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## USDA Forecast for Farm Exports

By Janet White, California Agriculture (Vol. 53-5, 1999)

**F**arm exports in the United States have dropped for 3 years, due in part to the Asian crisis, which began in July 1997. Now, new forecasts from the U.S.D.A. suggest the trend may have bottomed out. Better prospects in fiscal 2000 (Oct. 1, 1999 to Sept. 30, 2000) are based on anticipated global economic growth, especially in Asia, and reduced foreign production of some bulk commodities, such as wheat and soybeans.

The Asian crisis weakened global demand for agricultural products, partly by lowering incomes in affected countries. Other events also depressed prices, including large production of grains and oilseeds worldwide. Although the countries most affected by the crisis were in East Asia, ripple effects spread to Russia, South America and the oil-exporting countries of the Middle East.

U.S. farm exports declined steadily after reaching a high for the year ending Sept. 30, 1996. USDA reports they dropped from \$ 59.8 billion in fiscal 1996 to, \$ 57.3 billion in 1997, \$ 53.6 billion in 1998, and a projected \$ 49 billion in 1999. That represents a cumulative decline of 18 % over 3 years. However, the recent forecast, based on financial recoveries now under way in East Asia and elsewhere, predicts an upward trend beginning next year, with \$ 50 billion farm export value, which will continue to grow in the future.

The reasons for trade optimism include the fact that Japan's economy appears to be growing again after a long period of stagnation. The U.S. economy remains robust, with Gross Domestic Product (GDP) growing almost 4 % for the third year in a row, and the projected GDP up 2.5 % in the year 2000.

Depressed world demand and efforts of the crisis-affected countries to generate more export revenues have driven world prices of raw materials and manufactured goods down. This has reduced U.S. costs and allowed the economy to grow rapidly with little or no inflation. These same factors have made it more difficult to export U.S. agricultural commodities and products.

Another factor that is likely to affect U.S. farm trade in the future is the outcome of the ninth round of international trade talks, which will be launched at the World Trade Organization (WTO) Ministerial Conference in Seattle this December. While agriculture has been involved in each of the previous rounds, it was not until the Uruguay Round of Multilateral Trade Negotiations (ending in 1994) that real progress was made to negotiate overall reductions in barriers to agricultural trade.

Negotiations beginning in December will be aimed at opening agricultural markets, eliminating export subsidies and adopting related reforms. Among the most important goals is further reducing agricultural tariffs, which are, on average, still much higher than those on manufactured items.

[Excerpts taken from this article by Janet White who compiled sections from the Outlook for Agricultural Trade of Aug. 31, 1999.]

MAILING LABEL UPDATE  
Please send changes to:  
Dr. H.F. Schwartz, CBN Editor  
E207 Plant Science Building  
Colorado State University  
Fort Collins, CO 80523-1177



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**COLORADO DRY BEAN  
ADMINISTRATIVE UPDATE**

By Robert Schork, CDBAC Manager



**November CDBAC Meeting - Lakewood:**

The CDBAC has registered for a web page and e-mail service. Bob is currently designing the web page, so stay tuned for more information on its availability in the near future. At the November 1 meeting, the Colorado Commissioner of Agriculture Don Ament will present plaques to Bud Pekarek, Richard Folot and Robert Taylor for their years of leadership and service to the Colorado Dry Bean Administrative Committee and bean growers statewide.

Other agenda items will include a review of the CDBAC financial statements, review of the 2000 crop forecast, development of a preliminary budget for 2000, and discussion on the feasibility of changing the market order to allow directors to serve more than two consecutive terms.

**ACF Culinaricians of Colorado:**

Joan Brewster, ACF Executive Director, reported on their activities supported in part by the CDBAC. In April, they held a competition at the Colorado Restaurant Association trade show to name the winner of the Best Colorado Dry Bean Dish. Randy Mathews and Brad Taylor helped with the presentations to Chef Robert Meitzer of the Brown Palace who was named Best All Around. (See the Nutrition Section of this issue of Colorado Bean News)

In May, the chefs again held a "friendly" competition at the annual Colorado Celebrity PRO/AM Cooking Classic where over 900 people attended and had an opportunity to sample some of the finest cuisine in Colorado. Among the many dishes prepared by chefs were recipes featuring dry beans. The winning chef in the dry bean category was Chef Kent Palmerton from the Green Gables Country Club. He is Chef Robert Sherlocks's Sous Chef.

In July, Chef Ron Pickarski, CEC, Eco-Cuisine, A Culinary Olympic gold medalist and cookbook author, presented a seminar at the National American Culinary Federation convention in Chicago which featured dry beans; see excerpts of his presentation in the Nutrition Section of this issue of Colorado Bean News. His seminar was presented to a standing room only crowd of chefs from across the United States. The seminar was a huge hit and represented the dry bean industry well.

In September, Chef Robert Sherlock traveled with five other chefs to the Montrose "Best of the West" food festival which emphasizes Colorado products. He prepared a dish featuring dry beans and handed out literature about dry beans to those in attendance.

**National Dry Bean Council:**

The National Dry Bean Council (NDBC) was founded in the early 1940s, and represents the six production regions in the U. S. It was founded, in part, to promote the sale and consumption of dry beans in domestic and international markets, in addition to being a

## ***CDBAC Budget as of August 31, 1999***

<b>Budget Item</b>	<b>Budget (\$)</b>	<b>YTD – Actual \$</b>	<b>Remaining FY 1999 Commitments</b>	<b>Remaining Budgeted Funds</b>
Assessments	160,000	111,204		
Interest	2,500	2,574		
TOTAL Income	162,500	113,778		
Research	44,800	44,800	0	0
Administrative	18,000	9,000	6,000	3,000
Promotional	20,200	17,594	0	2,606
Meetings & Travel	12,000	7,070	0	4,930
Dues	50,000	25,000	25,000	0
CBN Newsletter	8,000	6,000	2,000	0
Accounting/legal	2,500	1,850	0	650
Refunds	2,000	1,592	0	408
Telephone, postage	2,000	2,723	0	(723)
TOTAL Expense	159,500	115,629	33,000	11,186
Excess (Shortage)	3,000	(1,851)		

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

CDBAC from page 2

liaison between government and industry. The NDBC can provide information on the supply, nominal values, quantity, and nutritional aspects of specific classes of beans. Phil Kimball – Exec. Secretary, National Dry Bean Council, 6707 Old Dominion Drive - Suite 315, McLean, VA 22101 [tele: 703-556-9305; fax: 703-556-9301; email: ndbc@internetMCI.COM]

State grower association members of the NDBC are:

- Nebraska Dry Bean Commission
- Idaho Bean Commission
- Colorado Dry Bean Administrative Committee
- California Dry Bean Advisory Board
- Michigan Bean Commission

Bean processors and shippers members of the NDBC are:

- Rocky Mountain Bean Dealers Association
- California Bean Shippers Association
- Washington Bean Dealers Association
- North Central Bean Dealers Association
- Western Bean Dealers Association
- New York State Bean Shippers Association
- Michigan Bean Shippers Association

Since 1916, dry bean producers and shippers in Colorado, Nebraska, Kansas, Montana, Wyoming, Texas, Utah and New Mexico have promoted the high quality of their bean production through the Rocky Mountain Bean Dealers Association. Composing the largest production region in the United States for both pinto and great northern beans, the RMBDA participates in a quality grading system which meets or exceeds the U. S. government standards. Dry bean producers in the states

of Colorado and Nebraska have joined together to promote their beans and to invest in research to improve the quality and cost efficiency of their production. Vickie Idler – Exec. Secretary, Rocky Mountain Bean Dealers Association, 11178 Huron Street, Building 1 - Suite 204, Denver, CO 80234 [tele: 303-280-5208; fax: 303-280-5217]

### ***NDBC Mexico Updates:***

SAGAR Zacatecas reported a planted area of 716,000 dryland hectares and 31,000 irrigated hectares, with 55 % as blacks and 45 % as other varieties. Rainfall was good until a month ago, but there are now concerns about the effects of prolonged drought since the middle of plant development. They estimate that 60,000 hectares could be damaged already by the drought. They are expecting a production of at less than 200,000 MT. Some 'Coyotes' estimate drought damage at 30 % of the crop, without considering further losses from early frosts.

SAGAR Durango reported 284,912 hectares planted in dryland and 3,533 hectares planted in irrigated areas. Rainfall has dropped off, and is only 38 % of the amount normally received by now. They estimate that 20,000 hectares could be damaged already by the drought; and some estimates are now at 30 % of the crop. Varieties planted are 50 % pintos, 30 % blacks, and 20 % azufrados and flor de mayo. Durango is expecting a production of 120,000 MT.

SAGAR Chihuahua reported 239,747 hectares planted with 8,345 hectares damaged by excess water and



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970-463-5468

Howard Schwartz, CSU Secretary  
970-491-6987

Steve Krosky, Greeley Elevator Treasurer  
970-352-2575

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

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. . . . . hfspp@lamar.colostate.edu

**Layout:** . . . . . Mark S. McMillan, (970)491-7846  
. . . . . msmcm@lamar.colostate.edu

**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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**AMERICAN DRY BEAN BOARD  
HIGHLIGHTS**

115 Railway Plaza, Scottsbluff, NE 69341 - Sue Hays, Executive Secretary



**August 19 Bean Flash:**

Omnibus survey results from earlier this year have provided BEAN with this topic for the first media release of this program year. Reviewed by the Promotion Committee, the release will be distributed by BEAN the middle of next week. In addition to BEAN's usual circulation to food and nutrition editors, this release will be sent to health and medical editors. The recipe is The Greek Hero, using Hummus, French bread, Kalamata olives, and feta cheese.

The sidebar for this release provides information on the calcium content of beans. In another Omnibus question, BEAN learned that healthy bones are a concern in the new millennium. Santa Fe Bean Mashers, featuring Navy beans and potatoes, is the calcium-rich recipe with this sidebar.

**September 1 Bean Flash:**

Promotion Committee members are reviewing the text for the new brochure we are developing this year. Tentatively titled, "Meals for the New Millennium, Today's Chefs Predict Tomorrow's Food", the text notes that chefs identified dry beans as one of the leaders on the list of foods of the future.

The brochure may quote BEAN Chef Spokeperson Katy Keck as stating that beans, "one of the oldest foods known to man, continue to play a role in culinary trends because they taste good, and are satisfying, nutritious, and versatile.

Recipes in the brochure may include: Asian Bean and Rice Rolls (red beans or light red kidney beans), Bean and Shrimp Risotto (light red kidney beans), Mango and Black Bean Salad with Grilled Tuna (black beans), Pasta with Beans and Greens (navy or pinto beans), and Stir-Fried Blackeyes and Beef with Black Bean Sauce (blackeyes or pinto beans).

**September 8 Bean Flash:**

Early results are coming in on the latest BEAN folate mat release, which was released this June. This is just the first of several activities in this year's national public relations program. To date, our release has generated 512 newspaper articles, reaching more than 26 million people. Major market placements include New York, Chicago, Miami, Minneapolis, St. Louis, Phoenix, Denver, and Milwaukee.

**September 27 Bean Flash:**

We are pleased to report that the Associated Press (AP) is distributing the Greek Hero recipe and photograph from our most recent recipe release to newspaper food editors nationwide. Greek Hero is one of two recipes included with our release entitled, "Feeling Good More Important than Looking Good in the New Millennium". This release is the first of four in the Omnibus series for this year. Editors received the release and photography in August.

Circulation of our recipes through the AP usually results in millions of impressions nationwide because a large number of newspapers rely on the AP for food page information. As an example, AP's distribution of our folate release starting last November has resulted in over 14.4 million impressions through newspapers covering a broad cross section of the country.

has a readership of nearly 4.5 million.

NOTE:

Nutritional Profiles for Cooked Dry Beans (all market classes) can be obtained from the American Dry Bean Board web site at [www.americanbean.org](http://www.americanbean.org)

**October 1 Bean Flash:**

On September 29, the Chicago Sun-Times food section (readership of 1.2 million) ran a story - The Mexican Food Trend Calls for U. S. Beans by the T - about the growing Latino population in the U. S. and its effect on the dry bean industry. The article gives information on black and pinto bean consumption trends and notes some of the ties to increased ethnic food popularity.

Quotes from Bob Green on the general trend toward consumption of Latino-style foods and Dick Gremel on his production of black beans are featured. Joe Perez gives information about the Goya product lines and their preference toward domestic purchasing of beans and spices.

USA Today included beans in a folate story that ran September 29. The article refers to a recent study that appears in the American Journal of Clinical Nutrition and lists beans as a natural source of folate. USA Today

**DRY BEAN GROWER ASSOCIATIONS  
U.S.A. RESEARCH COLLABORATION**

By Dr. Howard F. Schwartz, Colorado State University

**Introduction**

The United States bean industry and growers have promoted a progressive and dynamic working relationship with teams of research scientists, extension educators and other technical personnel from various land grant universities, the U. S. Department of Agriculture, and private organizations including seed, agrichemical and equipment companies since the early 1900s. This interactive relationship has elevated the value of diverse bean market classes in terms of nutrition, crop alternatives, economic return and overall sustainability for growers and the U. S. bean industry.

Many market classes of beans were originally introduced into the United States by immigrants who arrived from Europe and other areas of the world during the last 300 years, and by introgression of some plant species and selections made by early visitors and inhabitants from the Americas; i.e., Native Americans, Mexicans, Central Americans and others who cultivated tepary beans, wild beans, and other types of legumes in small gardens and subsistence fields for their families and communities. In the early to mid 1900s, the bean crop gained favor with growers as more than a source of protein for their family. The dry bean industry began to take shape as bean growers and dealers developed increasing political awareness and a more united voice as they expressed their needs for improvements in land race varieties and selections, production techniques, pest management practices, marketing, nutrition and education to establish their competitive position in the national and international marketplaces.

For many years, the USDA and various state governments supported these needs and priorities by directly financing positions (salaries for scientists, educators, technicians) and operating budgets required to conduct basic and applied research, extension and educational programs of benefit to dry bean growers, the industry, and consumers. However, beginning in the 1970s commodity groups began to see a decline in direct support from the government as more and more national and international agencies, projects and needs competed for limited tax dollars and funding sources. In addition,

See Research on page 10



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

## Research Personnel:

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

## Extension Personnel:

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

## Websites of interest to bean growers

**CSU VegNet**  
www.colostate.edu/Orgs/VegNet

**CSU Variety Trial Results**  
www.colostate.edu/Depts/SoilCrop/extens.html

**Ag Stats**  
www.usda.gov/nass/

**American Dry Bean Board**  
www.americanbean.org

**BeanGenes**  
beangenesis.cws.ndsu.nodak.edu

**BeanRef**  
www.ba.cnr.it/Beanref

**Colorado Department of Agriculture**  
www.ag.state.co.us/DPI

**Idaho Bean Commission**  
www2.state.id.us/bean

**Jacks Bean Company**  
www.jacksbean.com

**Michigan Dry Beans**  
www.concentric.net/~Mbsa

**Nebraska Dry Bean Commission**  
www.nebraskadrybean.com

**Northarvest Bean Growers Association**  
www.northarvestbean.org

**Nutrient Data Lab**  
www.nal.usda.gov/fnic/foodcomp

**Ontario White Bean Producers**  
www.wwdc.com/whitepeabeans/

**University of Nebraska, Lincoln IANR**  
ianrwa1s.unl.edu/cgi-bin/websearch  
(type "dry edible beans" to begin search)

## BEAN BYTES



### CSU Variety Trials & Other Research:

The Colorado State University Bean Variety Testing program conducted a series of trials in commercial fields and other sites with promising breeding lines and released varieties of pinto and other market classes throughout Colorado. Sites included: CSU ARDEC at Fort Collins, CSU Rocky Ford, CSU Fruita, CSU Yellow Jacket, Platteville (Jerry Alldredge + Brent Adler), Idalia (Ron Meyer + Dennis Towns), Julesburg (Gary Lancaster + Bruce Holcomb), and Yuma Irrigation Research Farm (Debbie Nicholes).

Other CSU Research trials in 1999 include weed management, disease management, various agronomic studies and technology transfer. Look for more information in the next newsletter of trial results supported in part by the CDBAC.

### CSU Bean Management Clinic:

More than 60 participants took advantage of the day-long clinic hosted by CSU bean research scientists and extension educators at the CSU ARDEC facility on August 10. The hands-on workshop enhanced field diagnostic skills, and demonstrated production and pest management strategies. Topics included production stages of development, irrigation management, nutrient management, salinity, entomology, plant diseases, weeds, abiotic stress effects, and herbicide modes of action and injury to the bean crop.

A highlight came at lunch as Chef Snooze (Robert Sherlock of Green Gables Country Club) served two of his delicious signature bean dishes plus shared bean promotion comments with the hungry and appreciative crowd.

### September 28 Regional Planning Meeting:

CSU hosted the planning meeting of the Central High Plains Bean & Beet Group at ARDEC to discuss extension and education activities for the upcoming year. The mission of this group is to use research and educational resources of Colorado State University, the University of Nebraska, the University of Wyoming, and the USDA-ARS in a regional collaborative effort to improve crop profitability and quality, and to conserve natural resources for the sugar beet and dry edible bean industries in Colorado, Nebraska, and Wyoming.

A beet production guide is underway for release next year. After its release, the committee will turn its attention to updating and reprinting the popular bean guide. At this time with the depressed markets and agricultural economy, there are no immediate plans underway for winter bean meetings.

### Colorado Proud Logo:

Contact the Colorado Department of Agriculture, Markets Division, 700 Kipling Street - Suite 4000, Lakewood, CO 80215 [tele: 303-239-4114; fax: 303-239-4125; email: markets@ag.state.co.us] for more information on COLORADO PROUD, a new marketing program for Colorado food and agricultural products.

Research strongly indicates that, given a choice, consumers prefer to purchase locally grown foods. The goal of this program is to make it easier for consumers, retailers and restaurants to identify and purchase Colorado products. The bright, distinctive COLORADO PROUD logo series will help residents of our state, other states and other countries easily identify high-quality Colorado foods.

The COLORADO PROUD and COLORADO FRESH logos may be used to promote any food or agricultural item that has been grown, raised or processed in Colorado. Non-food items must be at least 50 % agricultural origin by weight, and that agricultural base must have been grown, raised or processed in Colorado. The COLORADO ORGANIC logo may be used to identify Colorado agricultural products that have been certified by the Colorado Organic Certification program.



**2000 Colorado Ag Outlook Forum:**

Don Ament, Commissioner of Agriculture for Colorado, recently sent a letter to the CDBAC thanking the dry bean committee for its support of the previous Outlook Forum and inviting them to help sponsor the upcoming forum on February 10, 2000 at the Adam's Mark Hotel in downtown Denver. Look for more information in the next few weeks on registration for this forum.

The theme of the next forum is "International Trade and Environmental Markets". The Forum will examine two primary issues: (1) prospects for U. S. agriculture in global markets, and (2) growing markets for environmental benefits provided by agriculture - including open space, wildlife habitat, soil and water quality, watershed protection, and carbon sequestering.

What roles will the World Trade Organization play in lowering subsidies and resolving disputes over genetically modified crops? Under what conditions should environmental benefits produced by domestic and international agriculture be regarded as legitimate marketable products?



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grasshoppers. They are expecting a production of 120,000 MT. SAGAR also reported that there are still 25,000 MT of beans from the last crop warehoused in Chihuahua.

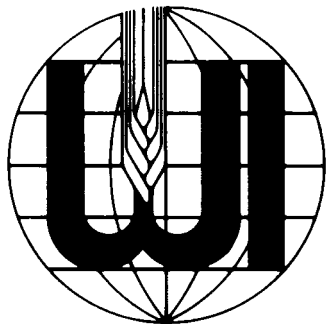
The Mexico harvest tour is currently underway with representatives from the NDBC, and more information will be forthcoming.

### ***Mexico's Import Auction Creates Controversy:***

By Brian Clancy, STAT, September 1999  
Excerpts from Northharvest Bean Growers Association Talkin' Beans

The recent auction of most of this year's duty-free import licenses for dry edible beans has not stilled the waters surrounding trade in the commodity between the United States and Mexico. For some processors, business cannot come quickly enough and frustration is already being expressed that the sale of permits was not immediately followed by shipping instructions. Of greater concern are reports by some U. S. shippers that their Mexican buyers were not awarded import permits at the auction.

Mexican importers paid an estimated US \$ 4.73 cwt for the right to import a specified tonnage of duty-free dry edible beans from the United States before December 31.



## **WESTERN INTERNATIONAL GRAIN**

**DRY BEAN RECEIVING &  
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		1-800-827-9559
Keenesburg:		(303)732-4241
Milliken:		1-800-635-2326

This amount is significantly higher than the duty rates that were applied to dry edible beans before NAFTA was negotiated.

Completion of the auction has generally pleased shippers in the United States. By contrast, it has angered Mexican growers in Sinaloa. Sinaloa's Cardena Farmers Cooperative claims there are still 98,000 MT of domestic beans in farm-loan storage with prices of only about U.S. \$ 24.50 cwt. At the same time, harvests in Zacatecas and Durango will be adding to supplies.

## ***DRY BEAN PRODUCTION SYSTEMS AND STATISTICS in the U.S.A.***

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

### ***Review of U.S. Bean Production Systems:***

Dry beans are produced on nearly 2 million acres in diverse cropping systems throughout the United States, and are categorized as either dryland (rainfed) or irrigated (center pivot or sprinkler, furrow or flood, drip). Crop rotations usually follow a 2 - 4 year interval with alternating crops that include small grains such as wheat, sunflower, corn, sugar beet, or vegetables such as potato and onion.

Most adapted dry bean varieties mature in 85 to 110 days, with machinery providing all labor required from planting to harvest. Growth habits vary from Type I (determinate) for most large-seeded market classes to Type II and III (indeterminate) for small to medium-seeded market classes. Most market classes offer a wide selection of varieties, and growers often select those varieties with the best adaptation, highest seed quality, and the most effective resistance to prevalent plant diseases.

Planting dates vary for specific regions within the United States, but the majority of dry beans are planted during May to July, and harvested during August to late September. Row spacing varies from 30 to 40 inches for dryland systems to 22 - 30 inches for most irrigated systems; and there are some solid seeded systems with a row spacing of 6 - 8 inches.

Certified seed classes are planted by most growers and this high quality product is obtained from private and public seed industries in western states such as Colorado, Wyoming, Idaho, Oregon, Washington and

California with drier environments that are less conducive to seed-borne plant pathogens and their diseases. Some midwestern states (Michigan, North Dakota, Minnesota) may increase the volume of western-produced seed stocks for one year prior to distribution to local growers. Most of the 1-year old certified seed is treated with pesticides (combination of bactericide, fungicide and insecticide) to enhance germination and seedling establishment.

Growers plant to stand to achieve recommended densities of 30,000 to 50,000 plants / acre for dryland systems, and 75,000 to 125,000 plants / acre for irrigated systems depending upon the varietal growth habit and market class. For example, a 75,000 plant population is desired for a type III pinto grown on a 30 inch wide row spacing under furrow irrigation; while a 100,000 plant population is desired for a type I light red kidney grown on a 22 - 30 inch row spacing under sprinkler irrigation.

Fertilizer inputs vary depending upon the cropping system, soil conditions and resources available to the grower. Soil pH may vary from 5 to 8 throughout the U. S. Soil types range from mineral (low organic matter less than 2 %) to organic, which in turn affects nutrient availability, deficiencies, toxicities and requirements for the bean crop. Therefore, fertilizer recommendations vary for their specific content and amount, depending on the soil conditions, plant population, market class and grower preference. A small portion of growers also rely upon inoculants (Rhizobium); especially those growers who produce organic beans.

Pesticides (herbicides, insecticides, fungicides, bactericides, nematicides) are applied to the seed, soil, or foliage, depending upon the specific chemistry involved, cost and targeted pest(s). Herbicides are applied pre-plant, pre-emergence or post-emergence, depending upon the specific chemistry, priority weeds, and cropping system. Common weeds throughout the U. S. include

nightshades, pigweed, lambsquarter and various grass species.

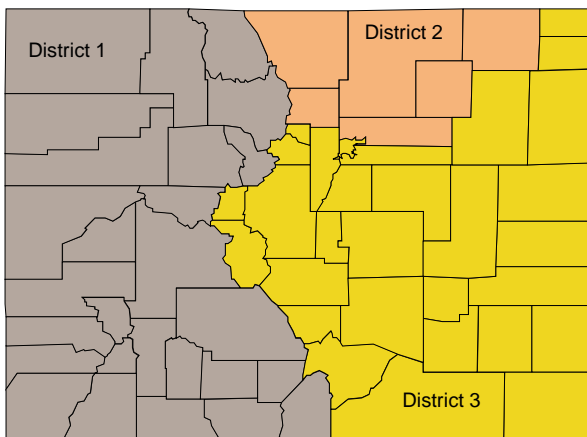
Soil-borne diseases and insects are generally targeted with seed and planter-box treatments; with some applications to the seed furrow at planting. Foliar and pod diseases and insect pests are generally targeted with foliar pesticides applied with a ground-rig, airplane or injection system. Applications can be made by the grower if licensed by state and/or federal programs, or by certified applicators.

Common insect pests throughout the U. S. include soil-borne (maggots, wireworms, cutworms), defoliating (flea beetle, grasshoppers, western corn rootworm, Mexican bean beetle), sucking and leaf-curling (aphids, leafhoppers, spider mites, thrips), and pod and seed-feeding (cutworm) insects. Each production region and season will vary for the complex of insect threats, if any, to the crop.

Common plant disease problems throughout the U. S. include fungal (Pythium, Rhizoctonia, Fusarium, white mold, rust, anthracnose, angular leaf spot), bacterial (halo blight, bacterial brown spot, common bacterial blight), viral (bean common mosaic, bean yellow mosaic, curly top) and nematode (root knot, root lesion) diseases. Each production region and season will vary for

See Systems on page 10

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the complex of disease threats, if any, to the crop.

Many growers rely upon crop consultants hired by the grower or provided by the local bean elevator to scout their fields for agronomic and pest problems, and provide advice on and timing for appropriate management strategies. These consultants often receive training from and work in collaboration with their local university research scientists and extension educators.

As the dry bean crop approaches maturity, some growers rely upon crop desiccants to obtain more uniform drying of the crop (e.g., high density plantings of light red kidneys) prior to undercutting, windrowing and combining operations when the seed moisture content (16 % or higher) is appropriate for threshing with conventional cylinder, rotary cylinder and specialized designs. Some upright plant types of navy and black beans are becoming more adaptable to direct cutting and threshing operations; e.g., in north central regions of the U. S.

Seed may be stored on farm by the grower, but generally is delivered from the field to local elevators for weighing, cleaning and storage at low moisture (12 - 14 %) until the crop is marketed. Elevators will segregate the harvested beans by market class, and some elevators also separate by the degree of seed quality demanded by domestic and international markets and consumers

### ***Review of Production Statistics:***

Table 1. Average USA Dry Bean Production Statistics by State, 1997 - 1999.

<b>STATE</b>	<b>Area Harvested (000 Acres)</b>	<b>Yield (lbs / Acre)</b>	<b>Total Production (000 cwt)</b>
California	123	2133	2649
<b>Colorado</b>	<b>143</b>	<b>1817</b>	<b>2594</b>
Idaho	103	2100	2144
Kansas	21	1917	395
Michigan	313	1617	5049
Minnesota	172	1500	2624
Montana	13	2187	287
Nebraska	191	2003	3825
New Mexico	8	1767	131
New York	33	1427	501
North Dakota	613	1327	8239
Oregon	10	1910	184
Texas	15	1173	188
Utah	6	620	38
Washington	38	2223	851
Wisconsin	8	1750	145
Wyoming	34	2197	725
<b>United States</b>	<b>1846</b>	<b>1654</b>	<b>30568</b>

The USA dry bean industry consists of 17 bean reporting states: California, Colorado, Kansas, Idaho, Michigan, Minnesota, Montana, Nebraska, New Mexico, New York,

North Dakota, Oregon, Texas, Utah, Washington, Wisconsin, and Wyoming.

Table 2. Average USA Production Statistics by Dry Bean Market Classes, 1996 - 1999.

<b>Market Class</b>	<b>Average Yield (000cwt, 1996-98)</b>	<b>Average Acres Planted (000 Acres, 1998-99)</b>
Black	2340	210
Small Red	655	36
Pink	700	50
Cranberry	522	37
Red Kidney	2210	152
Small White	119	3
Navy (Pea)	5141	333
Great Northern	2229	124
Baby Lima	577	20
Large Lima	522	26
Pinto	12607	863
Other (Yellow, Anasazi)	709	69
Blackeyed Pea (Cowpea)	706	45
Garbanzo (Chickpea)	408	30
<b>TOTAL</b>	<b>29385</b>	<b>1998</b>

Market types consist of snap, lima (large & baby), navy (pea), small white, small red, black, great northern, pinto, pink, cranberry, kidney (light red, dark red, white) and miscellaneous beans (e.g., Anasazi, Mayocoba, heirlooms - Swedish Brown, Jacob's Cattle, etc.); in addition some industry reports include garbanzo (chickpeas), blackeye (cowpeas), mung and adzuki beans.

At this point, estimates from industry representatives indicate that the 1999 crop production should be average, however, there are concerns that seed quality may be lower than average because of moisture problems before and during harvest in some regions of the country.

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many research programs lacked sufficient funding to keep up with inflation and exploding costs associated with the evolution of newer technologies.

Growers and dealers and their respective commodity associations were encouraged to get more involved in the handling, financing and future of their industry. Hence, bean growers in various states and regions of the United States joined together to form or strengthen groups, identify common areas of interest and concern, and take political action to replace lost funding and/or enhance limited funding sources for research, extension and education at the state and federal levels. Progressive leaders developed campaigns to educate the growers and dealers of the value of investment in research and extension projects at grower meetings and field days, newsletter articles and individual contacts. States with general Marketing Order legislation then required that a

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majority vote be expressed by commodity group members (growers, dealers) for creation of their check-off program and its specific components – i.e., marketing, quality control, promotion, research, and/or education.

The remainder of this paper will focus upon the background, organization, successes, and challenges of various bean grower groups, private industry representatives, and university personnel as they have forged strong working relationships to address the evolving needs of their growers, industry, and clientele.

**Examples of Bean Grower Associations / Check-off Boards:**

The following associations were developed in specific states and regions of the U. S. by progressive growers, dealers, research scientists and extension educators at the university level, state agency personnel (i.e., state Commissioners of Agriculture), and others throughout the last 30 years. The Michigan commission has been in existence since 1967, the Northharvest association since 1977, and the Colorado committee since 1988. Each state has established its own set of criteria regarding its structure and mode of operation. The bean production region in each state is usually divided into geographical districts (e.g, 1 to 8 in Idaho and Michigan), or bean varietal councils (e.g., 7 market classes in California).

Once the association has established a system for assessing and collecting check-off dollars from the growers and dealers, the state then creates a special board, commission or council to represent the bean industry and be accountable for proper handling of the check-off dollars according to the wishes of its members and legal procedures of the state and federal governments.

**USA Bean Check-off Boards**

**California Dry Bean Advisory Board:**

- 7 Market Class Boards with 14 growers, 7 dealers, 1 public member
- Check-off Contribution: general check-off of \$ 0.17/cwt – grower + \$ 0.01/cwt – dealer + a specific market class check-off determined by each Market Class Board; varies from \$ 0.03 – 0.08/cwt – grower only

**Colorado Dry Bean Administrative Committee:**

- 3 Districts with 6 growers, 3 dealers
- Check-off Contribution: \$ 0.04/cwt – grower + \$ 0.02/cwt – dealer

**Idaho Bean Commission:**

- Commercial, Seed and Snap Bean Industries with 4 growers, 4 dealers, and 1 seed industry member
- Check-off Contribution: \$ 0.08/cwt – grower + \$ 0.04/cwt – dealer

**Nebraska Dry Bean Commission:**

- 4 Districts with 6 growers, 3 dealers
- Check-off Contribution: \$ 0.05/cwt – grower + \$ 0.025/cwt – dealer

**Northharvest Bean Growers Association:**

North Dakota Bean Council

- 5 Districts with 5 growers
- Check-off Contribution: \$ 0.10/cwt – grower + \$ 0.00 dealer

Minnesota Dry Bean Research and Promotion Council

- 5 Districts with 5 growers
- Check-off Contribution: \$ 0.10/cwt – grower + \$ 0.00 – dealer

**Michigan Bean Commission:**

- 8 Districts with 8 growers, 2 dealers, 1 canner member
- Check-off Contribution: \$ 0.01/cwt – grower + \$ 0.01/cwt – dealer [an additional \$ 0.09/cwt – grower is assessed for promotion]

{NOTE: to convert check-off/cwt to U. S. \$ / metric ton, multiply rate by 22.05}

**Check-off Operating Procedures:**

The USA Bean check-off organizations consist of 9 to 22 members elected by their peers or appointed by that state’s governor or commissioner of agriculture for a 3 to 4 year period to represent growers and dealers from the state at-large or from a specific district/council within that state. These boards generally have representation or oversight provided by a member of that state’s



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government (i.e., commissioner of agriculture) to insure that fiscal and legal policies are followed by the board and to serve as a liaison with other state agencies and programs. In addition, each board usually hires an executive secretary or manager to help with the day-to-day operations of the board, and general conduct of its business. Some boards may request ad hoc representation from individuals from their state university and other segments of the industry; and receive input and advice from other bean advisory groups that operate in their state (e.g., the Nebraska Dry Bean Growers Association provides this type of input to the Nebraska Dry Bean Commission). The California board also has a public member that contributes to the process.

Each state or regional board establishes operating policies and guidelines, creates projected budgets for upcoming crop cycle check-off dollars, and solicits and selects priority projects (research, extension, education, promotion, industry representation). Each board represents their constituents at the state, regional, national and international levels by participating in trade and industry policy reviews, trade shows, and as voting

members in other bean industry organizations that focus on promotion, marketing and political issues (i.e., Rocky Mountain Bean Dealers Association, National Dry Bean Council, American Dry Bean Board).

Each check-off board is responsible for managing the bean contributions that are assessed to growers and dealers as beans are delivered to the dealer (first handler). The dealer maintains accurate records of the amount of beans delivered to their elevator, and then is responsible for forwarding these records plus payment to the designated state agency (commissioner of agriculture's office) on a periodic basis (for example, monthly to quarterly). Most states maintain annual records for each crop cycle, and check-off dollars usually represent the year of production, with payment assessed at the time of delivery to the elevator. Therefore, a grower may deliver a load of beans saved on-farm from the 1998 crop, followed by a load of beans from the 1999 crop; and the check-off payment will reflect each separate assessment by crop year by grower. Most states also keep separate records as to the market class that is assessed, i.e., pinto, black, great northern.

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**Summary of Check-off Dollars Generated  
during 1997 - 1999:**

The following table provides an estimate of the amount of check-off dollars that can be generated annually in various states that have implemented such programs during the last 30 years. These dollars are then allocated by the check-off board for specific programs that they have prioritized after input from their grower and dealer members, advisory groups, research scientists and extension educators, and others. Most states have a voluntary assessment, and a grower can request a refund of the fee that was automatically assessed; generally, refund requests are less than 5 %.

Most boards allocate 40 - 50 % of their budgets for research and extension projects, 10 - 15 % for administrative costs, 5 - 10 % for education (including newsletters and other correspondence with their constituents), a portion as carryover for the next year's budget, and the remaining income is used for promotion at the state and regional levels, and/or membership in national organizations such as the American Dry Bean Board and National Dry Bean Council.

**Table 1. U.S. Bean Check-off Est. for 1997-99**

STATE	Ave Prod (000 cwt/year)	Check-off \$/cwt	Potential Funds
California	2649	0.210	556,290
<b>Colorado</b>	<b>2594</b>	<b>0.060</b>	<b>155,640</b>
Idaho	2144	0.120	257,280
Nebraska	3825	0.075	286,875
North Dakota	8239	0.100	823,900
Minnesota	2624	0.100	262,400
Michigan	5049	0.100	504,900
<b>USA Total</b>	—	—	<b>2,847,285</b>

If one assumes that 50 % of these check-off dollars are committed to bean research and extension projects conducted by personnel at state universities in the United States, nearly 1.5 million dollars are available from bean commodity groups. Most of these dollars are allocated on an annual basis, and often range from \$ 2500 to \$ 5000 per grant or project. Some core projects such as genetic improvement, variety testing and IPM may each receive \$ 5000 to \$ 10000 annually, with project review and renewal on a 3 to 5 year basis. These check-off dollars are vital for research and extension programs to cover operating expenses incurred on behalf of the grower and dealer organizations that they collaborate with in their state and region.

These commodity dollars supplement other sources of income provided by state, regional and national budgets (Agricultural Experiment Station, Cooperative

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Extension, United States Department of Agriculture), research grants (National Research Initiative, Integrated Pest Management, special USDA programs, Environmental Protection Agency, Interregional Research Project No. 4, Pesticide Impact Assessment Program, Title XII CRSP, Western Region Project 150) and other sources (seed companies, pesticide companies, equipment dealers) to bean scientists for their salaries, technical support, equipment, travel budgets, supplies and other operating costs. In addition, genetic improvement programs generate additional dollars from local seed-grower organizations as tag fees and royalties for the sale of seed beans and protected varieties.

### ***Examples of Projects Financed by Bean Check-off Programs & Other Funding Sources:***

Communication is one of the critical issues for a check-off organization to inform its constituents of policies, needs, achievements, challenges and other issues of interest and concern to the bean grower and industry. Check-off dollars may subsidize industry newsletters that are distributed on a periodic basis (monthly to quarterly) to all bean growers in that state or region. In addition, bean companies often release their own newsletters which also contain articles on the value of and accountability for bean check-off programs.

Examples of bean industry newsletters in the United States include:

- California Dry Bean Advisory Board Newsletter
- Colorado Bean News
- Michigan Dry Bean Digest
- Nebraska Bean Bag
- Northarvest Bean Grower & Talkin' Beans

Genetic improvement is emphasized in each state or region with a check-off program, as growers appreciate the value of consistent yield, upright plant architecture, earlier maturity, seed quality, disease resistance and other attributes that contribute to the overall stability and performance of the dry bean crop in their specific production system. Therefore, the largest portion of bean check-off dollars are usually directed towards plant breeding programs which develop collaborative efforts with scientists in other disciplines (i.e., plant pathology, entomology, agronomy, physiology, nutrition) in universities, the USDA, the private sector, and international programs (e.g., Centro Internacional de Agricultura Tropical). Since the 1970s, statewide varietal performance has improved by 10 % or more every few years as newer and higher yielding varieties with acceptable agronomic characteristics and resistance to key pests are released periodically by university, federal and private sector breeding programs for every major market class of bean grown in the U. S. for domestic and international consumption.

Varietal testing of promising breeding lines and newly released varieties is another favorite project in states with check-off programs as growers and dealers rely upon objective data generated by university and private sector agronomists who often conduct these trials on agricultural experiment station sites and grower fields under commercial conditions. The industry is then able to make more informed and confident selections of those varieties with acceptable seed quality that are best suited to their local or regional growing conditions.

Agronomists also rely upon check-off dollars to conduct other studies that enhance production practices and performance of bean varieties adapted to local conditions. Examples of such studies include: soil compaction alleviation by soil ripping, planting date effects on maturity and yield stability, plant density including row/plant spacing, cropping components and rotations, irrigation practices, and fertility practices.

Of course Integrated Pest Management is another common theme throughout bean regions and is strongly supported by check-off boards as priority needs center on new and effective strategies for weed management, insect management, disease management by pesticides (conventional chemistry, biopesticides), varietal resistance, cultural practices, and other innovative means.

Technology advances also provide another opportunity for investment of check-off dollars as growers strive to incorporate newer technologies into their cropping systems. Examples include the use of: GPS/GIS (Global Positioning Satellite / Geographical Information System) for site-specific application of fertilizer and pesticides, remote electronic weather stations to monitor weather events that influence crop and pest development and management strategies, and satellites and computers that provide access to real-time information to marketing outlets and a wide range of bean expertise via email and the internet.

In conclusion, this framework of state, regional and national programs and collaboration will enable bean growers and industry, as well as the scientific community and private sector, of the USA to continue to progress and deal successfully with the challenges and opportunities that lie ahead in the 21st Century.

**BEANS: NUTRITION & CULINARY APPLICATIONS**

By Chef Ron Pickarski, CEC, Eco-Cuisine

Ron Pickarski is President and Executive Chef / Consultant for Eco-Cuisine, P. O. Box 17878, Boulder, CO 80308-0878 [tele: 303-402-0289; fax: 303-402-0246]. He is the first professional vegetarian chef to be certified as an Executive Chef by the American Culinary Federation. His specialty is gourmet vegetarian cuisine prepared with plant-based foods. Ron is the Founder/Director of the American Natural Foods Team which competes at the quadrennial International Culinary Olympics in Germany. Between 1980 and 1996, he won seven medals (gold, silver, bronze) with plant-based foods and was the first chef in the history of that prestigious event to do so. Ron has made numerous television appearances, and has published two cookbooks and many articles for national periodicals. The following excerpts are taken from a paper presented by Ron to the National American Culinary Federation Convention in Chicago in July.

The earliest recorded use of beans in the Americas was a group of cave dwellers in the Tamaulipas Mountains of Mexico between 7000 and 5000 BC. They gathered and eventually cultivated runner beans. Once a poor man's diet, beans are the dietary staple of Latin America and Asia. They are now becoming increasingly popular with North Americans, with vegetarianism on the rise, and also as ingredients in fusion-style and other evolving modern cuisines.

Nutrition is also a driving factor. Beans are a balanced food containing all the macro nutrients (complex carbohydrates and proteins, fats and fiber). Beans are also a good source of B vitamins and iron. Eating beans is simply eating close to a balanced diet which is generally understood in the dietary community as being a high complex carbohydrates, high fiber, low fat, and low protein diet.

My quick soak, quick cooking method is to rinse beans, bring them to a simmer in their soaking water and turn the heat off. Thirty minutes later, I drain the beans, then put them in a pressure cooker with fresh water and pressure cook for approximately 30 - 40 minutes or until soft. Optional speed scratch methods of cooking with beans are using canned or instant beans which have been cooked and dried, and are ready to rehydrate, cook and serve.

Some beans possess more assertive flavors, while others take on the flavors of foods with which they are cooked. Many ingredients such as garlic, ginger, shallots, tomatoes, turmeric, cilantro, cumin, coriander, chile peppers, smoked meats, squashes and carrots fare well with beans. Seasoning options are infinite depending upon culture and geographical region. Various preparation techniques create a variety of exciting flavors and textures. Ingredients used as digestive aids by various cultures are kombu (dried sea vegetable), ginger, asafetida, and fenugreek.

In my 20 years of Culinary Olympic competitions with vegetarian plant-based foods, one could have dubbed my presentations Bean Cuisine due to the extent that beans were used in my presentations. They were used in sauces, entrees, salads, desserts, condiments and pates. Beans are not only a nutritious food, they are a versatile culinary food that will increase nutritional value while lowering food cost.

**Smoked Black Bean Pate:**

- 1 cup black beans, dry
- 1 six inch piece of kombu (optional)
- 2 cups water
- 1/2 t sea salt
- 1/4 cup hickory chips
- 1/4 cup warm water
- 1 T oil
- 1 cup onions, chopped
- 2/3 cup mushrooms, chopped
- 3 garlic cloves
- 1 t thyme
- 1/2 t sea salt
- 1/4 t cumin
- 2/3 cup Tahini (sesame butter)
- 1/3 cup cooked bean juice
- 2 T Tamari

Soak beans for 2 - 4 hours in 3 cups of water. Drain and place in 2-quart saucepan with lid. Add kombu and 2 cups water, then pressure cook for 1 hour or boil for 1.5 hours (with 3 cups of water). Stir in salt and let beans sit for 20 minutes, then drain. Soak hickory chips in water for 10 minutes. Transfer drained beans to a metal pan and smoke them on high heat for 5 minutes on an electric stove or 8 minutes on a gas stove. Remove from heat and let them smoke covered for an additional 30 minutes.

In a 10 inch frying pan, heat oil and saute onions, mushrooms, garlic, thyme, salt and cumin on medium heat for 5 minutes. In a food processor, add smoked beans, sauteed vegetables, tahini, bean juice and tamari, then process until smooth. Transfer pate to a container or mold, then refrigerate until chilled. Serve with bread or crackers.

**Asian Black Bean Relish:**

Kent Palmerton, Sous Chef, Green Gables C. C.



First Place Dry Bean Recipe  
1999 Colorado Celebrity Pro / Am Cooking Classic

- 1 cup black beans, washed and soaked overnight
- 1/4 cup Maui onions, diced
- 1/4 cup cilantro, minced
- 1 T rice wine vinegar
- 1 t soy sauce
- 1 t Asian hot oil
- 1/4 t sesame oil
- 1/2 cup red pepper, diced

After soaking beans overnight, cook until tender, and shock in cold water. Prepare remaining ingredients in a bowl and mix together with black beans. Serve as a side dish for beef wrap.

**Pinto Bean Italian Sausage:**

Patricia A. Davis

- 6 cup pinto beans, soaked overnight
- 1 cup Italian parsley, minced
- 3 T fennel seed
- 2 cup firm tofu, minced
- 1 salt & pepper to taste
- 1 large onion, halved
- 1 T fresh oregano
- 6 garlic cloves
- olive oil, as needed

After soaking the pinto beans overnight, combine with the onion, garlic and oregano. Cook until the beans are soft. Use a food processor to puree the beans and then add the Italian parsley, fennel seeds and the salt and pepper to taste. Refrigerate overnight to allow the flavors to meld. Saute the minced tofu until crisp. Add to the bean mixture.

NOTE: you can find vegetarian sausage casings through a sausage distributor. After using a sausage stuffing machine, bake the sausages in a 300 degree oven for 30 minutes. Then remove the sausage (carefully) from the casings (the casings are non-edible) and saute in olive oil. Or shape sausage into desired shapes and saute in olive oil.

Serve with spaghetti with a red sauce or your favorite pasta and sauce.

# DRY BEAN VARIETY DESCRIPTIONS - Summary of Test Plot Data from Eastern Colorado & Western Nebraska during 1996 - 1998

Prepared by Drs. H. F. Schwartz, J. J. Johnson & M. A. Brick - Colorado State University (9/99)

VARIETY	Origin/Year <sup>1</sup>	Habit <sup>2</sup>	Maturity <sup>3</sup>	1996-98 Summary from CO + NE Data <sup>4</sup>			Seed Quality Observations <sup>5</sup>	Disease Resistances <sup>6</sup>
				Yield - lb/A	Seed/lb	# Test Sites		
<i>Pinto's</i>								
Apache	ISB-96	V	M	2224	1242	50	**	BC1 / BC2 / CT / RU
Bill Z	CSU-87	V	L	2260	1350	50	*	BC1 / BC2
Buckskin	Novartis-94	SU	L	2539	1272	12		BC1 / BC2 / CT / HB / BBS
Burke (USWA 19)	USDA-98	SU/V	L	2323	1246	16		BC1 / BC2 / CT / RU / HB
Chase	UN-93	V	L	2508	1312	50	**	RU / WM / HB / BBS
Elizabeth	Fox-	V	F	2325	1251	12	**	RU
Frontier	NDSU-97	SU	F	2582	1246	5		RU / WM
GTS 900	Gentec-98	V	F	2322	1297	11		BC1 / BC2 / RU / WM
Hatton	NDSU-95	V	L	2195	1216	8		BC1 / BC2
Maverick	NDSU-95	SU	F	2330	1314	12		BC1 / BC2 / RU
Montrose (CO 51715)	CSU-98	V	M	2761	1229	9	*	BC1 / BC2 / RU
Othello	USDA-86	SU	E	2666	1268	6	*	BC1 / BC2 / CT / FR
Poncho (ROG 179)	Novartis-98	V	F	2427	1263	46	*	BC1 / BC2 / RU / HB / BBS
Vision	Seminis-96	SU	F	2319	1321	50	*	RU / FR
Winchester	Novartis-95	V	F	2660	1369	6		
<i>Kidney Types</i>								
Enola (yellow)	Proctor-98	B	M	1948	1112	3		RU / WM
CE-LRK	UC-89	B	M	2157	777	4		BC1 / BC2 / RU / WM
Foxtire	Novartis-92	B	M	2682	938	2		BC / RU / WM / CB / HB
Sacramento	UC-75	B	M	2368	818	3		RU / WM
<i>Black's</i>								
Black Canyon /Stout (CSU 20)	CSU-99							
Black Jack	Gentec-93	B	F	1746	2427	2		WM / FR / HB
Midnight	SUNY-80	U	F	2331	2490	3		BC1 / BC2 / FR / PY
Shadow	Novartis-95	U	F	2469	2064	5		BC1 / BC2 / RU
Shiny Crow (CO 96902)	CSU-98	V	L	2443	2134	4		BC
UI 911	UI-93	U	L	2003	2555	3		BC1 / BC2
<i>Great Northern's</i>								
Beryl	Novartis-84	V	L	2689	1602	3		BC1 / BC2 / CT / CB
Harris	UN-80	V	L	2522	1312	3		BC1 / BC2 / BY / CB / HB
Ivory	Novartis-83	V	M	2345	1265	3		BC1 / BC2 / CT / HB
Marquis	Novartis-92	V	L	2922	1518	3		BC1 / BC2 / WM / CB / HB
UI 425	UI-84	V	L	2728	1376	4		BC1 / BC2 / CT
Weihing (GN 94-9)	UN-98	V	F	2528	1366	5		RU / CB

- Note 1: CSU = Colorado State University, Fox = Fox Bean of Idaho, Gentec = Gentec Seeds of Canada, ISB = Idaho Seed Beans, NDSU = North Dakota State University, Novartis = Novartis Seeds of Idaho, Proctor = Red Beard Bean of Colorado, Seminis = Seminis Seeds of Idaho, SUNY = Cornell University of New York, UC = Univ. of California at Davis, UI = Univ. of Idaho, UN = Univ. of Nebraska, USDA = USDA of Prosser Idaho
- Note 2: Growth Habit = V (vine), SU (semi-upright), U (upright), B (bush). Suggested plant populations: V = 75 - 80000, SU = 80 - 85000, U = 85 - 90000, B = 90 - 100000 / acre. Adjust fertility levels in relation to adjusted plant populations for each growth habit; for example, a common suggestion for low fertility soils for vine growth habits at 75000 plants is 75 lb N + 40 lb P / Acre.
- Note 3: Maturity Classification = Days from planting to vine cutting in our region; E (Early, 85-89 days), M (Medium, 90-94 days), F (Full Season, 95-99 days), L (Late, 100 or more days)
- Note 4: Yield data summarized from published reports of Colorado Variety Trials (CSU - J. Johnson), Nebraska Variety Trials (UN - D. Nuland) and Nebraska Farm Trials (D. Nuland & R. Zeller); these yields are conservative estimates of varietal potential since moderate plant populations were used uniformly for each trial, regardless of varying growth habits..
- Note 5: Seed Quality observations from dry bean industry and/or university personnel reflect the general appearance of seed of varieties that is generally light enough for most markets (\*) or which may exhibit premature darkening and/or yellowing (\*\*) during the 1st year after harvest.
- Note 6: Disease Resistance as defined by the variety release statement, and may range from immunity to tolerance to disease avoidance in our region: BBS = Bacterial Brown Spot, BC1 = Bean Common Mosaic Virus - NY Strain, BC2 = Bean Common Mosaic Virus - Type Strain, BY = Bean Yellow Mosaic Virus - Pea Strain, CB = Common Bacterial Blight, CT = Curly Top Virus, HB = Halo Blight, FR = Fusarium Root Rot, PY = Pythium, RU = Rust, WM = White Mold

