

**49th Annual
Montana Seed Potato
Seminar**

Proceedings



**Hosted by:
Northwest Montana Seed Potato Growers
In Cooperation With
Montana State University Extension Services**



November 11th, 12th and 13th, 2014

Hilton Garden Inn Missoula, Montana

Seminar Hosts: Northwest Montana Seed Potato Growers

Canyon View Farms, Inc.

Fleming Farms, Inc.

Don Koberg

Lake Farms, Inc.

Lake Seed, Inc.
Tim and Chanel Lake
Seminar Chair

Lake's Glacier View Farm

Mangels Station

Starkel Farms, Inc.
Roger and Kathy Starkel
Local Arrangements

Edward Starkel, LLC.

Streich & Associates, Inc.

Tobol Farms, Inc.

Staff of Montana Seed Potato Certification

Dr. Nina Zidack, Director

Susie Siemsen, Laboratory Supervisor

Eileen Carpenter, Inspector, Research Assistant

Elaine Nichols, Research Assistant

Kim Prosek, Inspector, Research Assistant

Teresa Meeker, Research Assistant

Barbara Oyster, Research Assistant

Jill Hiemburg, Research Assistant

Becky Huntsman, Program Coordinator

PROGRAM

2014 MPIA Member's Annual Meeting and
49th Annual Seed Potato Seminar
Missoula, Montana

TUESDAY, NOVEMBER 11th

10:00 a.m. - Research Committee Meeting

11:00 a.m. - Advisory Committee Meeting

2:00 p.m. - MPIA Board of Directors Meeting

4:00 p.m. - MPIA MEMBERS MEETING
Members Only Please

WEDNESDAY, NOVEMBER 12th

7:30 a.m. - Registration Open

8:00 a.m. - Coffee Break
Sponsored by Westland Seed

8:30 a.m. - The 2014 Crop Nina Zidack

8:45 a.m. - NPC Update Dan Lake followed by John Keeling

9:15 a.m. - United States Potato Promotions Board Steve Cottom followed by Blair Richardson

9:45 a.m. - PVMI Update Jeanne Debons

10:00 a.m. - Break

10:30 a.m. - Perspectives from 20 years of Potato Disease Management Research in Montana State University Barry Jacobsen

11:15 a.m. - Potato Leadership School Tim Droge

11:30 a.m. -United Growers of Montana John Venhuizen followed by Buzz Shahan

12:00 p.m. - Lunch
Sponsored by United Potato Growers of America

1:00 p.m. - Trade Show

1:00 p.m. - Ladies Lounge - Wine and Chocolates
Sponsored by Northwest Farm Credit Services

PROGRAM

2014 MPIA Member's Annual Meeting and
49th Annual Seed Potato Seminar
Missoula, Montana

4:30 p.m. - Reception

Sponsored by Spudnik, Wilber Ellis, Tractor & Equipment Co., Western States Equipment, Campbell Aviation, Mission Valley Ag, Helena Chemical Co., Milestone, BASF, Bayer Crop Science

5:00 p.m. - Entertainment

The Dark Horse Band
Sponsored by First Interstate Bank

THURSDAY November 13th

7:00 a.m. - 8:15 a.m. Breakfast

Sponsored by Watson Irrigation

8:00 a.m. - Registration

8:00 a.m. - Coffee Break

Sponsored by Lockwood Manufacturing

8:20 a.m. - Welcome

Tim Lake, Northwest Montana Seed Potato Growers

8:30 a.m. - Everything You Always Wanted to Know About Ring Rot but Were Afraid to Ask.

Neil Gudmestad, NDSU

9:15 a.m. - Contribution of Non-Colonizing Aphids to PVY Incidence in Potato in Southern Idaho

Erik Wenninger, UI

10:00 a.m. - Break

10:30 a.m. - Integrated Management of PVY using Roguing, BmJ Induced Resistance, Stylet oils and No-Gap Insecticides

Barry Jacobsen, Nina Zidack and Phil Hamm

11:15 a.m. - Keynote Address

John Youngberg, Executive Vice-President, Montana Farm Bureau Federation

12:00 p.m. - Luncheon

1:00 p.m. - New High Profile Diseases of Potato, How Bad are They?

Phil Hamm, OSU

1:45 p.m. - Think You Know Who Gets Your Property When You Die? Even if You Have a Will or Trust? Think Again!!!!

Marsha Goetting, MSU

SPEAKER BIOGRAPHIES

**Barry Jacobsen
Montana State University
Bozeman, MT**

Barry received his BS and MS degrees from the University of Wisconsin-Madison in 1969 and 1971 respectively and his Ph.D. from the University of Minnesota in 1973. He came to Montana State as Dean of the College of Agriculture and Director of the Montana Agricultural Experiment Station in 1992 and in 1994 he returned to the faculty of the Department of Plant Pathology. From late 1994-1996 he was the USDA IPM Program Coordinator in Washington, DC while continuing his research and extension program at MSU. He has worked in potato research and commercial potato production and IPM since 1974. While at MSU he has supervised 7 Ph.D. and 6 MS students in his program focusing on integrated disease management for potato and sugar beets and on biological control of diseases of these crops. His discovery of a *Bacillus mycoides* isolate (BmJ) that induces plant resistance to bacterial, fungal and virus diseases has provided a new tool in integrated disease management and BmJ will soon be registered by CERTIS USA.

**Neil Gudmestad, Ph.D.
North Dakota State University
Fargo, ND**

Dr. Neil C Gudmestad has conducted research on the diseases of potato for over 37 years. He began his career in seed potato certification with the North Dakota Department of Agriculture and joined the faculty at North Dakota State University in 1985. Dr. Gudmestad's research program conducts research on the biology and management of potato diseases with a special emphasis on studying emerging and re-emerging pathogens of potato in the United States. Dr. Gudmestad has published over 350 peer-reviewed articles, book chapters, technical papers and other publications over his career. Dr. Gudmestad has been honored by a number of organizations including Meritorious Service Awards from the Northern Plains Potato Growers Association in 1996 and the National Potato Council in 2000. Dr. Gudmestad has also received a number of honors and awards for his research and was named one of the inaugural University Distinguished Professors at NDSU in 2007, the highest honor the university can bestow.

**Erik Wenninger
University of Idaho
Kimberly Research & Extension Center
Kimberly, ID**

Since 2009, Erik has been an Assistant Professor of Entomology at University of Idaho, Kimberly Research & Extension Center, Kimberly, Idaho, studying behavior, ecology, and management of insect pests and their natural enemies in potato and sugar beet. Prior to working at University of Idaho, worked as a postdoctoral research associate with United States Department of Agriculture – Agricultural Research Service in Washington state and in Florida. He earned his Ph.D. in Entomology in 2005 at University of Massachusetts.

John Youngberg
Executive Vice President
Montana Farm Bureau Federation
Bozeman, MT

John Youngberg has served in several capacities with the Montana Farm Bureau during his 23year tenure, including, Membership field staff, Director of Membership, and Director of Member Services and Vice President of Governmental Affairs. Throughout his career with Farm Bureau he has served as a lobbyist. He has served as the chairman of the Statewide TMDL advisory committee since its inception. He also serves as a member of the Montana Board of Research and Commercialization, which awards \$2.4 million annually for research projects in Montana

John is also involved in local government serving on the Belgrade City Council for the last 24 years, and on the Belgrade City/County Planning Board. He has lived in Belgrade for 39 years where his wife is the Executive Director of the Belgrade Chamber of Commerce.

Phil Hamm, Ph.D.
Director & Professor Emeritus
Hermiston Agricultural Research & Extension Center
Oregon State University
Hermiston, OR

Phil Hamm has been with Oregon State University for nearly 40 years, initially working on diseases of conifer seedlings before moving to the Hermiston Agricultural Research and Extension Center in 1990 as the extension plant pathologist. Since that time he has had responsibility of diseases of high value irrigated crops in the Columbia Basin. Of particular importance has been diseases impacting potatoes. Over the years he has develop a program that has provided significant information to the regions potato growers related to the usefulness and proper way to use fumigation products, management of Verticillium Wilt, identification and management of silver scurf, corky ring spot, and other virus diseases of potato, primarily Potato Virus Y (PVY). Hamm became the director of the research station in 2005 and “semi-retired” in 2012 from being the plant pathologist but has continued to serve in that role. A new plant pathologist has recently been hired. Hamm will continue to serve as the unit director for the foreseeable future.

Marsha A. Goetting, Ph.D., CFP®, CFCS
Professor and Extension Family Economics Specialist
Montana State University
Bozeman, MT

Dr. Marsha A. Goetting is a Professor and Extension Family Economics Specialist at Montana State University in Bozeman. During the past six years she has presented over 330 educational sessions reaching over 11,500 Montanans with financial and estate planning information. She has also authored over 76 MontGuides and bulletins and has received national, regional, and state awards for her financial management and estate planning programs. Dr. Goetting received her Bachelors and Masters degrees in Family Economics and Adult Education from Kansas State University and her Ph. D. from Iowa State University.

SPEAKER ABSTRACTS

Dr. Barry Jacobsen

“Perspectives from 20 years of Potato Disease Management Research in MT”

It has been my privilege to work for Montana Seed Potato producers for the past 20 years. During this time the pathology program has made several contributions towards maintaining the high standards of Montana grown seed potatoes. The pathology program has focused on management techniques for Rhizoctonia canker and black scurf, black dot root rot, silver scurf, common scab, Sclerotinia white mold, PVY and storage diseases caused by soft rot bacteria and Fusarium sambucinum. Additionally, I have worked on BmJ, a bacillus bacterium that induces plant resistance and which has been shown to be useful in management of early blight, late blight, Sclerotinia white mold and PVY.

Rhizoctonia work began in 1994 and focused on the then new fungicide, azoxystrobin (Quadris/Dynasty). We were the first to show the exceptional efficacy of this compound both as a seed treatment (Dynasty) and as an infurrow planting time treatment. Yield increases of 10% or more over standard seed treatments are common when this treatment is used where Rhizoctonia is a problem and this treatment is still hard to beat. This research led directly to the labelling of both Quadris and Dynasty for Rhizoctonia control in potatoes. In addition, tubers were either clean or with very little black scurf. More recently we have demonstrated that Priaxor (BASF) applied infurrow and penthiopyrad applied as a seed treatment or as Vertisan give similar disease control. Both Priaxor and penthiopyrad are products that represent a new class of fungicide compounds, SDHI or carboximid class fungicides.

Black dot root rot research started in 1998 and has continued through 2014. We demonstrated that this disease causes 5-10% or more yield loss, is common throughout Montana, is seedborne and can cause tuber blemishes similar to silver scurf. Management techniques developed as part of Jack Meyer's MS thesis using Quadris infurrow plus a fungicide (mancozeb, chlorothalonil, Quadris, Headline) spray when plants are 10-12" tall are still effective, however new SDHI class fungicide products such as Vertisan and Priaxor used either infurrow or as the post emergence spray are proven good choices.

In our research on silver scurf we have demonstrated that much of what is identified as silver scurf infections is actually black dot and that silver scurf is controlled with piling time treatments of BioSave, BioSave + Mertect, azoxystrobin or the new Syngenta product, Stadium (azoxystrobin + fludioxanil + difenoconazole). While Stadium is labelled nationwide, the label explicitly says, "Do not use on seed potatoes or seed pieces". This restriction is because Syngenta is concerned about fungicide resistance management.

Common scab control was an early focus of this research program. We confirmed that PCNB (Blocker) was an effective aid in controlling common scab on susceptible varieties and we also showed that incorporation of 200lb ground barley in-furrow was also effective in controlling scab. The most significant contribution in this area was the work by Dr. Ivette Acuna in her Ph.D dissertation where she showed that potatoes are resistant to scab because they detoxify the thaxtomin toxin produced by the Streptomyces scabies bacterium by glucosylation (attached 2 sugar molecules). We used this tool to select for resistance in true potato seedlings and produced with the cooperation of Dr. Rich Novy (USDA ARS potato breeder at Aberdeen, ID) Ranger Russet type russet selections that are immune to scab. These lines are now used in Dr. Novy's breeding program.

Work on Sclerotinia white mold has focused on the variety Russet Burbank. Our work has shown yield losses of 5-10% depending on the year but more importantly to seed growers there is a consistent 10-15% increase in the % of tubers between 4 and 8 oz compared to the tuber profile from untreated plants. Research has shown that there is no difference in control from 5-10oz/A of Endura, 10 oz/A of Omerga and 11 oz/A of Luna

Tranquility all applied when approximately 10% of the plants had an open blossom. Lower rates of Omega and Luna tranquility show significantly reduced performance with single applications. With these fungicides, at the rates mentioned above, two applications (first bloom and 10-14 days later) have not shown significant increases in performance however BmJ has consistently needed two applications to equal the performance of the fungicides.

Research on storage diseases caused by soft rot bacteria and *Fusarium sambucinum* has focused on post-harvest treatments. Our program was one of the first to show that BioSave (*Pseudomonas syringae*) provided control of soft rot, *Fusarium* dry rot and silver scurf (but not black dot) when applied in 2 qt of water per ton. We have also shown that BioSave + Mertect 340F provided better control of *Fusarium* dry rot even with *Fusarium sambucinum* that is resistant to Mertect (in an early survey of MT dry rot isolates ~50% were resistant to thiabendazole the active ingredient of Mertect). We have also worked with several post-harvest fungicides including mancozeb, azoxystrobin, difenoconazole and fludioxanil. The last 3 are components of Stadium recently labelled by Syngenta for control of silver scurf and *Fusarium* dry rot- alas not labelled for seed potatoes. However, BioSave + Mertect has been equally effective for dry rot control. We have also examined the use of products such as Storox and Jet oxide that contain hydrogen dioxide and peroxyacetic acid both as direct post-harvest application and as gases. These products provide excellent control of soft rot but are only fungistatic in their control of *Fusarium* dry rot.

For the past 20 years, with your generous assistance, we have worked on *Bacillus mycoides* (BmJ) induced resistance for control of several potato diseases. Good to excellent control of early blight, *Sclerotinia* white mold, late blight, and PVY have been achieved. We are also examining control of soft rot and *Fusarium* dry rot from BmJ applications made 5 days before vine kill and data from the past two years appear promising for *Fusarium* dry rot control but not soft rot. PVY control will be discussed in the abstract "Integrated control of PVY using roguing, induced resistance and stylet oils".

I want to thank you for your generous cooperation in supporting this research for the past 20 years. I especially want to thank Dr. Nina Zidack and the Potato Lab crew, Dave and Steve Tobol, Dan, Tim, David and Pat Lake, Roger Starkel, Bill and Steve Cottom, Bill and Peggy Buyan, Dan Kimm, Jack Meyer, John and Tim Venhuizen and Nick, Sid, John and Cliff Schutter for providing research sites, research materials, encouragement and help in conducting this research.

Notes:

“Integrated Management of PVY using Roguing, BmJ Induced Resistance, Stylet Oils and No-Gap Insecticides”

Barry J. Jacobsen¹, Nina Zidack² and Phil Hamm³

1. Professor of Plant Pathology, Department of Plant Sciences and Plant Pathology, 2. Director Montana Seed Potato Certification Program and 3. Professor of Plant Pathology and Superintendent Hermiston Research and Extension Center, Oregon State University

Since 2010, we have been cooperating in a research program examining practical control of PVY using BmJ induced resistance, roguing, and no gap insecticides (neonicotinoid insecticide at planting and biweekly application of aphid feeding deterrent insecticides 60 days post planting to vine kill) BmJ was applied biweekly from emergence to vine kill. In 2012 we added stylet oils to this integrated control program. BmJ induced resistance reduce PVY incidence in winter tests by approximately 50% when using with roguing out infected plants and no gap insecticide programs during the growing season. Roguing alone was not as effective as programs incorporating BmJ but contributed about 40+% control. Programs without roguing were not as effective as those including roguing. No gap insecticide programs alone typically had the highest PVY infection at the end of the year. The most effective control of PVY (~70-8-% control) was with programs that incorporated stylet oil application every 4 days from emergence to vine kill, no-gap insecticide programs and roguing. We will discuss research from 2010, 2011, 2012, 2013 and 2014.

Notes:

Dr. Neil C. Gudmestad

“Everything You Always Wanted To Know About Ring Rot But Were Afraid To Ask.”

Bacterial ring rot (BRR) is a problem that continues to plague the potato industry in the United States. The disease can remain latent and can be problematic to detect in certified seed potatoes hence its cyclic nature. This presentation will be a refresher course on aspects of BRR that every grower needs to know and will also address some of the more recent information on pathogen detection and disease management.

Notes:

Dr. Erik J. Wenninger

“Contribution of Non-Colonizing Aphids to PVY Incidence in Potato in Southern Idaho”

Many aphid species transmit PVY in a non-persistent manner. Although green peach aphid (GPA), *Myzus persicae*, is the most efficient PVY vector, it is less abundant in the potato growing areas of Idaho than are many non-potato-colonizing aphids that can also transmit this pathogen. Though these aphids transmit PVY less efficiently than GPA, they may contribute to spread of PVY in adjacent potato fields due to their abundance. A field study was conducted during 2012-2013 to test the hypothesis that cereal aphids disperse to nearby potato fields as cereal crops dry down before harvest. Aphid fauna in four different commercial potato fields in south-central and south-eastern Idaho were sampled weekly using yellow sticky traps and yellow pan traps. Potato fields were chosen with an adjacent cereal field such that the prevailing westerly wind would facilitate aphid dispersal from cereal fields to potato. The most abundant cereal aphid species from pan trap samples were *Rhopalosiphum padi* (bird cherry-oat aphid; BCOA) and *Metopolophium dirhodum*; a diverse fauna of other aphids from other hosts was found as well. GPA abundance was relatively low. Aphid abundance peaked in mid- to late-July (cereal ripening stage) and decreased after early August (when cereals had dried). Field PVY occurrence increased in all the locations following mid-summer increases in aphid abundance in both years. Laboratory studies also were conducted with GPA, BCOA, and potato aphid (PA) to assess transmission efficiency for different strains (PVYO, PVYN:O, PVYNTN) and isolates of PVY. Transmission efficiency (percent infection of plants) was highest for GPA and did not differ significantly between isolates within each strain. For GPA and BCOA, isolates of NTN were transmitted with highest efficiency followed by isolates of O and N:O. BCOA transmitted PVY with higher efficiency than previously reported, suggesting that this species may be more important to PVY epidemiology than previously considered. These studies suggest that cereal aphids and other non-colonizing aphids are important contributors to PVY incidence in the potato-growing areas of southern Idaho.

Notes:

Dr. Phil Hamm
“New High Profile Diseases of Potato, How Bad are They?”

Notes:

Dr. Marsha Goetting
“Think You Know Who Gets Your Property When You Die?
Even if You Have a Will or Trust?
Think Again!!!!”

<http://www.montana.edu/estateplanning/eppublications.html>

Notes:

Speaker Addresses

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2014 Exhibitors

1, 4 Group Inc. PO Box 860 Meridian, ID 83680 208-887-9766	Ag Engineering & Dev. Co. PO Box 2814 Tri-Cities, WA 99302 509-582-8900	Ag Pro Systems, Inc. 405 Crow Lane Billings, MT 59105 406-679-4400
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Bayer Crop Science 624 17 th St Havre, MT 59501 406-750-4057	Better Built Manufacturing 1541 Sandhill Rd. Orem, UT 84058 801-591.9898	Biosafe Systems 22 Meadow Street E. Hartford, CT 06108 860-290-8890
Biowest Ag Solutions 9757 Hwy 45 Nampa, ID 83686 208-221-9414	Colorado Certified Potato Growers Association PO Box 267 Monte Vista, CO 81144 719-274-5996	Cooper Norman 444 Hospital Way, Ste 555 Pocatello, ID 83201 208-232-6006
Double L Global 3075 Warm Springs Way Heyburn, ID 83336 208-390-1128	Double M Ag & Irrigation 522 Lincoln St American Falls, ID 83211 208-226-2555	DuPont Crop Protection PO Box 223 Hobson, MT 59452 406-366-1287
Group AG, LLC. PO Box 982 Rexburg, ID 83440 208-356-7800	Helena Chemical Co. 10 5 th Ave S Laurel, MT 59044 406-628-8768	Hotsy Cleaning Systems 2428 W. Central Ave. Missoula, MT 59801 406-549-5447
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Pioneer Equipment Co. 404 W Hwy 39 Blackfoot, ID 83221 208-785-0008	Potato Services of Idaho PO Box 351 Rexburg, ID 83440 208-356-5332	Potato Variety Management Inst. 60380 Chickasaw Way Bend, OR 97702 541-318-1485
Rural Employment Opportunities PO Box 831 Helena, MT 59624 406-274-4172	Severinsen Irrigation, LLC. PO Box 482 Fairfield, MT 59436 406-467-3999	Spudnik Equipment Co. LLC PO Box 1045 Blackfoot, ID 83221 208-785-0480
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Valley Irrigation PO Box 215 West Yellowstone, MT 59758 406-461-8598	Watson Irrigation 7837 Hwy 287 Townsend, MT 59644 406-266-3741	Westbridge Agricultural Products 1260 Avenida Chelsa Vista, CA 92801 760-599-8855
Wilbur Ellis PO Box 1627 Great Falls, MT 59403 406-727-4500		

2014 Montana Seed Potato Seminar Contributors

Thank you for sponsoring these Seminar Events

Wednesday, November 12th

Coffee Break	Westland Seed
Lunch	United Potato Growers of America
Reception	Spudnik, Wilbur-Ellis , Tractor and Equipment Co., Western States Equipment, Campbell Aviation, Mission Valley Ag. Helena Chemical Co., Milestone, BASF, Bayer Crop Science, FMC, Moiese Fertilizer, Syngenta Crop Protection, Industrial Ventilation, CHS, UPI, DuPont Ag World Support Systems

Thursday, November 14th

Breakfast	Watson Irrigation
Coffee Break	Lockwood Manufacturing

Notes:

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