

**North Central Region Canola Research Program
Application Cover Page**

Project Title: Effect of paraquat and diquat applied preharvest on canola yield and seed quality

Lead Principal Investigator and Institution: Brian Jenks, North Dakota State University

Co-Principal Investigator(s): John Lukach, North Dakota State University-Langdon
Fabian Menalled, Montana State University-Bozeman

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Minot, ND 58701

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Phone Number of Lead PI: 701-857-7677

Fax Number of Lead PI: 701-857-7676

Funds Requested for 2007: \$30,000

Project Status: New _____ Renewal X

Does this project involve recombinant DNA, human subjects or vertebrate animals?
 Yes X No

If yes, please complete a CSREES Assurance Statement Form 2008 or a Research & Related Other Project Information Form that is available as part of the new application kit through Grants.gov.

Does this project involve the sale of goods or services? Yes X No
If yes, please indicate the nature of the sale in this space:

By signing this proposal, the applicant certifies that the information contained herein is true and complete to the best of their knowledge and accepts as to any award the obligation to comply with the terms and conditions of the Cooperative State Research, Education and Extension Service in effect at the time of the award.

PI Signature

Dept. Chair/REC Director signature
(applies only to NDSU applicants)

Authorized Organizational Representative
(applies only to non-NDSU applicants)

Effect of paraquat and diquat applied preharvest on canola yield and seed quality

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Montana State University
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Research Proposal

January 5, 2007

This study was conducted in 2005 and 2006. After consulting with the Canola Growers Association, we propose that the same study be conducted again in 2007 to help determine the effect of different environmental conditions. See progress report for results from 2005 and 2006.

Statement of the problem:

Current canola production practices include swathing, which helps the crop mature more uniformly across the field. Swathing at the optimum stage of ripening reduces green seed content as well as yield losses due to premature shattering.

Swathing presents financial challenges in that a grower may have to purchase a swather or pay to have his fields custom swathed. In addition, growers and custom swathers are not always able to get to every field in a timely manner. Swathing late can lead to fluffy windrows that are susceptible to blowing and increased shattering. The canola swath should be allowed to cure and ripen for 10 to 14 days, during which a strong wind may blow the swaths out of the windrow making combining very difficult and often resulting in yield losses due to shattering. Cool, wet conditions like which occurred in the 2004 growing season in the northern plains can extend the ripening and drying period to 28 days resulting in an increased risk of yield losses due to severe weather.

When it comes to swathing canola, one of the biggest challenges for canola growers is time. Swathing canola is slow and time consuming, which forces growers to begin swathing before optimum maturity in order to finish before the last of the crop is overripe. Swathing canola can also overlap with the need to be swathing other crops such as barley. A grower who has the capacity to swath 200 acres of barley per day may only be able to swath 80 acres of canola in the same time frame.

Canola growers are interested in the concept of straight combining canola. Currently, straight combining canola is not a recommended practice due to the lack of uniform maturity across fields. The risk with straight combining canola is that individual areas in a field or even on an individual plant can be ripe, but other areas are still green. Uneven maturation usually forces a grower to delay harvest, which can increase the risk of seed loss due to shattering. If straight combining canola is to become a viable practice, the grower will need a desiccant to aid in ripening the crop for harvest. Currently, there are no desiccants labeled for preharvest use in canola.

Justification:

In Europe, canola is straight combined. A unique combine header manufactured in Europe has been developed to straight combine canola. In 2004, a replicated large-scale trial was conducted in Rugby, ND to compare straight combining canola with this header versus the traditional method of swathing. Straight combining had 235 pounds per acre higher yield than swathing with similar seed and oil quality. This trial indicates that straight combining canola can be done successfully. However, the seed moisture and dockage was considerably higher with straight combining due to the fact that the stems were still green. The use of a desiccant prior to straight combining would have resulted in a drier crop at harvest.

Paraquat (Gramoxone Max) is a desiccant that is labeled for preharvest use in many crops

including soybean, dry bean, field pea, chickpea, lentil, and sunflower. Paraquat applied preharvest in canola could facilitate direct combining by drying down slow maturing areas of the field and allow growers to combine canola fields earlier.

Paraquat is not labeled yet in canola; however, USDA-IR-4 initiated residue trials in 2005 to establish a tolerance. Paraquat would likely receive full registration as early as 2008.

This study will be conducted to help determine the proper application window and harvest timing for a desiccant. If these desiccants are found to perform equally, paraquat would usually be the desiccant of choice since diquat is much more expensive. In this study, we will compare paraquat and diquat to the normal practice of swathing.

Research objectives:

1. Determine the effect of paraquat applied preharvest at three timings on canola yield, seed moisture, and seed quality.
2. Determine the effect of diquat applied preharvest at three timings on canola yield, seed moisture, and seed quality.
3. Compare yield, seed moisture, and seed quality of swathed canola to paraquat and diquat-treated canola.
4. Determine the effect of harvest timing following a paraquat or diquat application on canola yield, seed moisture, and seed quality.

Research procedures:

The study will be conducted at three locations: 1) North Central Research Extension Center, Minot, ND, 2) Langdon Research Extension Center, Langdon, ND, and 3) Montana State University, Bozeman, MT.

Paraquat and diquat will be applied preharvest at three timings as outlined in Table 1. The colors in the table describe the approximate seed color in the top, middle, and bottom one-third of the canola plant as it approaches physiological maturity. We will also document pod color in each one-third of the plant in addition to seed color. The three application timings will be approximately 3 to 4 days apart depending on weather conditions. The three timings will provide a range in canola maturity that will influence yield and seed quality and will help determine the correct application window to desiccate canola with paraquat and diquat. A tractor-mounted sprayer with the boom raised approximately 18" above the canola canopy will be used to apply paraquat and diquat. Paraquat will be applied at 1.25 pt/A with NIS at 0.25% v/v. Diquat will be applied at 1.5 pt/A with NIS at 0.25% v/v.

Table 1. Target canola stages for preharvest paraquat and diquat applications.

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Canola seed color	Application #1	Application #2	Application #3
Top 1/3	Green	Green to light green	Light green to yellow
Middle 1/3	Light green with a few just starting to turn reddish brown	Fewer light green with most light brown or reddish brown	Some light brown, but most reddish brown
Bottom 1/3	Light brown to reddish brown, some purple	Fewer light brown, mostly reddish brown to purple	Reddish brown or purple

One treatment will be swathed with a plot swather to compare current grower practices to the paraquat and diquat treatments. The paraquat, diquat, and swath treatments will be harvested at 7 and 14 days after application. The two harvest dates will help determine the consequences of delaying harvest past the minimum 7-day preharvest interval. We know that canola harvest can be delayed for days by wet soil conditions or other factors. The Reglone (diquat) label in Canada states that “delaying threshing after swathing desiccated crops will increase shattering and seed loss.” The label also recommends that the crop be harvested “no later than 14 days after application.”

Individual plots will be 10 by 30 ft arranged in a randomized complete block design with four replications. Data to be collected includes canola yield, test weight, seed moisture content at harvest, % oil content, green count, heat damage, total damage, grade, and seed loss due to shattering prior to harvest. Four sticky cards will be placed on the ground under the canopy just prior to or following the desiccant treatment. Sticky cards will be collected just prior to harvest and seeds will be counted to estimate yield loss per acre. We will also document seed and pod color at all swath and harvest dates. All data will be subjected to analysis of variance with SAS and mean separation using Fisher’s Protected LSD test at $\alpha = 0.05$.

Expected benefits:

1. Confirm the correct stages to apply paraquat and diquat as a desiccant to canola.
2. Generate important research comparing canola yield, seed moisture, seed quality, and oil content.
3. Will provide important information to aid producers in successfully straight combining canola and quantify the risks of straight combining versus swathing canola.
4. Could result in straight combining canola becoming a viable practice.

Duration:

This study will be initiated in April 2007. A report containing results, conclusions, and recommendations will be completed by February 1, 2008.

Project budget details per location:

<u>Salary</u>	<u>Cost</u>
Research Associate	\$6,000
Benefits	<u>\$1,800</u>
	\$7,800
<u>Operating</u>	
Seed	\$250
Fertilizer	\$150
Fuel	\$100
Repairs	\$300
Research supplies	<u>\$200</u>
	\$1,000
<u>Travel</u>	\$500
<u>Total</u>	\$9,300

Seed quality testing* \$2,100

* (Grade, damages kernels, dockage, moisture, green count: ADM in Velva, ND will analyze seeds at \$12.50 x 56 samples x 3 locations)

Each location will receive \$9,300 to conduct the study. All samples will be sent to Minot for analysis. Minot will need \$2,100 to pay for the seed quality testing by ADM.

Total funding at each location:

Minot	\$11,400 (includes seed quality testing for all locations)
Langdon	\$9,300
Bozeman	\$9,300

Total funding requested:

\$30,000

UNITED STATES DEPARTMENT OF AGRICULTURE
COOPERATIVE STATE RESEARCH, EDUCATION, AND EXTENSION SERVICE

BUDGET

OMB Approved 0524-0039
Expires 03/31/2004

ORGANIZATION AND ADDRESS

USDA AWARD NO.

North Dakota State University Fargo, ND 58105		DURATION PROPOSED MONTHS: <u> 12 </u> Funds Requested by Proposer	DURATION PROPOSED MONTHS: <u> </u> Funds Approved by CSREES (If different)	Non-Federal Proposed Cost- Sharing/ Matching Funds (If required)	Non-federal Cost- Sharing/Matching Funds Approved by CSREES (If Different)
PROJECT DIRECTOR(S) Dr. Brian M. Jenks, NDSU John Lukach, NDSU Dr. Fabian D. Menalled, Montana State University					
A. Salaries and Wages					
1. No. Of Senior Personnel		CSREES-FUNDED WORK MONTHS			
		Calendar	Academic	Summer	
a. <u> </u> (Co)-PD(s).....					
b. <u> </u> Senior Associates.....					
2. No. of Other Personnel (Non-Faculty)					
a. <u> 3 </u> Research Associates/Postdoctorates		2.4			18000
b. <u> </u> Other Professionals					
c. <u> </u> Paraprofessionals					
d. <u> </u> Graduate Students					
e. <u> </u> Prebaccalaureate Students					
f. <u> </u> Secretarial-Clerical					
g. <u> </u> Technical, Shop and Other					
Total Salaries and Wages →					18000
B. Fringe Benefits (If charged as Direct Costs)					5400
C. Total Salaries, Wages, and Fringe Benefits (A plus B) →					
D. Nonexpendable Equipment (Attach supporting data. List items and dollar amounts for each item.)					
E. Materials and Supplies					5100
F. Travel					1500
G. Publication Costs/Page Charges					
H. Computer (ADPE) Costs					
I. Student Assistance/Support (Scholarships/fellowships, stipends/tuition, cost of education, etc. Attach list of items and dollar amounts for each item.)					
J. All Other Direct Costs (In budget narrative, list items and dollar amounts, and provide supporting data for each item.)					
K. Total Direct Costs (C through J) →					30000
L. F&A/Indirect Costs (If applicable, specify rate(s) and base(s) for on/off campus activity. Where both are involved, identify itemized costs included in on/off campus bases.)					
M. Total Direct and F&A/Indirect Costs (K plus L) →					
N. Other →					
O. Total Amount of This Request →					30000
P. Carryover -- (If Applicable)Federal Funds: \$ Non-Federal funds: \$ Total \$					
Q. Cost-Sharing/Matching (Breakdown of total amounts shown on line O)					
Cash (both Applicant and Third Party) →					
- Non Cash Contributions (both Applicant and Third Party)					
AME AND TITLE (Type or print)		SIGNATURE (required for revised budget only)			DATE
Project Director					
Authorized Organizational Representative					
Signature (for optional use)					

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0524-0039. The time required to complete this information collection is estimated to average 1.00 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

Form CSREES-2004 (12/2000)

ORGANIZATION AND ADDRESS Montana State University (subcontract with North Dakota State University) Bozeman, MT				USDA AWARD NO.			
PROJECT DIRECTOR(S) Dr. Fabian D. Menalled, Montana State University				DURATION PROPOSED MONTHS: _12_	DURATION PROPOSED MONTHS: _____	Non-Federal Proposed Cost-Sharing/ Matching Funds (If required)	Non-federal Cost-Sharing/Matching Funds Approved by CSREES (If Different)
				Funds Requested by Proposer	Funds Approved by CSREES (If different)		
A. Salaries and Wages		CSREES-FUNDED WORK MONTHS					
1. No. Of Senior Personnel		Calendar	Academic	Summer			
a. ____ (Co)-PD(s).....							
b. ____ Senior Associates							
2. No. of Other Personnel (Non-Faculty)							
a. _1_ Research Associates/Postdoctorates		2.4			6000		
b. ____ Other Professionals							
c. ____ Paraprofessionals							
d. ____ Graduate Students							
e. ____ Prebaccalaureate Students							
f. ____ Secretarial-Clerical							
g. ____ Technical, Shop and Other							
Total Salaries and Wages →					6000		
B. Fringe Benefits (If charged as Direct Costs)				1800			
C. Total Salaries, Wages, and Fringe Benefits (A plus B) →				7800			
D. Nonexpendable Equipment (Attach supporting data. List items and dollar amounts for each item.)							
E. Materials and Supplies				1000			
F. Travel				500			
G. Publication Costs/Page Charges							
H. Computer (ADPE) Costs							
I. Student Assistance/Support (Scholarships/fellowships, stipends/tuition, cost of education, etc. Attach list of items and dollar amounts for each item.)							
J. All Other Direct Costs (In budget narrative, list items and dollar amounts, and provide supporting data for each item.)							
K. Total Direct Costs (C through J) →				9300			
L. F&A/Indirect Costs (If applicable, specify rate(s) and base(s) for on/off campus activity. Where both are involved, identify itemized costs included in on/off campus bases.)							
M. Total Direct and F&A/Indirect Costs (K plus L) →							
N. Other..... →							
O. Total Amount of This Request..... →				9300			
P. Carryover -- (If Applicable)Federal Funds: \$				Non-Federal funds: \$	Total \$		
Q. Cost-Sharing/Matching (Breakdown of total amounts shown on line O)							
Cash (both Applicant and Third Party) →							
- Non Cash Contributions (both Applicant and Third Party)							
AME AND TITLE (Type or print)				SIGNATURE (required for revised budget only)		DATE	
Project Director							
Authorized Organizational Representative							
Signature (for optional use)							

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Form CSREES-2004 (12/2000)

Brian M. Jenks

North Dakota State University Phone: (701) 857-7677
North Central Res. Ext. Center Fax: (701) 857-7676
5400 Highway 83 South E-mail: brian.jenks@ndsu.edu
Minot, ND 58701

Education:

Ph.D., Weed Science, Department of Agronomy, University of Nebraska, Lincoln, Nebraska.
December 1995.

Dissertation title: Movement, Degradation, and Detection of Atrazine Following Long-term Use in a Continuous Corn Cropping System

M.S., Agronomy, Department of Plants, Soils, and Biometeorology, Utah State University, Logan Utah. December 1990.

Thesis Title: Efficacy and Environmental Evaluation of DPX-79406 and DPX-V9360 for Wild Proso Millet Control

B.S., Agronomy, Department of Plants, Soils, and Biometeorology, Utah State University, Logan, Utah. June 1988.

Professional Experience:

Dec 97-PresentWeed Scientist, North Dakota State University, North Central Research Extension Center, Minot, North Dakota

Joint research (85%) and extension (15%) appointment. Responsible for developing and implementing an integrated weed management program in north central North Dakota that focuses on solving key weed management problems in chickpea, lentil, dry pea, sunflower, dry bean, canola, crambe, flax, and small grains.

Aug 95-Nov 97 Extension Coordinator, National Jointed Goatgrass Research Initiative, University of Nebraska, Scottsbluff, Nebraska

Central resource person to collect and disseminate information and to coordinate technology transfer activities for the National Jointed Goatgrass Research Initiative.

1991-95 **Research Assistant, Weed Science, University of Nebraska, Lincoln, Nebraska.**

Dissertation research focused on the fate of atrazine in continuous corn. Research objectives were to:

- 1) Compare an enzyme immunoassay with gas chromatography for atrazine detection in soil and water.
- 2) Determine the influence of surface and subsurface soil properties on atrazine sorption and degradation.
- 3) Evaluate the ability of the LEACHM model to adequately predict atrazine fate in surface and subsurface soils.

1988-91 **Research Assistant, Weed Science, Utah State University, Logan, Utah.**

Thesis research focused on wild proso millet control in corn. Research objectives were to:

- 1) Determine optimum application time and efficacy of DPX-V9360 and DPX-79406 for wild proso millet control.
- 2) Evaluate sensitivity of wheat, oats, alfalfa, corn, dry beans, and safflower to DPX-V9360 and DPX-79406 carryover.

Membership in Professional Organizations:

Weed Science Society of America
Western Society of Weed Science
North Central Weed Science Society
North Dakota Dry Pea & Lentil Assoc.
Northern Canola Growers Assoc.

Extension Publications

McKay, K, P. Miller, B. Jenks, J. Riesselman, K. Neill, D. Buschena, and AJ Bussan. Growing chickpea in the northern Great Plains. Extension publication A-1236, North Dakota State University, Fargo, ND, 58105.

Refereed Manuscripts (Published or in preparation)

Kegode, G. and B. M. Jenks. Biennial wormwood (*Artemisia biennis*) control in dry bean (*Phaseolus vulgaris*) (In preparation – Paper to be submitted to Weed Tech.)

Jenks, B. M., K. R. McKay, D. M. Markle, and G. P. Willoughby. Long-term Canada thistle control using crop rotations, cultural practices, and herbicide combinations. (In preparation - Paper to be submitted to Weed Sci.)

Jenks, B. M., K. R. McKay, D. M. Markle, and G. P. Willoughby. Effect of application rate and timing on weed control in Roundup Ready, Liberty Link, and Clearfield canola. (In preparation - Paper to be submitted to Weed Tech.)

Jenks, B. M., F. W. Roeth, A. R. Martin, and D. L. McCallister. 1998. The influence of surface and subsurface soil properties on atrazine sorption and degradation. Weed Sci. 46:132-138.

Jenks, B. M., F. W. Roeth, and A. R. Martin. 1997. Comparison of an enzyme immunoassay with gas chromatography for atrazine determination in water and soil. Bull. Environ. Contam. Toxicol. 58:696-703.

Abstract and Proceedings Papers - 39

Research Reports - Western Society of Weed Science, 41 reports
North Central Weed Science Society, 8 reports
North Dakota Weed Control Research Reports

**UNITED STATES DEPARTMENT OF AGRICULTURE
COOPERATIVE STATE RESEARCH, EDUCATION, AND EXTENSION SERVICE**

OMB Approved 0524-0039
Expires 03/31/2004

CURRENT AND PENDING SUPPORT

Instructions:

1. Record information for active and pending projects, including this proposal. (Concurrent submission of a proposal to other organizations will not prejudice its review by CSREES.)
2. All current efforts to which project director(s) and other senior personnel have committed a portion of their time must be listed, whether or not salary for the person involved is included in the budgets of the various projects.
3. Provide analogous information for all proposed work which is being considered by, or which will be submitted in the near future to, other possible sponsors including other USDA programs.

NAME (List/PD #1 first)	SUPPORTING AGENCY AND AGENCY ACTIVE AWARD/PENDING PROPOSAL NUMBER	TOTAL \$ AMOUNT	EFFECTIVE AND EXPIRATION DATES	% OF TIME COMMITTED	TITLE OF PROJECT
	Active:				
B. Jenks	NCGA, NDOC, CSREES National Canola Research Program	33,150	2006-2007	5	Impact of preceding crops on diseases in canola
B. Jenks and E. Eriksmoen	Cool Season Food Legume	25,114	2006-2007	10	Effect of seeding date, seeding rate, and fall- or spring-applied herbicides for weed management in lentil.
R. Lym et al.	CSREES special grant – Invasive weeds	20,213	2005-2008	3	Yellow toadflax control
B. Jenks and J. Lukach	CSREES – National Canola Research Program	20,700	2006-2007	5	Effect of paraquat and diquat applied preharvest on canola yield and seed quality
B. Jenks et al.	ND Oilseed Council	11,000	2006-2007	3	Safflower tolerance to sulfentrazone in conventional and no-till systems
B. Jenks	NDDPLA	11,800	2006-2007	5	Evaluation of dry pea tolerance to experimental herbicides and control of prickly lettuce and false chamomile.
	Pending:				
B. Jenks and E. Eriksmoen	CSREES – Cool Season Food Legume	22,220	2007-2008	5	Prickly lettuce/chamomile control and pulse crop tolerance to new herbicides

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Form CSREES-2005 (12/2000)

John R. Lukach

NDSU Langdon Research and Extension Center

9280 107th Ave ND, Langdon, ND 58249

Phone 701-256-2582, Fax 701-256-2580, E-mail john.lukach@ndsu.edu

Education:

M.S. 1982, North Dakota State University, Thesis topic: Gluten Strength Evaluation in Durum Wheat, Plant Breeding

B.S. 1974, North Dakota State University, Agronomy

Employment:

July 2000. Superintendent/Plant Scientist, NDSU Langdon Research Extension Center, Langdon, ND.

The superintendent responsibilities are 30% administrative as supervisor over the day to day operations of the center. He also coordinates labor, equipment and resources used by two other centers scientists and for about 20 projects from the Main ND Experiment Station at Fargo who do research at Langdon. The Langdon Center employs eight full time staff. The superintendent's research program is plant protection research in plant pathology, weed control and soil fertility.

June 1982 - July 2000 Director/Plant Scientist, NDSU Langdon Research Extension Center, Langdon.

March 1976 - June 1982. Assistant Agronomist, NDSU North Central Research and Extension Center, Minot, ND.

Annual Producer Oriented Publications:

Performance of Small Grains and Flax in Northeastern North Dakota, 1990-2006.

Performance of Row, Oil and Specialty Crops in Northeastern North Dakota, 1990-2006.

Small Grains Disease Report for Northeast North Dakota, 1993-1994 and 1997-2005

Publications:

McMullen M., and Lukach J. 2005. Results of the uniform fungicide trial on barley, North Dakota, 2005

Page 217 in: Proceedings of the 2005 National Fusarium head blight Forum. Dec. 11-13,

Milwaukee, WI. U.S. Wheat and Barley Scab Initiative, Michigan State Univ., East Lansing,

MI McMullen, M, Lukach, J, McKay, K, and Schatz, B. 2005. Wheat uniform fungicide trials, ND, 2005

Pages 218-220: Proceedings of the 2005 National Fusarium head blight Forum. Dec. 11-13

Milwaukee, WI. U.S. Wheat and Barley Scab Initiative, Michigan State Univ.

Bradley, C. A., S. Halley, J. Lukach, M. McMullen, J. Knodel, G. Endres, and T. Gregoire. 2004.

Distribution and severity of pasmo on flax in North Dakota and evaluation of fungicides and cultivars for management. Plant Dis. 88: 1123-1126

Lukach, J. 2004. Post applied Nitrogen for Wheat and Canola Production. 2004 Manitoba-North Dakota Zero-Till Proceedings. Vol. 26:126-128.

Lukach, J. 2004. Yield Response to Nitrogen Fertilizer by Application timing in Hybrid and Open Pollinated Canola Varieties. 2004 Manitoba-North Dakota Zero-Till Proceedings.

Halley, S. and Lukach, J. 2004. Calcium supplement alone or in combination with Ronilan fungicide for control of white mold in canola, 2003. Fungicide and Nematicide Tests.

Howatt K, Endres G, Lukach J, Jenks G, Valenti S, and Rystedt C. 2004. Glyphosate-Resistant Wheat Research in North Dakota. Poster. 57th Western Society of Weed Science

Halley, S. and J. Lukach. 2003. Effect of additives in combination with fungicides for control of Sclerotinia in canola Langdon, 2002. Fungicide and Nematicide Tests. Report 58:FC034.

Halley, S and J. Lukach. 2003. Flax cultivar response to fungicide application for the control of pasmo disease, 2002. Fungicide and Nematicide Tests Report 58:FC051.

Lukach, J. R. and E. J. Deibert. 2003. Timing sulfur fertilizer application for canola production in Northeast North Dakota. Poster. U.S. Canola Research Conference Washington, DC from Feb 23-25, 2003.

Lukach, J. 2001. Effects of Dew, Spray Volume and Adjuvant on Fungicide Control of Fusarium Head Blight in Durum wheat, HRSW and Barley. 2001 National Fusarium Head Blight Forum Proceedings.

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John Lukach	Active: None				
None	Pending:				

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Form CSREES-2005 (12/2000)

FABIÁN DANIEL MENALLED

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719 Leon Johnson Hall
Montana State University
Bozeman, MT 59717-3120
menalled@montana.edu

EDUCATION

1996. Ph.D. University of Massachusetts, Amherst.

1984. B.S. Biological Sciences. University of Buenos Aires, Argentina.

EMPLOYMENT HISTORY

2004 – Present. Assistant Professor of Weed Science. Department of Land Resources and Environmental Sciences. Montana State University.

2003. Associate Scientist. Department of Agronomy. Iowa State University.

2001 – 2002. Postdoctoral Research Associate. Department of Agronomy. Iowa State University.

1998 – 2000. Visiting Assistant Professor. Department of Entomology. Michigan State University.

1996 - 1997. Postdoctoral Research Associate. Department of Entomology. Michigan State University.

1995, 4 months. Research Assistant. Harvard Forest, Harvard University.

1990 - 1995. Research Assistant. University of Massachusetts.

1986 - 1990. Research Assistant. National Scientific Research Council, Buenos Aires, Argentina.

1985 - 1986. Research Assistant. Department of Biological Sciences. University of Buenos Aires, Buenos Aires, Argentina.

RESEARCH AND EXTENSION PUBLICATIONS

Peer reviewed publications: 32

Peer reviewed articles in preparation: 4

Book chapters: 9

Extension / experiment station bulletins: 13

Extension news releases / popular press articles: 29

Current and past two years peer-reviewed publications

White, S., K. A. Renner, F.D. Menalled and D. A. Landis. *Accepted after revisions.* Feeding preferences of weed seed predators and effect on weed emergence. *Weed Sc.*

Menalled, F. and R. Smith. *In press.* Competitiveness of herbicide resistant and susceptible kochia (*Kochia scoparia* (L.) Schrad.) under contrasting management practices. *Weed Biol. Mgmt.*

Menalled, F. *In Press.* Ecology and agriculture: Strategies for a sustainable development (*In Spanish*). *Biology*. 7th Edition in Spanish. H. Curtis; N. Sue, B. Arnes, A. Schnek and A. Massarini, eds. Editorial Médica Panamericana

Menalled, F., R. Smith, J. Dauer, and T. Fox. 2007. Impact of agricultural management systems on carabid beetle communities and invertebrate weed seed predation. *Agr. Ecosys. Environ.* 118: 49-54.

Menalled, F, M. Liebman, and K. Renner. 2006. The ecology of weed seed predation in herbaceous crop systems. *In Handbook of Sustainable Weed Management.* D. Batish, ed., pp 297-327. The Haworth Press, Inc. Binghamton, NY.

Smith R.G., B. Maxwell, F. Menalled, and L. Rew. 2006. Lessons from agriculture may improve the management of invasive plants in wildland systems. *Frontiers Ecol. Environ.* 4:428-434.

Alvarez, J.M., F. Menalled, and M.A. Hoy. 2006. Molecular tools in biological control. (In Spanish). *Revista Manejo Integrado de Plagas y Agroecología* 74: 4-11.

Heggenstaller A.H., F. D. Menalled, M. Liebman, P.R. Westerman. 2006. Seasonal patterns in post-dispersal seed predation of *Abutilon theophrasti* and *Setaria faberi* in three cropping systems. *J. Appl. Ecol.* 43: 999-1010.

Menalled, F., D. Buhler, and M. Liebman. 2005. Germination and early growth responses of crop and weed species to composted swine manure under greenhouse conditions. *Weed Tech.* 19: 784-789.

Menalled, F., K. Kohler, D. Buhler, and M. Liebman. 2005. Effects of composted swine manure on weed seedbank. *Agr. Ecosyst. Environ.* 111: 63-69.

- Westerman, P., M. Liebman, F. Menalled, A. Heggenstaller, R. Hartzler, and P. Dixon. 2005. Are many little hammers effective? Velvetleaf population dynamics in two- and four-year crop rotation systems. *Weed Sci.* 53: 382-392.
- Landis, D., F. Menalled, A. Costamagna, and T. Wilkinson. 2005. Manipulating plant diversity to enhance beneficial arthropods in agricultural landscapes. *Weed Sci.* 53: 902-908.

RESEARCH PRESENTATIONS

INVITED SEMINARS: 23

INVITED PRESENTATIONS AT SYMPOSIUMS: 21

Research Presentations at Regional, National, and International Meetings: 70

PROFESSIONAL SERVICE

2006-2009. Associate Editor of the *Agronomy Journal*.

2006-2007. Chair of the Agroecology Section. Ecological Society of America.

2006. Organizer of the Agroecology symposium "*Beyond labeling: Comparing the sustainability of conventional and certified alternative farming systems.*" Ecological Society of America meeting. Nashville, Tennessee

2006. Organizer and participant of the NC1026 meeting in Bozeman, Montana.

2006. Participant of the WERA77 meeting "Managing Invasive Weeds in Wheat", Denver, Colorado.

2005. Ad hoc reviewer. USDA/NRI. Integrative Biology of Arthropods and Nematodes Program

2002. Judge at the Buell-Braun Student Competition. Ecological Society of America.

PROFESSIONAL SOCIETIES

Ecological Society of America
Weed Science Society of America
Western Society of Weed Science
Weed Science Society of Japan

GRANTS AND CONTRACTS FUNDED SINCE 1988: \$1,849,512

TEACHING ACTIVITIES

Iowa State University. Sustainable Agriculture 530 -Graduate - Ecologically Based Pest Management Strategies. Jointly offered with Dr. M. Liebman, Dr. J. Obrycki, and Dr. M. Gleason.

Iowa State University. Agronomy 230 – Undergraduate – Crop Structure and Function. Jointly offered with Dr. R. Romero

Michigan State University. Entomology 812 - Graduate - Contributions of Ecological Theory to Biological Control.

Michigan State University. Entomology 812 - Graduate - Current Ideas in Insect Behavior and Ecology. Jointly offered with Dr. R. Isaacs.

Michigan State University. Extension Training Course. Biological Control in Field Crops; A Web-based Course for Agricultural Professionals. Jointly offered with Dr. D. Landis.

University of Massachusetts. Teaching Assistant. Natural Resources Conservation 150 - Undergraduate - Fundamentals of Applied Ecology.

University of Lujan, Buenos Aires, Argentina. Teaching Assistant. General Biology.

University of Buenos Aires, Buenos Aires, Argentina. Teaching Assistant. General Ecology

University of Buenos Aires, Buenos Aires, Argentina. Teaching Assistant. Principles of Biology

University of Buenos Aires, Buenos Aires, Argentina. Teaching Assistant. Introduction to Botany

University of Buenos Aires, Buenos Aires, Argentina. Teaching Assistant. Environmental Ecology

University of Buenos Aires, Buenos Aires, Argentina. Teaching Assistant. Landscape Ecology

biological control in IPM. *In* Emerging Technologies in Integrated Pest Management: Concepts, Research and Implementation. Kennedy G., T. Sutton eds., pp. 226-239. APS Press, St. Paul.

Landis, D., and F. Menalled. 1998. Ecological considerations in the conservation of effective parasitoid communities in agricultural systems. *In* Conservation Biological Control, P. Barbosa ed., pp. 101-121. Academic Press. San Diego, CA.

**UNITED STATES DEPARTMENT OF AGRICULTURE
COOPERATIVE STATE RESEARCH, EDUCATION, AND EXTENSION SERVICE**

OMB Approved 0524-0039

**CURRENT AND PENDING SUPPORT
Fabian Menalled**

Instructions: 1. Record information for active and pending projects, including this proposal. (Concurrent submission of a proposal to other organizations will not prejudice its review by CSREES.) 2. All current efforts to which project director(s) and other senior personnel have committed a portion of their time must be listed, whether or not salary for the person involved is included in the budgets of the various projects. 3. Provide analogous information for all proposed work which is being considered by, or which will be submitted in the near future to, other possible sponsors including other USDA programs.					
NAME (List/PD #1 first)	SUPPORTING AGENCY AND AGENCY ACTIVE AWARD/PENDING PROPOSAL NUMBER	TOTAL \$ AMOUNT	EFFECTIVE AND EXPIRATION DATES	% OF TIME COMMITTED	TITLE OF PROJECT
Pollnac, F. Maxwell, B. Menalled, F.	Active: WSARE	\$10,000	7/2006-7/2007	5%	Effects of weed communities in conventional and organic agricultural systems
Menalled, F.	WSARE	\$98,819	7/2005-10/2008	5%	Developing Distance Learning Based on Perceptions and Knowledge of Producers and Agricultural Professionals
Menalled, F Sciegienka, J	Montana Alfalfa Seed Committee	\$4,223	7/2006-7/2007	5%	Integrated management of Canada thistle
King, S. Menalled, F.	MSU Biobased Institute	\$20,000	7/2006-7/2007	2%	Weed control program for biodiesel fuel production
Menalled, F. Rew, L. Maxwell, B.	Organic Farming Research Foundation	\$4,874	5/2005-5/2007	5%	Assessing the Importance of Weed Diversity in Organic Wheat Fields
Menalled, F. Pollnac, F. Harbuck, K. Maxwell, B.	Montana Noxious Weed Trust Fund	\$10,538	7/2005-7/2007	5%	Assessing Weed Seedbank Dynamics, Weed Emergence, and Weed Competition in Spring Wheat Systems
Menalled, F. Harbuck, K. Rew, L.	Montana Wheat and Barley Committee	\$7,307	7/2006-7/2007	5%	Assessing Weed Seedbank Dynamics, Weed Emergence, and Weed Competition in Spring Wheat Systems
Menalled, F. Miller, P. Dyer, W.	Montana Noxious Weed Trust Fund	\$29,620	7/2005-7/2007	5%	Reducing the risk of crop injury due to soil-applied herbicides
M. Schat, Sing, S., Peterson, R., Weaver, D., Menalled, F.	Montana Noxious Weed Trust Fund	\$23,940	7/2006-7/2007	2%	A pilot project to demonstrate the feasibility of managing toadflax with biological control in burned areas
P.Miller, D.Buschena, C.Jones, B.Maxwell, R.Engel, F.Menalled, B.Jacobsen	CSREES-Integrated Organic Program	478,522	10/2005-9/2008	5%	Organic Production in the challenging environment of the Northern Great Plains: from transition to sustainability
Menalled, F. Miller, P. Blodgett, S.	WIPM. Addressing Western IPM issues	\$47,126	10/2005-9/2007	5%	Research and Extension on Integrated Biological and Cultural Management of Canada Thistle
Menalled, F, Davis, E.	Private companies	\$94,615	none	2%	Testing new and existing technology for weed control and crop safety. Unrestricted gifts.
Pending:					
Menalled, F. P. Miller, S. Blodgett, J. Sciegienka, N. Zidack, and J. Sciegienka	Organic Farming Research Foundation.	\$10,182	7/2007-7-2009	5%	Assessing the existence of synergistic interactions between pathogens and beneficial insects of Canada thistle
Menalled, F. P. Miller, S. Blodgett, J. Sciegienka, N. Zidack, and E. Davis	Montana Noxious Weed Trust Fund. Requested:	\$10,764	7/2007-7-2008	5%	Integration of pathogens, beneficial insects, and herbicides in the management of Canada thistle.

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0524-0039. The time required to complete this information collection is estimated to average 1.00 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Form CSREES-2005 (12/20)