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## *Bacterial Diseases of Bean*

A complex of bacterial pathogens and their diseases affect bean productivity. Each is favored by high moisture situations and factors such as storms, equipment, and irrigation water which move the pathogens within and between fields. Varying daily temperature conditions favor each disease: halo blight - less than 80 F; bacterial brown spot - less than 85 F; common bacterial blight and bacterial wilt greater than 80 F.

### ***Halo Blight Symptoms***

The first symptoms of infection are small water soaked spots on the leaflets. In a dry climate, this infected tissue dies and is tan-colored. A broad yellow-green halo develops around the spots. This broad halo helps distinguish halo blight from common bacterial blight which exhibits a narrow, lemon-yellow border around leaf lesions. Presence of the halo is absent under high temperatures. Systemic infection causes younger leaflets to curve and exhibit considerable yellowing on these leaves with no dead spots or distinct halos. Halo blight symptoms on pods begin as water soaked circular spots or water-soaked streaks on the pod suture. The bacterial ooze in the center of the spots appears light cream or silver colored. Early pod infection causes shriveled seeds. Stem girdling and joint rot occur above the cotyledonary node of plants grown from infected seed.

### ***Bacterial Brown Spot Symptoms***

Lesion size varies, but are usually small and brown, surrounded by a narrow yellow zone. Water soaked tissue may not be noticeable, but if present appear as small circular spots on the lower leaf surface. The centers of old lesions fall out, leaving tattered strips or holes on affected leaves. If the disease becomes systemic in the plant, lesions can occur along the stem. Pods from infected plants are bent or twisted with visual ring spots. Water-soaked brown lesions can form on pods. Older plants and plant parts are more resistant to infection.

### ***Common Bacterial Blight Symptoms***

Small water soaked spots on the underside of leaflets are the first symptoms. These spots enlarge and merge, becoming dried and brown. A narrow, bright lemon-yellow border of tissue encircles the lesion. Infected pods develop circular water soaked spots, and yellow masses of bacteria may appear at their center. Later, the spots dry and become reddish-brown sunken lesions. Early pod infection causes shriveled seeds, and the bacteria may cause yellowing under the seed coat of infected seeds. A stem girdling or joint rot occurs above the cotyledonary node of plants grown from infected seeds.

### ***Management***

- Plant certified seed of halo blight resistant or tolerant varieties.
- Plant streptomycin treated seed to help reduce seed coat surface contamination.
- Incorporate infected bean debris into the soil after harvest, and rotate beans with other crops for at least two years. Eliminate volunteer beans the following season.
- Stay out of bean fields when plants are wet.
- Do not spread old bean straw on fields to be planted to beans.
- Avoid reuse of irrigation water.
- Consider timely preventive sprays of bactericides such as copper during to mid-vegetative and early flowering (V3 to R2) stages to reduce spread of bacteria to leaves and pods, depending upon disease pressure and climatic conditions.

#### **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



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

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**Colorado Dry Bean Administrative Committee Update**

By Robert Schork, CDBAC Manager

**Independent Auditor's Report:**

Gary Scolfield, certified public accountant, submitted an independent auditor's report of the CDBAC's fiscal position on March 15, 1999 for the period ending December 31, 1998.

TOTAL Assets \$ 96,898  
TOTAL Revenues \$137,486  
TOTAL Expenses \$116,466

1999 CDBAC Budget Estimates:

TOTAL Income	\$160,000
Research	44,800
Administrative	18,000
Promotional	20,200
Meetings & Travel	12,000
Dues	50,000
Newsletter	8,000
Legal Fees	2,500
Refunds	2,000
Telephone, supplies	2,000
TOTAL Expenses	159,500
Excess of Revenue	3,000



**American Dry Bean Board:**

The CDBAC belongs to the ADBB, and shares the following list of officers for that organization:

Chairperson: Craig Maas from the Nebraska Dry Bean Commission  
Vice Chair: Alan Juliuson from the Northarvest Bean Growers  
Sec/Treasurer: David Nall from the California Dry Bean Advisory Board Exec.  
Director: Sue Hays, CMP, from Scottsbluff

Promotion Committee Members include Brad Taylor from the Colorado Dry Bean Administrative Committee, Jim Melban (California), Bob Turner (Bush Beans), Fran Carlson (Michigan), Jon Holzfafter (Nebraska), and Kathy Walton (North Dakota). i

**National Dry Bean Council:**

The CDBAC also belongs to the NDBC, and shares the following list of officers for that organization:

President: John Thoming from the California Dry Bean Advisory Board  
Vice President: Kevin Kelley from the Nebraska Dry Bean Commission  
Sec/Treasurer: Jim Patrick from the Idaho Bean Commission

CDBAC members of the NDBC include Bud Pekarek - Burlington and Steve Brown - Holyoke.

Overseas Representatives of the NDBC are strategically located in Spain, Italy, Mexico, Japan, France, Brazil and the United Kingdom.

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

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**Publication Material Due Dates:**

Fall Issue	[Market Emphasis]	Sep. 7
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Spring Issue	[Planting, Production Emphasis]	Apr. 7
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**Advertising Rates:**

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*
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- \*Negatives to be stripped in 100 lines

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

**AMERICAN DRY BEAN BOARD  
HIGHLIGHTS**

115 Railway Plaza, Scottshluff, NE 69341 Sue M. Hays, Executive Secretary

**May 4 Bean Flash:**

The American Dry Bean Board enjoyed excellent Bean Media coverage during 1998-99 with more than 112 million impressions and 622 stories. The results per activity were as follows:

- Quick conversions Release & Sidebar - 5.6 million
- Protein Release & Sidebar - nearly 8 million
- Folate Release & Sidebar - more than 14 million
- Spring Recipe Release - more than 10 million
- Folate Quick Kit - nearly 28 million
- Ongoing Media Relations - more than 46 million [includes Parenting, Woman's Day, Restaurants & institutions, other newspapers & magazines]

**May 12 Bean Flash:**

Gwen DeVries reports that the "Be'an Smart About Folate" radio public service announcement has won the 1998 Creativity in Public Relations Award for the top audio psa. The award was announced in New York City.

The April report for the ADBB website showed nearly 11,000 hits. More than 87% of the hits were from the US, and the rest came from 14 other countries including Canada, Australia, Japan and the UK. There was an average of 362 hits per day.

The ADBB is pleased to welcome the Rocky Mountain Bean Dealers Association as a non-voting Associate Member of the Board; Vickie Idler is their Executive Director.

Folate brochures have been reprinted and are available in our inventory. For consumer requests, we have an inventory of 25,000. The Promotion Committee is working on the Folate Mat Release and the Folate Postcard now for circulation soon.

**May 14 Bean Flash:**

USA Today included beans in a folate story on May 13, 1999 in the Life Section. The article states, "Researchers agree that it's still important to get dietary folate in its natural form in leafy green vegetables, orange juice, liver and beans."

The article discusses a recent folate study that appeared in the New England Journal of Medicine. USA Today has a readership of nearly 4.5 million.

**May 20 Bean Flash:**

The newest issue of TIME magazine focuses on research linking low levels of folate to the severe brain atrophy of Alzheimer's disease. The story includes beans - listing them first - as a high folate food. The article states that folate is known to regulate the level of amino acid homocysteine.

It appears that the National Institute on Aging may modify a trial currently under way that looks at the influence of supplemental B vitamins, including folic acid (the supplemental form of folate) on heart disease in 3000 older women.

Time has a readership of more than 11 million.

**June 8 Bean Flash:**

The BEAN Team has coordinated another placement with Associated Press (AP)! AP distributed the Falafel recipe and photograph from the Ethnic Recipe Release to newspaper food editors nationwide on May 24. As with other AP placements BEAN has achieved, this may generate national coverage resulting in millions of audience impressions. You may see this recipe featured in your local paper.

**BEAN BYTES**

**Nebraska Bean Field Day:**

The Nebraska Dry Bean Growers Association and the University of Nebraska Panhandle Research & Extension Center will co-sponsor the 1999 field day on August 18 at 1:00 pm at the Panhandle Research & Extension Center at Scottsbluff, NE. Interact with university and industry experts, and enjoy some of Cliff Walker's hog roast.

**Goals of the NDBGA:**

The 1999 Summer Issue of the Nebraska Bean Bag reports that the purpose of the Nebraska Dry Bean Growers Association is to represent every dry bean grower across the state of Nebraska and to develop programs and activities in the following areas:

- To promote research and informational programs in dry bean production, marketing and utilization.
- To seek ways to develop, promote and maintain domestic and foreign markets for dry beans.

- To carry out activities that seem reasonable and appropriate for improving the conditions under which dry beans are produced and marketed, including cooperation with departments and agencies of local, state, national and international governments.

Merlin Prior is the current president of the NDBGA which consists of 15 grower directors elected from 4 districts and at-large representation, with additional support provided by an office manager (Carole Amateis) and ex-officio director (David Nuland, Univ. of Nebraska Horticulturist, Panhandle Research & Extension Center).

**Farm Bill - FAIR:**

The 1999 Summer Issue of the Nebraska Bean Bag reviews the wording of the Federal Agriculture Improvement and Reform Act (FAIR) and how it affects dry bean growers. Section 118 prohibits the planting of fruits and vegetables (other than lentils, mung beans and dry peas) on contract acreage with these exceptions:

- the double cropping of fruits or vegetables in association with a contract commodity on contract acres is allowed in any region with a history of such practice, as determined by the Secretary, regardless of the planting history of an individual farm;

See Bytes on page 6



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# Colorado State University

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

## Research Personnel:

Howard Schwartz	Plant Pathology
Mark McMillan	Plant Pathology
Kris Otto	Plant Pathology
Mark Brick	Plant Breeding
Barry Ogg	Plant Breeding
Jerry Johnson	Variety Testing
Jim Hain	Variety Testing
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**  
beangenef.cws.ndsu.nodak.edu

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

**Colorado Bean Company**  
www.info2000.net/~colobean/contus.htm

**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

**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)

Bytes from page 5

- a fruit or vegetable can be grown without limitation on any farm with a history of fruit or vegetable production on contract acres, except that a contract payment shall be reduced by one acre for each contract acre planted to a fruit or vegetable in that year; and
- a producer with a history of production of a specific fruit or vegetable, as determined by the Secretary, is allowed to rent or lease contract acres to grow that fruit or vegetable, on any farm, without respect to the planting history of the individual farm.

The number of acres so leased or rented cannot exceed the average acres rented or leased by that producer in crop years 1991 - 1995. Years of no production are not included in the average, and for each contract acre so rented or leased, the contract payment shall be reduced by one acre.

## Northarvest Research Projects for 1999:

The Northarvest Bean Growers approved \$240,000 investment in research at North Dakota State University in 1999. These projects included dry bean breeding, white mold resistance, rust resistance, multiple disease resistance, zinc management, on-farm storage management and root rot management.

## White Mold Control

### excerpt from Northarvest Bean Grower. June 1999

Art Lamey, North Dakota State University extension plant pathologist, advises his growers that it may pay to spray fungicides (e.g., Topsin, Benomyl) when considering 4 factors in North Dakota:

1. Variety - some newer varieties are less susceptible to white mold, but they are not resistant. Under conditions highly favorable for white mold, all current varieties are likely to respond economically to a white mold fungicide application.
2. Row Closure - flowers and leaves remain wet when there is a canopy. Humid and foggy weather that keeps plants wet into the afternoon provides favorable infection potential without a canopy. Dry and windy conditions minimize the infection potential of plants without a canopy.
3. History of White Mold - if white mold has been a problem in the area (any severely infected fields within a couple of miles) in the past 3 years, then there is a potential for white mold.
4. Rainfall - if total water (rain + irrigation) exceeds 5 inches from June 1 to 10 days after initiation of bloom, fungicides were economical 67% of the time; if total water during this time exceeded 7 inches, fungicides were economical 85% of the time according to studies conducted by researchers at the University of Minnesota.

# Making Harvests More Nutritious

Agricultural Research, May 1999 Issue Excerpts from Article by Hank Becker, ARS

Iron deficiency is the most prevalent micronutrient problem in the world, affecting over 2 billion people globally, many of whom depend on beans as their staple food. ARS plant physiologist Ross M. Welch and a team of colleagues have selected 24 CIAT bean lines from diverse genetic backgrounds that have an enhanced ability to accumulate iron and zinc.

Their research showed that by selecting beans with high iron concentrations, they also produced beans with greater quantities of bioavailable iron. The enhanced level of iron was readily taken up and used by iron-deficient rats in a feeding study at Cornell University

The international team next plans rat-feeding studies to screen more iron- and zinc-enriched genotypes selected from 1440 accessions in the Cali bean collection for their iron and zinc bioavailability. This core collection represents the full range of potential genetic variability among bean species for any given trait.

Besides changing the expression of genes in the plants themselves, Welch says farming systems and agronomic practices can be modified to improve the healthfulness of food supplies. "The nutritional quality of food crops can be greatly affected by the types of fertilizer used and their placement within the soil," he says. "Adequate fertilization can significantly increase levels of vitamins

in plant tissue. Well nourished plants produce more vitamins than those poorly nourished."

Zinc uptake improved with increasing supply when phosphorus was applied at rates needed for optimum yields. Placement of fertilizer in the soil is also important.



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## 9 Bean Peasant Bake

by Chef Dave Jenson, Denver Marriott Southeast

**S**tart with a 2 lb mix of Anasazi, Garbanzo, Red, Black, Navy, Pinto, Kidney, Great Northern, Black-eyes

- Soak beans overnight with 4 sprigs Rosemary, ½ bunch cilantro, 10 cloves, 2 cinnamon sticks (spices wrapped in cheese cloth).
- Place all ingredients in stock pot and bring to boil. Reduce heat to a simmer, simmer for 1 - 1.5 hours until beans are tender.
- Remove seasoning bag. Discard cloves and cinnamon sticks. Clean and chop Rosemary and cilantro. Add back to beans.
- Julienne 5 slices of Hormel Maple-Pepper bacon and saute with ¼ lb green chili, ½ lb green pepper, ½ lb yellow onion, ¼ lb celery, ¼ lb carrot (all coarse chopped to ¼" or ½" pieces) and 2 oz Buffalo jerky chopped to fine julienne.
- Add saute mixture to beans.
- Add 11 oz Ketchup, ½ lb brown sugar, 3 oz molasses, and 2 Tbsp green tabasco to mixture, mix well but gently.
- Place in baking dish top with 4 slices Maple-Pepper bacon. Cover and bake at 350 degrees for one hour.
- Serves 25 - 30 people.

## Calcium in White Mold Management

Northharvest Bean Grower Association - 1999 Research Report

Researchers at North Dakota State University have reported that calcium sprays have reduced damage from white mold on dry bean trials under field conditions. Low rates of calcium (600 - 700 ppm) reduced bean blossom infections an average of 21 %, and high rates (2000 ppm) reduced infection by 27 % as compared to the Topsin M Fungicide check which reduced infection by 46 %.

J. Venette, P. Ross and R. Lampa conclude that calcium compounds can suppress white mold development in beans. In some conditions, foliar applied calcium may have substantial value in disease management. Additional studies are needed to understand the environmental and biological conditions that affect white mold suppression.

## Dry Bean Grower Survey

Northharvest Bean Grower Association - 1999 Research Report

North Dakota State University extension personnel (Art Lamey, Richard Zollinger, J. Luecke) conducted a survey of 1997 grower pest problems, and dry bean growers reported that weather was the worst production problem on 46 % of acres in Minnesota and 30 % of acres in North Dakota.

The second worst problem was disease, reported on 18 % and 19 % of the acres in Minnesota and North Dakota; with white mold as the primary problem, followed by root rot, bacterial blight and rust. White mold fungicides were applied to 52 % and 28 % of affected acreage in Minnesota and North Dakota; often as a broadcast. Grasshoppers and leafhoppers were the worst insect problems in both states.

The worst weed in Minnesota in 1997 was redroot pigweed, followed by foxtail and nightshade. Common herbicides included Basagran, Sonalan, Pursuit, Assure II and Eptam. Desiccants (Gramoxone Extra) were applied to dry beans on 33 % of Minnesota and 25 % of North Dakota respondents. Zinc was applied on 67 % of Minnesota and 53 % of North Dakota respondent's acres.



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Keenesburg:		(303)732-4241
Milliken:		1-800-635-2326

## FOOD QUALITY PROTECTION ACT

By Sandra McDonald, Bioagricultural Sciences & Pest Management Specialist

Since August 3, 1996, almost every conversation regarding pesticide issues has included the phrase "Food Quality Protection Act (FQPA)." Many people believe this to be the most significant legislation to affect agriculture in the last decade. The act amends the two major laws involving pesticides: the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) and the Federal Food, Drug, and Cosmetic Act (FFDCA).

FQPA revises FFDCA so the 1958 Delaney Clause no longer affects pesticides. In effect, the zero cancer risk standard for pesticide residues in some processed foods is replaced by a single "safe" standard of a reasonable certainty of no harm to consumers from pesticide residues in raw and processed foods. "Reasonable certainty" is a one in one million risk of cancer over a 70 year lifetime. The safety standard creates four areas for EPA review:

- cumulative effects (common mechanism of toxicity);
- aggregate exposure;
- sensitivities of major subgroups (such as infants and children); and
- estrogenic effects.

FQPA focuses on consumers and food, not the farmer. FQPA was designed to improve food safety in the United States so that the public will be more confident that their food is safe, especially for infants and children. Another stated purpose of FQPA was to base pesticide registration on sound scientific principles and make the process more efficient.

Pesticide registration review is now required on a 15-year cycle to ensure that all pesticides meet new safety standards. EPA plans to reassess 1/3 of all existing tolerances and exemptions by August 1999, another 1/3 by

August 2002, and the remainder by August 2006. EPA is to publish by August 1997 a fully developed plan for completing reassessment of the existing tolerances.

There are 620 pesticidal compounds registered with EPA. These active ingredients are formulated into about 20,000 registered products, of which about half, or 9300 are used on food or feed crops. Organophosphates, carbamates, triazines, pyrethroids and B-2 carcinogens are the classes of chemistry the EPA will scrutinize during the first three years of the reassessment.

The analogy of a "risk cup" is being used to describe aggregate exposure estimates. The full cup represents the total reference dose (RfD); each use of the pesticide contributes a specific amount of exposure that adds a finite amount of risk to the cup. As long as the cup is not full, meaning that the combined total of all estimated sources of exposure to the pesticide has not reached 100% of the RfD, EPA can consider registering additional uses and setting new tolerances. It has been decided that, in general, 80% of the risk cup will be set aside for dietary exposures. The remaining 20% of the risk cup will be left for non-dietary risk with 10% from water, 5% lawn and 5% residential exposure.

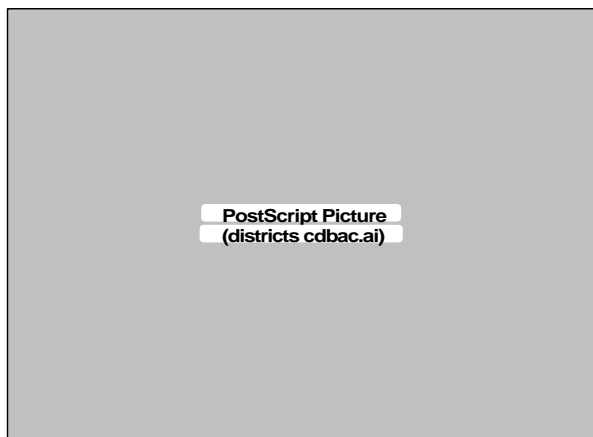


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## FURROW IRRIGATION TIPS

Excerpts from THE BEAN BAG, Summer 1998 Issue  
 By C. Dean Yonts, Univ. of Nebraska Ext. Irrigation Engineer, Scottsbluff

The first irrigation for the furrow irrigator is by far the most dreaded irrigation of the season. For dry beans the first irrigation usually occurs when the soil is loose and dry. Getting water to the end of the field is the ultimate goal but sometimes is very difficult. There are three things that can improve our conventional furrow irrigation practices: surge irrigation, furrow firming, and polyacrylamide.

Surge moves water at relatively short cycles (20 - 60 minutes) between two irrigation sets. The wetting and drying cycles tend to consolidate the soil particles and as a result, the infiltration rate is reduced allowing water to move faster down the field.

Furrow firming devices use a weighted wheel that conforms to the shape of the furrow. The goal is to firm the upper two inches of the soil to help water advance but not restrict root growth (by compaction). The reduction in advance time can be similar to using surge irrigation, and can actually enhance surge irrigation effects.

Polyacrylamide is a polymer which binds soil particles together and does not allow water in the furrow to erode soil off the field. If the soil particles are bound together and less vulnerable to erosion, more water can be put in an individual furrow.

## Abiotic Disease Problems

Excerpts from the Regional Dry Bean Bulletin 562A  
 By Dr. Howard F. Schwartz, Colorado State University


Extremes of temperature, moisture, hail, wind, and electrical storms stress and damage the bean plant. The degree of production problems resulting from weather extremes depends on the intensity and duration of the factor and the sensitivity of the variety grown. Poor seed quality will aggravate production problems by reducing plant stand and vigor and by predisposing already weakened plants to other factors such as Fusarium root rot. Plants may also be stressed by atmospheric pollutants and chemicals present at toxic levels in the soil, as well as by nutrient deficiency.

### **Bronzing:**

Bronzing is restricted to the upper leaf surface and appears as a reddish-brown flecking that may uniformly cover the entire leaf surface or parts of it. Bronzing may occur on one or more leaves of any given plant. Affected leaves may eventually turn yellow and drop. Damage varies considerably throughout and between fields. Bronzing is similar in color to rust, but rust spores are readily rubbed off of leaves and can be present on lower as well as upper leaf surfaces .

### **Factors Favoring**

Bronzing is related to the presence of ozone in the atmosphere, and damage can be proportional to the concentration and period of exposure to that air pollutant. High concentrations of ozone are moved downward from the upper atmosphere during severe

<h3>TRINIDAD / BENHAM</h3>	<p>Visit with your local                  Trinidad Field Representative</p>
<p>We at Trinidad/Benham have very capable people to serve and visit with you about any of your dry bean needs.</p>	<ul style="list-style-type: none"> <li>Alliance, NE . . . . .308-762-1866</li> <li>Imperial, NE . . . . .308-882-4363</li> <li>Bayard, NE . . . . .308-586-1010</li> <li>Moomaw Corner, NE . .308-586-1209</li> <li>Bridgeport, NE . . . . .308-262-1361</li> <li>Minatare, NE . . . . .308-783-1315</li> <li>Brule, NE . . . . .308-287-2304</li> <li>Hemingford, NE . . . . .308-487-3325</li> <li>Greeley, CO . . . . .970-352-0346</li> <li>Severance, CO . . . . .970-686-2678</li> <li>Sterling, CO . . . . .970-522-3595</li> <li>Wheatland, WY . . . . .307-322-2550</li> </ul>
	

thunderstorms, or are produced during lightning strikes. Ozone is also produced by a photochemical reaction on bright clear days with temperatures above 80 F in the presence of ambient air pollutants such as nitrite and sulfite. High soil moisture favors ozone bronzing because stomates remain open, whereas wilted plants with closed stomates are less sensitive. Plants grown at optimum soil fertility may be more sensitive than those grown at too high or too low fertility. Bronzing is widespread in areas which recently had severe thunderstorms. A glaze-like bronzing on bean leaves may also be caused by another air pollutant, PAN (peroxyacetyl nitrate), but this symptom appears on the lower leaf surface. Certain foliar pesticides, e.g., copper and sulfur products, applied during hot weather may also cause upper leaf surface burning similar to bronzing.

### **Management**

Use tolerant varieties if bronzing has been a problem. Certain varieties are susceptible to bronzing, but little is known about resistance in commercially grown varieties.

### **Storm Damage**

Once again, Mother Nature is hammering a wide portion of the Central High Plains during 1999, as bean (and other crop) fields have sustained moderate to severe damage in Kansas, Colorado and Nebraska in recent days and weeks. The following review covers some of the primary aspects of storm damage effects upon dry beans.

Strong winds, wind-blown soil particles, and hail damage bean tissue by causing abrasion, tearing, or shredding of leaves; aborting buds, blossoms and young pods; lodging entire plants; breaking branches and stems; or physically pulling and moving plants, thus shearing roots. Hail accompanied by wind and rain may also injure plant tissue and cause water soaking of large areas of injured tissue. Pathogenic bacteria may enter this tissue easily, and can be spread throughout the field by the force of the wind.

The amount of crop damage caused by hail depends on the intensity, duration and size of hailstones as well as the plant growth habit and its stage of development. Severe hail can reduce stands and delay crop maturity. Regardless of type, plants have more time to recover and may have less yield reduction when injured earlier rather than later in the season.

Irrigate severely damaged plants as soon as possible, regardless of rainfall received during a storm. Storm damaged plants are often less able to absorb soil moisture because of a shear-damaged root system and loss of large quantities of water through wounded foliage.

Replant beans only if absolutely necessary and feasible. Estimate the proportion of surviving plants with healthy nodes from which the plant can regrow; consider the economical benefit of the reduced stand loss and yield potential. Recommended plant stands for bush type kidneys are 85 - 100,000 plants/acre versus vine type pintos and northernns of 70,000 to 85,000 plants/acre. If replanting after June 15, use an early maturing variety. University of Nebraska researchers have not shown that foliar fertilizer post-damage is of any economical benefit to plant recovery, especially if the field had adequate fertility levels prior to the storm event.

All bacterial disease management procedures must be followed because of the increased risk of spreading these pathogens throughout the field to be replanted. Copper-based bactericides on a 7 - 10 day interval throughout the late vegetative to early pod set stages are recommended by CSU researchers, beginning 30 to 45 days post-emergence for all fields, regardless if storm damaged or not.



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## *Mexico Dominates U. S. Bean Market*

By Brian Clancy, STAT Publishing  
Excerpts from Northarvest Bean Grower, June 1999

Mexico's influence over the fate of the U. S. dry edible bean markets remains strong. Proof is the impact of the latest rounds of rumors over the timing of this year's import license auction had on grower and processor attitudes recently. Shippers outside North America remain focused on crop production difficulties in Argentina, continued demand from Venezuela, and light buying interest from Brazilian importers. As a result, they give more credence to speculation by Mexican traders that this year's auction of duty free import licenses won't be announced until July.

Anticipation of this event on both sides of the U. S. - Mexican border resulted in substantial quantities of dry edible beans being forward sold to Mexican importers. While there is a lot of trust between traders in the two countries, anxiety is building in the U. S. over the status

of high-valued contracts at a time when government inaction may prevent shipment from occurring when they should.

Clancy publishes STAT, a market bulletin serving the pea, bean, lentil and birdseed industries. You can buy a subscription to his newsletter. Telephone: 604-535-8505, email: publisher@statpub.com; web site: statpub.com; address: Stat Publishing, 250 H Street, Blaine, WA 98230.

## *DRY BEAN MARKET OUTLOOK*

Excerpts from Article By Gary Lucier, USDA - ERS  
Michigan Dry Bean Digest, Spring 1999 Issue

The 1998/99 pinto bean market can best be characterized as weak. Dealer prices in early March were 28 % lower than a year earlier. The only lower March price this decade was during the 1991/92 crop year. Economic Research Service (ERS) estimates of pinto bean stocks suggest January 1 stocks were burdensome, although still well below the record 1991/92 level. However, if 1999 pinto bean production approaches last year's size, stocks will exceed record levels and dealer prices during the 1999/2000 marketing year will resemble those seen in 1991/92 (\$ 16 - \$ 17). Even a 5 % cut in production will likely leave stocks near record levels.

Pinto bean export volume during calendar 1998 surged 93 % from the low levels seen in 1997. Most of the increased volume went to Mexico, Haiti, and the Dominican Republic. Pinto bean exports were valued at \$ 68 million and the average export unit value rose 9 % to \$ 26.30 per cwt. In the coming year, with stronger output in Mexico, it is likely that export volume will fall below last year's level of 2.6 million cwt. However, the lower prices expected in the coming season may enhance competitiveness in world markets and could keep annual volume around 2 million cwt.

In 1998, per capita use of pinto beans rose slightly to 3.7 pounds - the highest since 1992's record of 3.8 pounds. Total domestic utilization was an estimated 990 million pounds - a record high. With ample supplies and lower prices likely this year, per capita use of pintos is expected to reach a record-tying 3.8 pounds. Given the likelihood of another year of strong production in 1999, this level of use will likely be maintained in the year 2000 with prices expected to remain low throughout at least the first half of that year as well.

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

**Rust**

Cause . . . . . *Uromyces appendiculatus*  
 Part of Plant Affected . . . . . Leaves, stem, pods

**Symptoms**

Rust symptoms first appear on the upper and/or lower surfaces of leaves as small yellow or white slightly raised spots. Green pods, and occasionally stems, also may become infected and develop typical rust pustules. These spots enlarge and raise further to form reddish-brown or rust-colored pustules which are about 1/8 inch diameter and contain thousands of microscopic spores called urediniospores (summer spores) which allow the fungus to spread within and between fields. Pustules may be surrounded by a yellow border. Spores are readily released from the pustule and give a rusty appearance to anything they contact. Spores feel like talcum powder when rubbed between the fingers. Severe infection results in premature leaf drop. Pod set, and especially pod fill, can be reduced if infection is severe during early reproductive development of the bean plant. Near the end of the season, many pustules change color, and form dark brown to black teliospores (winter spores) which allow the fungus to overwinter in some production areas.

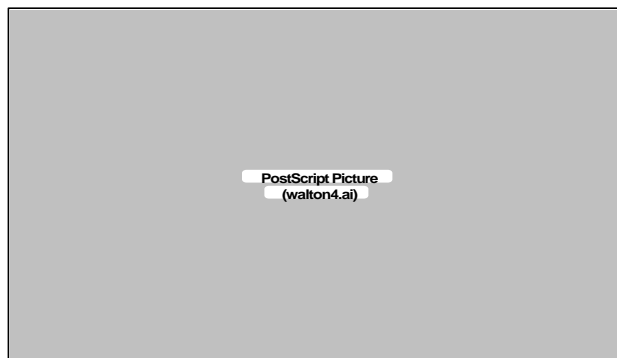
Rust reoccurs next spring when teliospores germinate to form basidiospores which then infect volunteer beans. Infected plants produce pycnia (yellow blisters on the upper leaf surface) and aecia (white cups) on the lower leaf surface or stems near the soil line. Aeciospores move with the wind currents and infect new crop bean plants, resulting in summer spore production. Summer spores are produced in repeating cycles of progressive disease development throughout the summer. Summer spores are moved long distances (regionally) by wind.

**Factors Favoring**

Rust development is favored by cool to moderate temperatures less than 86 F with moisture conditions that result in prolonged periods of free water on the leaf surface. Repeating cycles of summer spore development may occur at 10 to 14 day intervals under favorable conditions. The earlier plants become infected during development, the greater the potential for yield loss. Anything that delays plant maturity, such as hail damage, excess nitrogen, or late planting increases the potential for significant yield loss in the event that environmental conditions favor a rust epidemic.

**Management**

- Plant certified seed of varieties resistant to the prevalent races of rust in the area.
- Avoid the use of susceptible varieties, especially when planting after June 25, since plants may be exposed to more spore pressure from earlier maturing fields during late August and early September.



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- Incorporate infected bean debris into the soil after harvest and rotate with non-host crops for at least two years. Eliminate volunteer beans the following season.
- Monitor fields frequently during blossom and early pod development for the initial signs of rust, especially if daily high temperatures are less than 86 F and there is more than 0.25 inches of rainfall per week.
- Fungicides that prevent or reduce rust infection are more effective when applied early in the epidemic. Thorough coverage is essential.
- Moderately to severely rusted bean plants require twice as much moisture from irrigation as uninfected plants to maintain pod set and seed fill.

[from *Dry Bean Production and Pest Management*]

The site is sponsored by:  
 Colorado State University Agricultural Experiment Station and Cooperative Extension,  
 Colorado Dry Bean Administrative Committee, Nebraska Dry Bean Commission,  
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 Arkansas Valley Growers & Shippers Association, Gaffin Corporation,  
[Horvath Crop Protection](#), and ISK Biosciences Corp.

This site is maintained by [Dr. H.F. Schwartz](#) and [Mark S. McGowan](#)  
 Department of Entomology and Plant Management  
 Colorado State University, Fort Collins, Colorado, 80523-1177

# Field School

August 10, 1999 or August 12, 1999  
7 a.m. to 5:30 p.m. at CSU - ARDEC located on  
4616 NE Frontage Road, Fort Collins, CO  
(I-25 to exit 271; 3 miles north on east side)

A one-day, hands-on workshop for growers, crop advisors, agricultural chemical applicators and dealers, and seed and implement dealers to enhance field diagnostic skills, demonstrate production and pest management strategies, and provide continuing education credits.

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- Production Stages of Development
- Irrigation Management
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- Salinity
- Entomology
- Diseases
- Abiotic Stress
- Weeds
- Herbicide Mode of Action and Injury



### Registration \$150. Registration deadline June 15.

Please make check payable to: COLORADO STATE UNIVERSITY.

\$25 discount for participants in Winter Dry Bean Clinic [Note: \$50 late registration fee after June 15]

To register, mail your check & information to the CSU Office of Conference Services at:  
Field School, Office of Conference Services, Colorado State University, Fort Collins, CO 80523-8037

Telephone:(970) 491-7501 ~ Fax:(970) 491-3568 ~ Email:ocsreg@ocslan.sacc.colostate.edu

### Registration Information:

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## There's More Than Pork & Beans for Summertime Meals !

By Anna Aughenbaugh, Starlite Publications, Fort Collins, CO

Between the heat and our hectic schedules, it can be very hard to spend a lot of time in the kitchen. We still need to fix healthy, tasty meals to give us the energy to do all the activities on our agendas. With a little practice, you can get a meal on the table quickly. You will save money and get less fat and salt than going out for fast food. Stopping for fast food can be a treat or just what you have to have in an emergency, but try not to make it an everyday way of eating.

The following recipes can be made ahead of time, in the cool of the morning or evening. These main dish salads provide a complete protein. Canned beans may be used in place of dried. Be sure to rinse them, to remove some of the sodium. To help prevent the problem beans can cause, serve with applesauce, apple salad or just sliced apples.

### Black Bean & Tofu Salad

- 1 cup black beans
- 4 cups water
- 1 cup tofu, cut into 1/2 inch cubes
- 1 cup whole kernel corn
- 1 cup sweet red pepper, chopped
- 1/2 cup scallions, chopped
- 2 oz white miso
- 4 oz rice vinegar
- 1 t dried red pepper, flakes

Cook beans in 4 cups water for 1 hour or until beans are just tender. Drain and rinse with cold water to cool. Mix tofu, corn, pepper, scallions and beans. Whisk miso, vinegar and pepper flakes together and toss with bean mixture. Makes 6 servings.

### Layered Black Bean Salad

- 1 1/2 cups cooked black beans
- 1 cup lettuce, shredded
- 1/4 cup green pepper
- 1/2 cup whole kernel corn, cooked
- 1 avocado, sliced


Layer in large bowl: 3/4 cup beans, lettuce, pepper, corn, 3/4 cup beans, avocado.

#### Dressing:


- 2 T lime juice
- 1 T cilantro (or parsley)
- 1/8 t garlic powder
- 1/2 cup olive oil

Mix dressing ingredients in blender until thick, pouring oil in gradually. Pour over top of salad.

*As of Jan. 1, 1998 . . .*



*goes*



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Mention Colorado Bean News for free postage.  
If books are to be a gift, let us know who to autograph them to.

**BEAN DIAGNOSTIC CHECKLIST**

Field Id. #: \_\_\_\_\_

**Incidence of Plant Population Affected:**

[ **T** = Trace = < 1 %; **L** = Light = 1 - 25 %; **M** = Moderate = 25 - 50 %; **H** = High = > 50 % ]

**EMERGENCE and EARLY VEGETABLE GROWTH**

**Incidence:**

**Date:**

A. Seeds germinate but seedlings die before emergence ..... \_\_\_\_\_

\_\_\_\_\_

B. Seeds germinate but seedlings die after emergence ..... \_\_\_\_\_

\_\_\_\_\_

Comments:

Diagnosis/Management:

**BRANCHING and RAPID VEGETATIVE GROWTH**

**Incidence:**

**Date:**

A. Stunted, deformed or dying plants ..... \_\_\_\_\_

\_\_\_\_\_

B. Leaf deformation or damage ..... \_\_\_\_\_

\_\_\_\_\_

C. Leaf discoloration ..... \_\_\_\_\_

\_\_\_\_\_

D. Root/stem damage ..... \_\_\_\_\_

\_\_\_\_\_

Comments:

Diagnosis/Management:

**FLOWERING and POD FORMATION**

**Incidence:**

**Date:**

A. Stunted, deformed or dying plants ..... \_\_\_\_\_

\_\_\_\_\_

B. Leaf deformation or damage ..... \_\_\_\_\_

\_\_\_\_\_

C. Leaf discoloration ..... \_\_\_\_\_

\_\_\_\_\_

D. Root/stem damage ..... \_\_\_\_\_

\_\_\_\_\_

E. Flower damage or abortion ..... \_\_\_\_\_

\_\_\_\_\_

F. Pod damage ..... \_\_\_\_\_

\_\_\_\_\_

Comments:

Diagnosis/Management:

**POD FILL and MATURATION**

**Incidence:**

**Date:**

A. Stunted, deformed or dying plants ..... \_\_\_\_\_

\_\_\_\_\_

B. Leaf deformation or damage ..... \_\_\_\_\_

\_\_\_\_\_

C. Leaf discoloration ..... \_\_\_\_\_

\_\_\_\_\_

D. Root/stem damage ..... \_\_\_\_\_

\_\_\_\_\_

E. Pod damage ..... \_\_\_\_\_

\_\_\_\_\_

F. Seed damage ..... \_\_\_\_\_

\_\_\_\_\_

Comments:

Diagnosis/Management: