For import-sensitive industries, long transition periods and special safeguards will allow for an orderly adjustment to free trade with Mexico.

Our agreement with Canada is slightly more complicated because the U.S.-Canada Free Trade Agreement, which went into effect in 1989, was incorporated into NAFTA. Under these provisions, all tariffs affecting agricultural trade between the United States and Canada, with a few exceptions, were removed on Jan. 1, 1998. The exceptions are U.S. imports of dairy, poultry, eggs and margarine, which are covered by tariff-rate quotas.

Overall, I believe the six-year anniversary of NAFTA is something to celebrate. It was the first regional trade agreement ever signed by the United States. It has provided the United States with the impetus to develop

more regional trade relationships, such as the Free Trade Area of the Americas and the Asia Pacific Economic Cooperation forum, while still pushing for global reform under the World Trade Organization. Finally, NAFTA has helped reinforce our strong belief that open markets, where all countries can compete fairly and freely, are the best markets for U.S. agricultural products.

### Treatment of Tariffs:

Upon enactment of the NAFTA on January 1, 1994, the United States eliminated the tariff on dry beans imported from Mexico. These tariffs varied from 1.1 to 3.3 cents per kilogram.

### Treatment of Quantitative Restrictions:

Upon NAFTA implementation, Mexico converted its import licensing regime for dry beans imported from the United States (and Canada) to a transitional tariff-rate quota (TRQ). The TRQ will be in effect for 15 years. For U.S. dry beans, the initial duty-free quota into the Mexican market was 50,000 metric tons in 1994. This amount grows at a 3-percent annual compounded rate over the 15-year transition period. The quota for 1998 is 56,275 metric tons.

U.S. exports to Mexico in excess of the quota are assessed a tariff (based on the "tariffication" of Mexico's import license) initially equal to \$480 per metric ton, but not less than 139 percent. Over the first 6 years of the agreement, an aggregate 24 percent of this over-quota tariff is being eliminated, with the remainder to be phased-out over the rest of the 15-year transition period. The over-quota tariff for 1998 is \$384 per metric ton, but not less than 111.2 percent.

The NAFTA also established a separate TRQ for Mexico's dry bean imports from Canada. Canada gained an initial duty-free quota for 1,500 metric tons of dry beans for 1994. The annual growth rates for Canada's quota, the initial level of the over-tariff; and the over-quota tariff phase-out are the same as those set for the United States.

PostScript Picture  
(CoPrd\_bw.ai)

**NUTRITION IS TOPS FOR NEW  
MILLENNIUM**

Excerpts from Northarvest Bean Grower, June-July 2000

Nutrition is at the top of the checklist when it comes to family meal selection this millennium. According to the Millennium Meals Survey conducted for the Bean Education & Awareness Network (B.E.A.N.), more than three out of four Americans say they plan to select foods they know are nutritious. That's a good thing, because Americans left the last millennium with a long way to go.

According to the USDA, most children do not consume a diet that meets the recommended Dietary Guidelines. And, less than one in five children eats the daily recommended five servings of fruits and vegetables.

Registered dietitian Kim Galeaz advises parents to set a good example when it comes to healthy eating habits by making beans, grains, fruits and vegetables the foundation of family meals.

"From a nutrition perspective, beans are one of the best foods you can serve to your family," says Galeaz. "Beans are considered both a vegetable and a protein. This sets them apart as the only food found in two places on the USDA's Food Guide Pyramid. In addition, beans are rich in important nutrients that today's families don't always get enough of, such as dietary fiber, calcium and iron."

**Ham and Bean Tetrazzini**

- Vegetable cooking spray
- 2 C sliced mushrooms
- 4-6 oz low-sodium, reduced-fat ham, cut into 1/2 inch cubes
- 2 green onions and tops, sliced
- 1 10 3/4 oz can 98% fat-free, sodium-free cream of mushroom soup
- 1 1/4 C fat-free milk
- 1 15 oz can Red Kidney beans or 1 1/2 C cooked dry-packaged Red Kidney beans, rinsed, drained
- 1/2-3/4 C shredded Cheddar cheese Pepper, to taste
- 8 oz cooked spaghetti, warm
- 1/3 C plain dry bread crumbs, optional

Spray large saucepan with cooking spray; heat over medium heat until hot. Saute mushrooms, ham and green onions until mushrooms are tender and ham is beginning to brown, about 5 minutes. Stir in soup and milk and heat to boiling. Reduce heat and simmer, 2 to 3 minutes. Stir in beans and cheese; season to taste with salt and pepper. Stir in spaghetti. Spoon spaghetti mixture into greased 11x7 baking dish. If desired, sprinkle with bread crumbs. Bake at 350 degrees F. until bubbly, about 25 minutes.



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## **IDAHO BEAN WORKSHOP - Crop Management Session Commentary**

by Dr. Howard F. Schwartz, Professor of Plant Pathology, Colorado State University, Dept. of Bioagricultural Sciences & Pest Management, Fort Collins, CO 80523-1173

Note: On August 3 and 4, 2000, the Idaho Bean Workshop was held at Twin Falls, Idaho to celebrate 75 years of bean research and development, and 50 years of the Cooperative Dry Bean Nursery. Various reports and publications will be forthcoming as experts from around the world convened to review the status and future of bean research and needs. The following summary was prepared for the session that dealt with production and pest management papers.

### **Introduction**

The Crop Management Session provides an overview of critical factors which influence the productivity and plant health of beans in the western United States and elsewhere. The collective expertise of nearly a dozen scientists from major universities throughout the region provides valuable information regarding agronomic needs of the bean plant at different stages of growth, and pest threats which require timely and economical management decisions from bean growers and the industry.

### **Agronomic Needs - Soil Fertility**

Soils used for bean production in the western United States are primarily well-drained mineral soils under surface or overhead irrigation according to B. Brown and D. Westermann from the University of Idaho. Most soils are silt loam or lighter textured, vary in salinity, and have a pH that ranges from slightly acidic to highly calcareous. Major nutrient needs of beans focus on nitrogen (provided partially by nitrogen-fixing bacteria but primarily by nitrogen fertilizers), phosphorus, potassium, zinc; with varying needs for other elements such as iron, sulfur, boron, copper, and manganese. Depending upon the fertility component involved, applications may be broadcast or band incorporated during seed bed preparation, or side-dressed.

### **Current Problems in Soil Fertility:**

- Grower needs for private soil and plant testing lab services and private consultant recommendations have surpassed the availability of state personnel and resources
- Recent economic consolidation of these private resources has resulted in fewer professionals with graduate level training in plant nutrition being

- employed, and less nutrition-related research being sponsored by commercial interests
- Lack of applied research to determine the effect of bean yield potential on optimum rates of nitrogen, and other elements including sulfur, iron, copper and boron for cropping systems on mineral soils

### **Future Directions for Soil Fertility:**

- Further define and refine the fertilizer requirements of different bean market classes and cultivars, particularly the differences between dry and snap bean types
- Determine how cultivar differences in nutrient deficiency susceptibilities are genetically defined
- Document the effects of soil lime on phosphorus fertilization and soil fumigation upon mycorrhizal colonization of bean roots to more effectively exploit variable rate P applications
- Study the spatial variability of mineralizable nitrogen in fields in respect to variable rate N applications and precision agriculture technology
- Increase the nitrogen-fixing capabilities of beans under varying growth conditions

See WORKSHOP on page 13

**CSGA**  
**1/4 page**  
**Green**

WORKSHOP from page 12

- Improve soil tests for elements including sulfur and boron

**Agronomic Needs - Irrigation Practices**

Beans grow well in areas with low to medium rainfall, and respond to timely applications of surface and well water provided by furrow (rill), drip, and sprinkler (overhead) irrigation. R. Allen, D. Yonts and J. Wright from the Universities of Idaho and Nebraska and the USDA-ARS, respectively, estimate that the total net water requirements (precipitation and net irrigation) for maximum production of a 60 - 120 day bean crop range from 12 to 20 inches, depending upon season length and climate. Flowering and pod formation are the most sensitive stages for beans, which can develop a 3 to 5 foot long tap root with extensive lateral roots. A severe water deficit during the vegetative period may retard plant development, cause non-uniform growth, and delay maturity. The initial irrigation and interval between irrigations are critical decisions for growers, especially when dealing with disease threats such as Fusarium and white mold.

**Current Problems in Irrigation Practices:**

- Water use efficiency ratios vary with cultivar and soil fertility
- Difficulty and expense in measuring evapotranspiration requirements for individual crop cultivars has led to a deficiency in cultivar-specific information

- Interaction with plant disease spread and development in relation to the cropping system and yield goal

**Future Directions for Irrigation Practices:**

- Development of other models to compute evapotranspiration; i.e. Penman-Monteith equation or multi-layer models which will require more information
- Enhanced irrigation efficiency and timing in relation to limited water availability, water quality (salinity, nutrient runoff, soil erosion), disease management, and specific cultivar needs

**Pest Threats - Weeds**

Integrated weed management (IWM) is an approach whereby growers can more effectively control problem weeds by incorporating preventive, cultural, mechanical and chemical methods. B. Waters and D. Morishita from the University of Idaho warn growers that reliance on only a single method (i.e., herbicides) to control weeds should be avoided as it can cause a shift in or resistance within the weed population. Weeds compete with bean plants for water, nutrients, and sunlight, and decrease crop yield and quality. IWM emphasizes planting certified weed-free seed, properly composted manure, filtered surface or well irrigation water, scouting and description of new and herbicide-resistant weeds, proper crop rotation, optimal fertilizer placement, timely tillage operations, and the effective use of herbicides.

See WORKSHOP on page 14



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WORKSHOP from page 13

**Current Problems in Weed Management:**

- Priority species and concerns to bean growers in the western United States include broadleaf weeds such as hairy nightshade, common lambsquarters, common mallow, prickly lettuce, redroot pigweed, common cocklebur, common purslane, common sunflower; and grass species such as green foxtail, barnyardgrass, wild oat, wild-proso millet, and witchgrass
- Increasing incidence of resistance of weed species to specific herbicide chemistries
- As a minor crop, fewer herbicides are being registered for use on beans

**Future Directions for Weed Management:**

- Reliance upon programs such as IR-4 (Interregional Research Project No. 4) to facilitate registration of new pesticides on beans
- Integration of cultural and preventive practices with mechanical and chemical approaches to more effectively manage weeds
- Application of precision agriculture technology for site-

specific identification and management of selected weed species

- Prevention or early control of new weed species within bean cropping systems, slow weed adaptation, and enhance crop competition

**Pest Threats - Plant Diseases**

North American bean production regions are affected to varying degrees by a wide range of plant pathogens and the diseases they cause. R. Forster, J. Steadman and H. Schwartz from the Universities of Idaho, Nebraska and Colorado State, respectively, review the distribution of major diseases in the Pacific Northwest, High Plains, Red River Valley, Great Lakes and Southern Canada. Fungal root rots and white mold are annual threats to all classes of beans in every production region, while foliar diseases such as bacteria and rust occur sporadically in a few regions with variable weather conditions. Seed-borne viral, bacterial and fungal pathogens seldom cause serious losses in western states, but are major concerns to bean seed producers and the successful marketing of their seed product to the seed industry and growers throughout commercial bean regions.

**Current Problems in Plant Disease Management:**

- White mold stands out as the single biggest disease threat to bean production, especially with the shift from rainfed to irrigated production during the last 50 years; losses have been exacerbated by the release of late-maturing, vigorously-vining and high yielding, but highly susceptible cultivars
- Minimum tillage conserves more crop residues on the soil surface and can increase diseases such as rust and bacterial blights which survive from season to season to infect volunteer beans and/or be spread by wind, water and implements
- Poor cultural practices (heavy equipment, short crop rotations or the use of crops susceptible to the same pathogens) can contribute to soil compaction and poor drainage, which then increases the incidence and severity of root rots and fungal wilts
- Most bean fungicides and bactericides are protectant in nature, have limited efficacy, and require multiple applications which increases grower expense

**Future Directions for Plant Disease Management:**

- Development of high yielding cultivars with enhanced resistance to priority diseases such as white mold and root rots, in addition to regionally important diseases such as bacterial blights and rust with its pathogenically variable races
- Application of integrated disease management strategies which incorporate disease monitoring and

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WORKSHOP from page 14

- forecasting with certified seed, cultural practices (soil tillage), irrigation and fertility management, disease resistance, and the judicious use of new and more effective fungicide/bio-pesticide products
- Integration of disease, insect and weed management strategies with crop production practices and their inter-related responses to provide growers with a true systems approach to bean production and pest management decision-making

### ***Pest Threats - Insects***

Western-grown beans are attacked by a variety of insect pests that cause direct damage by their feeding activities and indirect damage by transmission of plant pathogens such as some viruses. R. Stoltz from the University of Idaho reviews priority insect pests such as the lygus bug, Mexican bean beetle, sugar beet leafhopper, western bean cutworm, seed corn maggot, wireworm, cutworms, aphids, thrips, two-spotted spider mite, bean weevil, and Indian meal moth. These pests can attack bean seedlings prior to emergence, after emergence, and even after harvest during storage. Bean growing areas in the Pacific Northwest generally do not have as many insect problems as the Midwest or eastern U. S. growing regions. Management approaches have relied upon insecticides, and cultural practices such as proper crop rotation and planting date.

### ***Current Problems in Insect Management:***

- Reliance upon specific insecticide chemistry, often done on a preventive or rescue basis with widespread

negative effects on beneficial insect populations as well, and sometimes eliciting resistance within populations of the insect

- Lack of economic threshold criteria and scouting calendars for many insect pests of bean

### ***Future Directions for Insect Management:***

- Application of biopesticides including entomopathogenic nematodes, fungi, bacteria and viruses, predatory mites, parasitic wasps; in addition to new synthetic chemistries that are selective, have reduced risk and are environmentally safe
- Pest monitoring, improved detection and the timely application of biorational and other controls
- Enhanced understanding of the role of changing crop production practices on insect pest activity and control

### ***Suggested Topics for the Discussion Session***

- What are public agency, private sector and commodity organization responsibilities with regards to addressing production and pest management needs of the bean growers and industry in bean production regions such as the Pacific Northwest?
- Rank the top 5 production and top 5 pest management priorities that public and/or private sectors should focus on during the next 10 years.
- How much emphasis should be placed on the role of pesticides, fertilizers and other inputs in future production practices and integrated pest management strategies?

DIET from page 3

Bread, Cereal, Rice, & Pasta Group (beans are 65% starch); as well as the Vegetable group because of their high fiber levels. In the light of findings in recent years with regards to the newly found health benefits of dry beans, strong consideration should be made as to how dry beans are classified in the new Dietary Guidelines. Their high nutrition value should be promoted to consumers by mentioning dry beans more frequently in the context of each of these food groupings.

The unique nature of dry beans and legumes has warranted their own category in the food guidelines and food pyramids in other cultures. This emphasis on dry beans and legumes demonstrates to consumers the importance of beans in a balanced diet. The Mediterranean and Asian Food Pyramids are both examples where dry beans are listed in separate categories (with seeds, nuts, and legumes). In both of these cases, dry beans are near the base of the food pyramid centered between the Fruits category and the Vegetables category. These Pyramids show consumers that the health benefits of dry beans are similar to those of fruits and vegetables. The U.S. Dietary Guidelines and eventually the Food Pyramid would show the versatile health benefits of dry beans if they did the same.

Emphasizing dry beans in the new Dietary Guidelines is

relevant to today's diet recommendations to improve nutrition. Dry beans are high in protein, complex carbohydrates, fiber, vitamins, and minerals – yet they are low in fat and are cholesterol free. This healthful combination enhances the quality of therapeutic diets designed to reduce risks from chronic diseases such as cardiovascular disease, diabetes mellitus, obesity, cancer, hypertension, and digestive disorders. The composition of dry beans that contributes to their health benefits include:

- Protein: Dry beans contain an average of 21-25% of calories from plant proteins.
- Carbohydrates: The dry bean is 60-65% carbohydrates, primarily composed of complex structural and storage polysaccharides (starch).
- Fiber: Dry beans contain a substantial amount of soluble and insoluble fiber. A one-half cup serving of beans contains 6.5-g total fiber, with 2.4-g soluble fiber.
- Vitamins: One cup of dry cooked beans can provide up to 50% of folic acid, 25% thiamin, 10-12% pyridoxine, 10% riboflavin, and 10% niacin for meeting the RDA's guidelines for adults.
- Minerals: Beans significantly contribute to RDA mineral requirements including calcium (10%), iron (33% in female and 55% in males), copper (20%), zinc (10%), phosphorus (25%), potassium (20%), and magnesium (20-25%) in a one-cup serving.

# IR-4 MINOR CROP PROGRAM

By Dr. Sandra McDonald, CSU Pesticide Education Specialist & Clark Oman, IR-4 Specialist for Colorado

Colorado State University is pleased to announce the creation of the Colorado Minor Crop Pesticide Program (CMCPP). Funding for the program is provided by IR-4, a federal program that provides data for registration of pest control products used on minor crops such as vegetables, fruits, herbs and ornamentals. The program is housed within the Department of Bioagricultural Sciences and Pest Management and is part of the Colorado Environmental Pesticide Education Program. The goal of the program is to provide Colorado growers with safe, effective, and economical tools to control pests on minor crops. To achieve this goal, the CMCPP will:

1. Work with individual growers, grower organizations, nurserymen, crop protection chemical companies, agricultural scientists and extension personnel to identify specific pest control needs.
2. Identify new pest management strategies and control options.
3. Prepare and submit a Pesticide Clearance Request (PCR) to IR-4 if a new pesticide or biopesticide is identified.
4. Participate in setting national research priorities.
5. Following the PCR selection and approval process, the CMCPP will carry out field residue trials according to Good Laboratory Practices to generate the food safety data required by EPA for registration.
6. Submit data to IR-4 for inclusion in registration packet to be sent to EPA.
7. After tolerance establishment, work with the Colorado Department of Agriculture and company registrants to develop a label for the pesticide.

In addition to this, we will be developing a series of minor crop profiles for the USDA Office of Pest Management Policy. These profiles will include information regarding acreage, value, Colorado's rank in U.S. production for a given crop, common production

practices, major pests and pest management strategies.

Crop profiles are a visible, accessible public tool for USDA, EPA, growers and others. The profiles background information on crop production and pest management practices will be used to evaluate and review EPA risk assessments, Reregistration Eligibility Documents (REDs), proposed risk mitigation/management measures, and proposed label modifications, i.e. changes in application rates of PHIs, crop deletions, buffer zones, REIs, etc. By comparing profile information with EPA assumptions we can better respond to risk assessments and other regulatory decisions that are being made.

Crop profiles help identify critical pest management needs, including the importance of individual pesticides to both IPM and Resistance Management Programs. Identifying how regulatory decisions may impact these established programs will be of significant importance during the implementation of FQPA and will help direct IR-4/CMCPP priorities.

Another goal of the program is to develop a collection of pesticide matrices that can be used to identify chemical and cultural methods of pest control for important minor crops within Colorado.

Our first field season has included field residue trials in cabbage/fungicide, tart cherries/fungicide, dry beans/insecticide, dry bulb onions/insecticide and herbicide, potatoes/herbicide, spinach/fungicide, and sunflowers/herbicide as well as efficacy and performance trials in cilantro/fungicide, potatoes/herbicide and spinach/fungicide.

Sandra McDonald serves as the Program's Field Research Director and State Liaison Representative. Clark Oman serves as the Minor Crop Pesticide Specialist and is responsible for managing the field residue trials, developing the minor crop profiles and pesticide matrices.

