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2006 Bean Day Highlights

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INSIDE: Bean Day 2006 Conference CD

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NORTHARVEST
Bean Grower

OFFICIAL PUBLICATION OF THE NORTHARVEST BEAN GROWERS ASSOCIATION

Volume 12, Issue 2 March-April 2006

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Bean Day 2006 CD Inside

Look inside this issue of the Northarvest Bean Grower for a CD containing the presentations delivered at Bean Day 2006 held January 20 in Fargo. Also inside, look for reports on research funded by your checkoff dollars.

ON THE COVER: Bean Day participants discuss new products and services at the meeting's trade show.
(photo by Assignment Photography, Inc., Fargo, ND)

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BeanBriefs

Juliuson, Sorenson, Myrdal elected to NHB Board

In district director elections held during 2006 Bean Day, Alan Juliuson, Hope, N.D., was reelected to represent District 4 (Steele and Traill Counties); Mark Myrdal, Edinburg, N.D., was reelected to represent District 1 (Pembina and Walsh Counties); and Todd Sorenson, Fisher, Minn., was elected to represent District 7 (northern Minnesota). Terms on the NHB board are for three years, with a limit of three terms.

Meeting Highlights Sclerotinia Research Efforts

A genomic map, disease-resistant beans and other research achievements were presented recently during the sixth annual meeting of the National Sclerotinia Initiative, hosted by the USDA Agricultural Research Service in Bloomington, Minn.

Sclerotinia is a fungal disease, caused by Sclerotinia sclerotiorum, affecting more than 400 species of broadleaf plants. Since 2002, ARS has led a multistate, multiorganization effort to counterattack the fungus on three fronts: epidemiology; development of resistance in germplasm; and chemical, biological or cultural control.

The initiative aims to protect seven crops that growers across the country are increasingly including in their rotation schemes: sunflowers, soybeans, canola, dry edible beans, chickpeas, lentils and dry peas. Poor genetic resistance to Sclerotinia in these crops costs up to $280 million annually in degraded quality and reduced yields, notes Larry Chandler, associate director for the ARS Northern Plains Area headquarters in Fort Collins, Colo.

During the meeting, participants from more than 14 universities and 11 trade groups, ranging from the American Soybean Association to the U.S. Dry Bean Council, discussed progress to date, as well as identified future research plans and needs through 2009, according to Chandler, the Sclerotinia Initiative's ARS coordinator.

Accomplishments to date include development of Sclerotinia risk-assessment maps that dry bean and canola producers can use to implement disease-management strategies; development of dry bean and lentil germplasm lines or cultivars that resist Sclerotinia; uses for the beneficial fungus Coniothyrium minitans as a biological pesticide product; genetically modified soybeans that produce an antifungal peptide against Sclerotinia; and the public release of the sequence for 14,552 of the fungus' genes. The database enables Sclerotinia researchers to search for genes by name, genomic location, their associated proteins and other information.

For more details, as well as recent research abstracts, visit the National Sclerotinia Initiative web site, www.whitemoldresearch.com.

Park River Grower Wins AgCountry FCS Door Prize

In the 2006 Bean Day door prize drawing, Dwight Johnson (right), Park River, N.D., won a $200 gift certificate sponsored by AgCountry Farm Credit Services, represented here by Scot Manthe, senior loan officer, Fargo.

Tulbek Named Crop Quality Specialist at Northern Crops Institute

Mehmet Tulbek recently began his duties as crop quality specialist at the Northern Crops Institute in Fargo. Tulbek will provide technical assistance to processors and end-users of non-cereal crops, such as soybeans, corn, lentils, dry peas, flax, chickpeas, and dry edible beans. He will also develop and conduct educational programs that identify market opportunities to promote the sales of non-cereal crops.

Tulbek

The new position was developed in response to the increasing diversity of crops produced in the four-state region, says Pat Berglund, NCI Director. Several regional commodity organizations, as well as the state of North Dakota, committed funds for this position, Berglund notes.

Tulbek's research includes evaluation of N.D. chickpea quality, and the characterization of fermented chickpea for dough and bread. He has a B.S. degree in Agricultural Engineering from the University of Ankara, Turkey, an M.S. degree in food engineering from Istanbul Technical University, and will complete requirements for his Ph.D. degree in cereal science at NDSU this spring. He is a member of the American Association of Cereal Chemists and the Institute of Food Technologists.

Favorite Food for Recovering Sago Mine survivor

USA Today in early February did a feature on the recovery of Randy McCloy, the only survivor of the tragedy in West Virginia in January that claimed the lives of a dozen coal miners in the Sago Mine.

Doctors say it's a miracle McCloy survived – he spent more than 42 hours in the mine polluted with toxic carbon monoxide, and when rescued, was unresponsive. Family members and doctors say his progress since has been remarkable. The key to Randy's long-term prognosis is communication. He is undergoing two hours of physical therapy and one hour of speech therapy daily. Once McCloy is able to speak or otherwise express himself, doctors and his family will have a better sense of his cognitive abilities.

He is making progress in communicating, and even expresses food preferences. Although McCloy still has a feeding tube for his medicine and for those days when he doesn't eat enough by mouth, wife Anna tries to hand-feed him meals as much as possible. His favorite: soft tacos with pinto beans and cheese from Taco Bell.

Three National Bean Groups Now One

American Dry Bean Board, U.S. Dry Bean Council and Beans for Health Alliance merge to form U.S. Bean Council.

Three national bean groups – the American Dry Bean Board, U.S. Dry Bean Council and Beans for Health Alliance – have voted to consolidate into a single, new organization called the U.S. Bean Council.

"It's really exciting. Everyone made compromises, but everyone walked away a winner. The dry bean industry will now speak with one voice," says Kevin Anderson, an East Grand Forks, Minn., grower, and president of the Northarvest Bean Growers Association.

The new organization was about a year in the making, says Randy Duckworth, executive director of the old USDBC, who will serve as executive director of the new USBC. "This is a huge development in our industry."

In the past, the three groups have all worked separately, with the USDBC focusing on exports, the ADBB working on domestic promotions, and the BHA concentrating on research and the nutritional value of beans.

The new organization will combine all of those functions under one roof. Those seeking information often didn't know which organization to turn to with questions related to dry beans. Just in terms of clarity, having one go-to organization to contact will be helpful, says Duckworth. "Our marketing efforts and research efforts will all tie in to each other and hopefully lead to greater consumption."

A major goal is to boost domestic promotions and get people eating more dry beans. "Our biggest market is the United States," he says. "About 75% of our product is consumed right here."

The new U.S. Bean Council will be supported by six grower checkoff organizations, seven dealer groups and two corporate members: Bush Brothers & Co. and ADM Edible Bean Specialties. The new organization will also add a new associate member classification so smaller bean companies and equipment dealers can join.

Cindy Brown, Menomonie, Wis., is the consolidated organizations' president. Steve Brown of Holyoke, Colo., was elected vice president and Doug Carlquist of Eden, Idaho, was elected secretary-treasurer. Mark Myrdal, Edinburg, N.D., serves on the national board's Executive Committee; Mike Beltz, Hillsboro, N.D., Government Affairs Committee; Mark Streed, Milan, Minn., International Programs Committee; and Alan Juliuson, Hope, N.D., on the U.S. Bean Council's Health Promotion Committee.

The USBC office will be headquartered in the State of Washington (Grapeview, west of Tacoma) with a liaison office in Washington, DC.

Includes contributing information from Capital Press Agriculture Weekly, a PNW farm publication.

Northarvest 2005 Dry Bean Research Update

Improving the capacity of beans for nitrogen fixation through varietal improvements and modification of inoculum procedures

Principal Investigator: Peter Graham, Professor, Dept. of Soil, Water, and Climate, University of Minnesota, St Paul

Research Objectives: Improving the capacity of beans for nitrogen fixation through varietal selection; and improving inoculant procedures used with beans

Benefits to North Dakota and Minnesota Dry Bean Growers: Environmentally friendly and highly sustainable; and reduce the costs of production through efficent N utilization

Research Method : a) Back cross populations made to combine ability for enhanced nitrogen fixation and agronomically acceptable grain type were grown out at Becker, MN and Park Rapids, MN. Plants received no fertilizer nitrogen, but were inoculated with Rhizobium and dependent on nitrogen fixation for yield; and b)Fungicide treated or non-treated Montcalm bean seed was inoculated using a number of different liquid inoculant formulations, then stored for up to 30 days, with periodic evaluation of rhizobial survival on seed.

Results: a) Individual plant selection has been practised and seeds harvested, with further plant testing to be carried out in the greenhouse (Feb to May, 2006) and field (Summer, 2006); and b) To this point no inoculant formulation tested has allowed survival of bean rhizobia equivalent to that obtainable with soybean rhizobia, and none has completely protected the rhizobia against seed applied fungicides. However:

- Much better survival of bean rhizobia was obtained using modified dilution fluid plus PVP40 as the carrier medium, than with other formulations
- UMR1899 generally survived better on the seed than did UMR1597

With the modified dilution fluid with PVP40 and strain UMR1899, rhizobial populations of 10^3 rhizobia seed^{-1} were recovered up to 15 days after inoculation where the seed was not treated with fungicide, but only up to 8 days where the seed was treated with Apronmax.

Grower Survey of Pest Problems, Pesticide Use, and Varieties in 2004

Principal Investigator: Carl A. Bradley, Extension Plant Pathologist, North Dakota State University

Research Objectives: To identify the major pest problems and management practices involved in dry bean production in the region.

Benefits to North Dakota and Minnesota Dry Bean Growers: This survey helps prioritize research needs and provides data needed for preparation of section 18 emergency exemption requests for pesticide use.

Research Method: A survey was sent to the dry bean growers in the Northarvest production region. The survey asked questions regarding the 2004 growing season. Responses were then returned to NDSU, where they were compiled and statistically analyzed.

Results: A total of 296 responses were received, which represented approximately 22% of the dry bean acreage in the Northarvest region. According to the survey responses, the top three disease problems in 2004 were (in order) white mold, bacterial blights, and root rots. The top three weed problems were nightshade, kochia, and Canada thistle. The top three insect problems were leafhopper, grasshopper, and seed corn maggot. The biggest production problem in 2004, according to the survey responses, was due to adverse weather. Similar to previous years, the most widely-grown pinto, navy, and kidney cultivars were Maverick, Navigator, and Montcalm, respectively.

Evaluation of dry bean cultivars for resistance to Fusarium root rot under field and controlled conditions

Principal Investigators: Carl A. Bradley, Extension Plant Pathologist, Jack Rasmussen, Chair, Plant Pathology Department, and Ken Grafton, Director, North Dakota Ag. Experiment Station, North Dakota State University

Research Objectives: To characterize Fusarium root rot resistance levels in a set of dry bean cultivars and to develop a greenhouse screening method that will predict the response of a cultivar to Fusarium root rot in the field.

Benefits to North Dakota and Minnesota Dry Bean Growers: Knowing the susceptibility or resistance level to Fusarium root rot in a dry bean cultivar can help growers choose which cultivar to grow based on known disease histories of fields. An accurate and efficient greenhouse method designed to screen dry bean lines for resistance to Fusarium root rot will aid in the development of resistant cultivars.

Research Method: A set of eleven dry bean cultivars, representing different market classes, were evaluated for their level of resistance to Fusarium root rot in field (Fargo, ND and Park Rapids and Perham, MN) and greenhouse trials. In the greenhouse, three different screening methods were evaluated (layered-inoculum, spore inoculum, and paper-towel methods). Results from the field and greenhouse trials were compared to identify the most resistant cultivars and to identify the greenhouse screening method that had the best relationship to the field results.

Results: The cultivars and breeding lines, 'Eclipse', 'Matterhorn', 'Maverick', 'Montcalm', 'Norstar', 'Othello', 'Red Hawk', 'Rojo Chiquito', 'T-39', 'Vax 3', and 'Vista' were all evaluated in the greenhouse and field tests. In the greenhouse tests using all three screening methods, 'Rojo Chiquito' had the greatest root rot severity rating, while 'Vax 3' had the least root rot severity rating. Of all the cultivars, 'Vax 3' had either the least or one of the least root rot severity ratings at all of the field trials. This suggests that 'Vax 3' may be a useful source of resistance to Fusarium root rot, and could be used to develop Fusarium root rot resistant dry bean cultivars adapted to the Northarvest region. All three greenhouse methods used to screen the cultivars for Fusarium rot resistance had good relationships with the field results. This suggests that any of these greenhouse screening methods could be used to identify dry bean cultivars or germplasm accessions with improved levels resistance to Fusarium root rot.

High-Selenium Pinto Beans as a Value-Added Product

Principal Investigators: Phillip Reeves, Ph.D., Principal Investigator (PI), and John Finley, Ph.D., Collaborating Investigator (PI)

Previous work performed with Northarvest Beans: An interim report, submitted in February, 2005, detailed the objectives of, and work conducted under, a grant given by Northarvest Beans to the Grand Forks Human Nutrition Research Center. The objectives of the grant were to conduct research to:

Objective 1. Determine the selenium (Se) content of field-grown pinto beans from the vicinity of Jamestown, North Dakota.

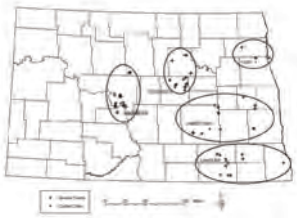
Objective 2. Quantify the contributors to variation of the Se content in pinto beans.

Beans collected from around the state of North Dakota were analyzed for Se and the results are summarized below.

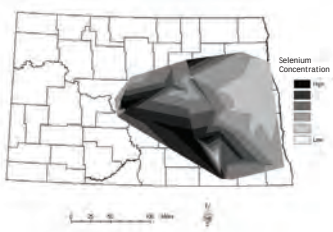
Briefly, beans were collected from 78 different fields and 37 different producers from five different geographical regions across North Dakota. The selenium content is included in Table 1.

The mean selenium concentration of all samples was 486 nanograms selenium/g (or 0.49 micrograms per gram) (Table 1), but there was wide variation (136 to 983 nanograms per gram; standard deviation of 253ng/g). Samples were analyzed as five distinct geographic clusters; selenium concentrations in 4 of the 5 clusters were similar while the Gilby area was lower than the rest (however, there were only 4 samples from this area). Wide variation was noted in all areas except Gilby.

Location of pinto bean samples collected in North Dakota in 2004.



General trends in selenium concentration throughout the 2004 study area.



Additional work conducted in 2005: Additional grant funds were given to the Grand Forks Human Nutrition Research Center, USDA/ARS, by Northarvest Beans for the purpose of extending the scope of the project. Results of field agricultural projects are highly dependent on the specific environmental conditions (primarily climate) that predominate while the plants are growing. Consequently, at least two seasons are needed to obtain accurate data, and therefore the primary purpose of the second grant was to extend the study for a second growing season. Additionally, funds were used to extend analyses to minerals other than Se.

Results obtained in 2005: Results obtained in 2005 were by the same graduate student that conducted the project in 2004 (Kristofer Parson). The project was supervised by Dr. John Finley until his resignation from the USDA/ARS in October, 2005; subsequent to that date the project was directed by Dr. Phil Reeves. Mr. Parson was a graduate student in the Department of Geography, Univ. North Dakota. The Department of Geography supervised the geographical modeling aspect of the project.

The primary problem encountered in 2004 was the lack of participation by bean growers in North Dakota. In an attempt to counter this problem, a letter from Northarvest Beans detailing the intent of the study and requesting their participation was included in mailings to bean producers. Approximately 250 producers were sent packets containing letters explaining the study, tools for collecting bean samples and instructions for doing so. The producers were asked to return the bean samples in return addressed, stamped envelope included in the packet. Despite the letter of request from Northarvest Beans, participation was less this year than in 2004 as only 19 producers sent samples from 37 locations (as compared to 37 producers and 78 locations in 2004). Analyses are ongoing but current results are summarized below:

Selenium content of pinto beans grown in North Dakota in 2005 (units in parts per million)

Mean	0.465
Median	0.417
Standard Deviation	0.307
Range	1.880
Minimum	0.92
Maximum	1.972

Results from 2005 compare quite favorably with results from 2004 (units in parts per million)

Mean	0.486
Median	0.440
Standard Deviation	0.255
Range	1.090
Minimum	0.119
Maximum	1.209

The results of both years are similar in that they demonstrate that pinto beans grown in North Dakota contain modest amounts of Se, and that some beans accumulate very large amounts of Se. The practical significance of this to the American diet can be calculated by assuming that a standard serving of beans (approximately 130g) contains approximately 33 g of dry beans. Thus, average North Dakota pinto beans would contribute ~ 0.450 X 33 = 15 micrograms of Se to the diet, whereas beans highest in Se would contribute ~ 1.5 X 33 = 50 micrograms of Se to the diet. The dietary requirement for Se is 55 micrograms per day; thus pinto beans could contribute from 30 - almost 100% of this Se requirement. This information could be used to help market beans grown in North Dakota.

Table 1: Selenium Content

Location	Number samples	Selenium (micrograms per gram)	Standard deviation	Min.	Max.
Fessenden	18	0.494	0.167	0.257	0.941
Gilby	4	0.250	0.77	0.182	0.380
Jamestown	14	0.545	0.278	0.223	0.983
Lamoure	11	0.505	0.192	0.136	0.834
Washburn	18	0.459	0.245	0.185	0.970
Overall Avg.		0.486	0.253	0.136	0.983

Efforts directed toward mapping the Se content of pinto beans grown in North Dakota: A major objective of the current study was to develop a geographical based map of the Se content of pinto beans. This effort is on-going.

Benefits to North Dakota/Minnesota bean growers: A recent conference hosted by the Grand Forks Human Nutrition Research Center highlighted the potential benefits to human health of enhancing the food supply with the essential trace element selenium (Se). Selenium is needed in moderate amounts (55 micrograms per day) for nutritionally essential functions such as producing enzymes that guard against oxygen stress in cells. However, a clinical study conducted in humans found that consumption of an additional 200 micrograms of selenium per day reduces the incidence of cancer, especially prostate and colorectal cancer. A large study (approximately 32,000 subjects) is currently being conducted in an attempt to confirm the previous finding of selenium-mediated reduction of cancer.

The implications of these studies for agriculture are substantial; a demand is developing for selenium-enriched foods, and this demand will certainly increase if the present prostate cancer trial yields positive results. Plant foods accumulate selenium partially in direct relationship to the selenium concentration of the soil, so soils enriched in selenium may produce selenium-enriched crops. North Dakota has areas with very high concentrations of selenium in the soil, and many of these areas are in regions where pinto beans are produced. Consequently pinto beans from North Dakota are a potentially valuable source of supplemental selenium; this attribute could be used to produce a value-added product and/or help to market pinto beans from North Dakota.

Evaluating Nitrogen Fertilizer Rates on Kidney Bean Yields and Surveying Root and Foliar Diseases of Several Dry Bean Types in Minnesota

Principal Investigators: James A. Percich, Professor, Plant Pathology and Becky Sheets, Research Technician, University of Minnesota

Benefits to North Dakota and Minnesota Dry Bean Growers:

- Nitrogen fertilizer field studies (2003, 2004, and 2005). The use of nitrogen fertilizer, regardless of amounts, in the form or urea did not significantly increase bean yields when compared to biological seed treatments with no nitrogen.
- New formulations of rhizobium inoculants were significantly better than other types and easier to work with in the field with significant dark red Kidney bean yields.
- A preliminary disease survey indicated that Anthracnose in Minnesota was extremely rare. Levels of white mold were low and the root rots and bacterial diseases were the most widespread regardless of bean types grown or location.

Research Methods:

A. Effects of Nitrogen Fertilizer Rates on Dark Red Kidney Bean Yields

A study to evaluate the effects of nitrogen fertilizer and biological seed treatments on yields was established on a farm with a history of root rot at Perham, MN in 2005. The experiment consisted of a completely randomized design (30 acres) with each treatment plot being 500 ft in length and consisting of four rows, replicated four times. There were seven treatments were the following:

1. Nitrogen 30 lb./A applied once at sowing.
2. Nitrogen 30 lb./A applied once at pre-bloom.
3. Nitrogen applied at 30 lb./A at sowing and pre-bloom.
4. Nitrogen applied at 30 lb./A at sowing and 60 lb./A at pre-bloom.
5. No nitrogen applied, but seed treated with Apron/Maxim/ + Lorsban + Rhizobium tropici
6. No nitrogen applied, but seed treated Bacillus subtilix + Rhizobium tropici
7. No nitrogen applied, but seed treated with Maxim/Apron + Lorsban

Replicated field studies in 2003, 2004, and 2005 clearly showed that the addition of more than 30 lb of total N/acre did not significantly increase bean yields in root rot infested soil, regardless of soil pH (Table 1). Field research conducted on grower farms in 2003 and 2004

Table 1. A review of nitrogen fertilization and biological seed treatments on the yield of dark red kidney beans in 2003, 2004, and 2005 with similar nitrogen applications, seed treatments, and in-field experimental designs at Staples and Perham, Minnesota.

Treatment Number	Nitrogen Application (pounds/acre)			Dark Red Kidney Bean Yield (pounds/acre)			
	Sowing	Pre-bloom	Total N 2003				
Staples[x]	Staples	Perham[y]	Perham	2004		2005	
1.	30	30	60	1,199 a[z]	1,270 a	2,169 ab	1,986 a
2.	30	60	90	1,266 a	1,338 a	2,325 ab	1,857 ab
3.	0	30	30	1,050 a	1,185 a	2,420 a	1,567 bc
4.	0	0	0	1,010 a	1,175 a	2,183 ab	1,563 bc
(Rhizobium)							
5.	0	0	0	1,158 a	1,193 a	2,196 ab	1,547 bc
(Bacillus subtilis + Rhizobium)							
6.	30	0	30	941 a	1,064 ab	2,169 ab	1,545 bc
7.	0	0	0	962 a	906 c	2,063 b	1,467 c
(Untreated seed)							

[x] Soil pH 5.7, Staples, MN
[y] Soil pH 6.2, Perham, MN
[z] Means followed by the same letter are not significantly (P=.05), Duncan's.

Table 2. Rhizobium Granular In-furrow and Seed Applied Formulations on the Yield of Dark Red Kidney Beans Sown in Root Rot Invested Soil without Nitrogen Fertilizer in 2005.

Treatment		Yield	Yield Over	Percent Yield
Formulation	Description	Pounds/A	Untreated	Over Untreated
1	applied to seed	1,798 a	1,047	139
2	granular in-furrow	1,627 a	876	116
3	granular in furrow	1,107 a	356	47
4	granular in furrow	936 b	185	25
5	granular in-furrow	916 b	165	22
6	applied to seed	774 b	23	3
7	Untreated seed	751 b		

Table 3. Survey[1] of dry bean diseases in Minnesota and their incidence in 2005.

Disease (causal agent)	Percent Incidence[2]
Fusarium Root Rot (Fusarium solani f. sp. phaseoli)[3]	100
Fusarium Wilt Yellows (F. oxysporum f. sp. phaseoli)[4]	50
Rhizoctonia Root Rot (Rhizoctonia solani AG4)[4]	10
Bacterial Brown Spot (Pseudomonas syringae pv. syringae)	100
Common Bacterial Blight (X. axonopodis pv. phaseoli)	100
White Mold (Sclerotinia sclerotiorum)	10[5]
Chaetoseptora Leaf Spot (Chaetoseptora wellmanii)	<1[6]
Anthracnose (Colletotrichum lindemuthianum)	<1
Halo Blight (Pseudomonas syringae pv. phaseolicoli)	<1
Pythium Blight (Pythium ultimum)	<1

1 Hubbard, Morrison, Wadena, Todd, Otter Tail, Clay, and Norman counties.
2 Percent plants diseased.
3 Fusarium root rot was found on all plants sampled regardless of dry bean type. Disease severity on irrigated dark red Kidney beans was significant and yield loss could be expected.
4 Fusarium wilt and Rhizoctonia root rot were often found in conjunction with Fusarium root rot (a root rot complex)
5 White mold, when found, was observed only in low root rot infested fields where the plants had a row canopy.
6 Diseases that were found in less than (<) one percent of plants observed at survey sites.

showed the addition of nitrogen fertilizer did not significantly increase yields when compared to seed treated with Bacillus subtilix +Rhizobium tropici and or with R. tropici alone without the addition of nitrogen fertilizer (Table 2). The same lack of nitrogen response was demonstrated on both acid and neutral soils at Staples and Perham, Minnesota, respectively (Table 2).

All the dark red kidney seed sown, regardless of treatment, contained Apron/Maxim + Lorsban. Nitrogen was applied in the form of urea. The soil contained 10 lb/A of nitrogen as carry-over from the previous cropping season at the time of sowing. The soil pH was 6.2. Standard agricultural practices were performed throughout the experiment.

B. Rhizobium Inoculants

A preliminary experiment was conducted in a grower's field (pH 6.2) having a history of edible bean production, and a history of root rot in 2005. A completely randomized experimental design consisting seven different formulations were evaluated. Formulations 1 and 6 were applied to the seed, formulations 2, 3, 4, and 5 were applied as granular in-furrow, and treatment 7 consisted of untreated seed.

All seed, regardless of experimental treatment had Apron/Maxim + Lorsban applied. Each treatment plot consisted of two middle rows each 40 feet in length. All treatments were replicated four times and statistical analysis (ANOVA) was performed. Standard agricultural practices were used throughout the experimental period.

C. Disease Survey

The first year of a two-year Minnesota dry bean disease survey was established and cooperative grower sites identified in 2005. The disease survey will evaluate foliar, vascular, and root diseases. Information to be recorded will focus on pathogen and disease identification, incidence and severity. Cropping history, soil type, pH and fertility program as well as disease management strategies, if employed, at each site will be recorded.

Results:

A. Effects of Nitrogen Fertilizer Rates on Dark Red Kidney Bean Yields:

Results of a three-year field (30 acre sites) study comparing the recommended use of nitrogen fertilizer at 30, 60, and 90 lb/A clearly showed that nitrogen fertilization, regardless of level, except for 30 lb./A urea at pre-bloom in 2005, did not result in significant yield increases when compared to seed treated with B. subtilix and R. tropici inoculants without nitrogen (Table 1).

B. Rhizobium Inoculants:

Our preliminary study clearly showed that rhizobium treatments 1, 2, and 3 resulted in significant yield increases when compared to all the other treatments (Table 2). Where as treatments 4, 5, and 6 did not differ significantly from each other or from the untreated control (treatment 7) (Table 2). Treatments 2 and 3 were granular in-furrow applications. All rhizobium treatments resulted in higher yields than the untreated control (Table 2). The granular in-furrow rhizobium formulations may offer the bean grower an easy and effective means of using dry bean rhizobium inoculants in the future. Again, it should be noted that no nitrogen fertilization was used in this study.

C. Preliminary Minnesota Disease Survey:

Root rot caused by the soil fungus Fusarium solani f. sp. phaseoli was found in on all dry bean types examined and in all production fields (Table 3). Fusarium wilt, caused by Fusarium oxysporum attacks the plants vascular system, was observed in 50% of all diseased plants and in all fields. Common bacterial blight and brown spot were found on all plants surveyed, regardless of bean type (Table 3). Unlike the reports from North Dakota State University, the presence of Anthracnose was extremely low with less than one percent of all the plants and fields observed (Table 3). The recent discussion of soybean rust and other emerging diseases has often resulted in statements that cannot be supported scientifically. Dry bean disease reports from North Dakota State University are different than our observations of Minnesota farms in 2005. A more intensive survey of Minnesota dry bean productions areas is needed.

Dry Bean Breeding Program

Prepared by: Gonzalo Rojas-Cifuentes, Jean R. Gelin, Albert J. Vander Wal

Project Leader: Dr. Kenneth Grafton, Research Associate: Dr. Jean R. Gelin, Research Associate: Dr Gonzalo Rojas-Cifuentes, Research Specialist: Albert J. Vander Wal

Objectives: The objective of the dry bean breeding program at NDSU is to develop high yielding, high quality bean genotypes adapted to the Northern Great Plains. This involves many characteristics of dry beans and different disciplines of research (e.g. genetics, pathology, physiology, nutrition etc.). Main effort are in pinto and navy beans, but also blacks, great northerns, reds and kidneys are important part of our program.

2005 Research Activities: Locations and Trials -- During 2005 growing season 39 experiments and breeding material were planted at 5 locations in North Dakota, and at 2 locations in Minnesota.

North Dakota Locations and Trials:

- Carrington -- Pinto Advanced Yield Trial (44 lines), Navy Advanced Yield Trial (47 lines), Black Advanced Yield Trial (24 lines), Great Northern & Reds Advanced Yield Trials (14 lines), Pinto Preliminary Yield Trial (247 lines split into 6 trials), Midwest Regional Performance Nursery (20 lines), F3 Space Plants (525 rows), F2 Space Plants (234 rows)
- Johnstown -- Pinto Advanced Yield Trial (44 lines), Navy Advanced Yield Trial (47 lines), Black Advanced Yield Trial (24 lines), Great Northern & Reds Advanced Yield Trials (14 lines)
- Forest River -- Pinto Variety Trial (16 lines), Navy Variety Trial (17 lines)
- Hatton -- Pinto Variety Trial (25 lines), Navy Variety Trial (24 lines), Miscellaneous Variety Yield Trial (26 lines)
- Prosper -- Pinto Variety Trial (14 lines), Navy Variety Trial (12 lines), Miscellaneous Variety Trial (11 lines), Pinto Preliminary Yield Trial (247 lines split into 6 trials), Red Preliminary Yield Trial (68 lines split into 2 trials)

Minnesota Locations and Trials:

- Park Rapids -- Miscellaneous Variety Trial (23 lines), Root Rot Study (11 cultivars), F5 Plant Rows (264 rows)
- Perham -- Miscellaneous Variety Trial (12 lines), Root Rot Study (11 cultivars), F4 Plant Rows (264 rows)

Crossing Block -- At NDSU greenhouses, 205 crosses were made. Of those 49% were pinto, 23% navy, 14% black and 14% great northern and red beans.

Disease Testing -- During 2005, 1520 line were tested for anthracnose resistance, 100 lines were tested for rust resistance and 100 lines were tested for common bean mosaic virus.

Cooperation Studies -- Root rot study was conducted at Park Rapids and Perham in Minnesota in collaboration with Drs. Rasmussen and Bradley, Plant Pathology Department at NDSU.

A population is being developed for white mold resistance for further screening for Dr. Rasmussen. A small trial was maintained in Park Rapids, MN in collaboration with Dr. Peter Graham, Soils Science Department, University of Minnesota, to develop lines with high nitrogen fixing abilities.

Winter Nurseries -- 280 F1 lines were sent to our winter nurseries in New Zealand. 580 F4 selections from F3 space plants (pinto, navy, great northern, red, and black beans), 238 F3 selections from F2 space plants (navy and black beans), 40 F5 selections from F4 plant rows and 17 F6 selections from F5 plant rows (kidney beans) were sent to our nursery in Puerto Rico.

DNA markers -- Microsatellite markers were used to screen a navy bean recombinant inbred line population for association with seed-micronutrient accumulation. This population was developed for the cross Albion/Voyager. Screening of the AN population that segregates for white mold resistance is underway.

Results:

- A total of 2500 test plots of advanced and preliminary yield trials were harvested. In advanced yield trials 44 pinto, 47 navy, 24 black and 14 great northern and red bean lines were tested
- For the variety trials 372 plots for the pinto, navy, miscellaneous and kidney.
- More than 4000 single plant selections from breeding trials were made and harvested. Due to wet conditions we were not able to plant approximately 20 acres of early generation trials, in which more selections would have been made.
- After many evaluations in several trials in and out of North Dakota about 3-4 experimental lines will be considered for pre-release in the near future.
- Microsatellite markers associated with accumulation of zinc, phosphorus, and calcium in the bean seed were identified. Further evaluation is needed before possible application in marker-assisted selection for these traits.

Field Evaluations of Four Dry Bean Populations For White Mold Resistance

Principal Investigators: Jack Rasmussen, Dept. of Plant Pathology, Ken Grafton, Dept. of Plant Sciences, and Bob Henson, Carrington (ND) Research and Extension Center, North Dakota State University.

Research Objective: White mold is a persistent and economically-damaging disease of dry beans in the Northarvest production area. Disease susceptibility is common in accepted cultivars, so the potential for serious economic damage in the future is high. Genetic resistance is the most efficient way to control any disease. The objective of this research is to identify new sources of genetic resistance to white mold in dry bean and to move that resistance into germplasm adapted to the Northarvest region that can be used by the breeding program for future cultivar development.

Research Method: This project was initiated with greenhouse experiments that identified dry bean lines from Mexico, Central America and South America with potentially new and useable white mold resistance. These dry bean lines, collected, maintained, and obtained from the USDA, are genetically different from our varieties. Collectively, they may contain valuable sources of genetic resistance for the Northarvest production area. Included in this genetic variability may be new sources of resistance to white mold. Four of the best lines identified from these screens were crossed with Othello, a disease-susceptible pinto bean cultivar adapted to this region.

A population of approximately 100 to 125 lines was developed in the greenhouse from each of the four lines by crossing them to Othello pinto bean. Each population was advanced to the F6 generation. F6 lines are genetically stable, like a cultivar, so are highly desirable for experimental purposes. This stability permits the increase of large amounts of seed of each population that can be used in multiple, replicated experiments in the field and greenhouse. Also, since they are genetically stable, F6 lines that show promise for white mold resistance can be expected to contribute genetic resistance to the breeding program in a predictable fashion.

Each line from each cross (nearly 500 lines in total) were previously evaluated in the greenhouse for white mold resistance. Last summer, the best 20 to 30 lines from each population, as determined by the greenhouse tests, were evaluated in replicated field plots for reaction to white mold. The field trials were performed at Carrington, ND. Plants were inoculated at flowering, then were misted to ensure high disease pressure. In all, 125 lines were tested, including 10 controls. Othello, the susceptible check, was killed by white mold throughout the plot. However, several lines showed good levels of resistance in replicated plots and may be of value for breeding purposes.

White Mold in Field

Carrington Research Plot

Spray Inoculation

Northarvest Bean Growers Association Research Committee

Each year, the volunteer members of the Northarvest Bean Growers Association Research Committee allocate dry bean checkoff funds where they believe there is the greatest opportunity for the greatest return for the greatest number of dry bean growers. In 2005, they allocated 29% of the total Northarvest budget, or $219,725 toward research. This report highlights the projects that were funded in 2005. Members of the Research committee include:

- Kevin Anderson, East Grand Forks, MN
- Mike Beelner, Menagha, MN
- Mike Beltz, Hillsboro, MN
- Mark Dombeck, Perham, MN
- Jon Ewy, Deer Creek, MN
- Gary Friskop, Wahpeton, ND
- Brian Love, Euclid, MN
- Mark Myrdal, Edinburg, ND
- Paul Schulz, Washburn, ND
- Jim Sletten, Northwood, ND
- Dan Webster, Penn, ND

Northarvest Bean Growers Association
50072 E. Lake Seven Road
Frazee, MN 56544

U.S. Dry Bean Leaders Meet with Johanns

USDA Secretary Mike Johanns and members of his staff met recently in Washington, D.C. with leaders of the newly formed United States Bean Council (USBC). Issues key to the U.S. dry bean industry were discussed:

WTO Negotiations – The USBC strongly supports elimination or significant reductions in tariffs and quotas that impede full and open trade, eliminating non-tariff trade barriers, and greatly reducing the allowance for "sensitive" products that a country can claim.

Food Aid – The USBC asserts that international trade negotiations are not the appropriate forum for determining issues relating to U.S. humanitarian food assistance programs, strongly supports maintaining U.S. in-kind commodity donations programs for both emergencies and developmental assistance programs, and strongly opposes the "cash only" position of the European Union.

New Farm Bill – The USBC is very interested in the establishment of a USDA national stocks report for dry beans; establishing an effective specialty crops grants program; and maintaining appropriate policies regarding the expansion of planting of non-program crops on program crop acreage to avoid unintended consequences to non-program crops.

Mexico Market and NAFTA – As Mexico is our largest export market, the USBC urges that NAFTA be implemented as negotiated, without the unilateral imposition of "protection options" for dry beans as recently suggested by Mexican officials.

USDA Secretary Mike Johanns (sixth from right) and members of his staff met recently in Washington, D.C. with leaders of the newly formed United States Bean Council to discuss U.S. dry bean industry issues.

Johanns indicated in followup meetings with Mexican government officials that they did not seek to rework or renegotiate any part of NAFTA as relates to U.S. beans. The Secretary also sought to reassure USBC leaders that the administration intends to pursue full implementation by all parties.

Juliuson in Successful Farming: Edibles Remain Best Crop

The Alan Juliuson family and their production of dry edible beans near Hope, N.D., were featured in the December, 2005 issue of Successful Farming magazine. Juliuson, vice president of the Northarvest Bean Growers Association, was the first farmer in North Dakota to grow great northern beans, the feature by Dan Looker pointed out.

Juliuson noted in the article that in recent years, he's seen soybeans replacing dry edibles, even though North Dakota still produces 48% of the nation's edible beans. He said in the article that edibles are a labor-intensive crop that keeps the family well-employed and discourages a lot of competition.

"This is a plant that has to have cooler temperatures when it starts to flower, otherwise it gets greatly reduced yields," he said of great northern beans, in the article. "It's very time-consuming. That's why a lot of people don't grow dry beans. It takes a lot of labor, a lot of time. You've got to babysit this crop."

Juliuson said that dry beans remain their best crop, netting about $100 to $140 an acre, compared to $60 to $70 from soybeans and even less from corn. Thus, "the next generation isn't likely to drop beans from the rotation."

The next generation would be his sons, Jeff and Lucas. Alan said in the article that he counts on the revenue from edibles to keep his farm profitable enough to allow his sons to gradually buy out most of the business. The article related strategies in which Alan may pass along the farm to his sons, including a change in business structure (perhaps a corporation, with family members owning shares that would eventually be bought out as well as gifted to the boys) as well as leasing them the farm's machinery until it's depreciated. Then for a modest price, they would own the machinery.

Alan Juliuson, vice president of the Northarvest Bean Growers Association, was featured recently in one of Successful Farming's "transitions" series of articles focusing on farm families that are transitioning management to a new generation. The feature was headlined "Transitions: More Than a Hill of Beans." Photo by Doug Hetherington, courtesy Successful Farming

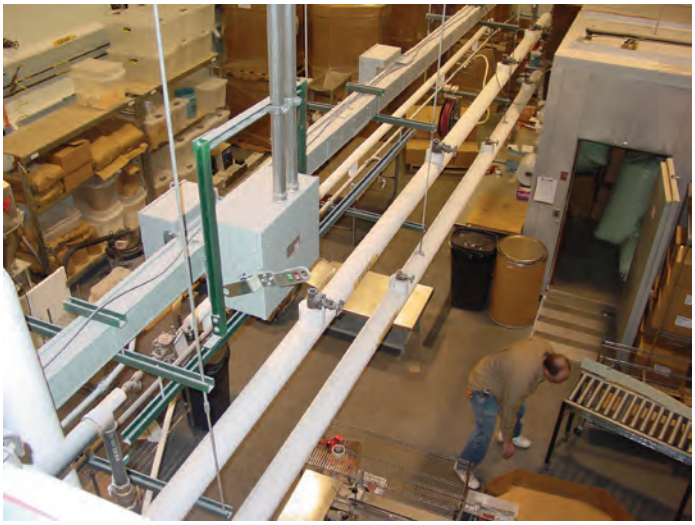
The article on the Juliusons was one of a series by Successful Farming, focusing on farm families that are transitioning management to a new generation. See the Juliuson feature in its entirety and others in the series online, www.agriculture.com. In the menu at left, under Special Features, click on 'Farmers for the Future' then 'Transitions Series.'

Heartland's Finest – A Gluten-Free Alternative

Beans fill void for celiac consumers

By Marlene Dufault

Heartland Ingredient, LLC is a company that markets, produces and processes dry whole beans to make nutritious, gluten-free products under its brand, Heartland's Finest. Jim LeCureux, general manager and Brent Sorenson, director of operations, both had worked together on past value added efforts and they came together again to develop a product using dry beans. "We wanted to give the consumer a good product and with beans grown here in the Northarvest area and in Michigan, it was natural that we wanted to do something with beans. They are loaded with nutrients and antioxidants and with the recently revised Food Pyramid promoting bean consumption, we knew we could make it work," says Sorenson.



Heartland's Finest processing and shipping facility, located at the University of Minnesota in Crookston, MN, processes dry whole beans to make nutritious, gluten-free products that especially appeal to consumers with celiac disease.

How It Began

In 1999, farmers in Michigan were looking for alternative uses for dry beans and had looked at a number of different opportunities. One opportunity came when LeCureux met with researchers at the University of Nebraska. The University had done some work with a celiac support group and knew the group was looking for products with more protein and fiber. Beans fit that profile so LeCureux and Sorenson, who both represent bean growers, decided to pursue this venture. The University of Nebraska developed a survey and the Celiac Sprue Associations sent the surveys to 1,200 of it's members throughout the country. Over 40% responded indicating the desired characteristics or traits in products they use. Beans fit those traits because beans are gluten-free, important to those with celiac disease.

Celiac disease, also known as celiac sprue, is a genetic disorder that affects approximately 3 million Americans. This digestive condition is triggered by consuming protein gluten which is found in bread, pasta, cookies and other foods containing wheat, barley or rye. Celiac disease (CD) occurs in people who have a susceptibility to gluten intolerance. There is no cure for CD but one can effectively manage it through changes in diet. The only acceptable treatment for celiac disease is following a strict gluten-free diet for life. What makes this difficult is that there are many hidden sources of gluten found in the ingredients of many processed foods.

That is where Heartland's Finest products fit in. "Our products were designed and developed for those that are gluten intolerant," says Sorenson.

Sorenson and LeCureux contacted Northern Crop Institute (NCI) in Fargo, ND who developed their cereal and pasta products. With NCI's help, along with support from AURI in Crookston, MN, USDA and University of MN Crookston, Heartland Ingredient LLC was formed. Heartland Ingredients LLC is currently owned by FarmConnect, a producer-owned organization in northwest Minnesota, with members from Minnesota, North Dakota, South Dakota, Iowa and Illinois, the Michigan Edible Bean Coop and individual investors. Northarvest's pinto beans are

Continued on Next Page

Heartland's Finest uses pinto and navy beans to produce their flour products. By using bean flour, bakers can eliminate gums and gelatins and as a result, get a better rise and texture in the bread.

Customer Testimonials

• The pastas are delicious! No weird aftertaste. The Mac and Cheese was outstanding, it so brings me back to my favorite MIA comfort foods.

• The flours to bake with...WOW! They are just great. Finally there is a product to eat that actually has some nutritional value. Thank You!!!

• I received some of what I ordered and cooked some ziti tonight for dinner and WOW!!! It was the best I've had of the many gluten free that I have tried!!!!! Thank you so much for such a good product and I know that I don't have to look any further for good pasta!!!

• I can't wait for our next support group meeting-they all will be sooooo happy with the news.

• I made the blueberry muffins with your navy bean flour and they only lasted 2 days in my house. They were so delicious!

• You have superior products. Until now I have been making my own pasta in an electric pasta maker and freezing for later use because I couldn't find anything satisfactory. But no more.

Gluten-free Ceros, a nutritious, flavorful and wholesome cereal made from pinto beans shown here in single serving packages. Flavors include original, raspberry and cinnamon.

sent to Iowa where they are milled. The bean powder is shipped to Minnesota and processed. The final products are packaged and blended at the Crookston, MN facility for packaging and shipping. "The help we have had is tremendous. Working with the different organizations was instrumental in getting Heartland's Finest off the ground. It was a great collaboration." Sorenson stated.

Heartland's Finest currently uses pinto beans from the Northarvest region to make cereal products and navy beans from Michigan to make their pasta line. Both beans are used in their flour products. Currently on the grocery shelves are products made from whole dry bean flour and corn such as macaroni and cheese, elbow macaroni, linguini, spaghetti, rotini and ziti. "These are all gluten-free. The customers talk about them being products that look and taste like products they use to eat," says Sorenson. "We recently got some high marks from some Italians that have CD. And when you can please an Italian with good pasta, you must be doing something right" says Sorenson with a grin. "We have also worked with different celiac groups and all these products have received high praise."

One of the celiac groups that have given its approval is the Celiac Sprue Association. This organization recently gave Heartland's Finest their CSA Certification, which means it has been tested, reviewed and received its final approval. This indicates that Heartland's Finest products are gluten-free, and provides an additional, independent level of security for customers. The CSA logo will soon appear on all packaging which indicates that there are no traces of wheat, barley, rye or oats in Heartland products.

New Products

The newest products for Heartland are Gluten-Free Ceros which provides nutritious, flavorful and wholesome cereals made from pinto beans. Flavors include original, raspberry and cinnamon. Ceros also comes in small single serving packages, which are great for an after school snack. Currently, the company is working on a bread mix and lasagna. LeCureux says one baker in Detroit has been using their bean flour to make navy bean bread for over a year. It is their top selling gluten-free bread. By using the bean flour, the baker can eliminate gums and gelatins and as a

result, he gets a better rise and texture in the bread.

Distribution Network

Currently, Heartland's Finest products are in 35 states. LeCureux frequently meets with celiac support groups and grocery and health food stores in different states to introduce their product lines.

LeCureux says that they attend as many food shows that they can. Heartland's booth is always full of consumers looking for a good gluten-free product, either for themselves or for family and friends. Samples of the products are given out to attendees and after tasting the product, their response is terrific. "It is quite powerful when someone comes up to you at a convention and says, 'Thank you for giving my child hope!' That is something that stays with you for a long time," says Sorenson. LeCureux agrees. "It gives you a good feeling when someone comes up to you, thanking you for making a product for them. We are not just out to sell another product. We are actually trying to help people."

To find store locations that carry Heartland's Finest products or to check out some of their recipes, go to their web site at www.heartlandsfinest.com.

The humble bean is a heavyweight in diet benefits and economic possibilities

The dry edible bean has been described as the Rodney Dangerfield of food products, no getting enough respect from consumers.

So says Gerald Combs, director of the U.S. Department of Agriculture's Human Nutrition Research Center in Grand Forks and a member of a partnership including UND that is working to reposition beans in the American diet.

"Beans are very healthful, very versatile, but they tend to be under consumed," Combs told a symposium of bean industry experts in 2003. His lab is now in the middle of a research project to better understand the cancer-fighting qualities of the bean.

In retrospect, that two-day conference about the health benefits of beans was a seminal event, asserts Bill Lesch, professor and chair of UND's Department of Marketing. Sponsored by the Human Nutrition Research Center, the College of Business and Public Administration, it brought together collaborators from the nation's leading bean production area. One result was a commitment to research, both to verify the health-enhancing qualities of beans and to increase sales.

That's great news to farmers in the Red River Valley of North Dakota and Minnesota, who grow about half the beans in the United States, including the vast majority of the most popular variety, the Pinto. One of the big players in this business is Northarvest, headquartered in Frazee, MN.

As part of UND's commitment to research and public service,

Gerald Combs

Lesch and marketing faculty members Mary Askim-Lovseth and Robert Tangsrud have collaborated with Northarvest's executive vice president, Tim Courneya, doing market studies and consulting in their areas of expertise.

The grant-funded work is a win-win situation, Lesch observes, contributing directly to the region's economic wellbeing and generating superb, real-life teaching materials for UND's undergraduate and graduate business students.

Until recently the bean industry had focused almost exclusively on production, notes Courneya. Little attention was given to understanding the consumption side: basic information about institutional and retail customers and the types of volumes of beans being distributed through the system. Who is eating beans these days (and perhaps as important, who isn't), where, and in what form?

When a misstep can cost millions of dollars, he said, this kind of "structural: data is man-

datory to evaluate opportunities and decisions for increasing bean use.

Take school cafeterias, for example.

That segment of the food service market is favorably inclined toward the nutritional component of menu decisions. But according to Professor Askim-Lovseth's research, the reality is that beans are, for the most part, not being included there. If the health benefits of beans beyond their nutritional value can be documented and the product tailored to the preferences of kids, the result could be very big for Red River Valley growers.

There are other possibilities besides the health connection upon which to base market growth, Lesch says, including the creation of new beans-based foods and even, as with the soybean, value-added applications not yet imagined. His colleague Tangsrud is working with North Dakota State University's Food Processing Center to begin exploring industrial possibilities at the USDA research facility in Peoria, Ill. Biomass fuels and lubricants, fiber for producing specialty papers, and feed stocks for the pharmaceutical industry are among the possibilities.

Still, it is additional scientific research into the health benefits of beans that has the highest promise of reinvigorating sales, Lesch says.

According to the Human Nutrition Research Center Director Combs, existing studies indicate that beans have properties that ward off the incidence of deadly bowel cancer, second only to lung cancer in the toll it takes among Americans. A team headed by Philip Reeves and John Finley is about halfway through a 16-week study of human subjects that will hopefully verify and expand upon this earlier work. Final results are due later this year.

The Center is testing the notion that eating a single daily meal of beans – compared to a meal of meat and pasta that is nutritionally comparable but low in fermentable fiber – will alter the "microflora" in the colon in ways that reduce the risks of cancer.

Previous studies with rats, used as a model of human metabolism, suggest that what we eat induces a kind of Darwinian "survival of the fittest" effect among the hundreds of species of bacteria that live in the bowel. The fiber provided by eating beans, it is hypothesized, encourages a population boom among those species that love to ferment substances known to enhance colon health and fight cancer. Evidence suggests this result can have other benefits for a person at risk for heart disease and diabetes.

The project involves 40 volunteers each in the study and control groups. For the first four weeks, baseline physiological data are collected, including even the sampling of each subject's breath. Then for 12 weeks both groups report to the Center each day for their meals. The last five days involve new measurements and, most critically, the collection of stool samples for analysis.

The scientists will seek to determine what species of bacteria now reside in the subject's bowel and what changes can be observed in the two groups compared to the baseline data.

More importantly, Reeves says, they will use the bacteria to recreate the digestive processes in the laboratory, where, with the most advanced analytical equipment in the world, they can observe and learn in ways not otherwise possible.

Combs, who left his tenured position at Cornell to take over the Grand Forks center, admits he has a missionary zeal when it comes to the health benefits of crops grown in the region around his facility. For example, he is intrigued by the high levels of selenium – know to be an anticancer agent – in much of the soil in this part of the world, as well as the possibility of growing more specialty crops such as buckwheat, which he believes can help in the fight against diabetes.

Combs says he understands that the face

Continued on Next Page

of nutritional research is changing in America, especially as the big food companies increasingly spin off such efforts to third parties, including universities. Contrary to the common wisdom, the budget of his own Center is not funded entirely by the U.S. taxpayer. Rather, his bosses in Washington insist that he and his staff leverage their federal budget with outside dollars. The current bean study, for example, is paid for in large part by the Beans for Health Alliance, funded by a coalition that includes the U.S. Agency for International Development, Northarvest, and the giant food processing companies H.J. Heinz and Bush Brothers.

As a former faculty member where the practice is a way of life, Combs is comfortable competing for outside research funding.

He also believes part of the USDA's mission to improve the nation's health means that new knowledge must be disseminated as soon and as broadly as possible. Thus, getting to know – and involving – the faculty in UND's Marketing Department was an early priority.

"Jerry is an experienced collaborator, someone who understands the power of partnerships in scientific research as its highest level," notes Peter Alfonso, UND's vice president for research. "He understands that one should prepare the way early to transfer new knowledge to those who can develop it for the ultimate benefit of our society. This guy has a million ideas and the credibility, energy, and persuasiveness to make them happen."

Source: *University of North Dakota, Office of University Relations. Reprinted with permission.*

Bean Day 2006

Disease Prevention Starts with Seed, Field Selection

Disease prevention in your '06 bean crop begins with seed selection and field history, says Jack Rasmussen, professor and interim chair of the NDSU Department of Plant Pathology.

Planting certified, anthracnose-free seed is the best way to prevent the introduction of this pathogen into a dry bean field. Prevention is indeed the best way to manage this disease; anthracnose is usually introduced to a field by infected seed or by machinery during cultivation or harvesting.

While seed treatments and fungicides can help prevent disease, genetics is still the best answer, says Rasmussen. Keep resistance to white mold, rust, fusarium root rot, blight, and BCMV in mind as well when selecting varieties and bean types (see variety descriptions in the latter part of this issue). If you know you're going to plant a certain variety, the sooner you lock in your seed, the better; no sense in risking not getting enough seed of the variety you intend to plant.

Keep field history in mind when planting dry beans – the anthracnose pathogen can survive on infected plant residues in the field for two years (and up to five years on infected seed stored at 40° F, something to

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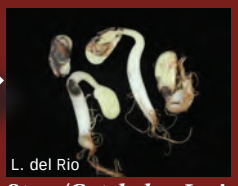
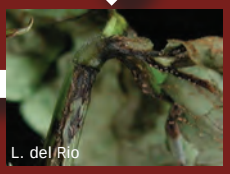
Anthracnose Disease Cycle (Seedborne)

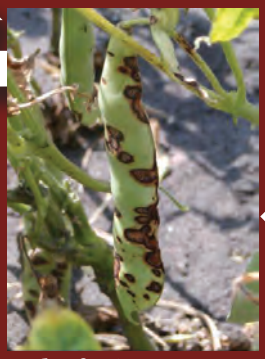
Infected Seed



Stem/Cotyledon Lesions



Spores are Produced in Lesions



Pod Infection

White Mold Disease Cycle

Sclerotia

Apothecia

Ascospores land on petals

Ascospores use dying petals for energy source

watch with bin-run seed). Rotation from beans for three to four years is generally recommended for reducing the risk to most diseases.

Field history is particularly important with Sclerotinia, which produces the hard, black resting bodies called Sclerotia that can survive in the soil for a number of years (five or more) and infect susceptible broadleaf crops in subsequent years, if weather is conducive to the formation of white mold. Sclerotinia/white mold susceptible crops include canola, sunflower, dry peas, lentils, dry edible beans, and soybeans.

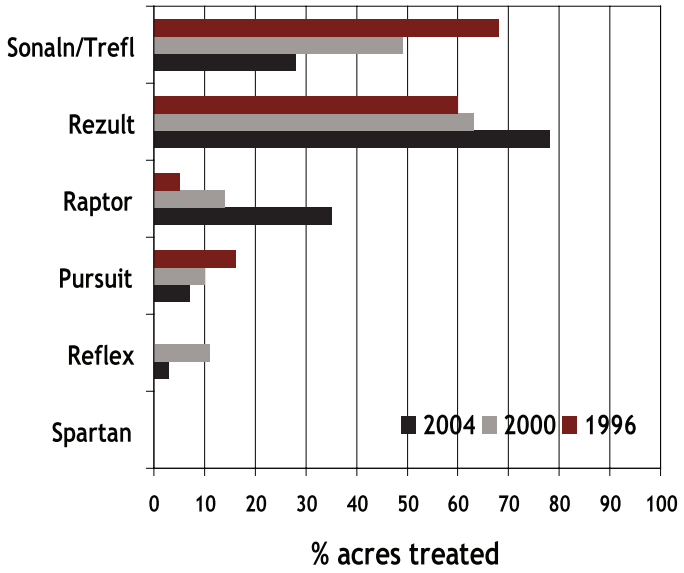
'06 Dry Bean Herbicides

Pursuit Plus has been labeled for use on dry beans; the pre-plant incorporated product is a combination of Pursuit and Prowl (20 fl oz/ac = 18 oz Prowl + 2 oz Pursuit). The product controls more than 45 broadleaf weeds and grasses, including nightshade and foxtail, according to manufacturer BASF. NDSU extension weed scientist Richard Zollinger notes that either product alone does not perform well against wild buckwheat. "But put them together and we have seen some excellent wild buckwheat control."

Zollinger says that after another Section 18 label for Reflex herbicide this year, the post-emerge Syngenta product is expected to receive full federal registration mid-2006.

Valent has come out with Select Max, a different formulation compared to Select, optimized for improved uptake and translocation for control of volunteer Roundup Ready corn, problematic annual and perennial grasses and volunteer cereals. Zollinger notes that product absorption in wheat is about 50% better with the new post formulation.

FMC has discontinued manufacturing of the granular product Spartan DF in favor of the liquid formulation, Spartan 4F. Dry beans aren't on the label of the liquid formulation, but the use of Spartan in dry beans was limited anyway, says Zollinger.



This graphic from NDSU extension weed scientist Richard Zollinger indicates herbicide use trends in dry beans in N.D. since 1996. Herbicides labeled for dry beans in North Dakota can be found online at www.ag.ndsu.nodak.edu/weeds - see the 'ND Weed Control Guide.'

Optimizing Dry B
Fertilizer Costs a

Yield risks are low in dry beans during times of high
Some yield increases are possible for higher N rates,

Dave Franzen recalls that when he started in the fertilizer business in 1976, the price of anhydrous ammonia was about $125/ton. Now, it's about $500/ton or 30 cents/lb N, with the price of urea ranging about $276-368/ton and UAN about $168-224/ton. And the NDSU extension soils specialist doesn't see the price falling much from this plateau over the long-term.

He says that while ammonia and urea are being imported into the U.S. in record quantities, the infrastructure hasn't been able to keep up with the increased need, stressed further by the lingering effects of last year's Hurricane Katrina which disrupted barge traffic. But it's the increased cost of energy which is the real lynch pin to the trend in higher N costs – more than 90% of the cost of making anhydrous ammonia now is the cost of natural gas.

"We are entering a new era in N management," he says. This means more attention must be given to soil testing to accurately account for residual N – Franzen estimates that now, only about 25% of N.D. farmers use soil testing to guide N rates.

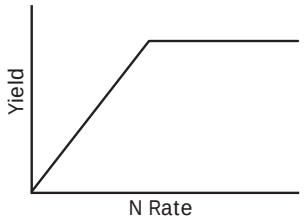
Franzen also sees more interest in site-specific or variable rate fertilizer applications, and zone soil sampling. Instead of a composite soil testing approach, where 20-30 soil cores are combined, mixed, and then a subsample is obtained from the bucket to represent the entire field, the field is broken up into logical zones, guided by topography (landscape) yield maps, soil electrical conductivity (EC sensors, aerial photography (hired plane, or FSA aerial photos) and satellite imagery (usually NDVI- normalized digital vegetative index which is based on an infrared/red ratio of reflectance from crop canopy).

Three to five zones are usually sufficient to improve the grower's understanding of the nitrate patterns in fields, and provide more confidence in the soil analysis numbers for use in N rate determination (More information on zone sampling online at www.ext.nodak.edu/extpubs/soilfert.htm - see the site-specific publications).

Fertility recommendations in the past were developed in a time when N was cheaper, and crop prices were higher from an inflationary perspective. But with $500+/ton ammonia fertilizer, more attention is also being given to economic optimum N rates. "Should N rates be the same regardless of the price of N and the crop? Probably not," he says.

NDSU, for example, is exploring adjustments to its recommended N rates for a number of crops grown in the state to reflect increased costs – generally, as crop prices decline and N costs increase, N rates may be adjusted, albeit slightly. Certainly, cutting back on fertilizer N too much will affect yield and quality of most crops. But generally, yield response to N, and economic return compared to

Current dry bean recommendations (N rate = YG x .05 less credits) do not consider either crop prodice or N price.



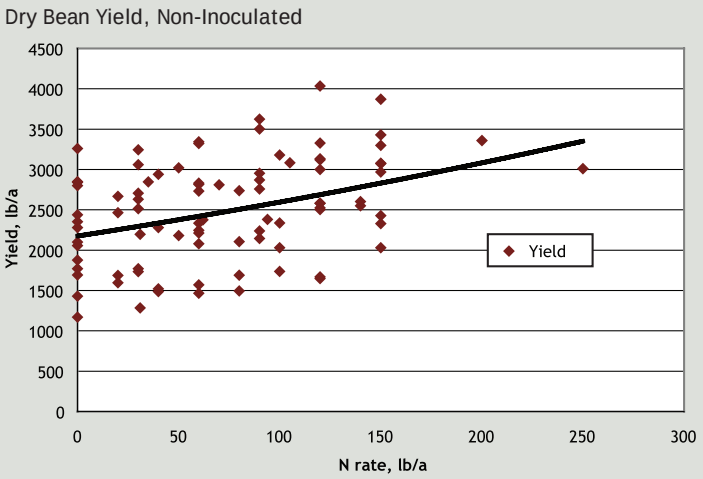
ean Yields When re Expensive

e N prices (higher than 20 cents/lb N) for reductions in rates. but generally are not high enough to offset higher N costs.

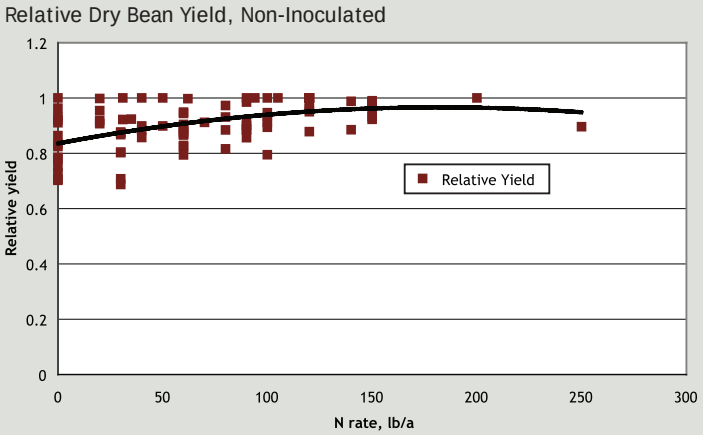
the cost of N, tends to level off at high N rates.

Franzen recommends crop producers know their existing soil N in fields through soil sampling analysis, and establish reasonable yield goals based on past experiences and historical average yield. Use the historical yield average for a field and current fertilization recommendations to arrive at a base N rate. Then from the recommended total N rate, consider decreasing the rate by about 10% for 30-cent N, and 15% for 40-cent N.

Data from 16 site years of non-inoculated dry bean N trials in MN and ND since 1990. The "cloud" of data is a series of lines. Yield goal doesn't mean much.



If the data from each site is divided by the highest yield in the plot, the result is a plot of relative yield by N rate which makes more sense.



Dry bean fertility

More research data is needed to better resolve the issue of economic N rate and yield, but Franzen says the 10% to 15% reduction in rate when N is 30 cents/lb or more may be considered for most crops, including dry beans.

Franzen says N fertility recommendations for dry beans have generally been 'wishy-washy' on purpose. Some growers produce dry beans fine without N, while some growers need some. He advises growers to use past experience to guide N application decisions. "If soils historically support high levels of yield and nodulation in certain fields, and have not needed additional N in the past, this is not the year to start using some," he says.

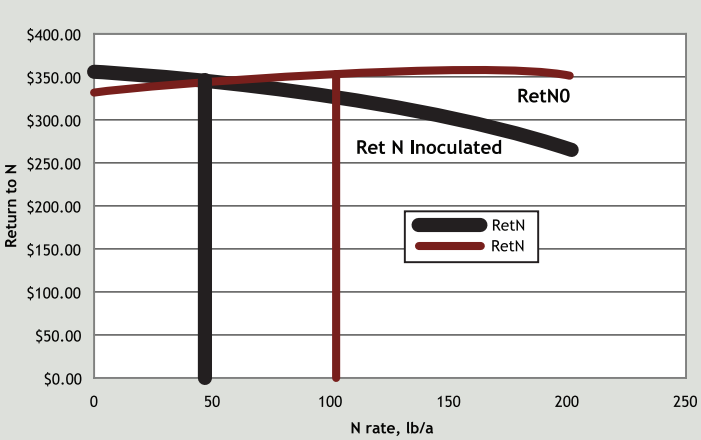
Research indicates that dry bean yield goals can vary widely compared to actual yields, despite N rates (see graphics).

Thus, Franzen says yield risks are low in dry beans during times of high N prices (higher than 20 cents/lb N) for reductions in rates. Some yield increases are possible for higher N rates, but generally are not high enough to offset higher N costs.

In addition, if soil P levels are high, no P fertilizer is needed to increase yield. And if soil K levels are higher than 80 ppm, no additional K needs to be applied. Use zinc if soil test levels are less than 1 ppm. Zinc sulfate is cheaper than other products, but first year availability is best with fine granules compared with large standard granules – Franzen advises exploring the use of fine granules through granular applicators.

It's suggested to consult with a local agronomist or certified crop advisor for dry bean fertility recommendations tailored to your own farming operation.

Research data indicate maximum N rate regardless of "yield goal" should be about 50 lb/acre for inoculated dry beans and 100 lb/acre for non-inoculated dry beans.



NDSU extension soils specialist Dave Franzen explains in the first graphic that the current fertility recommendation system is based on yield goal, and a straight line relationship between N rate and yield. This works OK when N prices are cheap, but when N prices are high, another system should probably be used that takes into account the diminishing return to N when N rates are increased. The next two graphics illustrates research that show how actual dry bean yields can vary despite N rates that range from zero to 250 lb/ac. The last illustration shows how economic return to N becomes less as the price of N increases.

Fruit/Veg Provision May Be Reformed

The fruits and vegetables provision in the current farm bill may be ruled as trade distorting in the ongoing WTO Doha round of trade negotiations, and could thus be reformed in the next farm bill.

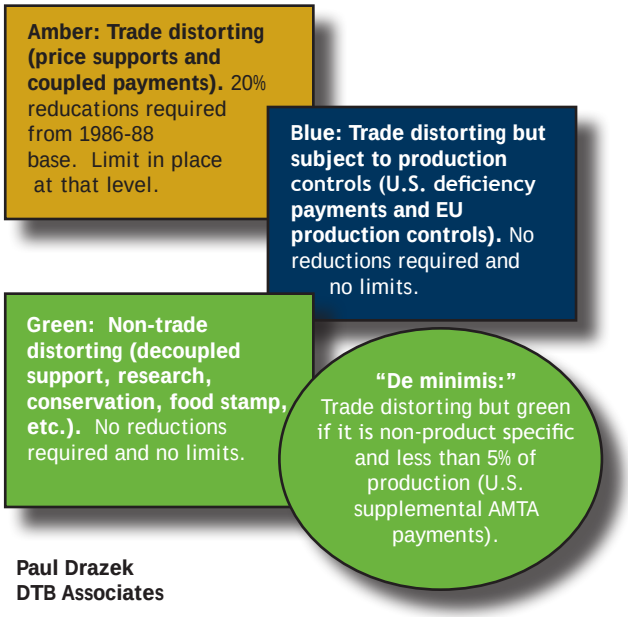
The FAV provision is a carryover of the 2002 Farm Bill from the 1995 "Freedom to Farm Act." The planting flexibility provision permits any commodity to be grown on contract acreage, except fruits and vegetables, including dry edible beans and potatoes. Some exceptions are made for fruits and vegetables, with an acre-for-acre loss of payment.

Scott Stofferahn, deputy director for Sen. Kent Conrad, explained during the 2006 Bean Day that other countries may argue that the FAV, since it restricts the planting of certain crops on direct payment acreage, influences production decisions, and is thus trade distorting. Food aid – also very important to the U.S. dry bean industry – might also be challenged in the WTO.

Bryan Dierlam, an aide to House Agriculture Chairman Bob Goodlatte, also indicated in a recent press report that the current prohibition on planting specialty crops such as fruits and vegetables on land that gets subsidies will be up for debate, because a WTO panel ruled that the restriction means that the U.S. program of direct payments to farmers cannot be classified as non-trade distorting. The fruit and vegetable growers view the planting prohibition as "their safety net," Dierlam said in the article, and if it's eliminated, "they are going to seek support in other ways."

WTO's Infamous Colored Boxes

Will the FAV provisions be ruled trade distorting?



Paul Drazek
DTB Associates

Your Bean Day 2006 CD

Review all the presentations that were delivered at Bean Day 2006 on this interactive CD.

This CD is meant for playback on a computer running Microsoft Windows 98 or later. Insert the CD in your computer's drive. It should start automatically. If not, launch the file called "index.html" directly from the CD.

Once the menu is launched, you may select the presentation you wish to view. To skip ahead in the presentation, simply click on the slide, or use your keyboard's right arrow key.

NDSU Close to Hiring New Dry Bean Breeder

Yield, canning quality, seed size, upright growth habit, and disease resistance remain top breeding priorities

NDSU is close to hiring a new dry bean breeder, although the university came close to not having one at all.

Ken Grafton started his career at NDSU, arriving in 1980. He built up the dry bean breeding program, releasing a number of varieties, including Maverick, Norstar, and Eclipse. However, when he moved into administration – as director of the N.D. Agricultural Experiment Station in 2002, and as dean of the College of Agriculture last year – the dry bean breeding position became vacant, and the N.D. Legislature actually eliminated the open slot as part of a budgetary move.

"I was really pleased to see the effort the Northarvest Bean Growers placed this past legislative session to get that position reinstated," Grafton says. In fact, a search committee was formed to find Grafton's replacement at NDSU as dry bean breeder, which attracted 31 applicants, and narrowed to six finalists. The new NDSU dry bean breeder will be announced late winter/early spring. A new pulse crop pathologist will be named as well, who will focus on diseases that affect dry beans, chickpeas, peas and lentils.

Developing varieties adapted to the Northarvest region, as well as coordinating performance trials, will continue to be the dry bean breeding emphasis. Yield, maturity, growth habit, seed traits, and canning quality are key selection criteria, as is resistance to the diseases that can affect dry beans.

Working collaboratively with USDA and other public breeding programs, Grafton says rust, blight, and BCMV have been easier to breed genetic resistance to than white mold.

"We do have resistance sources for we're trying to incorporate into varieties as rapidly as we can, particularly in pintos, but white mold is so environmentally dependent, and the genes for resistance should not be mistaken for immunity," Grafton says. "We would probably still see some disease if conditions are right for white mold, even in a highly resistant line."

White Mold

Root Rot

Bean Anthracnose Symptoms

White mold, root rot, and anthracnose are three key diseases of genetic resistance emphasis in the NDSU dry bean breeding program

Grafton says NDSU is placing more emphasis on developing resistance to anthracnose, as well as root rot. "Especially with the growth of kidneys in central Minnesota. Root rot has historically been a problem in kidney beans," says Grafton, adding that it can affect other bean types as well. "It's an unseen yield eliminator, and we probably have more root rot than we think."

"Nutrition Sells"

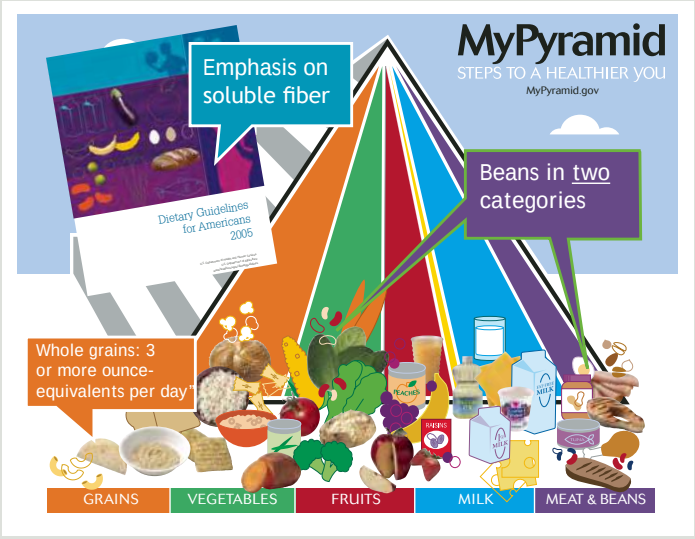
Dry beans have a good fit in meeting consumer trends, and are a food product that lends itself well to market promotion

Dry beans are one of the few foods that fall under two categories of the new USDA Food Guide Pyramid: Vegetables, as well as Meat & Beans. "That has marketing advantages, clearly," says Dr. Gerald Combs, director of the USDA-ARS Human Nutrition Research Center, Grand Forks, N.D.

It's also significant federal dietary guidelines revised about a year ago put an emphasis on soluble fiber. "This is relevant to whole grains, but relevant to dry beans as well, which are also a good source of soluble fiber," says Combs, who discussed nutrition and dietary trends during the 2006 Bean Day.

These trends include a graying population, increasing scale of retail food marketing, vertical integration of food marketing channels, growth of convenience foods and prepared meals, a growing interest in locally and organically produced foods, and a growing interest in more "functional" foods that have specific health benefits.

Dry beans have a fit in all of these trends; a product that lends itself well to market promotion, since its nutrition sells. "I see a food low in fat, low in calories, high in protein, a good source of soluble fiber, can be a source of iron, and potentially a source of folate," says Combs. "Beans naturally lend themselves to a diet that would be useful in managing a healthy body weight, managing and preventing type 2 diabetes, promoting cardiac health, reducing colorectal cancer, and having a role in preventing anemia,



which affects about 7 out of 10 women in the world today."

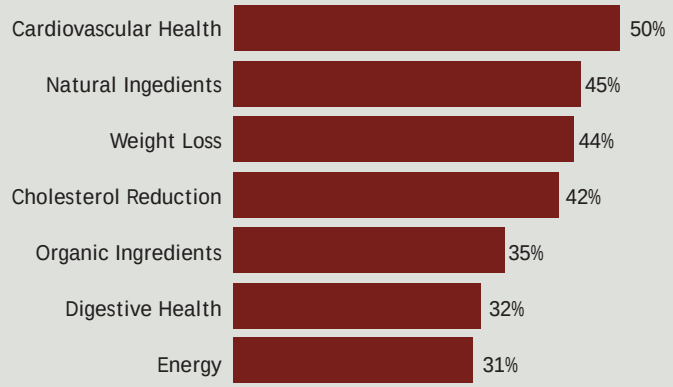
Both basic and applied research geared toward improving the health of the U.S. food supply is conducted at the Grand Forks Nutrition Research Center, one of six such nutrition centers in the country, and the only one located within an agricultural area,

Combs points out. The health research conducted here is not only conducive to better human nutrition, but also for economic development and business opportunities for the foods being studies, including dry beans.

In an era when more consumers are concerned about colon health, Combs says dry beans have shown to be beneficial for 'hind gut health,' or proper functionality of the lower digestive system. Further, preliminary research at the Grand Forks Center, from an eight-week study with human participants, indicates that regular consumption of a meal that includes beans per day, about a half cup, was sufficient to lower cholesterol levels.

Top Functional Food Opportunities

Next 2-5 Years



2004 Prepared Foods Functional Food Trends Survey of Largest 400 Multinational Food Companies

"This tells us, here's a food with a healthful profile, which probably has health effects bigger than we can impute from the basis of nutrient composition alone," says Combs.

Cuisines Preferred in 2005

- Low fat +47%
- Low carb +32%
- Fat free +25%
- High protein +25%
- Vegetarian +25
- Raw foods +22%
- Organic +22%
- High protein +22%
- Chinese +22
- Italian +20%
- Mexican +19

U.S. Emphasizing More Multi-Class Dry Bean Food Aid

Packed with nutrition, able to be prepared in a variety of ways, easy to ship and store in a wide variety of climates – there's a universal familiarity and appeal to dry beans which make it a commodity that's ideal for food aid in areas of the world where it's needed.

"Beans are acceptable everywhere. People all over the world like to eat beans," says Charles Wachsmuth, food aid representative with the U.S. Dry Bean Council. The Council consults regularly with federal and international agencies and food relief missions, Wachsmuth says, to identify where we can do the most good, and which countries might use the most beans in food aid. "We want to tell them how good beans are, and how they can be used to help people."

About 28,000 metric tons of U.S. dry beans valued at about $16.7 million were distributed as food aid to 16 countries in 2005. The value of shipments in the first quarter of this year (just over $8 million) was already approaching 50% of the total sold in 2005, with first quarter volume in 2006 (16,910 MT) already approaching 60% of total shipped in 2005.

Areas of the world identified as hunger hotspots most in need of U.S. dry bean food aid in 2006:

- Eastern Africa - Kenya, Somalia & Tanzania
- South Africa Region – Malawi, Zimbabwe, Lesotho, Botswana, Mozambique & Swaziland
- Western Africa – Mali & Niger
- Central America and the Caribbean – Guatemala, Honduras, Nicaragua, El Salvador, Haiti & Jamaica.

The Council will conduct dry bean-focused food aid missions this year to Guatemala, Honduras, Kenya, Malawi, Mozambique, Angola, Senegal and Mali. Wachsmuth notes that dry bean growers can apply to take part in a food aid mission to see first-hand how U.S. dry bean food aid programs are accomplished.

He says too that the Council also sponsors 'reverse trade missions' – bringing overseas representatives involved with food aid to the U.S. to learn more about the American dry bean industry, from production to processing.

Something new that the Council is emphasizing more is multi-class ordering – food aid that includes a mix of great northerns and navies, for example, or pintos and dark reds. This is something that helps stabilize price and supply of beans produced in the various U.S. regions, if the recipient country finds multi-class food aid acceptable. "And in nine cases out of 10, it is acceptable," says Wachsmuth. "In fact, you'll find seven to nine bean classes already eaten within the country."

Drought-Ravaged Mexico Will Need U.S. Beans

There's no question that with a drought-affected domestically produced dry bean crop in 2005, Mexico will be importing beans from the U.S. "It's just a matter of how much, when, and where from," says Bill Thoreson, sales manager for North Central Commodities, Johnstown, N.D.

Thoreson was part of a four person group (which also included Judd Keller, Tom Gilley, and Cliff Rogenbuck) that scouted the Mexican dry bean harvest outlook last fall. It was Thoreson's fifth such 'market intelligence mission.' "I think it's very important for we as an industry to make a determination about what their crop is going to be," he says, of this key south-of-the-border market.

In the past, the industry delegation split into two groups that each visited different production areas. Last fall, the tour stuck to just one group, which Thoreson believes is better. "That way you have the same eyes looking at the same crop making the same determination," he says.

The group evaluated dry bean fields in the states of Zacatecas, Durango, and Chihuahua. Drought was apparent in most areas they visited. "Everywhere we went, we saw a crop with a potential first set, but absolutely no second or third set." Thoreson says the Mexican dry bean crop may be about half of what it was in 2004.

"They will need beans to meet a shortfall in supply. If you figure that demand in Mexico is about 800,000 to 1 million metric tons, and 20% of that market is pintos, they are in excess of 1 to 1.5 million bags short of what their needs are," he says, but adds that this doesn't necessarily set up an overly bullish situation for U.S. dry bean demand. "The U.S. produced about 13 million bags of pintos last year, with demand of about 11 million bags – we need Mexico."

Drought was common in many dry bean fields in Mexico last year, resulting in a supply shortfall.

In some cases, dry bean harvesting in Mexico involves beans dumped on a tarp laid out on the ground, and bagging by hand. Still, dry bean technology is improving in Mexico – the government is investing in three dry bean processing plants and harvesting equipment to improve the quality of beans that reach the consumer.

Marketing Challenges for North American Dry Beans

Acreage of blacks expected to rise sharply in '06

U.S. producers bemoaning the price of dry beans might want to look at the bright side of things – at least you're not in Canada.

A number of producers in Manitoba dealt with record rainfall, which hurt production. A narrower exchange rate these days also means a lower value for Canadian-produced dry beans. Several years ago, a price of $19/cwt beans equated to $30.40 Canadian. Today, it's about $22.75 Canadian.

"That's an $8 difference in value, right off the top," says John Thompson, dry bean sales manager for Thompson USA Ltd, Blenheim, On. "I think those who are trading internationally understand (the effect that the U.S./Canadian exchange rate has on dry bean value) but a lot of Canadian producers don't understand the U.S.-Canadian price relationship. It's a double whammy. Not only do we have soft markets, Canadian producers have lost more on the currency. Canada right now is not the cheapest producer. I would say that today, the cheaper producer of beans is the U.S."

Thompson pointed out during his presentation at Bean Day 2006 that Canada also lacks a key government program outlet to help reduce bean supply – food aid, which in the U.S. comes in the form of the federal PL 480 "Food for Peace" program.

"Canada has basically wiped out all its food aid programs. There's none left anymore. Fight for that (PL 480), keep it as long as you can, because it's a fantastic program," Thompson says. "It's U.S. dollars tied to buying U.S. products, and it's a great thing."

Continued on page 33

World Edible Bean Production Increased About 3% In 2005

U.S., Canada, and Italy had largest production gains

Total world production of edible beans increased about 3% according to recent tabulations provided by FAO and recent revisions from specified countries.

So says John Parker, an international dry bean market analyst from Oakton, Va., and a former USDA analyst, who presented an overview of the global dry bean market at Bean Day 2006.

Parker says U.S. edible bean production increased from 807,000 tons in 2004 to about 1.24 million tons in 2005, a rise of 53%. The United States, Canada, and Italy had the greatest gains for bean production in 2005. Gains in the U.S. and Canada were mostly because of an increase in area and the rebound from a reduced harvest because of adverse weather in 2004. Canada's production increased about 41% to a range of 300,000 tons.

An increase to 23.5 million tons for world output of edible beans in 2005 still left the quantity slightly below production of 23.6 million tons in 2002. Parker points out that the slight increase in overall global supply couldn't be characterized as burdensome, and may help provide some price support compared to prevailing prices in North Dakota in recent months, especially if North American weather/production problems would arise.

Following is Parker's profile of key dry bean importers and exporters in the global marketplace.

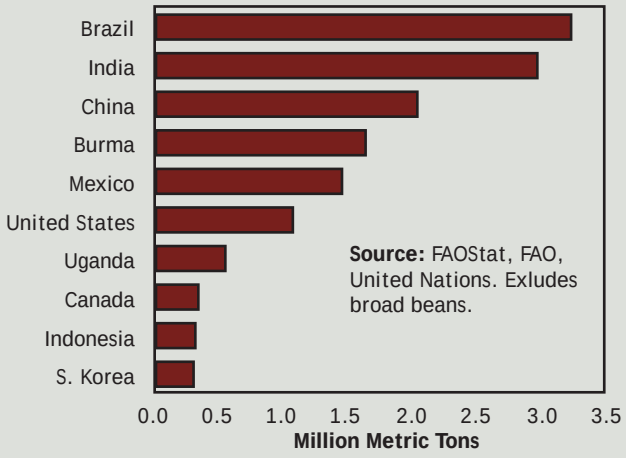
China Leading World Producer Of Edible Beans

China's production of edible beans increased about 3% to nearly 4 million tons in 2005. The main type of beans exported from China is classified as kidney beans. This includes the classes of beans similar to the major types of beans produced in North America. Kidney beans account for nearly half of China's reported output of dry beans, and about two-thirds of bean exports. China was the second major world bean exporter during 2002-05, when shipments averaged about 900,000 tons annually. China produces about 2 million tons of broad beans, including lima beans and certain larger type of beans.

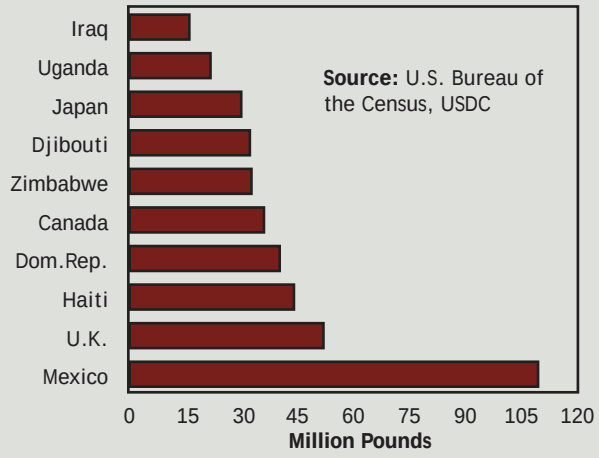
Brazil Ranks Second Among Major World Producers of Edible Beans

Edible bean production in Brazil increased about 3.7% in 2005 to approximately 3.09 million tons. Brazil produces many types of beans, and black beans are an important part

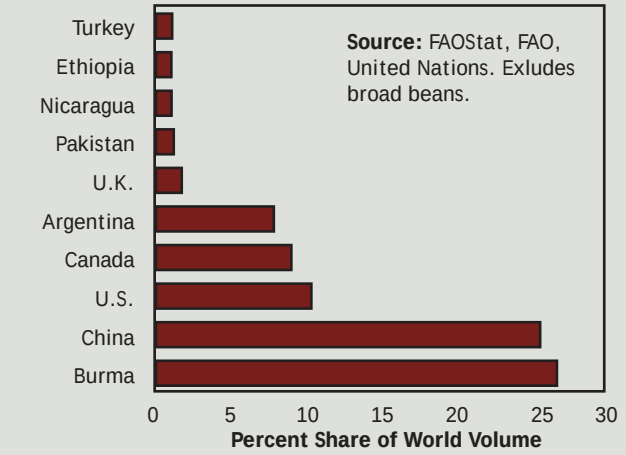
World Dry Beans: Top Producers During 2002-04



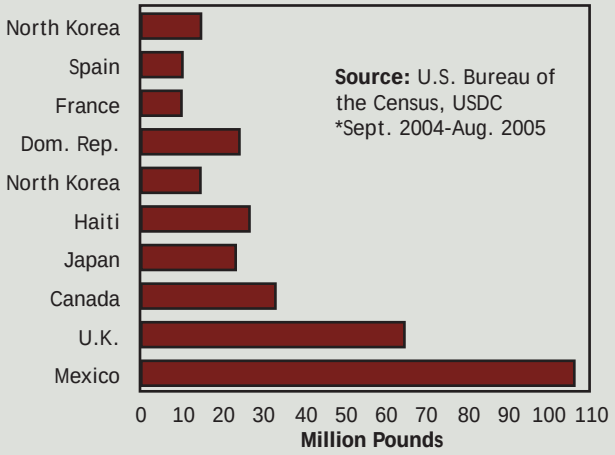
U.S. Dry Bean Exports: Top Markets 2003-04



Top World Dry Bean Exporters, 2001-03



U.S. Dry Bean Exports: Top Markets 2004-05*



of the diet. Brazil was a larger importer of beans in the 1990's before their domestic crop rose to a higher level.

India's Bean Production Includes Many Types Not Important in North America

Output of edible beans in India increased about 3.7% in 2005 to about 3.09 million tons. India has substantial production of black mapte, mung, and haricot beans. India is the leading world importer of edible beans, mostly coming from Burma and Australia.

Myanmar (Burma) Ranks Fourth In World Bean Production and First In Exports

Beans have been a major cash crop for farmers in Myanmar (Burma, located just south of China) in recent years. Production of edible beans in Burma increased slightly in 2005 to about 1.56 million tons. Burma's bean exports were in the range of 1 million tons annually during 2002-05. India, Bangladesh, Pakistan, Sri Lanka, and Indonesia are major markets for Burma's bean exports. Burma has a special market for lima beans in Japan.

Mexico's Harvest Declined In 2005

Adverse weather reduced Mexico's yields in 2005 and the harvest declined something in the range of a fifth from the 2004 level. The reduction from an average of about 1.43 million tons for Mexico's bean production annually during 2002-04, to approximately 1.1 million tons in 2005, tended to change the market setting, resulting in prices for beans in Mexico increasing in 2005.

Argentine Crop Rebounds

Argentina's edible bean production fell by half between 2002 and 2004 to a low of 150,000 tons, mostly because of a steep reduction for exports to Brazil. Argentine bean production rebounded about a fourth in 2005 to a range of 187,000 tons. White Alubia beans from Argentina are a favorite for some consumers in Europe, especially in countries bordering the Mediterranean.

French Production Shows Upward Trend

Output of edible beans in France advanced from 380,000 tons in 2003 to about 480,000 tons in 2005. Most of the increase was in the broad bean category. Use of machinery of cultivation of certain varieties of large beans contributed to the upward trend. France is a significant market for U.S. Great Northern beans.

Sharp Increase in Italian Production

Italy had an increase of about 57% for edible bean production in 2005 to about 110,000 tons. Beans can fit into multiple cropping rotations on irrigated land in Italy. Over half of the beans consumed in Italy are imported.

Continued on page 34

Marketing Challenges • *from page 31*

'05 Supply, '06 Demand

Dark Red Kidneys – Thompson estimates that 73,400 acres of production in the U.S. and Canada in 2005, at an average yield of 17.5 bags per acre, would be about 1.285 mil cwt, and with '04 carryover, total supply is about 1.343 mil cwt. Estimated demand of 1.2 mil cwt would leave an '05 carryover of 143,000 cwt.

"Pretty steady demand, but significant oversupply, and the dark red markets, when they are oversupplied, they are difficult to move," Thompson says. "Generally I try to encourage growers who produce these types of beans to try to contract, it helps keep their returns more viable."

Pintos – Thompson notes that North Dakota and Minnesota account for about half of North American pinto acres, and Nebraska, Colorado, and Manitoba, another 30%. All told, North American pinto acreage was up about 16% in 2005, with production at about 13.5 mil cwt, assuming an average of 15.5 bags per acre. Even if Mexico is a strong buyer of beans this year, there will still be a carryover of about 2.5 to 3 million cwt.

"The pinto market thus far has seemed fairly balanced between grower selling and end user buying. With the overall numbers, you would certainly expect the market to soften, but there are factors that may play in as well," Thompson says. "If there are any production problems after June 1, it could affect values through harvest."

Blacks – A 20% drop in '05 acreage combined with production problems in Mexico and consistent demand means "we'll almost clean up on blacks," says Thompson.

Navies – While harvested acreage was down over 30% in Manitoba, it was up over 80% in Ontario, up 40% in Michigan, and up about 1% in Minnesota/North Dakota. Overall North American navy harvest acreage was up about 11% from 2004, and with total supply estimated at about 7.2 mil cwt, and demand at about 6 mil cwt, that leaves a projected carryout of over 1 mil cwt.

"So navy beans as well are in an oversupply situation, although there tends to be more forward contracts with navies, which makes it not quite as liquid as some of the other markets," Thompson says. "Forward contracting makes the market a little more predictable on returns, and it doesn't seem to have the volatility as pintos or blacks."

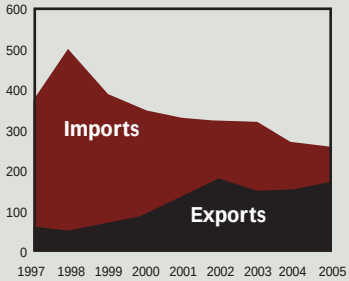
A Guess at '06 Acreage

Thompson took an early guess at how bean class acreages might change in '06 compared to '05 – very speculative, he says, based on discussions with others in the industry about how growers in the U.S. and Canada might react to the supply/demand picture for the various bean classes.

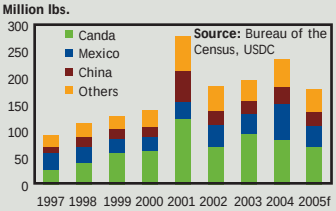
Not surprisingly, the short supply and a good price is likely to boost '06 acreage the most for blacks. "In Michigan, producers consider it a gamble crop, because it has such volatility. Of course, they don't put all of their acres into blacks, but it's one they like to play with. It's one that could be oversupplied, but Mexico could come into the market strong again, so it's hard to know."

Overall North American dry bean acreage is expected to increase in 2006. "How it all allocates out, I'm sure you (growers) will all decide that," he says.

U.S. Trade in Dry Beans by Quantity
(thousand tons)



U.S. Crop Year Dry Bean Imports
Million lbs.



World Outlook • *from page 33*

Ethiopia's Bean Yield Fluctuations Important

Ethiopia's edible bean production declined 13% in 2003, and imports rose to a peak of about 32,000 tons in 2004. Imports tend to occur after adverse weather has seriously reduced yields, and reductions in the pipeline have occurred. U.S. exports of beans to Ethiopia through food aid reached 15,000 tons in 2004, but no repeat orders came in 2005. Ethiopia's bean harvest rebounded to about 610,000 tons in 2004 and remained near that level for 2005.

Egypt's Edible Bean Production Remains Steady

Output of edible beans in Egypt averaged about 450,000 tons annually during 2002-05. Fava beans produced in Egypt are used to prepare a type of mash used with bread. Extensive research has helped Egypt to obtain very high yields for beans cultivated on irrigated land. Most of the 300,000 tons of edible beans imported by Egypt come from Australia and China.

Australia's Bean Yields Fluctuate Depending On Weather

Australian farmers have large fields where beans are cultivated and harvested with machinery. Drought sometimes reduces yields. Australia's edible bean harvest increased to 78,000 tons in 2002 and a peak of about 880,000 tons in 2004, before dropping back to about 75,000 tons in 2005. It is ironic that Australia's edible bean production and exports were greater than those of the United States in 2004.

Kenya's Bean Production Was Higher In The Past

Kenya's bean production declined from about 480,792 tons in 2002 to a low of 277,501 tons in 2004, before rebounding a tenth to about 31,000 tons in 2005. Larger imports

John Parker

are needed to allow a return to higher levels for per capita bean consumption in Kenya. Smaller imports of beans from Uganda added to the need for more beans from North America in the last several years.

Uganda's Bean Production Was Steady In 2005

A reduction of about 11% for Uganda's 2003 bean crop to 480,000 tons left shortages in this market, and U.S. food aid shipments to Uganda reached a peak of 10,000 tons in 2004. A return of favorable weather contributed to a more normal crop of 550,000 tons in 2004 and a slightly larger crop in 2005.

North Korea Needs More Beans

Edible beans are an important source of protein for many families in North Korea. Bean production was in the range of 300,000 tons annually during 2002-04. Food aid shipments of U.S. beans to North Korea reached 4,487 tons in 2004 and were about half that level in 2005. China has been the major source for bean imports into North Korea in the recent decade.

Rwanda And Burundi Have High Per Capita Bean Consumption

Per capita consumption of edible beans is among the highest in the world in Rwanda. A shift by some food aid agencies to dry peas for distribution in Rwanda caused a slight decline in consumption in the last several years. Edible bean production in Rwanda fell from 250,000 tons in 2002 to about 200,000 tons in 2005.

Burundi 's bean production fell from 248,914 tons in 2001 to 220,218 tons in 2004 and remained steady in 2005. Burundi has been a customer for imported beans provided by food aid agencies. High prices led to a shift from large bean imports in 2005 to greater dry pea imports.

Indonesia's Edible Bean Output Higher In The Past

Black mapte and mung beans grow well in the moist climate of Indonesia. Bean production in Indonesia fell from a peak of 340,000 tons in 2002 to 310,000 tons by 2005. Indonesia is a large importer of beans from China, Australia, and Burma.

Bean Production in Belarus Enhanced By Mechanized Agriculture

Belarus has a large tractor factory where the models carry the same name as the country. Edible bean production in Belarus increased to a peak of 316,000 tons in 2004, before retreating a fourth in 2005. If farmers have a large crop of beans, demand from manufacturers of animal feed is usually strong.

Japan Importing More Beans

Total edible bean imports into Japan increased in the last several years, when bean production was steady in the range of 118,000 tons. Red Adzuki beans account for most of the harvest in Japan. A change in the trade policy from import quotas for specific countries to a more open system should allow greater sales of U.S. beans to Japan in the coming year.

Peru Strives To Produce More Beans For Export

Output of beans in Peru increased about 15% in 2005 to approximately 150,000 tons. Cultivation of beans in irrigated areas near Chiclayo has increased in recent years. Peru exports high quality dry beans for high prices. Some lima beans exported to Japan may have a price of over $900 per ton.

South Africa's Bean Production Peaked In 2004, Before Falling In 2005

Dry bean production in South Africa was in the range of 190,000 tons in 2004, but adverse weather caused the harvest to drop to about 270,000 tons on 2005. South Africa has large consumption of red speckled and cranberry type beans. China provided most of the 96,000 tons of beans imported into South Africa in 2003.

Cuba's Bean Production Steady In 2005

Cuban planners sought to encourage bean production in recent years. Some mechanized state farms had an increase in the area planted in beans. Bean production in Cuba rose to about 135,000 tons in 2005. Cuba imported over 80,000 tons of beans from China annually during 2003-05.

Russian Edible Bean Production Rising

Russian imports of dry beans were larger in the past. China and the United States had significant shipments of dry beans to Russia on an intermittent basis in the past. Russian bean output rose to about 30,000 tons by 2005.

Demand Greater Than Supply in Iraq

Consumption of edible beans in Iraq was in the range of 80,000 tons in 1997, mostly because of large imports from the United States and China. Imports from these two major suppliers were about 50,000 tons in 2003, but very few beans were shipped directly to Iraq by major world exporters in 2005. Iraq's edible bean production averaged about 26,000 tons annually during 2003-05.

Certified Dry Bean Seed

Plant These Excellent Dry Bean Varieties

- Developed at Michigan State University -

Montcalm - Full Season Dark Red Kidney bean with good yield potential. Industry Standard For Canning Quality.

Red Hawk - Dark Red Kidney bean - four days earlier than Montcalm with virus and anthracnose resistance.

Chinook 2000 - High yielding Light Red Kidney Bean with excellent disease package and acceptable canning characteristics.

Jaguar - High Yielding Black bean, anthracnose resistant. Excellent choice for direct harvest.

Condor - NEW! Anthracnose resistant Black Bean with upright plant type. High pod placement for direct harvest. Similar maturity to T-39 and Jaguar.

Seahawk - High Yielding upright navy variety with excellent white mold tolerance. Three days earlier than Vista.

Merlot - New upright small red. Produces excellent yield and superior quality.

Please contact MCIA for a Seed Dealer near you:

Michigan Crop Improvement Association
phone: 517/332-3546
website: www.michcrop.com

Spicy Bean Soup With Dumplings

by Lynne Bigwood,
Northarvest Home Economist

This recipe is from The Bean Cookbook. It is a simple vegetarian soup; a one-dish meal made from canned and fresh vegetables and a quick bread topping.

Combine all the ingredients in a crockpot and cook them on low for 10 – 12 hours, high for 4 – 5 hours or some combination of the two that fits your schedule. Automatic shift is a good option to get it simmering a little quicker. Then 45 minutes before serving, turn the slow cooker to high heat, make the dumplings and drop them on the top of the soup. Cover and cook for 30 minutes more.

The dumplings are pretty soft so if you have any leftovers you may want to discard the rest of the dumplings and just keep the soup. Try it and see what you think.

Serve the soup with toasted cheese sandwiches, crackers and cheese, a hamburger or cold meat sandwich and fruit.

Another option for this soup would be to add a pound of browned lean hamburger to the pot when you start. The seasoning may need to be adjusted if you add ground meat. If you don't have green chili peppers, use more chili powder or use jalapeno peppers for a hotter flavor.

The soup has a nice flavor and thick consistency. And the dumplings were done in 30 minutes (test them with a toothpick). ■

Spicy Bean Soup With Dumplings

Six 1-1/2 cup servings (approx. 10 cups soup), 520 calories per serving, 7% calories from fat

Soup Ingredients:

- 2 cans (15-16 ounce) beans such as kidney, pinto or great northern, drained and rinsed
- 3 cups water
- 1 can (14-15 ounce) stewed tomatoes
- 1 can (15-ounce) whole-kernel corn, drained or creamed corn
- 2 medium carrots, sliced (1 cup)
- 1 large onion, chopped (1 cup)
- 1 can (4-ounce) chopped mild green chili peppers, undrained
- 2 tablespoons instant beef or chicken bouillon granules
- 1-2 teaspoons chili powder
- 1 teaspoon garlic powder or 2 cloves garlic, chopped fine

Method:

1. Combine all ingredients in a slow cooker (Crockpot) and cook on low heat for 10-12 hours (or on high heat for 4-5 hours).
2. About 45 minutes before mealtime, turn the slow cooker to high heat. Mix together the dumpling recipe.

Cornmeal Dumpling Ingredients:

- 1/3 cup white flour
- ¼ cup cornmeal
- 1 teaspoon baking powder
- Dash salt and pepper
- 1 egg white, beaten
- 2 tablespoons low-fat milk
- 1 tablespoon cooking oil

Method:

1. In a small mixing bowl, stir together the dry ingredients.
2. In another bowl, combine the egg, milk and oil.
3. With a fork, gently stir the egg mixture into the flour mixture. Do not overmix. Drop rounded teaspoons of dumpling mixture on top of the soup.
4. Cover the soup and cook for 30 minutes more.

TheBeanScene

Carol Janesko, registered dietician with the WIC program in Pittsburgh, PA sent in this photo of a bulletin board in her office using materials provided by the Northarvest Bean Growers. The WIC program provides its clients with one pound of dry beans each month. Janesko says many of the mothers in the program are not familiar with cooking and serving dry beans, but the recipes provided by the Northarvest Bean Growers are encouraging them to try a "new" food. She says she has been getting a positive response from her clients as a result of the program.

The Minot KMOT-TV Living Ag Classroom was held in conjunction with the Ag Expo at the North Dakota State Fairgrounds January 25 and 26. Eleven commodity groups participated in three 1-½ hour sessions each day. Almost 900 4th grade students and 50 teachers attended the two-day event. Thirteen new teachers requested teaching kits. Instructor comments about what they find the most valuable were, "I like your Ag Show demonstration. The children always mention this section." and "Each year the 'Bean Crazy' game is frequently recorded as a favorite Ag Show activity when we return to our school to journal about the Ag Show!" Four classes got the maximum points and hit "Bean Crazy" playing the game this year. Normally there is one a day and two or three who either lose money or make very little. In the photo above, Holly Arnold, NDSU Extension Food and Nutrition Program staff from Ward County visits with a group of students.

Beans: Ward off colon cancer

One of the most underrated nutritional powerhouses on the market today is beans, says Susan Moores, a Minneapolis nutritionist and a spokesperson for the American Dietetic Association. Not only are beans a great source of protein and antioxidants but they're full of fiber, which has been shown in some studies to help prevent colon cancer. "To stay healthy you really need to keep your GI tract moving," says Steven G. Pratt, M.D., author of SuperFoods Rx, "and eating beans is a good way to do that." Furthermore, in a study published in November 2005 in The Journal of the American Medical Association, a healthy diet rich in lean protein—about half from plant sources such as beans—was found to lower blood pressure and "bad" LDL cholesterol, and to cut the risk of heart disease by 21 percent. It doesn't matter which bean you choose—"pick a bean, any bean," Moores says—but aim for two to four servings a week.

Source: *AARP Magazine*

2005 Dry Bean Performance Testing Results

Following are dry bean performance testing results completed in 2005 along with variety descriptions, compiled by Duane Berglund, extension agronomist, North Dakota State University. Reported here are trials conducted in Minnesota at Perham and North Dakota at Hatton, Forest River, Carrington, Minot, and Pembina County, near Cavalier. Complete results, including trials at Prosper (which had flooding injury and incidences of bacterial blight throughout) Langdon, Williston, other locations near Minot, and an irrigated trial at Carrington, can be found in NDSU Extension Bulletin A-654 "North Dakota Dry Bean Performance Testing 2005" available at county extension offices. Results can also be found online at www.ag.ndsu.nodak.edu/aginfo/variety/drybean.htm.

Michigan dry bean variety trial results can be found online at www.css.msu.edu/VarietyTrials/Index.html.

Test trials in North Dakota and Minnesota are supported in part by fees collected from entrants of private varieties, as well as the Northarvest Bean Growers Association, North Dakota Dry Bean Council and the Minnesota Dry Bean Research and Promotion Council with checkoff funds.

2005 Pinto Bean Variety Trial - Hatton, ND

Variety	Maturity	Plant Height	100 Seed Wt.	Yield
	Days	cm	gms	cwt/A
Buster	99	46	42.5	32.8
Rally	100	49	44.0	30.8
La Paz	99	49	38.4	29.7
Winchester	98	50	42.7	29.4
GTS-900	100	47	42.9	28.3
Maverick	102	43	43.5	26.9
Remington	96	41	40.0	26.9
Othello	96	44	39.0	23.3
Topaz	89	39	42.3	22.6
EXP MEAN	97	45	42.1	28.1
C.V. %	2	9	3.2	8.8
LSD 5%	3	7	2.2	4.1

2005 Navy Bean Variety Trial - Hatton, ND

Variety	Maturity	Plant Height	100 Seed Wt.	Yield
	Days	cm	gms	cwt/A
Cirrus	98	47	20.8	28.8
Navigator	102	63	21.4	26.8
Mayflower	108	56	22.2	26.6
Premiere	108	44	22.2	24.8
Seahawk	110	52	23.4	24.1
Ensign	106	49	22.6	23.4
Vista	113	56	20.0	20.0
Norstar	107	47	20.9	16.5
EXP MEAN	106	53	21.1	24.7
C.V. %	3	10	5.1	15.7
LSD 5%	4	8	1.5	5.5

2005 Miscellaneous Bean Variety Trial - Hatton, ND

Variety	Class*	Maturity	Plant Height	100 Seed Wt.	Yield
		Days	cm	gms	cwt/A
Matterhorn	GN	98	53	38.3	30.8
Floyd	P	101	37	37.3	28.9
Jaguar	B	102	61	19.7	28.5
Merlot	SR	109	48	40.4	28.4
T-39	B	111	50	21.8	28.1
Eclipse	B	101	57	21.9	27.8
Condor	B	106	58	22.4	25.2
Ryder	SR	97	42	40.3	22.9
EXP MEAN		105	52	34.6	25.4
C.V. %		2	9	2.9	13.1
LSD 5%		3	8	1.7	5.4

* GN-Great Northern, P-Pink, B-Black, SR-Small Reds

2005 Pinto Bean Variety Trial - Forest River, ND

Variety	Maturity	Plant Height	100 Seed Wt.	Yield
	Days	cm	gms	cwt/A
Buster	100	47	43.9	26.4
GTS-900	102	53	41.3	24.4
Rally	102	48	44.1	24.0
Othello	98	39	40.5	24.0
Floyd	98	39	35.6	22.4
Maverick	101	42	41.8	21.6
Ryder	96	53	37.8	20.5
Remington	97	51	40.4	19.1
Merlot	103	58	40.8	18.4
Topaz	93	44	40.8	17.8
Winchester	96	40	37.5	17.5
EXP MEAN	99	48	41.3	21.4
C.V. %	2	12	3.8	8.1
LSD 5%	2	8	2.2	2.5

2005 Navy Bean Variety Trial - Forest River, ND

Variety	Maturity	Plant Height	100 Seed Wt.	Yield
	Days	cm	gms	cwt/A
Ensign	102	48	22.3	23.0
Premiere	106	48	23.3	21.5
Vista	104	56	17.9	19.7
Navigator	103	54	19.6	19.5
Norstar	105	50	18.9	19.4
Cirrus	100	43	20.3	19.3
Mayflower	105	56	19.9	19.2
Seahawk	104	46	21.0	18.0
EXP MEAN	103	49	20.4	21.1
C.V. %	1	10	3.9	12.1
LSD 5%	1	7	1.1	3.6

Making Sense of Hybrid Statistics

Mean refers to the average number for a particular trait or characteristic evaluated in the trial.

Coefficient of variability (C.V. %) is a relative measure of the amount of variation or consistency recorded for a particular trait, expressed as a percentage of the mean. Generally, trials with low C.V. rates are more reliable for making hybrid choices than trials with higher C.V. rates. Trials with C.V. rates below 15-20% are generally considered to be reliable for comparing yield.

Least significant difference (LSD 5%) Use this to accurately determine if one variety is better than another for a given trait. This is a statistical way to indicate if a trait such as yield differs when comparing two hybrids. If two hybrids differ by more than the indicated LSD 5% value for a given trait, they would most likely differ again when grown under similar conditions. If two varieties differ by less than the LSD for a particular trait, then there's no statistical difference.

For example, if a performance trial table indicates one bean variety yielded 2,000 lbs/acre compared to another variety in the same plot that yielded 1,785 lbs/acre, and the LSD for this particular plot trial data is 325 lbs/acre, there is no statistical difference in yield between the two varieties. There would be a statistical yield difference, however, between a variety that yielded 2,000 lbs and another that yielded 1675 lbs.

It's best to compare relative performance of a variety over many years and locations. Consult with an agronomist or your local seed dealer for more specific variety information.

2005 Miscellaneous Bean Variety Trial - Perham, MN

Variety	Class*	Maturity	Plant Height	100 Seed Wt.	Yield
		Days	cm	gms	cwt/A
Mogul	DRK	100	49	53.9	21.2
Chinook	LRK	102	53	53.1	19.2
Silver Cloud	WK	105	50	60.5	16.9
Red Hawk	DRK	99	47	52.4	12.1
Montcalm	DRK	100	48	49.3	11.2
Celrk	LRK	94	40	54.4	9.9
EXP MEAN		101	50	55.0	16.2
C.V. %		1	13	5.3	31.5
LSD 5%		1	9	4.2	7.3

*DRK-Dark Red Kidney, LRK-Light Red Kidney, WK-White Kidney

Drybeans - 2005 Pembina County - Cavalier

Variety	Type	100 Seed Wt.	Yield				
			2003	2004	2005	2 yr	3 yr
		grams	lbs/ac				
Buster	Pinto	41.1	2540	1280	2023	1652	1948
GTS 900	Pinto	41.0	--	1053	2217	1635	--
Maverick	Pinto	39.6	1964	1209	2019	1614	1731
Othello	Pinto	38.0	2248	1706	2162	1934	2039
Ralley	Pinto	41.8	--	959	1856	1407	--
Topaz	Pinto	37.6	2116	1616	1651	1634	1794
Navigator	Navy	19.9	1928	1635	2059	1847	1874
Norstar	Navy	18.4	1803	1321	1859	1590	1661
Seahawk	Navy	22.5	--	1934	1651	1792	--
Vista	Navy	19.6	2116	1851	2526	2189	2164
Eclipse	Black	22.8	--	1400	2448	1924	--
T-39	Black	20.7	1992	1105	2103	1604	1733
Red Hawk	Red Kidney	46.0	1896	2471	1248	1859	1872
Trial Mean		31.5	2044	1542	1986	--	--
C.V. %		4.7	6.0	8.0	9.6	--	--
LSD 5%		2.5	198	194	321	--	--

Planting Date: May 24
Harvest Date: September 23

Dry Bean Planting Rates

Planting rates vary from 40 to 65 pounds per acre, depending on row spacing, plant type and percent pure live seed. Navy beans range from 2,200 to 2,500 seeds per pound. Planting rates suggested for navy beans are 40 to 45 pounds per acre of pure live seed. Studies conducted at various plant populations do not indicate any significant advantage to having populations greater than 90,000 plants per acre for Type I navy beans. Slightly higher planting rates are advised under irrigation.

Pinto beans range from 1,200 to 1,500 seeds per pound. Planting rates suggested for pints are 50 to 65 pounds per acre of pure live seed. Populations of 70,000 plants per acre for Type III (Pinto) beans have been found to be adequate. In some instances, reduced yields were observed when plant populations were below these recommendations. Under irrigation, some lodging has been observed in the Type I cultivars at extremely low plant populations. No relationship between spacing and plant population was found in studies conducted in North Dakota.

Rates should be adjusted for low germination or cool, wet planting conditions. To obtain desired plant popula-

Continued on Next Page

2005 Dry Bean Performance Testing Results

North Central Research Extension Center—Minot Dry Edible Bean Variety Trial

Variety	Maturity	Days to Bloom DAP	Days to Maturity DAP	Plant Height in	Seed Weight g/1000	Test Weight lb/bu	Seed Yield 2003	2004	2005	2 Year	3 Year
							lb/A				
Pinto											
Othello	E	70	102	16	401.5	59.6	2064	1793	1827	1810	1895
Maverick	ME	70	102	17	388.3	58.1	2288	2606	1854	2230	2249
GTS 900	L	71	105	19	395.3	58.8	--	1198	1506	1352	--
Buster	ME	71	104	15	427.8	57.4	2227	1616	1955	1785	1933
Ralley	ME	71	105	19	417.3	58.9	--	1470	1373	1421	--
Topaz	E	71	102	17	393.3	56.7	--	1614	1211	1413	--
Navy											
Navigator	ML	72	104	17	197.8	63.8	1894	2479	1837	2158	2070
Vista	ML	71	105	18	193.8	64.3	1915	2113	1954	2033	1994
Black											
Eclipse	M	72	102	16	204.5	64.0	--	2116	2168	2142	--
T-39	M	71	104	17	209.0	63.5	2014	1993	2198	2096	2068
Kidney											
Red Hawk	M	70	107	14	512.3	55.2	1347	1382	1169	1275	1299
LSD 5%	--	2	3	NS	30.6	0.6	368	405	410	--	--
C.V.%	--	1.8	1.8	13.2	4.5	0.7	13.1	16.5	16.4	--	--
Mean	--	71	104	17	319.7	61.0	1942	1720	1752	--	--

Maturity: E=early, ME=medium early, M=medium, ML=medium late *DAP=Days after planting*
Norstar and Seahawk variety data not reported due to poor stand

Dry Edible Bean - Dryland Carrington

Variety	Market Class	Seeds per Pound	Seed Weight grams/100	Test Weight lb/bu	Seed Yield 2005 lb/ac	3-yr.Avg. lb/ac
Buster	Pinto	1405	32.5	57.8	1772	1878
Eclipse	Black	2326	20.0	63.4	1659	1622
GTS 900	Pinto	1426	31.9	58.6	1545	--
Jet	Black	2527	18.1	64.2	2098	--
MXI-1516-7	Pinto	1457	31.2	59.7	1658	--
MXI-1520-1	Pinto	1363	33.4	58.3	1506	--
Maverick	Pinto	1456	31.2	58.4	1457	1684
Navigator	Navy	2605	17.5	63.4	1740	1713
Norstar	Navy	2888	15.7	64.7	1647	--
Othello	Pinto	1427	32.0	60.0	1770	1750
Ralley	Pinto	1350	33.7	58.6	1831	--
Red Hawk	Dark Red Kidney	2484	18.5	63.3	1758	1514
Seahawk	Navy	1890	28.4	57.6	1137	--
T-39	Black	2267	20.3	62.4	1710	1726
Topaz	Pinto	1324	34.3	57.1	1413	1668
Vista	Navy	2147	24.4	60.8	1349	1589
	MEAN	1986	25.3	60.8	1622	--
	C.V.%	18.7	21.7	2.3	10.2	--
	LSD.05	527	7.8	1.9	234	--

Planting Date = May 20 ; Harvest Date = September 1 ; Previous Crop = Spring Wheat

Planting Rates

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tions, overseed live seed by 10 to 15 percent to compensate for losses during emergence. The normal planting depth is about 2-2 1/2 inches. Seed should not be planted deeper unless the topsoil is dry. Plant seeds in moist soil if possible. Windbreaks of corn or sunflower can be planted in fields where winds could become at harvest. Growers should test their planter on a hard surface and in the field at normal planting speeds to ensure proper depth and seeding rate.

From the NDSU ProCrop Database: www.ag.ndsu.nodak.edu/aginfo/procrop/procrop.htm.

Variety Descriptions										
Class and Cultivar	Origin	Mat[3]	Plant Type[2]	Blight Common	Blight Halo	BCMV Type	BCMV NY15	Fusarium Root Rot	White Mold	Rust[1]
PINTO										
AC Pintoba	Ag. Can.	ML	UV	S	T	-	-	-	A	MS-S
Apache	Idaho Seed Bean	M	V	S	T	-	-	-	S	R
Arapaho	CSU	M	V	S	T	R	R	-	S	S
Bill-Z	CSU	M	V	S	T	R	R	-	S	MR
Buckskin	Rogers	ME	V	-	-	R	R	-	S	S
Burke	USDA-Prosser	M	V	S	T	R	R	-	S	R
Buster	Seminis	ME	UV	S	T	R	R	-	S	R
Chase	U. Neb.	L	V	MR	R	S	S	-	T	R
Fargo	Rogers	E	V	S	T	-	-	-	S	MS-S
Focus	Seminis	M	UV	S	-	-	-	-	A	R
Frontier	NDSU	L	UV	S	T	R	R	-	A	R
GTS 900	GenTec	L	UV	S	T	-	-	-	A	S
Grand Mesa	CSU	L	UV	S	S	R	R	-	A	R
Hatton	NDSU	E	V	S	T	R	R	-	S	S-MS
Kodiak	MSU	M	USV	-	T	R	R	-	A	R
Maverick	NDSU	ME	V	S	T	S	S	-	A	R
Montrose	CSU	E	V	-	T	R	R	-	S	R
Othello	USDA-Prosser	E	V	S	T	R	R	-	S	S
Pinata	Idaho Seed Bean	VE	V	-	-	R	R	-	A	-
Rally	GenTec	L	UV	-	-	-	-	-	A	R
Remington	Rogers	ME	UV	S	T	-	-	-	A	R
Sierra	MSU	ML	UV	S	S	S	S	-	A	R
Topaz	Rogers	E	V	S	T	R	R	-	S	S-MS
UI-320	U. Idaho	ME	V	S	-	R	R	-	S	R
Winchester	Rogers	ME	UV	VS	-	-	-	-	A	R
NAVY										
Agri-1	Agri-Sales	M	B	S	T	R	R	-	A	R
Arthur	NDSU	ME	USV	S	T	R	R	A	R	-
Avanti	Seminis	M	USV	-	-	R	R	-	-	R-MS
CDC Whitecap	U. Sask	M	USV	S	-	-	-	-	S	R
Cirrus	Hyland	ME	USV	-	-	-	-	-	S	-
Compass	Ag. Can.	E	B	S	-	-	-	-	-	-
Envoy	GenTec	M	B	-	-	R	R	-	S	R
Ensign	Roger	M	USV	-	-	R	R	-	-	R
Huron	MSU	M	USV	-	-	R	R	-	T	R
Laser	U. Ontario	VL*	UV	S	T	R	R	-	T	-
Mackinac	MSU	M	USV	S	T	R	R	-	T	R
Mayflower	MSU	ML	USV	-	T	R	R	T	T	R
McHale	Seminis	ME	B	S	T	R	R	-	-	R
Navigator	Rogers	M	USV	-	-	R	R	-	T	R
Norstar	NDSU	ME	USV	S	T	R	R	-	T	R
Premiere	Ag. Can.	M	UV	S	-	R	R	-	-	R
Regent	Ag. Can.	ME	UV	S	-	R	R	-	-	R

2005 Dry Bean Performance Testing Results

Variety Descriptions										
Class and			Plant	Blight		BCMV		Fusarium	White	
Cultivar	Origin	Mat[3]	Type[2]	Common	Halo	Type	NY15	Root Rot	Mold	Rust[1]
NAVY (continued)										
ROG 331	Rogers	M	UV	S	-	R	R	-	A	R
ROG 372	Rogers	M	UV	S	-	R	R	-	A	R
Schooner	Rogers	ML	USV	-	-	R	R	-	S	R
SeaHawk	MSU	ML	USV	S	-	R	R	-	T	S
Skipper	Ag. Can.	E	B	S	-	-	-	-	-	-
Stingray	W.G. Thompson	ML	UV	S	-	R	R	-	T	R
AC Trident	Ag. Can	ML	UV	S	-	R	R	-	T	R
Vista	Ag. Can.	ML	USV	-	-	R	R	-	T	R
Voyager	Rogers	ME	V	-	-	R	R	-	S	S-MS
CRANBERRY										
Cran-09	GenTec	M	B	-	-	R	R	S	S	R
Hooter	Seminis	M	B	VS	S	R	R	MR	S	R
Mich. Imp	MSU	L	V	-	-	-	-	-	S	R
Taylor Hort.	Unknown	E	B	-	-	-	-	S	S	R
UI-50	U. Idaho	M	B	-	-	R	R	-	-	-
UI-686	U. Idaho	M	V	-	-	R	R	-	-	R
SMALL RED										
AC Earlired	Ag. Can	E	V	S	-	-	-	-	S	S
AC Scarlet	Ag. Can	ME	USV	S	S	-	-	S	S	S
Cajun	Rogers	E	UV	-	-	-	-	-	-	MR
Carman	Idaho Seed Bean	E	V	-	-	R	-	-	S	-
Garnet	Rogers	M	V	-	-	R	R	-	S	S
Merlot	MSU	ME	USV	S	S	R	R	T	S	R
NW63	USDA-Prosser	ML	V	S	T	R	R	T	S	S
UI-239	U. Idaho	ME	V	-	-	-	-	-	S	S
UI-259	U. Idaho	M	V	-	-	-	-	-	S	S
BLACK										
Black Magic	GenTec	L	USV	S	T	R	R	T	T	R
Blackhawk	MSU	L	USV	S	T	R	R	T	T	R
Blackjack	GenTec	ML	USV	-	-	R	R	-	-	R
CDC Expresso	U. Sask.	E	USV	-	-	-	-	-	T	-
CDC Jet	U. Sask.	ME	USV	R	-	-	-	T	T	R
Condor	MSU	ML	USV	S	S	-	R	R	T	R
Domino	MSU	L	USV	S	T	R	R	T	T	R
Eclipse	NDSU	M	USV	-	-	R	R	T	T	R
Jaguar	MSU	M	USV	-	-	R	R	-	T	R
Onyx	Rogers	ME	USV	-	-	R	R	-	T	R
Panther	Rogers	M	USV	-	-	R	R	-	T	R
Phantom	MSU	E	UV	S	R	R	R	R	A	R
Raven	MSU	ME	-	-	-	R	R	-	S	R
Shadow	Rogers	ME	USV	-	-	R	R	-	T	R
Shiny Crow	CSU	M	V	-	-	R	R	-	S	R
T-39	U. Calif.	M	USV	S	T	R	R	T	T	R
UI-911	U. Idaho	M	V	-	-	R	R	-	-	R

Variety Descriptions										
Class and			Plant	Blight		BCMV		Fusarium	White	
Cultivar	Origin	Mat[3]	Type[2]	Common	Halo	Type	NY15	Root Rot	Mold	Rust[1]
PINK										
Alberta Pink	U. Alberta	E	V	S	-	S	S	-	S	S
Flamingo	Idaho Seed Bean	E	V	-	-	-	-	-	S	S
ROG 922	Rogers	M	V	-	-	R	R	-	S	S
Rosalee	U. Sask.	E	V	S	-	-	-	-	S	S
UI-537	U. Idaho	E	V	-	-	R	R	-	S	S
Viva	USDA-Prosser	M	V	-	-	-	-	R	S	S
LT RED KIDNEY										
California Early	U. Calif.	E	B	S	S	R	R	S	S	S
Chinook 2000	MSU	M	B	-	T	R	R	S	-	R
Foxfire	Rogers	ME	B	T	R	R	R	T	T	R
Redkanner	Cornell U.	ML	B	S	T	-	-	T	-	-
Sacramento	Agri-Sales	E	B	S	S	S	S	S	S	S
DK RED KIDNEY										
AC Calmont	Ag. Can.	ML	B	S	S	R	R	S	S	R
Cabernet	Rogers	ML	B	VS	S	R	R	MR	S	R
Drake	Seminis	M	B	S	S	R	R	S	T	R
Isles	MSU	M	B	S	T	R	R	T	T	R
Montcalm	MSU	ML	B	TV	TV	R	R	S	T	R
Nichols	U. Calif.	L	B	VS	S	R	R	MR	S	R
Redhawk	MSU	M	B	S	T	R	R	-	T	R
ROG 802	Rogers	ME	B	S	T	R	R	T	T	MR
WHITE KIDNEY										
Beluga	MSU	M	B	S	T	R	R	S	S	R
Lassen	Agri-Sales	E	B	S	S	R	R	S	S	R
GREAT NORTHERN										
Matterhorn	MSU	ME	USV	S	T	R	R	-	A	R
Beryl	Rogers	M	V	S	S	-	-	-	S	-
UI 59	U. Idaho	E	V	S	R	R	R	-	S	S
UI 465	U. Idaho	M	V	S	-	R	R	T	S	R
US 1140	USDA-Prosser	E	V	S	R	R	-	-	S	S
Weihing	U. Neb.	ME	USV	T	T	R	R	-	A	R

*Cultivar has a tendency to express a green stem trait which may lead to quality problems.
[1]Disease reactions based upon field observations in North Dakota. A=Avoidance; S=Susceptible; T=Tolerant; R=Resistant; MS=Moderately Susceptible; MR=Moderately Resistant.
[2]V=Vine; B=Bush; UV=Upright Vine; USV=Upright Short Vine.
[3]RM=Relative Maturity; E=Early; ME=Medium Early; M=Medium; ML=Medium Lake; L=Late.

Planting and Stand Establishment

Dry edible beans should not be planted until the soil has reached a minimum temperature of 50 F at planting depth. Planting too early in cool, wet soil may result in reduced stands. In addition, frost may be a problem with early planted and emerged seedlings. The most common and recommended planting time in North Dakota is from May 15 through June 1. Delayed plantings may result in reduced yield and delayed maturity.

From the NDSU ProCrop Database: www.ag.ndsu.nodak.edu/aginfo/procrop/procrop.htm.

Cowboys, Campfires, and Beans: A Thing of Poetry

Who can forget the infamous campfire scene of "Blazing Saddles" involving a bunch of hungry cowboys and heaping servings of baked beans, just as hilarious today as when the movie came out in 1974 (32 years ago!).

"Farting is the great common thread in mankind, yet it was so outside the bounds of manners that no one had ever put it on screen before. It was kind of historic," said Andrew Bergman, in an Entertainment Weekly article. Bergman cowrote "Blazing Saddles" with Mel Brooks and Richard Pryor.

In fact, so outside the bounds of manners that one version of "Blazing Saddles" edited for television removed all sounds of belching and flatulence from the campfire beans sequence. As a result, viewers watched the cowboys standing up and sitting down for no apparent reason, according to the Internet Movie Database Inc. (www.imdb.com).

Cowboys, campfires, and beans seem to go as naturally together as say, cowboys and cowboy poetry. Why is it that ranching is the only profession that seems to produce poets? Leave it to a cowboy poet to address that very question in, of course, cowboy poetry:

Why Cowboy Poetry?

By Fred Engel

Now cowboy poetry
has been around,
For a heck of a long time.
It's just common everyday stuff,
Stories that cowboys
have put to rhyme.
It sort o' got lost in the shuffle,
back there for a while.
But since the gatherings,
like the ones started in Elko,
It's become what some
call a new popular style.
New? Not at all. Popular? Yes.
And style? Well, you bet! But
how is it that "cowboy" poetry
Has come to be all of this?
No one's ever heard
of "plumber" poetry,
Or about carpenters
who recite in verse.
And there's no such
thing as "lawyer" poetry.
Thank God! What
could be worse!
Now teachers, doctors,
and merchants,
Sure, they're all a
talented bunch.
And then there's those folks who
report the news at noon,
When we're all eatin' lunch.
There's folks who work with
computers, Punchin'
buttons, instead of cows,
'Til their heart's content.
And there's the weather
guessers, also known as
meteorologists,
Who are always pitchin'
in their two cents.
But it's the cowboy,
the cowpoke,
The vaquero, the old buckaroo,
Who tells us about the ride
down life's trail
Musing from the down to
earth point of view.
Because along with his
rough and tumble life style
And ways of the old Wild West,
There's just a certain
degree of romance
That sorts us out from
all of the rest!

Engel lives in the mountains of northern Utah, where he trains horses. His cowboy poetry has found its way into books, national publications like the New York Times, radio, and the web, including www.cowboypoetry.com/fredengel.htm. What cowboy poetry collection wouldn't be complete without homage to campfire beans?

Pinto Beans Over the Fire

By Fred Engel

Pinto beans over the fire,
boiling in the pot
In plenty of water,
pre-soaked or not.
Add some salt to taste
when their skins turn pink
and they start to break
Then let 'em boil for 4 to 6
hours, it's well worth the wait.
Now add a few bacon rinds,
cooked or not
And let them add some flavor to
what's cookin' in the pot.
Then add some chili powder
and a green onion or two
You can add them or
not, it's really up to you.
Of course some chopped fresh
garlic will add to the taste
And you can be sure if
there's any left-over, they
won't go to waste.
See, they're just as good
on the second or third day
When you mash 'em and fry
'em, and roll 'em in a tortilla, the
south of the border way.
Then whatever
happens after that
Blame it on your horse
or your dog, or just fan
it away with your ol' hat!

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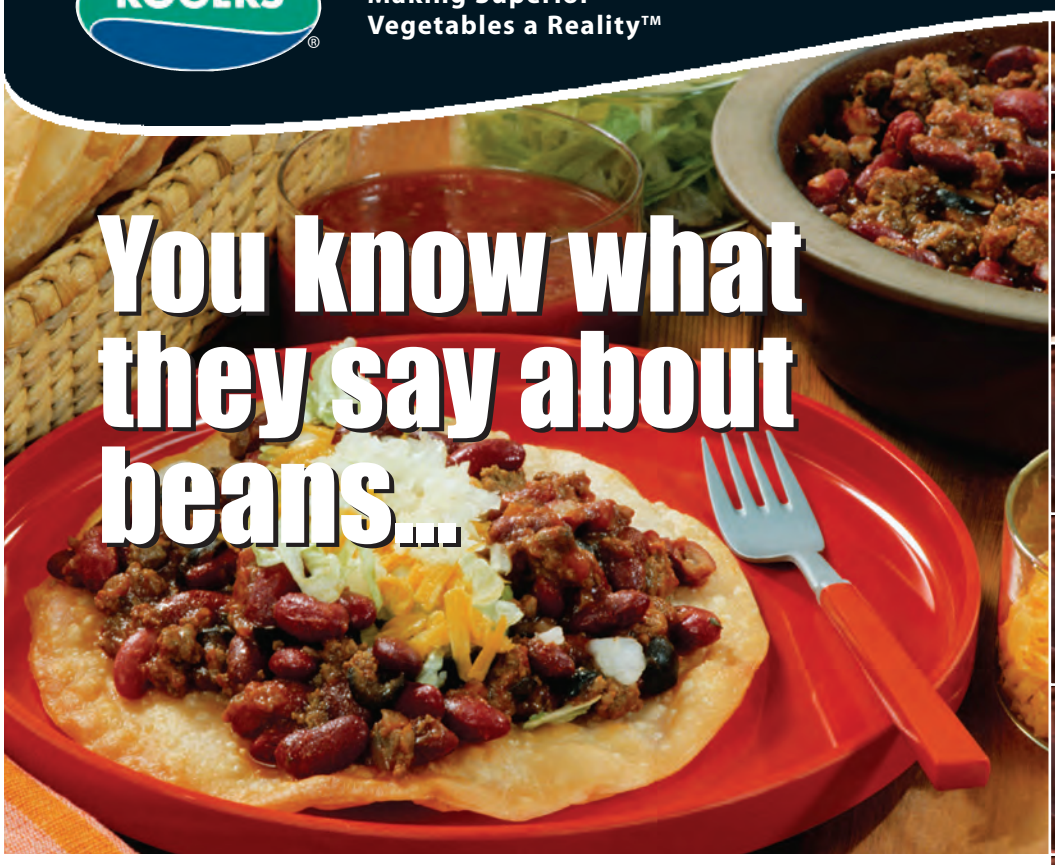

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- Navy Navigator
- Navy ROG331
- Navy ROG417
- Navy Schooner
- Pink Floyd
- Pink ROG312
- Pink ROG922
- Pinto Remington
- Pinto Topaz R
- Pinto Winchester
- Small Red Ryder

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Spicy Bean Soup with Dumplings: Here's a simple vegetarian soup; a one-dish meal made from canned and fresh vegetables and a quick bread topping. For the recipe, see page 37. For more recipes, see the Northarvest Bean Growers Association Web site, www.northarvestbean.org or the American Dry Bean Board Web site, www.americanbean.org.