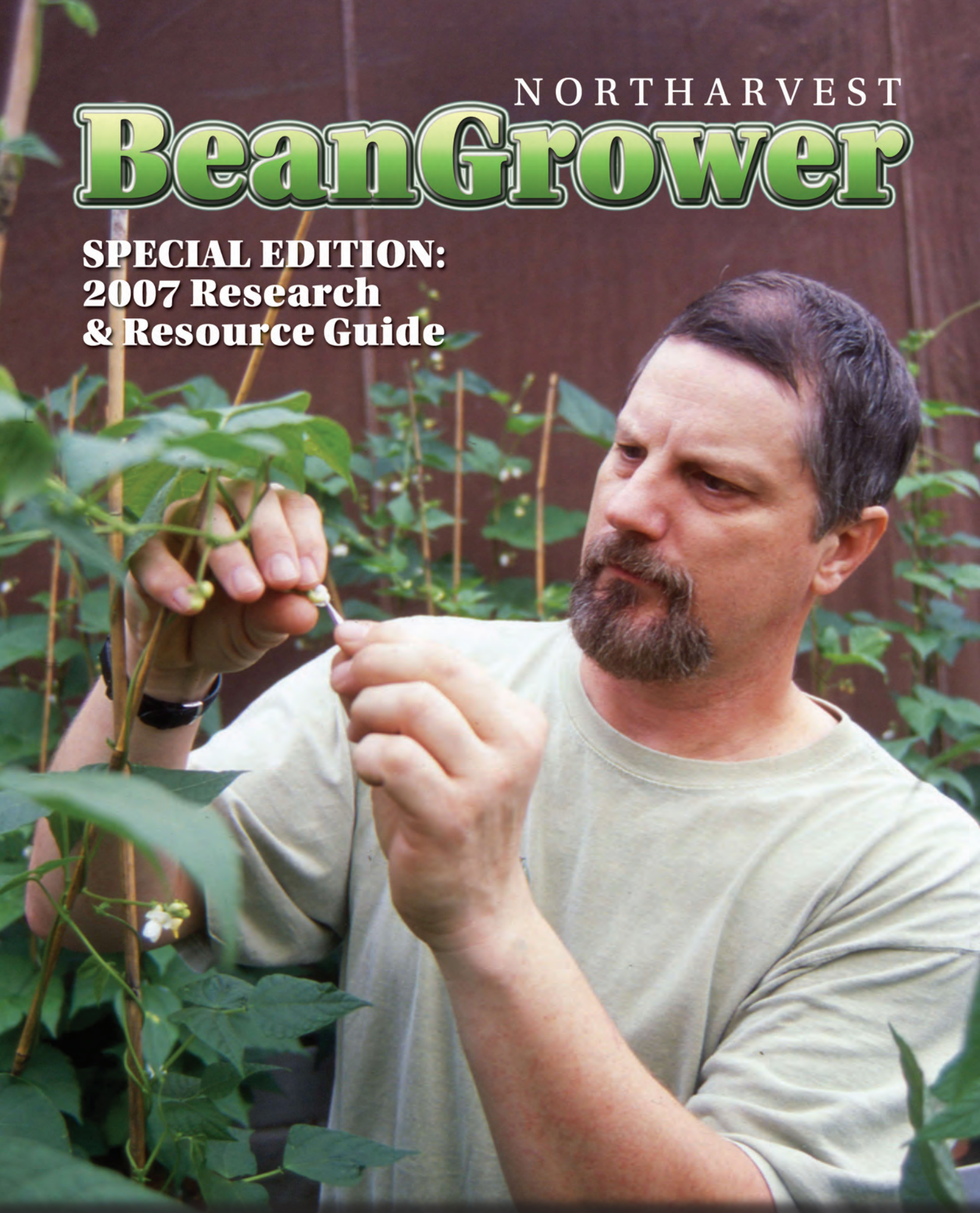

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Paul Driscoll,
MN/DAK Field Rep

Office
218-773-9786

Cell
218-693-1010

Email
pdriscoll@cvbean.com

NORTHARVEST BeanGrower

OFFICIAL PUBLICATION OF THE NORTHARVEST BEAN GROWERS ASSOCIATION

Volume 13, Issue 2 — 2007 Research & Resource Guide

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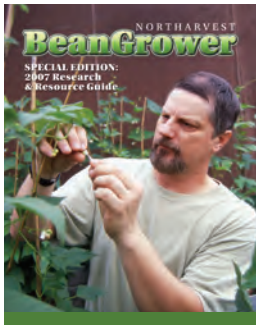

Dry Bean Fact of the Month

Dry bean disease research is funded in part by the USDA ARS-led National Sclerotinia Initiative. Proceedings from the 2007 5th Annual S.I. Meeting can be found online at www.whitemoldresearch.com under "News & Events."

ON THE COVER: Longtime NDSU dry bean research specialist Jody Vander Wal. *(Photo: Lon Tonneson)*

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2007 Northarvest Resource Directory

Bean Organizations

Company Name	Address	Phone/Fax
United States Dry Bean Council (Headquarters)	Grapeview, WA 98546	Ph: 360-277-0112 / Fax: 360-233-0621
United States Dry Bean Council (Gov't Affairs Office)	Washington, DC 20036	Ph: 202-466-4500 / Fax: 202-466-5777
California Bean Shippers Association (CBSA)	Sacramento, CA 95814	Ph: 916-441-2514
California Dry Bean Advisory Board (CDBAB)	Dinuba, CA 93618	Ph: 559-591-4866
Colorado Dry Bean Administrative Committee (CDBAC)	Buena Vista, CO 81211	Ph: 719-395-5757
Idaho Bean Commission (IBC)	Boise, ID 83720-0015	Ph: 208-334-3520
Michigan Bean Commission (MBC)	St. Johns, MI 48879	Ph: 989-224-1361
Michigan Bean Shippers Association (MBSA)	East Lansing, MI 48823	Ph: 517-336-0226
Minnesota Dry Bean Research & Promotion Council	Frazee, MN 56544-8963	Ph: 218-334-6351
Nebraska Dry Bean Commission (NeDBC)	Scottsbluff, NE 69361	Ph: 308-632-1258
New York State Bean Shippers Assn. (NYSBSA)	Seneca Castle, NY 14547	Ph: 585-526-5427
North Central Bean Dealers Assn. (NCBDA)	Thompson, ND 58278-0391	Ph: 701-261-4157
North Dakota Dry Edible Been Seed Growers Assn.	Fargo, ND 58105	Ph: 701-231-8067
Northarvest Bean Growers Assn. (NHBGA)	Frazee, MN 56544-8963	Ph: 218-334-6351
North Dakota Dry Bean council	Frazee, MN 56533-8963	Ph: 218-334-6351
Rocky Mountian Bean Dealers Assn. (RMBDA)	Elizabeth, CO 80107-1285	Ph: 303-646-8883
Washington Bean Dealers Assn. (WaBDA)	Quincy, WA 98848	Ph: 509-787-1544
Western Bean Dealers Assn. (WBDA)	Hansen, ID 83334	Ph: 208-423-4900

Bean Seed Suppliers & Buyers

Company Name	Address	Ph/Fax/Web/Email	Beans
ADM Edible Bean Specialties, Inc	P.O. Box 149, 22nd St. N. Olivia, MN 55277	Ph: 320-523-1637 Fax: 320-523-5683	Navy
ADM Edible Bean Specialties, Inc.	P.O. Box 255, 557 Industrial Drive St. Thomas, ND 58276	Ph: 701-257-6721 Fax: 701-257-6577	Pinto, Navy
ADM Edible Bean Specialties, Inc.	P.O. Box 124, Hwy 7 W Appleton, MN 56208	Ph: 320-289-2430 Fax: 320-289-2008	Navy
ADM Edible Bean Specialties, Inc	16255 Hwy 13 Barney, ND 58008	Ph 701-439-2266 Fax: 701-439-2723 clayton_day@admworld.com	Black, Pinto, Navy
ADM Edible Bean Specialties, Inc.	P.O. Box 249 1804 Front Street Casselton, ND 58012	Ph: 701-347-5321 Fax: 701-347-5552	Black, Pinto, Navy
ADM Edible Bean Specialties, Inc.	9451 Hwy. 18 P.O. Box 676 Cavalier, ND 58220	Ph: 701-265-8385 Fax: 701-265-4804	Pinto, Navy
ADM Edible Bean Specialties, Inc.	P.O. Box 98 108 MN Ave W Galesburg, ND 58035	Ph: 701-488-2214 Fax: 701-488-2538	Pinto, Navy
ADM Edible Bean Specialties, Inc.	77 East 3rd Street P.O. Box 25 Grafton, ND 58237	Ph: 701-352-1030 Fax: 701-352-3430	Pinto
ADM Edible Bean Specialties, Inc.	P.O. Box 437 Northwood, ND 58267	Ph: 701-587-5900 Fax: 701-587-5927	Pinto, Navy
Agricore United	P.O. Box 6600 Winnepeg, Manitoba Canada R3C 3A7	Ph: 204-944-5432 Fax: 204-944-5454	Pinto, Navy, Black

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Bean Seed Suppliers & Buyers

Company Name	Address	Ph/Fax/Web/Email	Beans
Alvarado Bean Co.	P.O. Box 961 120 1st Ave. E. Alvarado, MN 56710	Ph: 218-965-4668 Fax: 218-965-4916 albean@wiktel.com	Pinto, Cranberry, Great Northern, Navy, Pink
B T R Farmers Co-op	6001 60th Ave NE Leeds, ND 58346	Ph: 701-466-2281 Fax: 701-466-2022 Web: btrfarmerscoop.com btr@gondtc.com	Pinto
Barlow Grain & Stock Exchange	260 Elevator Road Carrington, ND 58421	Ph: 701-984-2617 Fax: 701-984-2616	Pinto
Bird Island Bean Co. LLC	P.O. Box 249 Bird Island, MN 55310	Ph: 320-365-3070 Fax: 320-365-3811	Navy
Bollingberg Seeds	5353 Highway 15 Cathay, ND 58422	Ph: 701-984-2486 Fax: 701-984-2485	Pinto
Bremen Elevator Company	310 Railway Right-of-way Bremen, ND 58356	Ph: 701-947-5966 Fax: 701-947-5967	Pinto
C & F Foods/ Turtle River Bean Co.	P.O. Box 55, Highway 33 Manvel, ND 58256	Ph: 701-696-2040 Fax: 701-696-2042	Black, Pinto
Cando Farmers Grain & oil	Box 456 101 9th Street Cando, ND 58324	Ph: 701-968-4466 Fax: 701-968-4447	Pinto
Cavalier Bean Co.	P.O. Box 297 308 Industrial Park Cavalier, ND 58220	Ph: 701-265-8495 Fax: 701-265-8576	Pinto
Central Valley Bean Cooperative	401 Broadway P.O. Box 162 Buxton, ND 58218	Ph: 701-847-2622 Fax: 701-847-2623 Web: www.centralvalleybean.com gary@centralvalleybean.com	Pinto
Chippewa Valley Bean Co., Inc.	N2960 730th St Menomonie, WI 54751	Ph: 715-664-8342 Fax: 715-664-8344 cbrown@cvbean.com	Dark Red Kidney, Light Red Kidney

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Bean Seed Suppliers & Buyers

Company Name	Address	Ph/Fax/Web/Email	Beans
Colgate Commodities	HC 2, Box 17 Colgate, ND 58046	Ph: 701-945-2580 Fax: 701-945-2634 nelsondm@polarcomm.com	Black, Pinto, Great Northern, Light Red Kidney, Navy, Pink
Diversified Bean LLC	38026 330th Ave SW Climax, MN 56523	Ph: 218-857-3341 Fax: 218-857-3390	Black, Pinto, Great Northern, Navy, Pink, Small Red
Earthwise Processors, LLC	4111 30th Ave S Moorhead, MN 56560	Ph: 218-287-5510 Fax: 218-287-5499	Black, Pinto, Navy
Engstrom Bean & Seed	6131 57th Ave NE Leeds, ND 58346	Ph: 701-466-2398 Fax: 701-466-2076	Black, Pinto
Falkirk Farmers Elevator Co.	101 Main St. Washburn, ND 58577	Ph: 701-462-8572 Fax: 701-462-8574	Pinto
Farmers Elevator Co. of Honeyford	2472 30th St. NE Gilby, ND 58235-9711	Ph: 701-869-2466 Fax: 701-869-2456	Pinto, Navy
Fessenden Coop Assn.	P.O. Box 126 900 Railway St Fessenden, ND 58438	Ph: 701-547-3354 Fax: 701-547-3574 Web: www.fess coop.com gsmith@fesscoop.com	Pinto
Forest River Bean Co., Inc.	P.O. Box 68, #1 Side Rd Forest River, ND 58233	Ph: 701-248-3261 Fax: 701-248-3766	Black, Pinto, Dark Red Kidney, Light Red Kidney, Pink, Small Red
Grafton Farmers Co-op Grain Co.	129 E 6th Street Grafton, ND 58237	Ph: 701-352-0461 Fax: 701-352-0280	Pinto

Bean Seed Suppliers & Buyers

Company Name	Address	Ph/Fax/Web/Email	Beans
Grand Forks Bean Co.	2120 N. Washington St PO Box 5357 Grand Forks, ND 58206-5357	Ph: 701-775-3984 Fax: 701-775-3985	Pinto
Green Meadow Bean	2489 380 Street Gary, MN 56545	Ph: 218-356-8131 Fax: 218-356-8132 gmbc@arvig.net	Black, Pinto, Cranberry, Dark Red Kidney, Great Northern, Light Red Kidney, Navy, Pink, Small Red, White Kidney
Green Valley Bean	58473 St., Hwy 34 Park Rapids, MN 56470	Ph: 218-573-3400 Fax: 218-573-3434	Dark Red Kidney, Light Red Kidney, Pink, White Kidney
Haberer Foods	41591 180th Street Morris, MN 56267	Ph: 320-795-2468 Fax: 320-795-2986	Dark Red Kidney, Light Red Kidney
Hubbard Prairie Bean Corp.	13137 189th Ave. Park Rapids, MN 56470	Ph: 218-732-5552 Fax: 218-732-8945	Dark Red Kidney, Pink
JM Grain Inc.	12 N Railroad Street PO Box 248 Garrison, ND 58540-0248	Ph: 701-463-7261 Fax: 612-435-4868	Pinto
Johnstown Bean Co.	3295 Johnstown St Johnstown, ND 58235	Ph: 701-869-2680 Fax: 701-869-2692 jbc@polarcomm.com	Black, Pinto
Joliette Ag Systems Inc	15866 Highway 5 Pembina, ND 58271	Ph: 701-454-6226 Fax: 701-454-6244 jwarner@polarcomm.com	Black, Pinto

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Bean Seed Suppliers & Buyers

Company Name	Address	Ph/Fax/Web/Email	Beans
Kelley Bean Company	2407 Circle Drive PO Box 2488 Scottsbluff, NE 69363	Ph: 308-635-6438 Fax: 308-635-7345 Web: www.kelleybean.com jswanson@kelleybean.com	Pinto, Dark Red Kidney, Great Northern, Light Red Kidney, Navy, Pink, Small Red
Kelley Bean Company	PO Box 99 703 Division Ave South Cavalier, ND 58220	Ph: 701-265-8328 Fax: 701-265-8533	Black, Pinto, Dark Red Kidney, Light Red Kidney, Navy, Pink
Kelley Bean Company	RR 2, Box 11A Hwy 18 So. Mayville, ND 58257	Ph: 701-786-2997 Fax: 701-786-4214	Pinto, Navy
Kelley Bean Company	650 2nd Street NE P.O. Box 253 Perham, MN 56573	Ph: 218-346-2360 Fax: 218-346-2369	Dark Red Kidney, Light Red Kidney
Kelley Bean Company	1328 Dakota Ave Hatton, ND 58240	Ph: 701-543-3000 Fax: 701-543-4195	Black, Pinto, Navy
Kelley Bean Company	524 S 7th St PO Box 290 Oakes, ND 58474	Ph: 701-742-3219 Fax: 701-742-3520	Black, Pinto, Dark Red Kidney, Light Red Kidney, Navy
Kirkeide's Northland Bean Co.	4520 12th St NE Fessenden, ND 58438	Ph: 701-547-3466 Fax: 701-547-3539	Black, Pinto, Navy
Klindworth Seed & Bean Co.	2139 Highway 30 Fessenden, ND 58438-9441	Ph: 701-547-3742 Fax: 701-547-2592	Pinto

Bean Seed Suppliers & Buyers

Company Name	Address	Ph/Fax/Web/Email	Beans
Knight Seed Company, Inc.	PO Box 989 Burnsville, MN 55337	Ph: 952-894-8080 Fax: 952-894-8095	
Larimore Bean Co. Inc.	PO Box 607 Larimore, ND 58251	Ph: 701-343-6363 Fax: 701-343-2842 lbc@polarcomm.com	Black, Pinto
Larson Grain Co.	100 2nd Ave Englevale, ND 58033	Ph: 701-683-5246 Fax: 701-683-4233	Black, Pinto, Dark Red Kidney, Navy
Lee Bean & Seed Inc.	P.O. Box 37, 3 mile So. Hwy 9 Borup, MN 56519	Ph: 218-494-3330 Fax: 218-494-3333	Black, Pinto, Navy
Manvel Bean Co.	2875 18th St NE Manvel, ND 58265	Ph: 701-696-2271 Fax: 701-696-8266	Pinto
Mayport Farmer's Co-op	Edible Bean Division PO Box 338 Portland, ND 58274	Ph: 701-786-4062 Fax: 701-786-4098	Black, Pinto, Navy
Miller Elevator Company/ Trinidad Benham	4082 22nd Ave Larimore, ND 58251	Ph: 701-397-5261 Fax: 701-397-5783	Navy
Northwood Bean Co. Inc.	301 Potato Road Northwood, ND 58267	Ph: 701-587-5206 Fax: 701-587-5650 nbc@polarcomm.com	Black, Pinto
Northwood Equity Elevator	600 Lander Ave PO Box 380 Northwood, ND 58267	Ph: 701-587-5291 Fax: 701-587-5296	Black, Pinto

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Bean Seed Suppliers & Buyers

Company Name	Address	Ph/Fax/Web/Email	Beans
O'Brien Seed, Inc	PO Box 505 321 2nd Ave SE Mayville, ND 58257	Ph: 701-788-9118 Fax: 701-788-9119	Black, Pinto, Pink, Small Red
Parent Seed Farms Ltd.	Box 36 St. Joseph, Manitoba Canada ROG 2CO	Ph: 204-737-2625 Fax: 204-737-2248	Black, Navy, Pinto, Light Red Kidney, Dark Red Kidney, Small Red, Pink
Red River Bean of Oslo	PO Box 227 105 Oak Street Oslo, MN 56744	Ph: 218-695-3040 Fax: 218-695-3040	Black, Pinto
SK Food International	4749 Amber Valley Parkway, Suite #1 Fargo, ND 58104	Ph: 701-356-4106 Fax: 701-356-4102 Web: www.skfood.com skfood@skfood.com	Black, Pinto, Cranberry, Dark Red Kidney, Great Northern, Light Red Kidney, Navy, Pink, Small Red
SRS Commodities	411 2nd Avenue NE PO Box 386 Mayville, ND 58257	Ph: 701-786-3402 Fax: 701-786-3374	Black, Pinto
St. Hilaire Seed Co.	PO Box 85 Hwy 32 S St Hilaire, MN 56754	Ph: 218-964-5407 Fax: 218-964-5415	Black, Pinto, Navy
Stony Ridge Foods, Inc.	715 Atlantic Avenue Benson, MN 56215	Ph: 320-842-3401 Fax: 320-842-3403 dhughes@stonyridgefoods.com	Black, Dark Red Kidney, Light Red Kidney, Navy

Bean Seed Suppliers & Buyers

Company Name	Address	Ph/Fax/Web/Email	Beans
The Bean Mill	42631 450th Ave Perham, MN 56573	Ph: 218-346-2151	Dark Red Kidney, Light Red Kidney, Pink
Thompsons USA Limited	PO Box 374 41703 Highway 2 SW E Grand Forks, MN 56721	Ph: 218-773-8834 Fax: 218-773-9809	Black, Pinto, Dark Red Kidney, Light Red Kidney, Navy
TMT Bean & Seed Farm	3718 67 Ave SE Cleveland, ND 58424	Ph: 701-763-6544 Fax: 701-763-6545	Pinto, Navy
Tronson Grain Co.	115 W 1st St Doyon, ND 58327-2807	Ph: 701-398-3512 Fax: 701-398-3609	Pinto
Valley Bean Assn.	301 Oak Street PO Box 250 Oslo, MN 56744	Ph: 218-695-2201 Fax: 218-695-3006	Black, Pinto, Pink, Small Red
Walhalla Bean Co.	PO Box 67 1920 Hwy. 32 N. Walhalla, ND 58282	Ph: 701-549-3721 Fax: 701-549-3725 wbc@utma.com	Black, Pinto, Navy, Small Red
Walhalla Bean Company	7400 55th Street South Grand Forks, ND 58201	Ph: 701-775-3317 Fax: 701-775-3289 wbcm@gfwireless.com	Black, Pinto, Navy
Walton Ag Services	106 First Avenue Englevale, ND 58033	Ph: 701-683-5743 Fax: 701-683-5957 waltonag@drtel.net	Black, Pinto, Dark Red Kidney, Small Red

2007 Northarvest Resource Directory

Northarvest Bean Growers Staff

Name	Address	Phone/Fax	Email
Lynne Bigwood Home Economist	50072 E Lake Seven Rd Frazee, MN 56544	Ph: 218-334-6351	ldbigwood@bis.midco.net
Faye Courneya Office Manager	50072 E Lake Seven Rd Frazee, MN 56544	Ph: 218-334-6351 Fax: 218-334-6360	nhbean@loretel.net
Tim Courneya Executive Vice President	50072 E Lake Seven Rd Frazee, MN 56544	Ph: 218-334-6351 Fax: 218-334-6360	nhbean@loretel.net
Sonja Kosler Office Assistant	50072 E Lake Seven Rd Frazee, MN 56544	Ph: 218-334-6351 Fax: 218-334-6360	nhbean@loretel.net
Directors for the Northarvest Bean Growers, Minnesota Dry Bean Research & Promotion Council and North Dakota Dry Bean Council can be found on page 3.			

Bean Researchers & Research Leaders

Name	Address	Phone/Fax	Web/Email
Ken Bertsch Seed Commissioner	North Dakota State Certified Seed Dept 1313 18th Street North, P O Box 5257 Fargo ND 58105	Ph: 701-231-5400 Fax: 701-231-5401	www.ndseed.com kbertsch@state-seed.ndsu.nodak.edu
Brian Sorenson Technical Director	Northern Crops Institute Bolley Drive, NDSU, Fargo, ND, 58105-5183	Ph: 701-231-7736 Fax: 701-231-7235	www.northern-crops.com Brian.Sorenson@ndsu.edu
Dr. Kenneth F. Grafton, Director	North Dakota Agricultural Experiment Station Morrill Hall 315, Fargo, ND 58105-5435	Ph: 701-231-6693 Fax: 701-231-8520	K.Grafton@ndsu.edu
Dr. Gerald Combs	Grand Forks Human Nutrition Research Center 2420 2nd Ave N, Grand Forks, ND 58202	Ph: 701-795-8456 Fax: 701-795-8230	gcombs@gfhnrc.ars.usda.gov
Dr. Jack Rassmussen	PO Box 5012, NDSU Fargo, ND 58105	Ph: 701-231-8362 Fax: 701-231-7851	jack.rasmussen@ndsu.edu
Dr. Mehmet C. Tulbek	Northern Crops Institute NDSU, NCI 240 1240 Bolley Dr, Fargo, ND 58105	Ph: 701-231-5493 Fax: 701-231-7235	mehmet.tulbek@ndsu.edu
Dr. Phil Reeves	Grand Forks Human Nutrition Research Center 2420 2nd Avenue, N., Grand Forks, ND 58202	Ph: 701-795-8456 Fax: 701-795-8230	preeves@gfhnrc.ars.usda.gov
Dr. Blaine Schatz	Carrington Research Extension Center, 663 Hwy 281 N, PO Box 219, Carrington, ND 58421-0219	Ph: 701-652-2951 Fax: 701-652-2055	blaine.schatz@ndsu.nodak.edu
Dr. Clifford Hall	Food Science Program, NDSU Harris Hall 210, Fargo, ND 58105	Ph: 701- 231-6359 Fax: 701-231-5171	clifford.hall@ndsu.edu
Dr. Richard K. Zollinger	Dept of Plant Sciences Loftsgard Hall 470H, NDSU, Fargo, ND 58105-5051	Ph: 701-231-8157 Fax: 701-231-8474	r.zollinger@ndsu.edu
Dr. Burton L. Johnson	Dept of Plant Sciences Loftsgard Hall 470D, NDSU, Fargo, ND 58105-5051	Ph: 701-231-8895 Fax: 701-231-8474	burton.johnson@ndsu.edu
Dr. James A Percich	Plant Pathology, 316 Stak H 1519 Gortner Ave, St Paul, MN 55108	Ph: 612-625-6240	jamesp@umn.edu
Dr. Peter Grahm	Dept of Soil, Water & Climate, 256 Borlaug Hall 1991 Upper Buford Circle, St. Paul MN 55108	Ph: 612-625-8268 Fax: 612-625-2208	graha019@umn.edu
Dr. Juan Osorno	Dept. of Plant Pathology, 166 Loftsgard Hall NDSU, Fargo, ND 58105	Ph: 701-231-7971 Fax: 701-231-8474	Juan.Osorno@ndsu.edu

2006 Dry Bean Performance Testing Results

Following are dry bean performance testing results completed in 2006 along with variety descriptions, compiled by Duane Berglund, extension agronomist, North Dakota State University. The report can also be found in NDSU Extension Bulletin A-654 "North Dakota Dry Bean Performance Testing 2006" available at county extension offices. Results can also be found online at www.ag.ndsu.nodak.edu/aginfo/variety/drybean.htm.

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

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

2006 Dry Bean Variety Trials -- Forest River, ND (Walsh County)

Variety	Class*	Maturity	Plant Height	100 Seed Wt.	Yield
		Days	cm	gms	cwt/A
Floyd	PK	87	54	25.7	17.8
Othello	P	84	53	29.1	17.8
Buster	P	87	55	33.1	17.7
Maverick	P	88	60	32.3	16.1
Winchester	P	88	53	29.6	16.0
ROG922	PK	89	60	32.8	15.9
Topaz R	P	82	49	28.9	14.8
Ryder	SR	85	62	28.1	14.6
GTS-900	P	91	62	35.4	14.4
Remington	P	87	62	28.3	13.6
EXP MEAN		88	59	30.6	16.0
C.V. %		1	8	4.7	9.4
LSD 5%		1	7	2.0	2.1

*P = pinto PK = pinks SR = small red

2006 Pinto Bean Variety Trials -- Hatton, ND (Traill County)

Variety	Maturity	Plant Height	100 Seed Wt.	Yield
	Days	cm	gms	cwt/A
Buster	84	61	34.2	22.6
Maverick	90	68	34.8	18.9
Topaz R	78	60	31.2	18.5
Othello	84	58	34.5	15.6
Remington	84	69	28.8	15.2
Winchester	81	56	30.0	15.0
Rally	91	57	36.4	11.9
GTS-900	90	69	36.9	10.7
EXP MEAN	86	64	33.0	17.7
C.V. %	2	12	5.1	15.3
LSD 5%	2	11	2.4	3.8

2006 Navy Bean Variety Trials -- Forest River, ND (Walsh County)

Variety	Maturity	Plant Height	100 Seed Wt.	Yield
	Days	cm	gms	cwt/A
Ensign	87	59	18.2	18.4
ROG331	88	65	13.4	18.2
GTS-549	84	59	18.2	17.9
T 9905	88	62	17.5	17.3
Norstar	89	62	15.8	17.3
Cirrus	86	55	17.3	16.8
T 9903	89	60	18.9	16.7
Seahawk	89	56	17.4	16.7
Mayflower	90	63	16.6	16.7
Vista	88	66	15.9	16.4
Sailor	81	57	15.5	16.1
Navigator	88	64	14.8	16.1
EXP MEAN	87	62	16.5	17.3
C.V. %	1	8	4.4	9.7
LSD 5%	1	7	1.0	2.4

2006 Navy Bean Variety Trials -- Hatton, ND (Traill County)

Variety	Maturity	Plant Height	100 Seed Wt.	Yield
	Days	cm	gms	cwt/A
T9903	89	68	18.9	21.5
T9905	90	73	18.0	20.9
Cirrus	84	67	16.6	20.2
GTS-549	90	66	17.8	19.9
ROG331	87	65	13.5	19.9
Ensign	85	77	17.5	19.7
Navigator	89	76	15.9	19.6
Sailor	79	70	16.2	19.0
GTS-544	93	70	17.6	17.6
Vista	91	72	15.7	17.4
Seahawk	93	62	20.4	16.9
Mayflower	93	77	15.9	15.4
Norstar	94	56	18.2	13.0
EXP MEAN	89	69	16.7	18.9
C.V. %	2	10	4.5	13.9
LSD 5%	2	10	1.1	3.7

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, than 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 seed dealer for more specific variety information.

Acknowledgements

The following contributing their time, land and other material to the 2006 bean yield trials:

- Ken Grafton, NDSU dean and director, North Dakota Agricultural Experiment Station, and dry bean breeder
- Gonzalo Rojas-Cifuentes, Research associate, Plant Sci-

Continued on next page

2006 Pinto Bean Variety Trials -- Prosper, ND (Cass County)

Variety	Maturity	Plant Height	100 Seed Wt.	Yield
	Days	cm	gms	cwt/A
Buster	85	53	35.0	29.5
Othello	88	49	32.5	28.7
GTS-900	90	59	38.4	26.9
Maverick	87	59	33.2	24.1
Topaz R	84	49	32.3	22.6
Winchester	93	59	29.8	21.4
Remington	88	56	29.5	20.1
EXP MEAN	89	58	34.3	25.2
C.V. %	1	9	7.2	14.4
LSD 5%	1	8	3.5	5.2

2006 Navy Bean Variety Trials -- Prosper, ND (Cass County)

Variety	Maturity	Plant Height	100 Seed Wt.	Yield
	Days	cm	gms	cwt/A
GTS-544	96	62	21.9	31.9
ROG331	93	68	16.4	31.3
T 9903	94	64	22.7	30.7
Cirrus	92	59	19.6	30.0
Mayflower	97	72	19.2	29.7
T 9905	95	69	21.6	29.5
Sailor	81	68	17.8	29.0
Navigator	96	70	19.1	28.2
Ensign	94	67	20.4	27.5
Norstar	92	60	19.1	27.0
Vista	96	68	19.5	26.8
Seahawk	92	56	21.2	23.2
EXP MEAN	93	66	19.6	28.6
C.V. %	1	6	5.0	13.0
LSD 5%	2	5	1.4	NS

2006 Misc. Bean Variety Trials -- Hatton, ND (Traill County)

Variety	Class*	Maturity	Plant Height	100 Seed Wt.	Yield
		Days	cm	gms	cwt/A
Matterhorn	GN	86	68	30.8	29.7
Floyd	PK	86	48	27.5	22.8
Condor	BL	95	77	17.2	22.2
Ryder	SR	84	70	28.8	21.4
T-39	BL	90	70	17.2	21.4
ROG922	PK	87	63	31.4	21.2
Jaguar	BL	91	76	17.8	20.8
Eclipse	BL	82	71	17.2	20.2
Merlot	SR	91	69	31.8	19.6
Sedona	PK	90	72	30.8	18.0
Black Jack	BL	89	68	17.8	17.6
EXP MEAN		89	69	25.1	21.2
C.V. %		2	7	12.5	10.7
LSD 5%		3	7	4.4	3.2

*GN = great northern PK = pinks SR = small red BL = black

2006 Misc. Bean Variety Trials -- Prosper, ND (Cass County)

Variety	Class*	Maturity	Plant Height	100 Seed Wt.	Yield
		Days	cm	gms	cwt/A
Matterhorn	GN	92	70	34.3	34.7
Eclipse	BL	94	69	19.7	32.1
Jaguar	BL	97	69	18.6	32.0
T-39	BL	96	64	19.9	31.7
ROG922	PK	90	60	35.0	29.9
Ryder	PK	92	60	35.4	28.8
Floyd	PK	91	50	28.9	28.2
Condor	BL	95	65	23.2	27.7
Merlot	SR	92	71	36.0	27.4
EXP MEAN		93	65	26.9	29.7
C.V. %		1	8	12.6	9.6
LSD 5%		2	7	4.9	4.1

*GN = great northern PK = pinks SR = small red BL = black

2006 Dry Bean Variety Trials

ences Department, NDSU
- Jody Vander Wal, Research technician, Plant Sciences Department, NDSU
- Bryan Hanson, Agronomist, Langdon Research Extension Center, Langdon, N.D.
- Blaine Schatz, Director and agronomist, Carrington Research Extension Center, Carrington, N.D.
- Steve Zwinger, Agronomist, Carrington Research Extension Center
- Mark Halvorson, Agronomist, North Central Research Extension Center, Minot, N.D.
- Neil Riveland, Agronomist, Williston Research Extension Center, Williston, N.D.
- Brian and Rod Shanilec, Forest River, N.D.
- Mark Dombeck, Perham, Minn.

2006 Misc. Bean Variety Trials -- Park Rapids, MN (Otter Tail County)

Variety	Class*	Maturity	Plant Height	100 Seed Wt.	Yield
		Days	cm	gms	cwt/A
Capri	CR	106	49	47.1	27.1
Chinook 2000	LRK	106	60	43.7	22.6
Foxfire	LRK	88	52	44.5	21.8
Ryder	SR	88	48	27.8	19.8
Montcalm	DRK	97	52	42.3	18.8
Redhawk	DRK	88	48	40.5	16.8
Calif. Early	LRK	86	44	46.2	12.6
EXP MEAN		96	51	41.1	19.5
C.V. %		4	7	10.4	11.5
LSD 5%		6	5	6.1	3.2

*LRK = light red kidney DRK = dark red kidney
SR = small red CR = cranberry

2006 Misc. Bean Variety Trials -- Perham, MN (Otter Tail County)

Variety	Class*	Maturity	Plant Height	100 Seed Wt.	Yield
		Days	cm	gms	cwt/A
Foxfire	LRK	89	46	38.0	13.0
Montcalm	DRK	89	48	35.8	12.2
Chinook 2000	LRK	91	56	34.2	11.1
Calif. Early	LRK	80	43	43.2	10.3
Redhawk	DRK	90	48	35.3	10.1
Ryder	SR	87	53	24.7	8.6
EXP MEAN		90	53	35.4	10.9
C.V. %		2	10	12.5	19.3
LSD 5%		2	8	6.4	NS

*LRK = light red kidney DRK = dark red kidney SR = small red

Variety Descriptions										
Class and			Plant	Blight		BCMV		Fusarium	White	
Cultivar	Origin	Mat[3]	Type[2]	Common	Halo	Type	NY15	Root Rot	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

2006 Dry Bean Variety Trials

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
Sailor	Rogers	ME	USV	-	-	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										
Capri	MSU/ARS	M	B	S	-	R	-	S	S	MR
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
Ryder	Rogers	M	USV	-	-	MR	-	-	-	-
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
Black Jack	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

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]
BLACK (continued)										
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
PINK										
Alberta Pink	U. Alberta	E	V	S	-	S	S	-	S	S
Flamingo	Idaho Seed Bean	E	V	-	-	-	-	-	S	S
Floyd	Rogers	ML	V	-	-	-	-	-	S	R
ROG 922	Rogers	M	V	-	-	R	R	-	S	S
Rosalee	U. Sask.	E	V	S	-	-	-	-	S	S
Sedona	MSU/ARS	M	USV	S	-	R	-	R	A	MR
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.

2006 Dry Bean Variety Trials

Dry Edible Bean -- Dryland, Carrington

Variety	Market Class	Height	Exhibited Habit*	Bloom	Pound	Weight	Weight	Seed Yield 2006	Seed Yield Avg.
		inch	1-9			gram/100	lb/bu	lb/ac	lb/ac
Buster	Pinto	13.8	4.0	44.8	1433	31.7	54.5	1033	1366
Eclipse	Black	13.3	5.7	49.5	2694	16.9	58.9	1160	1387
GTS 900	Pinto	15.9	5.7	48.8	1348	33.7	56.4	1458	1249
Maverick	Pinto	12.6	5.0	46.3	1557	29.2	54.4	1145	1135
Navigator	Navy	11.9	6.0	49.8	2823	16.2	60.9	1070	1288
Norstar	Navy	15.6	4.3	50.0	2598	17.5	62.1	984	--
Othello	Pinto	11.8	3.0	43.3	1565	29.1	57.4	1544	1635
Rally	Pinto	14.8	5.3	47.8	1316	34.5	56.0	1259	1382
Red Hawk	Dark Red Kidney	14.6	3.7	44.5	1685	27.0	51.6	734	1169
Seahawk	Navy	14.3	5.3	46.0	2679	17.1	61.0	1216	1088
T-39	Black	15.9	4.3	50.5	2908	15.7	60.4	1307	1431
Topaz R	Pinto	13.5	4.7	42.8	1575	28.9	51.8	1240	1431
Vista	Navy	13.4	5.0	49.5	2673	17.0	61.3	755	1091
Mean		14.3	5.5	47.4	2034	24.5	57.4	1166	--
C.V.%		14.3	21.5	2.1	10.4	10.7	1.5	20.6	--
LSD .05		NS	1.9	1.4	298	3.7	1.2	3 40	--

Planting Date - May 22; Harvest Date - Aug. 22; Previous Crop - Spring Wheat
*Exhibited growth habit: score taken just prior to harvest, scale of 1 to 9: 1=prostrate & viney habit to 9 =very upright and compact habit.

Dry Edible Bean -- Irrigated, Carrington

Variety	Market Class	Days to Bloom	Seeds per Pound	Seeds per Pound	Seed Weight	Test Weight	Seed Yield	Seed Yeld
			2006	3-Yr. Avg.			2006	3-Yr. Avg.
Buster	Pinto	45.5	1169	1161	38.8	58.7	3239	2617
Eclipse	Black	51.3	2479	2395	18.3	61.9	2753	2340
GTS 900	Pinto	48.5	1211	1250	37.5	59.3	3134	2529
Maverick	Pinto	44.5	1232	1243	36.9	59.4	3043	2511
Navigator	Navy	50.8	2641	2410	17.2	62.1	2613	2282
Norstar	Navy	49.0	2701	2521	16.8	63.9	2154	2008
Othello	Pinto	43.0	1175	1186	38.6	60.3	2686	2341
Rally	Pinto	48.0	1160	1166	39.1	59.3	3247	2587
Red Hawk	Dark Red Kidney	45.0	1032	877	44.0	56.9	2398	2138
Seahawk	Navy	47.5	2397	2101	19.0	62.6	2419	2216
T-39	Black	51.0	2486	2361	18.3	61.7	2559	2192
Topaz R	Pinto	42.8	1270	1248	35.7	57.2	2269	2054
Vista	Navy	49.3	2673	2475	17.0	63.2	2667	2309
Mean		47.7	1741	--	29.8	60.4	2881	--
C.V.%		2.5	3.3	--	3.1	1.0	7.3	--
LSD .05		1.7	81	--	1.3	0.8	299	--

Planting Date - May 22; Harvest Date - Aug, 28; Previous Crop - Spring Wheat

Dry Edible Bean -- Langdon								
Variety	Type	100 Seed Wt.	Days to Mature	Yield 2003	Yield 2005	Yield 2006	Yield 2-Yr.	Yield 3-yr.
		grams		lbs/ac	lbs/ac	lbs/ac	lbs/ac	lbs/ac
Buster	Pinto	44	96	2444	2741	3758	3249	2981
GTS 900	Pinto	40	95	--	2145	3610	2878	--
Maverick	Pinto	40	94	2396	2691	3706	3199	2931
Othello	Pinto	42	93	1976	2391	3698	3045	2688
Rally	Pinto	42	94	--	2343	3778	3061	--
Topaz R	Pinto	41	86	--	--	3210	--	--
Navigator	Navy	21	98	1688	2435	3582	3009	2568
Norstar	Navy	21	99	1740	*	3103	--	--
Seahawk	Navy	23	99	--	1970	3343	2657	--
Vista	Navy	20	98	2184	2598	3817	3208	2866
Eclipse	Black Turtle	22	96	--	2379	3610	2995	--
T-39	Black Turtle	21	96	2496	2159	3094	3094	3094
Red Hawk	Red Kidney	49	99	1780	1827	2886	2357	2164
Mean		33.2	96.1	2088	2144	3530	--	--
C.V.%		4.0	2.4	11.0	17.7	10.5	--	--
LSD .05		2.2	3.8	386	627	613	--	--

Planting Date: May 24 Harvest Date: Sept. 14 *The variety Norstar was planted but no data reported due to poor stands.

Dry Edible Bean -- Cavalier (Pembina County)							
Variety	Type	100 Seed Wt.	Yield 2004	Yield 2005	Yield 2006	Yield 2-Yr.	Yield 3-Yr.
		grams	lbs/ac	lbs/ac	lbs/ac	lbs/ac	lbs/ac
Buster	Pinto	45	1280	2023	3322	2673	2208
GTS 900	Pinto	42	1053	2217	3018	2618	2096
Maverick	Pinto	39	1209	2019	2523	2271	1917
Othello	Pinto	36	1706	2162	2678	2420	2182
Rally	Pinto	44	959	1856	2279	2068	1698
Topaz R	Pinto	38	--	--	2510	--	--
Navigator	Navy	22	1635	2059	2830	2445	2175
Norstar	Navy	23	1321	1859	2007	1933	1729
Seahawk	Navy	26	1934	1651	3182	2417	2256
Vista	Navy	22	1851	2526	3226	2876	2534
Eclipse	Black Turtle	25	1400	2448	2786	2617	2211
T-39	Black Turtle	22	1105	2103	2850	2477	2019
Red Hawk	Red Kidney	42	2471	1248	1843	1546	1854
Mean		32.6	1542	1986	2697	--	--
C.V.%		4.8	8.0	9.6	16.9	--	--
LSD .05		2.6	194	321	767	--	--

Planting Date: May 26 Harvest Date: Sept. 8

Dry Edible Bean -- Dryland, Williston Research Extension Center									
Variety	Bloom Date from planting	Plant Height inch	1,000 Kwt. gms	Seeds per Pound	Test Weight lbs/bu	Seed Yield 2004 lb/ac	Seed Yield 2005 lb/ac	Seed Yield 2006 lb/ac	Seed Yield 3-Yr. Avg. lb/ac
PINTO BEANS									
Buster	48	18	325	1396	51.9	951	675	262	629
GTS 900	48	21	281	1614	48.5	944	601	178	574
Maverick	48	17	281	1614	53.4	992	581	278	617
Othello	42	14	238	1906	58.1	843	651	510	668
Rally	48	20	304	1492	54.9	916	692	288	632
Topaz R	46	16	256	1772	50.9	853	601	328	594
Mean	47	17	281	1614	52.9	892	633	307	--
C.V.%	1	19	3	3	1.0	16	25	17	--
LSD .05	1	NS	20	117	1.4	NS	NS	78	--
NAVY BEANS									
Navigator	49	13	148	3065	60.8	827	619	318	588
Norstar	49	12	155	2926	63.1	748	454	344	515
Seahawk	43	13	165	2749	61.2	776	912	323	670
Vista	50	15	156	2908	62.7	565	879	284	576
BLACK BEAN									
Eclipse	50	16	190	2387	50.0	--	--	205	--
T-39	50	11	154	2945	60.2	792	875	440	702
Mean	48	13	162	2800	59.7	721	748	319	--
C.V.%	2	8	3	3	1.1	17	10	17	--
LSD .05	1	2	13	210	1.6	NS	214	84	--
Planting Date: May 18 on fallow		Harvest Date: Oct. 2							

2006 Dry Edible Bean Variety Trial, North Central Research Extension Center -- Minot														
Variety	Maturity	Days to Bloom	Days to Mat.	Plant Ht.	Lodge	Disease	Seed Wt.	Seeds/ Pound	Test Weight	2004	2005	2006	2-Yr.	3-Yr.
		DAP	DAP	in	0-9	0-9	g/1000		lb/bu	lb/A	lb/A	lb/A	lb/A	lb/A
BLACK														
Eclipse	M	57	90	23	0.8	2.3	183.8	2472.5	60.6	2116	2168	2404	2286	2229
T-39	M	58	91	21	3.0	3.3	185.1	2457.0	60.9	1993	2198	2204	2201	2132
KIDNEY														
RedHawk	M	52	92	17	2.0	2.0	450.7	1008.5	53.7	1382	1169	1934	1551	1495
NAVY														
Navigator	ML	57	91	24	0.3	4.3	182.2	2493.0	61.4	2479	1837	2090	1964	2135
Vista	ML	56	93	26	1.5	5.8	191.8	2369.0	61.9	2113	1954	2262	2108	2110
Norstar	ME	57	93	20	1.8	4.3	193.5	2351.5	62.3	--	--	1734	--	--
Seahawk	ML	56	90	23	1.3	3.8	214.2	2125.0	61.0	--	--	1968	--	--
PINTO														
Topaz	E	51	85	21	3.3	1.8	386.9	1174.0	54.5	1614	1211	2141	1676	1655
Othello	E	52	84	17	3.0	1.0	368.9	1230.5	58.5	1793	1827	2558	2192	2059
Maverick	ME	53	87	25	3.0	0.5	362.7	1252.0	57.3	2606	1854	2481	2168	2314
Buster	ME	54	90	27	3.8	4.3	418.3	1085.5	55.9	1616	1955	2463	2209	2011
GTS 900	L	55	91	24	2.3	3.3	378.6	1203.0	57.1	1198	1506	2270	1888	1658
Ralley	ME	54	90	24	3.3	2.8	370.8	1228.0	56.6	1470	1373	2296	1834	1713
Mean		54	90	23	2.0	3.0	300.6	1704.2	58.7	1720	1752	2341	--	--
C.V. %		2.7	1.9	16.7	36.3	36.3	3.8	3.6	1.0	16.5	16.4	7.8	--	--
LSD 5%		2	2	5	0.9	1.5	24.2	128.1	0.8	405	410	258	--	--

Maturity: E=early, ME=medium early, M=medium, ML=medium late DAP=Days after planting
Lodging score based on scale 0-9 (0=upright, 9=flat) Disease score based on scale 0-9 (0=no disease, 9=high disease incidence)

2006 Dry Edible Bean Variety Trial -- Benson County, North Central Research Extension Center -- Minot											
Variety	Maturity	Days to PM	Plant Height	Seed Weight	Seeds/ Pound	Test Weight	2004	2005	2006	2-Yr.	3-Yr.
		DAP	in	g/1000		lb/bu	lb/A	lb/A	lb/A	lb/A	lb/A
BLACK											
Eclipse	M	95	13	202.0	2252	60.5	--	1845	994	1420	--
T-39	M	95	12	186.4	2446	61.5	--	1953	1173	1563	--
KIDNEY											
RedHawk	M	99	14	437.4	1039	53.8	--	1436	778	1107	--
NAVY											
Navigator	ML	96	15	181.2	2511	61.7	--	2067	995	1531	--
Vista	ML	97	14	207.9	2196	62.1	--	1267	1123	1195	--
Norstar	ME	98	14	195.3	2328	61.8	--	1007	602	805	--
Seahawk	ML	97	14	201.2	2261	61.8	--	1357	888	1122	--
PINTO											
Topaz	E	97	14	355.8	1277	54.2	--	1566	955	1261	--
Othello	E	97	14	336.6	1352	58.0	--	1475	1099	1287	--
Maverick	ME	96	13	359.4	1265	56.2	--	2069	1089	1579	--
Buster	ME	96	13	386.1	1179	55.7	--	1767	1135	1451	--
GTS 900	L	99	17	396.9	1144	56.8	--	1615	911	1263	--
Ralley	ME	98	15	405.2	1121	56.8	--	1228	941	1084	--
Mean		97	14	297.3	1704.1	58.6	--	1589	986	--	--
C.V. %		1.9	10.9	4.8	6.5	0.7	--	31.4	12.2	--	--
LSD 5%		3	2	30.4	234.3	0.6	--	NS	171	--	--

Maturity: E=early, ME=medium early, M=medium, ML=medium late DAP=Days after planting
Lodging score based on scale 0-9 (0=upright, 9=flat) Disease score based on scale 0-9 (0=no disease, 9=high disease incidence)

Northarvest 2006 Dry Bean Research Update

Resistance Against Fusarium Root Rot of Dry Bean

Authors: Jack B. Rasmussen, Carl A. Bradley, Vineeta Bilgi, and Ken F. Grafton

Research Objectives: The objectives of this research project are to (1) identify new sources of genetic resistance to root rot, (2) determine the genetics of the resistance in segregating populations, and (3) facilitate the introgression of the genetic resistance into the NDSU dry bean breeding program.

Research Method: Previous research supported by Northarvest helped us develop a reliable greenhouse and laboratory test for dry bean root rot. We used that procedure to assess disease resistance/susceptibility in eleven dry bean cultivars representing different market classes. This research also suggested that the dry bean line known as Vax 3 had the least root rot severity rating when tested under field and greenhouse conditions and may be of value to the breeding program.

To understand the mode of inheritance and the number of genes controlling the trait for Fusarium root rot resistance, populations were developed from genetic crosses between Vax 3, a small red bean, and Red Hawk, a dark red kidney bean highly susceptible to root rot. Progeny of the crosses were evaluated for disease reactions in the greenhouse and in the laboratory for resistance to root rot using a procedure known as the sand-cornmeal-inoculum layer method. This inoculation method was selected based on its positive correlations between greenhouse and laboratory experiments with the field results. Progeny of crosses were advanced to the F3 generation in the greenhouse to facilitate additional genetic studies and to develop the progeny into recombinant inbred populations that can be used by the breeding program.

Results: Eighty F1 generation seedlings were tested for their response to Fusarium root rot in replicated trials over time. All F1 progeny were found to be resistant, suggesting that root rot resistance in Vax 3 is conditioned by one or more dominant genes.

Currently F2, and F3 generation is being tested for its resistance to Fusarium root rot, while F4, F5, and F6 generations are being developed into recombinant inbred populations. The data that will be obtained from these tests will help determine the segregation ratio and if there is a single gene or more than one gene responsible for resistance.

The knowledge of gene(s) controlling resistance will help in the breeding programs that aim to develop Fusarium root rot resistant cultivars.

Development and Characterization of Omega-3 Fortified Bean Paste

Author: Dr. Mehmet C. Tulbek

Bean paste is a staple food mainly consumed as a ready to eat product in the U.S. In addition bean paste is primarily consumed in Latin American and Asian countries. However bean and bean products are deficient in terms of omega-III fatty acids. Flaxseed oil is the main source of omega-III fatty acids, which can be supplemented to cereal products. The objectives of this research were i) to develop a flaxseed oil fortified bean paste process; ii) to determine the effects of flaxseed oil on bean paste quality and shelf life stability; and iii) to determine nutritional analysis of bean paste.

Two bean paste making methods were developed. First method was developed according to a bench top scale frying process. Bean flour (46.4 g.) was fried with canola oil (22.3 g.) for 5 min. Bean paste was stored at fridge for 24 h. for further shelf life quality evaluation. Second method was developed with Mixolab, which is a dough testing instrument. Mixolab tests were conducted for 45 min. at 80 RPM blade speed. This method was used to determine the mixing attributes and the effects of flaxseed oil in bean paste.

Flaxseed oil addition significantly decreased ($P<0.05$) bean paste firmness and chewiness scores. Pinto flour showed higher texture attributes compared to black bean flour, however data showed no significance. Mixolab tests indicated that flaxseed oil decreased mixing parameters in bean paste. As the flaxseed oil fortification increased, mixing stability, pasting and setback scores significantly ($P<0.05$) decreased. Pinto and black bean flour pastes showed significant variation in terms of stability, pasting and setback scores. Results indicated that bean flour gave superior paste firmness and pasting properties compared to wheat flour. Shelf life stability of bean paste was evaluated by headspace volatile analysis. Gas chromatography was conducted and secondary metabolites of lipid oxidation were analyzed. Propanal the primary aldehyde of α-linolenic acid was not detected in bean paste samples at 3 day storage at ambient conditions. Bean paste samples were refrigerated and paste quality did not deteriorate in 8-week storage. Results indicated no lipid oxidation due to flaxseed oil addition.

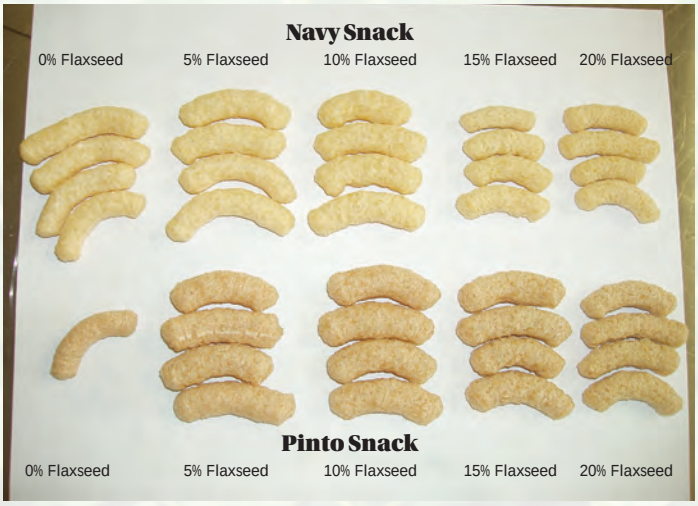
In conclusion bean paste can be fortified with flaxseed oil. Bean paste is a stable product with excellent texture and pasting properties, which can be preserved in refrigerator for storage.

Development and Characterization of Omega-3 Fortified Extruded Bean Snacks

Author: Dr. Mehmet C. Tulbek

Extrusion is a unique food processing technique which improves the quality of edible beans by inactivating anti-nutritional components and improving nutrient bioavailability. Extruded snacks are deficient in terms of fiber and omega-3 fatty acids. Thus extruding dry beans can be a means of developing health based extruded snacks by fortifying bean flour and cold milled flaxseed, which are major sources of fiber and omega-3 fatty acids respectively. The objectives of this project were i) to develop a method for producing extruded snack products from omega-3 fortified dry bean flour; ii) to assess the shelf life and sensory properties of the extruded bean snack products and iii) to establish an optimal production method (scale-up) for converting omega-3 fortified dry bean flour into an extruded snack food based on sensory feedback from potential consumers.

Extrusion was conducted according to standard corn curl processing method developed by Wenger. Screw speed and water absorption levels were adjusted at 310 RPM and 0.128 kg/min respectively. Specific mechanical energy values decreased as the cold milled flaxseed addition increased during process. Extruded snack quality analyses indicated that 5 and 10 % cold milled flaxseed addition did not affect expansion ratio, bulk density, water activity and snack firmness parameters. Extruded snacks made with navy bean flour showed slightly lower bulk density than extruded snacks made with pinto flour. We might relate this phenomenon due to the differences in cooking and pasting properties of pinto and navy flours. However extruded pinto snacks fortified with 5 and 10% cold milled flaxseed gave higher expansion ratio scores compared to extruded navy snacks (See image above).



Linear positive relationship was observed between the snack bulk density and cold milled flaxseed fortification. Bulk density scores significantly ($P<0.05$) decreased as the percentage of cold milled flaxseed increased in bean snacks. This might be due to the high levels of protein, oil, fiber and gums of flaxseed which deteriorated extrusion process. In addition cold milled flaxseed fortification increased water activity (a_w) values of extruded bean snacks. Extruded snacks fortified with 15 and 20% cold milled flaxseed addition significantly ($P<0.05$) increased water activity values of extrudates. Flaxseed oil fraction serves as a lubricant and assists extrusion by decreasing specific mechanical energy. However protein, fiber and gum fractions of flaxseed absorb water, which increases water activity of the end product. High water activity may cause gumminess and chewiness in the end product. Detrimental impact of water activity on snack texture attributes can be improved with additional drying. This phenomenon might be important for scale up, since additional drying will be required for bean snacks fortified with 15 and 20% cold milled flaxseed. Shelf life stability of extruded bean snacks was evaluated by headspace volatile analysis. Gas chromatography was conducted and secondary metabolites of lipid oxidation were analyzed. Propanal the primary aldehyde of α-linolenic acid was not detected in all extruded bean snack samples at 8-week storage. Results indicated no lipid oxidation due to cold milled flaxseed addition. In addition antioxidant rich pinto and navy flours might have an impact on shelf life stability during storage. In conclusion extruded bean snacks could be introduced as high fiber and high omega-III products to the snack food market. Bean snacks fortified with 5 and 10% cold milled flaxseed showed superior quality parameters and shelf life stability.

Grower Survey of Pest Problems, Pesticide Use, and Varieties in 2005

Author: 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 2005 growing season. Responses were then returned to NDSU, where they were compiled and statistically analyzed.

Results: A total of 291 responses were received, which represented approximately 16% of the dry bean acreage planted in the Northarvest region in 2005. According to the survey responses, the worst production problems in 2005 for North Dakota growers were weather-related problems (37%) followed by weeds (24%), and for Minnesota growers were weeds (21%) followed by diseases (19%). 'Maverick' (54%) and 'Buster' (10%) were the two most popular dry bean cultivars grown in North Dakota, and 'Montcalm' (20%) and 'Red Hawk' (9%) were the two most popular dry bean cultivars grown in Minnesota.

Dry Bean Breeding Program Research Report 2006

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

Project Leader: Dr. Kenneth Grafton (up to December 2006); Dr. Juan Manuel Osorno (January 2007), Research Associate, Dr. Jean R. Gelin (up to September 2006); Research Associate, Dr Gonzalo A. Rojas-Cifuentes; Research Specialist, Albert J. Vander Wal

Objectives: The objective of the dry bean breeding program at North Dakota State University 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.). The first priority is to improve pinto and navy market classes, but also black, great northern, red and kidney market classes are important part of our breeding program.

Locations and Trials: During 2006 growing season 61 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 (48 lines)
- Navy Advanced Yield Trial (14 lines)
- Black Advanced Yield Trial (12 lines)
- Great Northern & Reds Advanced Yield Trials (20 lines)
- Midwest Regional Performance Nursery (20 lines)
- F4 Plant Rows, Great Northern, Navys, and Blacks (3656 rows)
- F5 Plant Rows Pintos, Great Northerns, Reds, Navy's and Blacks (1064 rows)
- F6 Plant Rows Great Northern, Reds, and Blacks (1495 rows)

Johnstown

- Pinto Advanced Yield Trial (48 lines)
- Navy Advanced Yield Trial (14 lines)
- Black Advanced Yield Trial (12 lines)

- Great Northern & Reds Advanced Yield Trials (20 lines)
- Zn Navy Study (10 lines)

Forest River

- Pinto Variety Trial (18 lines)
- Navy Variety Trial (19 lines)

Hatton

- Pinto Variety Trial (23 lines)
- Navy Variety Trial (23 lines)
- Miscellaneous Variety Yield Trial (24 lines)
- Pinto Advanced Yield Trial (48 lines)
- Navy Advanced Yield Trial (14 lines)
- Black Advanced Yield Trial (12 lines)
- Great Northern & Reds Advanced Yield Trials (20 lines)
- Preliminary Yield Trial (37 lines)
- Zn Navy Study (10 lines)
- F4 Plant Rows Navys and Blacks (288 rows)
- F5 Plant Rows pintos, great northerns, reds, navys and blacks (624 rows)
- F2 Space Plant pintos, great northerns, reds, navys and blacks (717 rows)
- Space Plant Increase (64 rows)

Prosper

- Pinto Advanced Yield Trial (48 lines)
- Navy Advanced Yield Trial (14 lines)
- Black Advanced Yield Trial (12 lines)
- Great Northern & Reds Advanced Yield Trials (20 lines)
- Pinto Variety Trial (14 lines)
- Navy Variety Trial (14 lines)
- Miscellaneous Variety Trial (7 lines)
- Preliminary Yield Trial (37 lines)
- F4 Plant Rows Navys and Blacks
- F5 Plant Rows Pintos, Great Northerns, Reds, Navys and Blacks (624 rows)

Minnesota Locations and Trials:

Park Rapids

- Miscellaneous Variety Trial (12 lines)
- Kidney Preliminary Yield Trial (150 lines split into 3 trials)

Perham

- Miscellaneous Variety Trial (9 lines)
- Root Rot Nursery (240 lines)

Disease Testing: During 2006, 120 lines were tested for anthracnose resistance, 80 lines were tested for common bean mosaic virus, NL-3 race resistance and 20 lines were tested for white mold resistance.

Winter Nurseries: 1786 F5 selections from F4 plant rows including pinto, navy, great northern, red, and black beans, 340 F3 selections from F2 space plants (great northern, navy and black beans) were sent to our nursery in Puerto Rico.

Results:

- A total of 1512 test plots of advanced and preliminary yield trials were harvested. In advanced yield trials 48 pinto, 14 navy, 12 black and 20 great northern and red bean lines were tested
- For the variety trials, 652 test plots were harvested, including pinto, navy, miscellaneous and kidney trials.
- More than 6500 single plant selections from breeding trials were made and harvested from F2 space plants and F4 plant rows.
- 620 row selections from breeding trials were made and harvested from F5 and F6 plant rows.
- After many evaluations in several trials in and out of North Dakota, 2 pinto experimental lines are being considered for pre-release next summer.

Further Steps:

- 15 elite pinto lines will be increased and screened for diseases at NDSU greenhouse facilities.
- Anti aging (seed coat color) pinto material from Idaho will be tested and include as a parent in our crossing block.

Resistance to White Mold in Dry Bean

Authors: Jack B. Rasmussen and Ken F. Grafton

Research Objectives: The objectives of this research are to identify new sources of resistance to white mold and to incorporate that genetic resistance into the breeding program.

Research Method: In previous work, potential new sources of resistance to white mold were identified in dry bean lines from Mexico, Central America, and South America. Those lines were crossed with a susceptible cultivar adapted to this region (Othello) and progeny of these crosses were developed into recombinant inbred (RI) populations that would segregate for reaction to white mold. Those populations were analyzed in the greenhouse and in the field to identify parents for the breeding program. Several RI lines with good resistance to white mold and adequate seed coat characteristics were identified. These were crossed to cultivars such as Maverick, Matterhorn, Condor, and others, as a mechanism to combine genetic resistance with excellent agronomic characteristics.

In this work, progeny of these crosses were developed into F2 populations in the greenhouse. F2 progeny were evaluated in the greenhouse for resistance to white mold. Those experiments were based on the "straw test", the best way to evaluate white mold reaction in the greenhouse. Plants were evaluated on a scale of 1 (no disease) to 9 (dead plant) several days after inoculation.

Results: Five F2 populations were developed. To date, approximately 30 F2 individuals from each population (150 total) have been evaluated in the greenhouse. The majority of F2 progeny in each cross showed intermediate to high levels of susceptibility. Plant death resulting from severe white mold infection was common. However, each population had at least a few progeny that showed resistance to white mold that was superior to the susceptible parental variety. Those plants were allowed to advance to the F3 generation. Analysis of additional F2 progeny is underway. The experiments suggest that genetic resistance to white mold is controlled by multiple genes but is heritable.

Evaluation of Dry Bean Seed Treatment Products

Authors: Dr. Robert Henson and Blaine Schatz.

Dry bean growers have historically utilized seed treatments as a standard practice to control losses from a complex of seed rot and seedling blight diseases and to reduce the potential for infections from surface borne bacterial blight. The complex of fungal seed rot and seedling diseases are caused by forms of Fusarium, Rhizoctonia, and Pythium. The necessity of utilizing seed treatments has been questioned by growers as they assess specific input costs during times of increasing costs of production. Both growers and industry personnel have expressed interest in an evaluation of dry bean seed treatments in the Carrington region since a moderate portion of the seed used in this and other areas is locally produced. The intent of this research is to provide current information on the response of dry bean seed treatment and the effectiveness of a broad spectrum of fungicides in controlling root and seedling diseases.

Fungicide Treatment	Established Stand	"Days to 75% Leaf Drop"	Seeds / Pound	1000 KWT	Test Weight	Seed Yield
	plants ft^{-2}			gms	lbs/bu	lbs/ac
Untreated Check	1.8	86.0	1410	322	56.0	1186
Captan 400C	2.0	85.5	1416	321	56.6	1331
Captan 400 + Agstrep	2.0	86.8	1434	317	56.6	1491
Captan 400 + Allegiance + Agstrep	1.9	86.3	1405	323	56.3	1392
Captan 400 + Allegiance + Kodiak + Agstrep	2.0	85.3	1395	326	56.8	1418
Apron XL	2.0	85.5	1406	323	57.2	1506
ApronMaxx RTA	2.0	86.5	1405	326	57.2	1398
ApronMaxx RTA + Agstrep	2.0	85.0	1416	321	56.8	1439
ApronMaxx RTA + Cruiser	2.0	85.0	1405	324	56.7	1439
Dynasty	1.8	85.3	1382	329	56.8	1400
Dynasty + Apron XL	1.6	85.3	1398	325	56.2	1394
Dynasty + ApronMaxx RTA	1.9	85.0	1407	323	56.8	1408
MEAN	1.9	85.6	1406	323	56.7	1400
C.V.%	15.7	1.9	4.6	4.4	1.0	11.6
LSD.05	NS	NS	NS	NS	NS	NS

The field experiment to assess dry bean seed treatments was established at the Carrington Research Extension Center on May 26. The trial was planted on a Heimdal silt loam soil that was seeded to barley the previous year. Soil parameters on the site included: pH of 8.1; organic matter of 3.0%; phosphorous of 5 ppm; and soil nitrate at the 0 to 24 inch depth was 52 pounds N. The pinto bean cultivar 'Maverick' was planted at a seeding rate of 80,000 pure live seeds per acre. Seeds were placed at a planting depth of 2 ½ inches to promote an extended time to emergence. Treatments were arranged as a randomized complete block design with four replications. Individual plots were four rows wide (30 inch spacing) and 25 ft in length. Seed treatments were applied based on the following rate equivalents: Captan 400 (Captan) at 2.0 fl oz/cwt; Allegiance

Continued on Next Page

Experimental Herbicides and Desiccants in Dry Edible Beans

Author: Richard Zollinger, NDSU Extension Weed Scientist

KIH-485: Kumiai America Chemical Company is developing KIH-485 for preemergence weed control in corn. The compound has not been registered by the EPA but is currently under review. Registration in corn may occur in 2008 followed by registration to other crops with adequate safety. It is of unknown mode of action and unique chemistry. The NDSU Extension Weed Science Project has conducted 3 years of research in corn. Grass weed control is excellent and comparable to Dual, Outlook, Harness, Surpass and other soil-applied herbicides labeled in corn but control of broadleaf weeds is much greater. Greater than 90% control of foxtail, redroot pigweed, common lambsquarters, wild buckwheat, kochia, wild mustard, marshelder, and common ragweed was observed. Studies from other areas in the mid-west show it will control more weeds than those listed above. Preliminary research from Colorado State University and University of Guelph, Ontario, Canada reported selectivity of KIH-485 on some dry bean types. The compound is different than any other soil-applied herbicide registered in dry bean by controlling grass and many broadleaf weeds. Research on

KIH-485 – 2.8 to 5.24 oz/A

KIH-485 rates and application timings in dry beans types at multiple locations is needed to document weed control at rates safe on dry bean.

In 2006, experiments were conducted near Hatton and Thompson, ND, to evaluate dry bean type response to soil-applied KIH-485. Ensign, Maverick, T-39, and Montcalm were planted followed by soil application of KIH-485 treatments.

KIH-485 was applied at 1x, 1.5x, and 2x the rate for the soil type at each location. The dry beans in all treatments were hand harvested and there were no significant difference in yield from the weed-free check.

Results -- Hatton and Thompson:

Both studies were evaluated 12, 21, 28, 43, and 70 days after application for dry bean safety. No visual injury was observed for any treatment at any evaluation. The four dry bean types showed good emergence. There was no stunting, chlorosis, burning, deformed leaves or injury symptoms. There was little to no rain after PRE applications which may limited the amount the soil-applied herbicide was activated. Redroot pigweed emerged after application which also demonstrates lack of moisture activation because pigweed is susceptible to KIH-485 and controlled easily. These studies should be conducted again next year to observe dry bean response when KIH-485 has been adequately activated with sufficient rainfall. (Dept. of Plant Sciences, North Dakota State University, Fargo).

Permit (Halosulfuron): Gowan Chemical Company recently bought the marketing rights of Permit (halosulfuron) from Monsanto for use in minor and speciality crops. Halosulfuron is labeled as Permit in corn and as Sandea in minor/specialty crops. Permit is a mid-residual, sulfonylurea herbicide with activity on many broadleaf weeds, including wild mustard, smartweed, sunflower, cocklebur, marshelder, and ragweed. The herbicide has a residue but all crops can be planted the year following application except canola (15 months), sunflower (18 months), and sugarbeet (36 months). Gowan is seeking registration of Permit on potato, dry beans, and some vegetable crops. Almost no research has been done with dry bean crop tolerance, adjuvant enhancement, and weed efficacy with Permit in the main dry bean growing area of North Dakota and Minnesota. Registration of soil-applied Permit on dry bean occurred in 2007 with postemergence registration to follow after sufficient data has shown adequate safety. Research should be conducted to develop a database of information to answer grower questions about

Seed Treatments • ***Continued from previous page***

FL (Metalaxyl) at 0.75 fl oz/cwt; Apron XL (Mefenoxam) at 0.32 fl oz/cwt; ApronMaxx RTA (Mefenoxam+Fludioxonil) at 5.0 fl oz/cwt; Dynasty (Azoxystrobin) at 0.153 fl oz/cwt; Cruiser at 1.28 fl oz/cwt; and Agri-Strep 500 (Streptomycin) at 0.83 oz/cwt. All data reported in the following table were collected from the interior two rows of the four row plots.

The trial results from the 2006 field trial are shown in the table on the previous page. Review of the data from 2006 will show that no differences among treatments were identified across the traits recorded. The growing conditions from the time of planting until the first trifoliate growth stage were very favorable for plant development. Average soil temperatures from planting until the time of emergence were 67 degrees F which created a favorable environment for rapid plant development. Limited rainfall and low humidity continued throughout the growing season that further limited potential for plant disease to impact dry bean performance. These data provide a review of the influence of seed treatments on dry bean performance in an environment unfavorable for disease development and expression. The growing season of 2006 provided a perspective of the impact of seed treatments, however the conditions were not typical of the regions long-term environment. The intent of the Carrington REC would be to continue this evaluation in another season when cooler and wetter weather conditions prevail to reflect the typical conditions for planting dry beans in the region.

Permit and to develop a use program wherein crop safety is protected and weed control is efficacious.

In 2006, experiments were conducted near Thompson and Hatton, ND, to evaluate dry bean type tolerance to Permit. Ensign, Maverick, T-39, and Montcalm were planted after which soil-applied Permit treatments were applied and postemergence treatments were applied on June 14 to V2 to V3 (1 to 2 inch) navy, pinto, black bean, and kidney bean.

Results -- Hatton: At June 14, pinto, navy, kidney, and black beans were in the unifoliate stage and showed good emergence. No injury was observed with any treatment. This rating is approximately 21 days after planting. There was no stunting, chlorosis, burning, deformed leaves or injury symptoms. No weeds were emerging except volunteer wheat in the treated plot area which was a light infestation. There was little to no rain after PRE applications.

At June 29, (7 DAT after the Permit POST treatments), there was no visible injury.

At July 14, there was no visible injury. Pinto beans were 8 to 10 inches tall and flowering, navy beans were 6 to 8 inches tall and flowering, kidney beans were 10 to 12 inches tall and flowering, and black beans were 6 to 9 inches tall and flowering.

At August 9, there was no visible injury in any treatment. All bean types were green without any indication of beginning senescence and no indication of stress from any herbicide treatment as exhibited in delay in physiological maturity.

Results -- Thompson: At June 7, pinto, navy, kidney, and black beans were all in the unifoliate stage and showed good emergence. No injury was observed with any treatment. This rating is approximately 14 days after application. There was no stunting, chlorosis, burning, deformed leaves or injury symptoms. Very little rain occurred after application. Redroot pigweed was emerged which Permit has some activity. This may indicate that the herbicide applied PRE was not activated by rain. Almost all weeds were in the wheel tracks of our tractor from seeding.

At June 15, no visible injury and beans were in the 1st to 2nd trifoliate. Redroot pigweed was emerging to 2 inches tall.

At July 14, there was no visible injury. Pinto beans were 14 to 18 inches tall and flowering, navy beans were 10 to 12 inches tall and flowering, kidney beans were 12-14 inches tall and flowering, and black beans were 14 to 18 inches tall and flowering.

At August 9, no injury was observed in any treatment. Beans were green without any indication of beginning senescence and no indication of stress from any herbicide treatment as exhibited in delay in physiological maturity. (Dept. of Plant Sciences, North Dakota State University, Fargo)

Dry bean desiccation: Through Northavest Dry Bean Grower funding, Valor was found to be an effective desiccation and Valent, in collaboration with IR-4 are seeking full Section 3 labeling anticipated in 2008.

Carfentrazone: FMC labeled Aim (carfentrazone) in 2005 as a desiccant in several crops, including dry bean. One year of testing in 2005 found it to be similar to Gramoxone in speed dry bean leaf but not vine desiccation. Preliminary research also shown enhancement of Aim by certain adjuvants. Research is proposed to test Aim in a graduated rate range and with adjuvants to determine speed and extent of desiccation.

In 2006, an experiment was conducted near Hatton, ND, to evaluate dry bean desiccation from Aim and Valor with adjuvants. 'Ensign' navy bean was planted on June 1, 2006. Desiccation treatments were applied on August 23 to beginning of naturally senescing dry bean. Dry bean senescence at application was quantified in the following manner: 50% green pods, 50% yellow pods, 0% leather pods, 5 to 10% top leaf drop, and 50 to 60% bottom leaf drop.

Generally, Gramoxone Inteon increased desiccation faster and quicker than other treatments which was better than previous years. Over 0.75 inches of rain occurred following application. From 0 to 7 DAT the weather was sunny, warm, and breezy with 55F lows and 80F highs. At 10 DAT, there was less differences between treatments. Valor slightly increasing control over Aim. Desiccation from Gramoxone and glyphosate was better than previous years. At 10 to14 DAT, 0.2" rain occurred with sunny and highs were in the 70F which may explain the increased desiccation.

Dyne-Amic + Valor desiccated vines well but it was until 10 DAT for Gramoxone to equal Valor+Dyne-Amic vine control of 73%. Valor increased control over Aim over time and all treatments desiccated dry bean greater than the untreated. Dyne-Amic and Superb HC with Valor and Aim and Gramoxone had 94% or better leather pods at 14 DAT. (Dept. of Plant Sciences, North Dakota State University, Fargo).

The research projects reviewed in this report were funded by the Northarvest Bean Growers Association.

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

Bean Production Across the U.S.

1. Arizona
Blackeye Beans
Garbanzo Beans
Pinto Beans

2. California
Baby Lima Beans
Blackeye Beans
Dark Red Kidney Beans
Garbanzo Beans
Large Lima Beans
Light Red Kidney Beans
Pink Beans

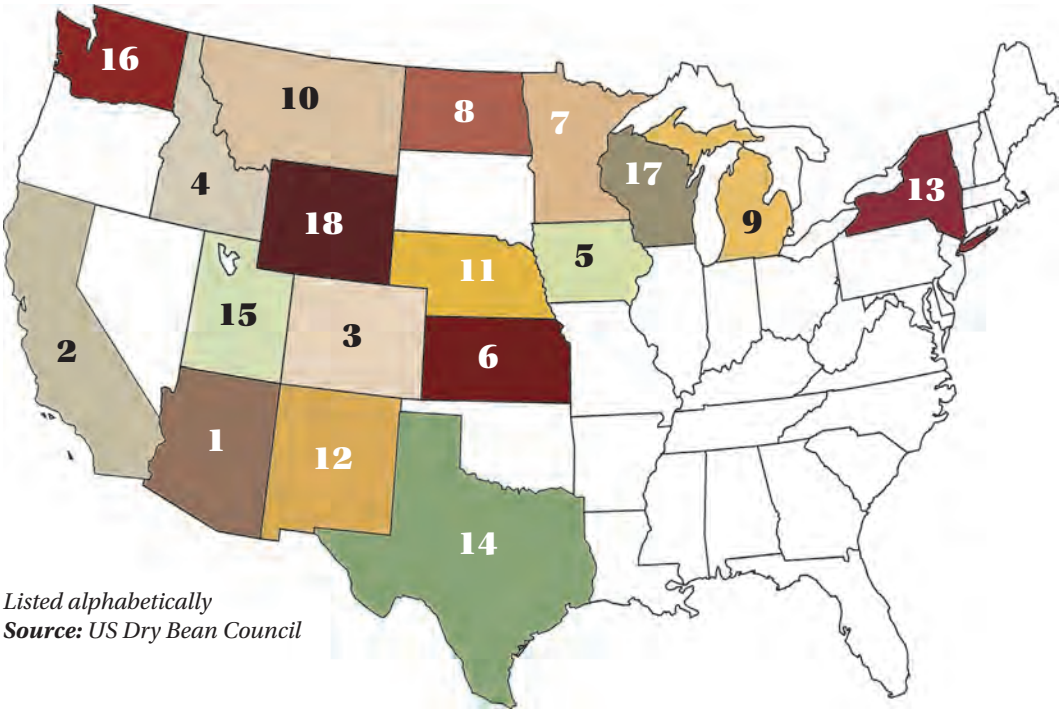
3. Colorado
Black Beans
Great Northern Beans
Light Red Kidney Beans
Navy Beans
Pinto Beans
Small White Beans

4. Idaho
Black Beans
Dark Red Kidney Beans
Great Northern Beans
Light Red Kidney Beans
Navy Beans
Pink Beans
Pinto Beans
Seed Beans
Small Red Beans
Small White Beans

5. Iowa
Adzuki Beans

6. Kansas
Navy Beans
Pinto Beans

7.Minnesota
Black Beans
Cranberry Beans
Dark Red Kidney Beans
Great Northern Beans
Light Red Kidney Beans
Navy Beans
Pink Beans
Pinto Beans
Small Red Beans



Listed alphabetically
Source: *US Dry Bean Council*

8. North Dakota
Black Beans
Cranberry Beans
Dark Red Kidney Beans
Great Northern Beans
Light Red Kidney Beans
Navy Beans
Pink Beans
Pinto Beans
Small Red Beans

9. Michigan
Adzuki Beans
Black Beans
Cranberry Beans
Dark Red Kidney Beans
Great Northern Beans
Light Red Kidney Beans
Navy Beans
Otebo Beans
Pinto Beans
Small Red Beans
Yellow Eye Beans

10. Montana
Pink Beans
Pinto Beans

11. Nebraska
Black Beans
Great Northern Beans
Light Red Kidney Beans
Navy Beans
Pink Beans
Pinto Beans

12. New Mexico
Navy Beans
Pink Beans
Pinto Beans

13. New York
Black Beans
Light Red Kidney Beans

14. Texas
Blackeye Beans
Pinto Beans

15. Utah
Pinto Beans

16. Washington
Black Beans
Dark Red Kidney Beans
Light Red Kidney Beans
Pink Beans
Pinto Beans
Small Red Beans
Small White Beans

17. Wisconsin
Light Red Kidney Beans
Dark Red Kidney Beans

18. Wyoming
Great Northern Beans
Navy Beans
Pinto Beans

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Variety Trial Results and 2006 Research Update Inside: Review the results from the 2006 Dry Bean Variety Trials beginning on page 16. Also, read about the results of research funded by Northarvest in the 2006 Northarvest Dry Bean Research Update beginning on page 27.