## PGA RESEARCH ARCHIVE

## SEED





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ALBERTA AGRICULTURAL RESEARCH INSTITUTE

ON-FARM DEMONSTRATION

FINAL REPORT PROJECT NUMBER: 92-F005-1

## The Use of Single-Drop Russet Burbank Potato Seed Planted at Two In-Row Spacings



Principal Co-Operator:	Mike Wind Windiana Farms Box 2783 Taber, Alberta TOK 2GO
Co-applicant:	Ed VanDellen Potato Growers of Alberta #230, 2116-27th Ave. N.E. Calgary, Alberta T2E 7A6
Project Coordinator:	Clive Schaupmeyer, Head Horticulture Section Alberta Special Crops and Horticultural Research Center S.S. 4 Brooks. Alberta T1R 1E6

#### Abstract

Mike Wind, a potato grower from Taber, planted approximately 14 acres of Russet Burbank potatoes in the center of a pivot circle of potatoes using single-drop (whole) seed tubers weighing 2 to 3 ounces. The whole pieces were planted at 12-inch and 14-inch in-row spacings. The remainder of the field was planted at 12-inch in-row spacing using seed pieces cut from seed tubers greater than 6 ounces.

Stem numbers per plant were high in both the whole and cut-seed areas of the field. There were no differences in stem numbers per plant or percent stand between the whole and cut seed portions of the field. There were no appreciable differences in yield between the single-drop and cut-seed portions of the field. The tubers from the whole-seed portion of the field, planted at 12 inches between plants, were smaller, but more uniform, than the tubers harvested from the cut-seed portion also planted at 12 inches.

The demonstration did not show the same results as plot studies. In this demonstration the plants grown from cut seed had higher stem numbers than normally seen in commercial fields where cut seed is used. Whole seed has been shown to have significantly more stems than cut seed pieces of the same size. The reasons why the plants grown from cut seed in this demonstration had high stem numbers are uncertain. Stem numbers from cut seed are known to increase with the physiological age of seed tubers, size of cut seed pieces, and size of mother tubers before cutting. (The size of the uncut mother seed tubers or cut seed pieces were not measured prior to planting. Relatively small mother seed tubers and large cut seed pieces would result in higher stem numbers.)

This project did demonstrate the work-load and handling advantages of whole seed tubers. The principal co-operator was so impressed with the advantages of handling whole seed that he is planning to plant a half circle or full circle of potatoes using whole seed in 1993, depending on availability of whole seed. Because of this the on-farm demonstration will not be repeated as originally planned.

#### PURPOSE OF THIS DEMONSTRATION

Seed-piece research in Alberta, Washington state and Ontario has shown the benefits of seed lots that have mother tubers under 10 ounces. Whole, or single-drop seed pieces have been shown to be very productive and require much less work (cutting and handling) at planting time. This project was to demonstrate some of the benefits of whole potato seed.

#### OBJECTIVES

The objectives as stated in the application form were as follows:

- To have farmers understand the benefits of planting single-drop seed.
- 2) To have farmers understand the improvements in stand and plant uniformity from using single-drop seed.
- To demonstrate the benefits of high populations of uniform vigorous plants.

#### PROCEDURE

The principal cooperator, Mike Wind, purchased 15 tons of whole Russet Burbank potato seed' from Tri-Seeds Ltd. and planted it along with cut seed of comparable quality on April 21, 1992. (Photos 1 to 4.) The whole seed was planted in the middle of a pivot circle and the cut seed on both outside portions. (Figure 1.) The whole seed was planted at 12 and 14 inches in the row<sup>2</sup>, and the cut seed was planted at 12 inches in the row<sup>3</sup>.

The original project proposal was to plant two varieties, Russet Burbank and Norchip, however a contract to grow Norchip was not available. Therefore only Russet Burbank was used in this demonstration. The principal cooperator purchased single drop seed for less than budgeted for and therefore planted a larger demonstration than planned.

<sup>&</sup>lt;sup>2</sup> The original plan was to plant Russet Burbank single-drop seed at 10" and 11" in-row spacings. The contracting processor changed its contract specifications for spacing and therefore the spacings used in the demonstrations were changed from the original proposal.

<sup>&</sup>lt;sup>3</sup> A second treatment was applied to the field which is noted here, but as there was no direct relationship to this demonstration no further references will be made in this report. The east half of the field was treated with Vapam<sub>TM</sub> soil fumigant in the fall of 1991. Some benefits claimed by the manufacturer include improved tuber set where infestations of rhizoctonia fungi may be severe enough to prune small tubers and stolons. In some fields it may even increase stem numbers. The Vapam treatment was likely referred to on the summer tour of demonstrations, thus the reference to that treatment here.





Photo 1. Whole seed on truck ready for loading into planter.



Photo 2. Closeup of whole seed.

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Photo 3. Whole seed in planter.



Photo 4. Mike Wind with exposed planter row showing uniform seed-piece placement.

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Sec. 1

Figure 1.

## FARMING FOR THE FUTURE ON-FARM DEMONSTRATION



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#### DATA COLLECTED AND OBSERVATIONS

Stem populations and stands were recorded on July 7, 1992 from all three portions of the field. (Table 1.) Contrary to research findings there were no differences between the stand and stem number between the whole-seed and cut-seed portions of the field.

The stem numbers recorded were high in both the whole and cut-seed portions. They were consistent with stems numbers measured in population studies at Brooks that indicate that between two and three stems per linear foot are required to achieve maximum yields of Russet Burbank potatoes for processing.

The crop was harvested on September 20, 1992. No yield data were attempted because there were no apparent differences between the various portions of the field. The yields from all portions of the field were high, and over 20 tons per acre were put into storage from the entire field. The tubers from the whole-seed portion of the field, planted at 12 inches between plants, were smaller, but more uniform, than the tubers harvested from the cut-seed portion also planted at 12 inches.

#### DISCUSSION

The demonstration did not show the same results as plot studies. In this demonstration the plants grown from cut seed had higher stem numbers than normally seen in commercial fields where cut seed is used. Whole seed has been shown to have significantly more stems than cut seed pieces of the same size. The reasons why the plants grown from cut seed had high stem numbers is uncertain, but likely was a result of the uniform size and shape of the tubers in the seed lot that was cut. Stem numbers from cut seed are known to increase with the physiological age of seed tubers, size of cut seed pieces, and size of mother tubers before cutting.

This project did demonstrate the work-load and handling advantages of whole seed tubers. Whole seed is picked up at the seed grower's farm, driven to the field, unloaded into the planter and planted. Normally whole seed does not require seed-piece treatments to prevent seed decay. Seed tubers that require cutting are normally picked up at the seed grower's farm, unloaded in a storage at the commercial farm, picked up with a scoop loader/piler, run through the cutter, loaded back onto a truck and finally unloaded again into the planter. The cutting operation requires several people to man the (\$40,000) cutter. These people are at risk of being exposed to fungicide dust from the seed treater.

Recent studies in Washington State have shown that the process of loading, unloading, cutting, re-loading in a truck and again into the planter cause bruising damage to mother tubers and cut seed pieces. These bruises have been shown to caused seed-piece decay, reduced stand, and reduced plant vigor. Although poor stand and vigor, as a result of excessive handling, were not evident in the parts of the demonstration field planted with cut seed, this is another reason why growers might be interested in using whole seed.

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#### CONCLUSIONS

The demonstration did not meet the objectives of showing the agronomic benefits of using whole seed. However, in the background statement on page 6 of the application we stated, "Whole or single-drop seed pieces ... require much less work (eg. cutting and handling) at planting time." This was clearly established in the demonstration and the Principal Co-operator, Mike Wind, is planning to expand his use of whole seed. The extent of use will depend on the availability of whole seed.

The last objective in the application stated, "To demonstrate the benefits of high populations of uniform vigorous plants." The entire field in this demonstration had high stem populations. When this was coupled with good mid-season management the result was high yields of top-quality potatoes for processing.

#### RECOMMENDATIONS FOR FUTURE ACTION

This demonstration will not be repeated because of the impact it had on the principal co-operator. He plans to use whole seed when possible in the future.

Alberta Agriculture staff and other industry staff will continue to stress the importance of plant stand establishment and stem populations on the production of high yields of quality potatoes.

## Table 1.

## ON FARM DEMONSTRATION USE OF WHOLE POTATO SEED

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## STEM NUMBERS

			VAPA	M					NO V	APAN	1	
	1 <b>4</b> "S		12"S		12"C		1 <b>4</b> "S		12"S		12"C	
	# pl	stem	# pl	stem	# pl	stem	# pl	stem	# pl	stem	# pl	stem
Rep. 1	40	117	40	117	47	141	40	139	39	120	50	173
Rep. 2	35	111	47	144	46	148	37	112	46	124	42	141
Rep. 3	39	112	42	122	46	144	37	119	43	128	49	160
Rep. 4	39	115	42	150	39	121	39	110	46	139	43	142
Total	153	455	171	533	178	554	153	480	174	511	184	616
STEMS/PL	ANT	2.97		3.12		3.11		3.14		2.94		3.35
				3.07						3.14		
STEMS/FC	TOC	2.28	· · · · · · · · · · · · · · · · · · ·	2.67		2.77		2.4		2.56		3.08
				2.57						2.68		

	STAND					
	14"S	12"S	12"C	14"S	12*S	12"C
STAND %	89.3	85.5	89	89.3	87	92
		87.9 per	cent	6m318	89.4 pe	rcent

Notes: S = single - drop seed. C = Cut seed.

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Crop Diversification Centre South S.S. #4 Brooks, Alberta Canada T1R 1E6 Telephone 403/362-1300 Fax 403/362-1306

January 24, 2001

Board of Directors Potato Growers Association 6008 - 46<sup>th</sup> Avenue Taber, Alberta T1G 2B1

### Re: <u>Request for Research Funding - 2001/2002</u>

Dear Board Members:

Enclosed are 20 copies of the research funding application for our project entitled "A comparison of biocontrol and chemical seed piece treatments for control of *Rhizoctonia* on potatoes". The proposal is a condensed version of the AARI application submitted in January and the first page is a summary of the project. This is a collaborative project addressing concerns expressed by fresh market producers as well as others. The results of this project will enable us to make recommendations to improve marketable yields, reduce crop losses and improve food safety. The trial will be conducted in field plots at CDC South. Industry participants will contribute cash and in-kind funding for the project. We are requesting \$1,500 from the PGA for 2001 and a further \$1,500 for 2002, for a total of \$3,000. Please contact me if you have any questions (403-362-1314).

Thank you for your consideration. We look forward to hearing from you.

Sincerely

Michele Konschuh, Ph.D. Potato Research Agronomist



Crop Diversification Centre South



S.S. #4 Brooks, Alberta Canada T1R 1E6 Telephone 403/362-1300 Fax 403/362-1306

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Thank you for your consideration. We look forward to hearing from you.

Sinceret

Michele Konschuh, Ph.D. Potato Research Agronomist

## Farming For the Future Research Funding Program Application - 2001/2002

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	TartA
Projec for co	ct Title: (maximum 15 words) A comparison of biocontrol and chemical seed piece treatments ontrol of <i>Rhizoctonia</i> on potatoes
Identi I	ify the Strategic Research Priority, which best fits your project. Choose only one.         Agri-food & Health - Functional Foods &       Non-food, Fibre & Industrial Uses, including         Nutraceuticals       Molecular Farming         Environmental Sustainability       X       Primary Agriculture and Food Safety         Genomics, Proteomics, Bioinformatics & Other       Value-added Processing
In the Strate Overa Rhizo causir numb safety produ the pr of <i>Tric</i> the Ca	e space provided below, please describe how the following aspects of your proposal advance the egic Priorities. (delete bulleted text for more space) all purpose ctonia solani reduces potato yields as a result of stem and stolon cankers and reduces marketability by ng black scurf on tubers. Few commercial chemical treatments are available to Canadian growers, but a er of products are registered in the U.S. Today's consumers are more and more conscious of food v and environmental issues, yet still expect an abundant food supply of high quality. New control cts utilize natural biochemistry and beneficial microorganisms to control plant diseases. The purpose of roposed research is to assess the effectiveness of several biocontrol products, including Alberta isolates choderma, for control of <i>R. solani</i> and to compare these with chemical control products about to enter anadian market place.
<u>Key C</u> 1. 2.	<u>Objectives</u> To compare various biocontrol and chemical seed piece treatments for efficacy at controlling <i>R.</i> <i>solani</i> on fresh market potatoes, and To determine if <i>Trichoderma</i> spp. isolated from soils in southern Alberta are effective as biocontrol agents for <i>R. solani</i> on fresh market potatoes.
Poten Contro biode repres safety	<u>itial Benefits to Industry and Society</u> ol of <i>Rhizoctonia</i> on potatoes through the use of chemical fungicides, biocontrol organisms, or gradable chemicals would allow producers to increase marketable yields. Some of these new products sent more environmentally friendly approaches to disease control and may represent improved food y for consumers.
<u>Total</u>	cost of project and dollar amount requested from AARI
Total	cost of project: \$28,060 Amount requested from AARI: \$6,900
Pleas Expe Antic	e indicate: cted Commencement Date:April 2001 ipated duration of project:Two years_
Wher	re does your project best fit on the Research Continuum? Choose only one.

## **Progrid Evaluation**

## 1. Contributions to Advancement of Agri-food Knowledge

In the space provided, please describe in point form the expected contributions to the advancement of agrifood knowledge.

- Will determine which, if any, of the commercial treatments about to enter the Canadian market place are effective for control of *Rhizoctonia solani* on fresh market potatoes in Alberta.
- Will determine whether *Trichoderma* isolated from soils in southern Alberta are effective as biocontrol agents for *R. solani*.
- Will provide comparative data for chemical, biocontrol and biostimulant treatments so that growers can make informed decisions about how best to control *R. solani* for their intended market.

## 2. Benefits to Alberta's Agri-food Industry

4.1

In point form, please describe the knowledge transfer plan, in the space provided.

- Results of this research will be made available to all of the industry and government participants in the form of a final report.
- Results will be presented at breakfast meetings of the Potato Growers of Alberta (PGA) and Hort Congress so that all producers may benefit from the information gathered.
- If specific recommendations are forthcoming as a result of the research results, a fact sheet outlining these recommendations will be produced and made available to the producers, the PGA, and to industry participants.

In point form, please describe the potential benefits to the Agri-food industry and to society, in the space provided.

- Seed, processing and fresh market potato producers all suffer economic losses from *Rhizoctonia* in the soil. Fresh market potatoes may be rendered un-marketable by the black lesions produced by *Rhizoctonia*. Producers would like to use fungicides to control *Rhizoctonia* but none of the products available in the U.S. are currently registered in Canada.
- Information collected through the proposed research may facilitate registration of the products in Canada and make them available to producers sooner.
- By comparing the various control methods, we will also be able to provide information to growers to allow them to make informed decisions about which product to use as they become available.
- Some producers, especially those growing fresh market potatoes, are attempting to grow pesticidefree or with reduced use of pesticides. The use of biocontrol products may ensure unblemished potatoes without the negative association of pesticide applications.

## 3. Background and Objectives

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## 6. Research Design, Method & Analysis

In the space provided below, please describe the Research Design, Method and Analysis and Research Plan for the duration of the proposed project. Include reference to the most relevant literature references for your research design and methodology.

This project will be carried out at the Crop Diversification Centre South in Brooks, Alberta on dark brown loam soils. To encourage *Rhizoctonia* infection, the trial will be planted in a field plot where potatoes were grown the previous year. Two (or more) varieties of potato grown for the fresh market, such as Yukon Gold, Norland or Penta, will be planted in four replicated blocks of 12m rows (in-row spacing of approximately 20cm and between-row spacing of approximately 90cm). Guard potatoes will be planted in the outside rows and in the first and last hill of each row to minimize edge effects. Each block will consist of the following treatments:

- 1. Control no seed treatment
- 2. Maxim (fludioxonil)- seed piece treatment
- 3. Blocker (pentachloronitrobenzene) in-furrow treatment
- 4. Quadris (azoxystrobin) in furrow treatment
- 5. Companion (*Bacillus subtilis*)- bacteria-based biocontrol product
- 6. Intercept (*Pseudomonas cepacia*) fungus-based biocontrol product
- 7. T-22 (*Trichoderma harzianum*) fungus-based biocontrol product
- 8. *Trichoderma* spp. from Alberta potential biocontrol product
- 9. 94815 Trigger biostimulant seed piece treatment
- 10. T-30 (Trichoderma harzianum) fungus-based biocontrol product from Alberta

Date of emergence, stand counts and stem counts will be noted. In early July, one half of each row will be hand dug and assessed for stem and stolon cankers. The remaining potatoes will be topkilled approximately 95 to 100 days after planting and harvested mechanically two to three weeks after topkilling. Yield data will be determined and tubers will be assessed for external deformities. A sample of 20 tubers will be washed and scored for *R. solani* sclerotia (black scurf). These tubers will be cut to estimate internal deformities and stem-end necrosis. The remaining tubers will be placed in storage at  $4^{\circ}$ C. Each month, a sample of 20 tubers will be washed and scored for *R. solani* sclerotia for *R. solani* sclerotia for up to 8 months after harvest. Each treatment will be compared to the control and to other treatments for efficacy against *R. solani*.

The project will be carried out for two consecutive years to minimize environmental differences between years. The experimental design will be maintained for both years.

#### References:

- Bains, P.S., H. Bennypaul, V. Bisht, and C. Schaupmeyer. 1999. Fungicidal control of fusarium dry rot, rhizoctonia canker and black scurf, and silver scurf diseases of potatoes. 14<sup>th</sup> International Plant Protection Congress. Jerusalem, Israel. July 25-30.
- 2. Jager, G., H. Velvis, J.G. Lamers, A. Murdoch, and Js. Roosjen. 1991. Control of *Rhizoctonia solani* in potato by biological, chemical and integrated measures. Potato Res. 34: 269-284.
- 3. Leach, S.S. and R.E. Webb. 1993. Evaluation of potato cultivars, clones and a true seed population for resistance to *Rhizoctonia solani*. Am. Potato J. 70: 317-328.
- 4. Murdoch, C.W. and S.S. Leach. 1993. Evaluation of *Laetisaria arvalis* as a biological control agent of *Rhizoctonia solani* on white potato. Am. Potato J. 70: 625-634.
- 5. Platt, H.W., F. Canale, and G. Gimenez. 1993. Effects of tuber-borne inoculum of *Rhizoctonia solani* and fungicidal seed potato treatment on plant growth and Rhizoctonia disease in Canada and Uruguay. Am. Potato J. 70: 553-559.
- 6. Powelson, M.L., K.B. Johnson, and R.C. Rowe. 1993. Management of diseases caused by soilborne pathogens. *In:* Potato Health Management (R.C. Rowe, ed.).APS Press, St. Paul, MN. pp. 149-158.
- 7. Wicks, T.J., B. Morgan, and B. Hall. 1995. Chemical and biological control of *Rhizoctonia solani* on potato seed tubers. Austr. J. Exp. Agriculture. 35: 661-664.

Please provide justification for the amount requested in each of the main budget categories. Ensure the amounts are appropriate and consistent with the Guidelines.

#### Personnel:

The personnel for this project involve technical staff for planting, irrigating, weed control, harvest, storing and grading potatoes. Technical help will also be required for data collection and processing. Estimates of the time involved are based on years of work conducting regional trials for the Western Canadian Potato Breeding Program. All supervision for the project and some technical help will be provided as in-kind government contributions. Technical help will be required for the following operations each year:

2 days preparation for planting (seed cutting, seed treatments; 2 people)

1 day plot preparation (2 people)
2 days planting (3 to 4 people)
1 day hilling (2 people)
weekly irrigation of plots (1 person)
weekly weeding of plots (2 people)
2 days emergence and stand count data (2 people)
2 days stem count data (2 people)
2 days stem and stolon canker (4 people)
3 days harvest (3 people)
2 days grading (3 people)
on-going storage and grading
data entry and analyses

#### Travel:

Travel requirements of the project involve attending two PGA breakfast meetings per year (one in the south and one in central Alberta) and attending Hort Congress in the second year to present findings.

#### Supplies:

Seed potatoes, fertilizer inputs, pesticides, fuel costs, stakes, tags and bags will be required to conduct this field research. Treatments for *Rhizoctonia* control were also included in supplies as in-kind contributions from industry.

#### CDL:

Communication costs relate to preparing data and results for technology transfer. This will most likely take the form of slides or overheads and the possible preparation of a fact sheet on control of *Rhizoctonia solani*.

#### Overhead:

CDC South charges 5% overhead on all projects funded externally. Overhead charges by government agencies are not eligible for funding through AARI and these charges will be covered from the AAFRD operating budget for the potato program.

## Part D

## **Research Team: Biographical Information**

This personal information is being collected for the purpose of assessing the researchers' qualifications under the authority of the ASRA Act. It is subject to the provisions of the Freedom of Information and Protection of Privacy Act.

#### **Team Member - Biographical Data**

Please provide the following biographical data for each member of the research team (including the team leader) Name (surname first):

Konschuh, Michele Nadine

-	-	•	
Institution	Field Specialization	Degree/Diploma	Year Completed
U of Calgary	Developmental Plant Physiology	/ Pn. D.	1995
U of Calgary	<b>Biological Sciences - Botany</b>	B.Sc.	1989

#### Relevant Professional Experience (begin with present position):

Post-Secondary Education and Training Relevant to Proposal:

Dates 2000 - present	Position or Function Potato Research Agronomist	Employer Alberta Agriculture, Food & Rural Development (AAFRD	Location Brooks, AB
1998 - 2000	Technologist - Biotechnology	AAFRD Broo	oks, AB
1998 - present	Vice-president, R & D	Grow West Plant Regenerat	ion Medicine Hat, AB
1996 - 1998	Post-doctoral fellow	U of Alberta, AFNS	Edmonton, AB
<b>Research Acti</b>	vities Related to Research Proposal (I	ist up to 4 projects):	
<u>Title</u> Development o	of a biocontrol for grey mold on tomatoes	s. J Calpas, JP Tewari	Date 1998 - present
Characterizatio MN Konschuh,	n and production of powerful, consistent AM Johnson-Flanagan	, and reliable Echinacea.	1998 - 2000

Reducing green seed in canola using antisense technology. AM Johnson-Flanagan, J Singh, L. Robert 1996 - 1998

Relevant Articles Published in Refereed Journals and Other Relevant Works in the Last Three Years Miranda, J, MN Konschuh, EC Yeung & CC Chinnappa (1999) *In vitro* plantlet regeneration from hypocotyl explants of *Stellaria longipes* (Caryophyllaceae). Can J Bot. 77: 318-322.

Politeski Morissette, JC, MN Konschuh, J Singh, L. Robert & AM Johnson-Flanagan (1997) Reduction of chlorophyll accummulation in seed of transgenic *Brassica napus* using antisense-technology. Acta Hort. 459: 183-190.

Hawkins, GP, **MN Konschuh** & AM Johnson-Flanagan (1997) Breaking the linkage between freezing tolerance and vemalization in winter *Brassica napus*. Acta Hort. 459: 397-402.

Konschuh, MN & Thorpe (1997) Metabolism of 14C-aspartate during shoot bud formation in cultured cotyledon explants of radiata pine. Physiol Plant. 90: 144-151.

## Part D Research Team: Biographical Information

Please provide the following biographical data for each member of the research team (including the team leader) Name (surname first): Bains, Piara

Post-Secondary Education an	d Training Relevant to Proposal:		
Institution	<b>Field Specialization</b>	Degree/Diploma	Year Completed
University of Alberta	Plant Pathology	Ph. D.	1989
University of Alberta	Plant Pathology	M. Sc.	1 <b>980</b>
Punjab Agric. University	Horticulture	M. Sc.	19 <b>74</b>
Punjab Agric. University	Plant Pathology	B. Sc.	1972

**Relevant Professional Experience (begin with present position):** 

Dates	Position or Function	Employer	Location
1996-Present	Senior Research Scientist	AAFRD	Edmonton, AB
1992-1996	Research Scientist	AAFRD	Edmonton, AB
1988- 1992	Laboratory Scientist	AAFRD	Edmonton. AB

Research Activities Related to Research Proposal (list up to 4 projects):

<u>Title</u>	Date
Project Manager, Alberta Agricultural Research Institute Project (99M516)	1999-Present
Project Manager, Alberta Agricultural Research Institute Project (98M204)	1998-Present
Project Manager, Alberta Agricultural Research Institute Project (97M077)	199 <b>7-</b> 99
Project Manager, Alberta Agricultural Research Institute Project (97M078)	199 <b>7-</b> 98
Project Manager, Alberta Agricultural Research Institute Project (95 E111)	1 <b>995-</b> 9 <b>7</b>
Project Manager, Alberta Agricultural Research Institute Project (94M604)	1994-96

Relevant Articles Published in Refereed Journals and Other Relevant Works in the Last Three Years Bains, P.S., V.S. Bisht, D.R. Lynch, L.M. Kawchuk and J.P. Helgeson. 1999. Identification of stem rot (*Erwinia* 

carotovora subspecies atroseptica) resistance in potato. American Journal of Potato Research 76:137-141. Bains, P.S. 1999. Soil survival, host range, cultivar reactions and fungicidal control of silver scurf pathogen of potato. Alberta Agricultural Research Institute. Edmonton, Alberta. Project no. 94M604. 46p.

Bains, P.S., H.S. Bennypaul, S.F. Blade and C. Weeks. 2000. First report of hemp canker caused by *Sclerotinia* sclerotiorum in Alberta, Canada. Plant Disease 84:372.

Bains, P.S., H. Bennypaul and M. Mirza. 1999. First report of powdery mildew of green-house grown tomatoes in Alberta, Canada. Plant Disease 83:488.

Bains, P.S. 1999. Integrated management of entomosporium leaf and berry spot disease of saskatoon. Alberta Agricultural Research Institute, Edmonton, Alberta. Project no. 95E111. 58p.

Lange, R.M., P.S. Bains and R.J. Howard. 1998. Efficacy of fungicides for control of Entomosporium leaf and berry spot of saskatoon. Plant Disease 82:1137-1141.

Bains, P.S., R.M. Lange and R.J. Howard. 1996. Development of a fungicidal control program for entomosporium leaf and berry spot of saskatoon. Alberta Agricultural Research Institute, Edmonton, Alberta. Project no. 93-0290. 43 pp.

Lynch, D.R., L.M. Kawchuk, J. Hachey, P.S. Bains and R.J. Howard. 1997. Identification of a gene conferring high levels of resistance to Verticillium wilt in *Solanum chacoense*. Plant Disease 81:1011-1014.

Bains, P.S., V.S. Bisht and D.A. Benard. 1996. Soil survival and thiabendazole sensitivity of *Helminthosporium solani* isolates from Alberta. Potato Research 39:23-29.

Total Number of Articles Published in Refereed Journals in the Last Three years 9

8.1	Team Member 2	Piara Bains	Title	Plant Pathologist
;	Signature		Date	
	Name: Agency's Signing Auth	Alan Hall	Title	Director, Plant Industry Division
	Signature	×	Date	Jan 9, 2001
	Team Member 3	8- <u></u>	Title	
;	Signature		Date	
	Name: Agency's Signing Autl	nority	Title	
	Signature		Date	
C	Other Researchers	S This personal information is being co qualifications. It is subject to the prov	llected (under the authority of th visions of the Freedom of Inform Title	ne ASRA Act) for the purpose of assessing the research teams' hation and Protection of Privacy Act.
C	Other Researchers	S This personal information is being co qualifications. It is subject to the prov Melanie Nielsen	llected (under the authority of th visions of the Freedom of Inform Title	Potato Technologist
C	<b>Name</b> Function in Project	S This personal information is being co qualifications. It is subject to the prov Melanie Nielsen Field Supervision	llected (under the authority of th risions of the Freedom of Inform Title Organization Telephone #	Potato Technologist AAFRD 403-362-1317
c	Name Function in Project Signature	S This personal information is being co qualifications. It is subject to the prov Melanie Nielsen Field Supervision	Ilected (under the authority of th risions of the Freedom of Inform Title Organization Telephone # Title	Potato Technologist AAFRD 403-362-1317
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2	Name         Function in Project         Signature         Name         Function in Project         Signature	S This personal information is being co qualifications. It is subject to the prov Melanie Nielsen Field Supervision	llected (under the authority of the risions of the Freedom of Inform Title Organization Telephone # Title Organization Telephone # Title Organization	Potato Technologist AAFRD 403-362-1317

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Prl.

Project 329014 New: x Renewal:\_

## MEMORANDUM OF UNDERSTANDING

Between:

### THE POTATO GROWERS OF ALBERTA

(hereafter referred to as "PGA")

and the

Alberta Agriculture, Food & Rural Development (hereafter referred to as "AAFRD")

- Project Title: " A comparison of biocontrol & chemical seed piece treatments for control of *Rhizoctonia* on potatoes".
- Objectives: 1. To compare various biocontrol and chemical seed piece treatments for efficacy at controlling *R. solani* on fresh market potatoes; and
   2. To determine if *Trichoderma* spp. isolated from soils in southern Alberta are effective as biocontrol agents for *R. solani* on fresh market potatotes.

## STATEMENT OF WORK

Alberta Agriculture, Food & Rural Development is willing to undertake the study for PGA which hereby agrees to pay to contribute toward the costs of researching the information required as described.

## PERIOD OF WORK

The research project will commence on April 01, 2001. A yearly report will be provided to PGA by Feb 28, 2002.

## **BASIS OF PAYMENT**

The sponsor of the project, PGA will provide \$1,500 upon finalization of the memorandum to AAFRD, to cover the following estimated yearly cost:

Casual Manpower (on an as need basis): \$1,500.00

Materials & Supplies

\$

The Budget can be adjusted and used at the discretion of the project manager.

Payment of research project expenditures will be made from funds made available to AAFRD up to the maximum amount of funds received from the sponsor.

AAFRD will provide a record of revenue and expenditure upon project completion or depletion of funds. Any remaining funds after completion or termination of the project can be used for research at the discretion of the project manager.

### RESPONSIBILITY OF PROJECT MANAGER

The project manager for this study is Michele Konschuh. She will provide all reports to AAFRD and the sponsor.

The project manager will authorize expenses and submit them to the appropriate AAFRD department for processing payment.

The project manager is not eligible for any manpower funds for herself.

#### AMENDMENTS OR TERMINATION

This Memorandum of Understanding may be amended by mutual consent of the parties as evidenced by an exchange of letters.

Either AAFRD or PGA may terminate this Memorandum of Understanding by providing two weeks notice in writing to the other party.

### NOTICES AND REPRESENTATIVES

Notices for all purposes of or incidental to this Memorandum of Understanding shall be effectively given if delivered personally, or sent by registered or certified mail to the representatives of the parties designated as follows:

Alberta Agriculture, Food & Rural Development:

Vern Warkentin Executive Director Potato Growers of Alberta 6008 - 46<sup>th</sup> Ave. Taber, AB T1G 2B1 Dr. Ron Howard Horticulture Unit Leader Crop Diversification Centre South S.S. #4, Brooks, AB T1R 1E6

Information generated from the project may be used by the Department of Agriculture, Food & Rural Development, and PGA.

The sponsor, PGA relinquishes ownership of any materials, supplies and assets purchased with the project funds to the AAFRD which assigns control to the project manager's departmental division.

The parties affirm their acceptance of the terms of this Memorandum of Understanding by signing below.

Copies bearing original signatures of this Memorandum will be kept by each party.

Michele Konschuh, Ph.D, Project Manager

May 14, 2001 Date

I agree that the project manager named above may supervise this project.

TR. J. Howa

ay 14'01

Ron Howard, Horticulture Unit Leader

Vern Warkentin, Executive Director Potato Growers of Alberta

Juhilia Signat

May 9/01 Date



Crop Diversification Centre South S.S. #4 Brooks, Alberta Canada T1R 1E6 Telephone 403/362-1300 Fax 403/362-1306

June 7, 2002

## RECEIVED JUN 1 2 2002

Potato Growers of Alberta 6008 – 46<sup>th</sup> Avenue Taber, AB T1G 2B1

Attention: Vern Warkentin, Executive Director

Re: MOU for "A comparison of biocontrol and chemical seed piece treatments for control of *Rhizoctonia* on potatoes"

Dear Vern;

Thank you for your e-mail in March advising me that the PGA is willing to fund our project entitled "A comparison of biocontrol and chemical seed piece treatments for control of *Rhizoctonia* on potatoes" in 2002. As a formality, we like to set up a Memorandum of Understanding (MOU) with each cooperator for externally funded projects. Please review the enclosed MOU. If the terms of the MOU are acceptable, please sign both copies and return an original to me. If you would prefer to propose alternate terms, please contact me at 403-362-1314 and we can discuss the terms further. An invoice will be issued under separate cover. Thank you.

Sincerely

Michele Konschuh, Ph.D. Potato Research Agronomist

Project #629014 New: Renewal: X

## MEMORANDUM OF UNDERSTANDING

Between:

Potato Growers of Alberta (hereafter referred to as "PGA")

and

Alberta Agriculture, Food & Rural Development (hereafter referred to as "AAFRD")

- <u>Project Title:</u> A comparison of biocontrol and chemical seed piece treatments for control of *Rhizoctonia* on potatoes.
- <u>Objective:</u> To compare various biocontrol and chemical seed piece treatments for efficacy at controlling *R. solani* on fresh market potatoes.

### STATEMENT OF WORK

Alberta Agriculture, Food & Rural Development is willing to undertake the study for the PGA, which hereby agrees to pay to contribute toward the costs of researching the information required as described in the research proposal.

#### PERIOD OF WORK

The research project will commence on April 01, 2002. A yearly report will be provided to the PGA by March 15, 2003.

#### **BASIS OF PAYMENT**

The sponsor of the project, the PGA, will provide \$2,500 upon finalization of this memorandum to AAFRD, to cover the following estimated yearly costs:

Casual Manpower (on an as need basis):	\$2,000
Materials & Supplies	\$500

The Budget can be adjusted and used at the discretion of the project manager.

Payment of research project expenditures will be made from funds made available to AAFRD up to the maximum amount of funds received from the sponsor.

AAFRD will provide a record of revenue and expenditure upon project completion or depletion of funds. Any remaining funds after completion or termination of the project can be used for research at the discretion of the project manager.

### RESPONSIBILITY OF PROJECT MANAGER

The project manager for this study is Dr. Michele Konschuh. She will provide all reports to AAFRD and the sponsor.

The project manager will authorize expenses and submit them to the appropriate AAFRD department for processing payment.

The project manager is not eligible for any manpower funds herself.

#### AMENDMENTS OR TERMINATION

This Memorandum of Understanding may be amended by mutual consent of the parties as evidenced by an exchange of letters.

Either AAFRD or the PGA may terminate this Memorandum of Understanding by providing two weeks notice in writing to the other party.

#### NOTICES AND REPRESENTATIVES

Notices for all purposes of or incidental to this Memorandum of Understanding shall be effectively given if delivered personally, or sent by registered or certified mail to the representatives of the parties designated as follows:

Potato Growers of Alberta	Alberta Agriculture, Food & Rural Development:
Mr. Vern Warkentin	Dr. Christine Murray
Executive Director	Branch Head, CDCS
Potato Growers of Alberta	Crop Diversification Centre South
6008 – 46 <sup>th</sup> Avenue	S. S. #4
Taber, AB T1G 2B1	Brooks, AB T1R 1E6

Information generated from the project may be used by the Department of Agriculture, Food & Rural Development, the PGA, and other sponsors of the project.

The sponsor, the PGA, relinquishes ownership of any materials, supplies and assets purchased with the project funds to the AAFRD which assigns control to the project manager's departmental division.

The parties affirm their acceptance of the terms of this Memorandum of Understanding by signing below.

Copies bearing original signatures of this Memorandum will be kept by each party.

Michele Konschuh, Project Manager

June 7, 2002 Date

I agree that the project manager named above may supervise this project.

ustine 7 Christine Murray, Branch Head, CDCS

Date 10 2002

Signature, Division Director

Mr. Vern Warkentin, Executive Director Potato Growers of Alberta

Date

July 8/02



Crop Diversification Centre South S.S. #4 Brooks, Alberta Canada T1R 1E6 Telephone 403/362-1300 Fax 403/362-1306

March 8, 2002

Potato Growers of Alberta 6008 – 46<sup>th</sup> Avenue Taber, AB T1G 2B1

acapted

Attention: Board of Directors

## **Re:** Application for Funding

"A Comparison of Biocontrol and Chemical Seed Piece Treatments for Control of *Rhizoctonia* on Potatoes"

Dear Board Members:

Enclosed are 10 copies of the funding application for our project entitled "A Comparison of Biocontrol and Chemical Seed Piece Treatments for Control of *Rhizoctonia* on Potatoes". The proposal is a renewal of a project funded in 2001. The trial will be conducted at CDCS with Yukon Gold and Russet Burbank potatoes. A number of industry participants have expressed interest in contributing to the project, but assessing stem canker and black scurf is very labour intensive. We are requesting a contribution of \$2,500 from the PGA for 2002. A third year of data may also be required.

A progress report summarizing the 2001 data has been sent to all cooperators, including the PGA. The results of this project will enable us to evaluate new and existing products for their effectiveness at controlling Rhizoc. Please contact me if you have any questions (403-362-1314).

Thank you for your consideration. I look forward to hearing from you.

Sincerely

Michele Konschuh, Ph.D. Potato Research Agronomist

## **POTATO GROWERS OF ALBERTA**

## FUNDING APPLICATION

## (RENEWAL)

A comparison of biocontrol and chemical seed piece treatments for control of *Rhizoctonia* on potatoes

Submitted by

Michele Konschuh, Melanie Nielsen, and James Calpas

March 8, 2001

## PRINCIPAL APPLICANT INFORMATION

η.

Principal applicant's name	Phone
Michele Konschuh	403-362-1314
Research agency or company	
AAFRD, CDC South	
AAFRD, CDC South Mailing Address	Postal code
AAFRD, CDC South Mailing Address S.S. #4, Brooks, AB	Postal code T1R 1E6

Crop Diversification Centre South, Brooks, AB

## b) Objectives

8. To compare various biocontrol and chemical seed piece treatments for efficacy at controlling *R. solani* on fresh market potatoes.

## 5C) Research Plan

This project will be carried out at the Crop Diversification Centre South in Brooks, Alberta on dark brown loam soils. To encourage *Rhizoctonia* infection, the trial will be planted with infected seed in a field plot where potatoes have been grown in rotation. Two varieties of potato, such as Yukon Gold and Russet Burbank, will be planted in six replicated blocks of 10 m rows (in-row spacing of approximately 20 cm and between-row spacing of approximately 90 cm). Guard potatoes will be planted in the outside rows to minimize edge effects. Each block will consist of the following treatments:

- 1. Control no seed treatment
- 2. Maxim (fludioxonil)- seed piece treatment
- 3. Blocker (pentachloronitrobenzene) in-furrow treatment
- 4. Quadris (azoxystrobin) in furrow treatment
- 5. Companion (Bacillus subtilis)- bacteria-based biocontrol product
- 6. Trichoderma spp. from Alberta potential biocontrol product
- 7. 94815 Trigger biostimulant seed piece treatment
- 8. Easout PSPT (thiophanate-methyl) seed piece treatment
- 9. EN0516 experimental formulation seed piece treatment
- 10. Moncut (flutolanil)
- 11. Other?

Date of emergence, stand counts and stem counts will be noted. In early July, one half of each row will be hand dug and assessed for stem cankers. The remaining potatoes will be top-killed approximately 95 to 100 days after planting and harvested mechanically two to three weeks after top-killing. Yield data will be determined and tubers will be assessed for external deformities. A sample of 50 tubers will be washed and scored for *R. solani* sclerotia (black scurf). Each treatment will be compared to the control and to other treatments for efficacy against *R. solani*.

## 5D) Action Plan and Work Schedules

b) Second year: 2002/2003

Lay out plots, treat seed, plant potatoes
Emergence data, stand count, stem counts
Assess plots for stem cankers
Top-kill and harvest trials, yield data, grading
Assess stored tubers for black scurf, data analyses
Present results at PGA Annual Meeting
Submit final report

## 7) BUDGET AND MANPOWER NEEDS FOR 1 YEAR 7A) MANPOWER TO BE HIRED WITH PGA/OTHER FUNDS

NAME (If known)	POSITION	TIME REQUIRED	RATE OF PAY	AMOUNT REQUIRED
Professional and Technical manpower	Program Leader	0.20 year		\$12,500
1	Black Scurf Scoring	20 days	\$125/day	\$2,500
Casual manpower	Field Labour	40 days	\$110/day	\$4,400
		TOTAL LABO	UR COSTS	\$19,400

## 7B) TRAVEL EXPENSES TO BE PAID WITH PGA/OTHER FUNDS FOR 1 YEAR

DESTINATION	PERSON(S)	PURPOSE	NUMBER OF TRIPS	TRAVEL COSTS	MEALS AND ACCOM.	TOTAL COST
PGA Annual Meeting	2	Present Info	1	\$280	\$320	\$600

TOTAL TRAVEL COSTS S600

## 7C) MATERIALS, SUPPLIES AND SERVICES TO BE PAID WITH PDI/OTHER FUNDS

DESCRIPTION	COST
Seed potatoes	\$200
Bags, tags, stakes, etc.	\$200
Treatments - donated	
TOTAL COST OF MATERIALS, SUPPLIES AND SERVICES FOR 1 YEAR	\$400

## 7G) VALUE OF "IN KIND" CONTRIBUTIONS BY RESEARCH AGENCY FOR 1 YEAR

Include estimated value of research staff time and operating budgets contributed by principal researcher's agency, or other cooperator's agency, towards this project in the period covered by this application. (Funding is not requested for these items.)

DESCRIPTION	PERSON YEARS	APPROX. VALUE
Professional, technical, and other staff	0.25	\$12,500
Materials and supplies	\$200	
Travel	\$200	
Overhead (estimate)		\$1,000
	TOTAL VALUE "IN-KIND" COSTS	\$13,900

## ESTIMATED TOTAL PROJECT COST FOR 1 YEAR

ESTIMATED TOTAL COST OF PROJECT (1 YEAR) E & F	\$21,400
------------------------------------------------	----------
### 8) APPROVAL BY PRINCIPAL APPLICANT'S EMPLOYER

The undersigned declare the approval and support of their organization for the research project as described in this application. Signatures confirm that space and basic facilities for carrying out the proposed research are available for use and that the applicant is authorized to participate in this research project.

Christine Murray Christine Murray Director March 8 2002

### 9) TERMS AND CONDITIONS

The applicant(s) agree that, upon acceptance of funding, a commitment is made to:

a) Conduct the research as laid out in the proposal, excepting changes mutually agreed upon by the applicant(s) and the Executive of the Alberta Potato Research Association.

b) Allow the Alberta Potato Research Association to use all information, data and results generated as a result of the research for extension purposes.

c) Not publish or present any data from this study without the written permission of the Chairman of the PGA Board.

Principal Cooperator Signature 8,2002 March

Date

PGA Executive Committee Signature

Date



6008, 46th Avenue Taber, Alberta T1G 2B1

Phone (403) 223-2262 Fax (403) 223-2268 e-mail: pga@albertapotatoes.ca www.albertapotatoes.ca

June 12, 2003

Seed Potato Program, AAFRD Crop Diversification Centre North RR6, 17507 Fort Road Edmonton AB T5Y 2Y8

Attention: Patricia McAllister

### Re: Effect of Quadris in-furrow in high organic matter soils.

Dear Tricia,

We are pleased to advise that the Board of the Potato Growers of Alberta has approved your application for research funding. The approval is in the amount requested, \$2,000.00 and the funds are available to meet the timelines specified in your application. When requesting the funds for the project, please provide an invoice that specifies the amount, GST and to whom payable.

Yours truly,

Vern Warkentin Executive Director

Not paid yet - Sept 8/03

### Section II. STUDY PLAN AMENDMENT **DOCUMENTATION AND CHANGE FORM**

### Study Plan: 02PGA01

Trial code: 02PGA01-AB

#### Study Title: Magnitude of Residue of Azoxystrobin (Quadris) Applied In-furrow to Potato in 2002.

Amendment Number: 3

Study Director: Gary Coukell

Study Plan Section(s) affected: New Section.

Description of Change(s):

Addition of Section II: Analytical Phase of Study Plan Number: 02PGA01

Justification for change(s):

As stated in Basic Study Information, item 6, page 3 of 10, the analytical phase of the study plan was to be added by amendment.

Effective Date of Change: January 22, 2003

Study Director Signature and Date: They Conchell Jan 22, 2003 Study Director Management Signature and Date: ERAD Harler Jon 22, 2003



Magnitude of Residue of Azoxystrobin (Quadris) Applied In-furrow to Potato in 2002

Study #02PGA01

### SECTION II: ANALYTICAL PHASE OF STUDY PLAN NUMBER: 02PGA01

1. Title: Magnitude of Residue of Azoxystrobin (Quadris) Applied In-furrow to Potato in 2002 (Analytical Phase)

2. Test Item: Quadris flowable fungicide (250 g azoxystrobin / L)

3. Test System: Potato tubers

### 4. Test System Sample Identification:

Samples identified as 1-1, 2A-1, and 2B-1 were delivered frozen to Enviro-Test Laboratories (ETL) on 21 October 2002, as documented in the field notebook. ETL assigned the lab sample identification: L1209 Fr. #1-3, and placed them under storage conditions of approximately -20 C.

5. Regulatory Guidelines: OECD GLPs and PMRA DIR 98-02

### 6. Analytical Phase Schedule:

Proposed analytical phase start date:January 2003Proposed analytical phase completion date:February 2003

### 7. Analytical Laboratory:

Enviro-Test Laboratories 9936 - 67 Avenue Edmonton, AB T6E 0P5 Ph: 780-413-5227 Fx: 780-434-9178

### 8. Objective:

The objective of this analytical phase is to analyse the test system samples to determine residue levels of the fungicide azoxystrobin and its geometric isomer, R230310.

The analytical method to be used for this phase has been supplied by Syngenta Crop Protection and is entitled "RAM 243/05 Residue Analytical Method for the Analysis of Azoxystrobin and R230310 in Crops".

Samples from this study will be analysed concurrent with Syngenta Crop Protection samples treated with the same active ingredient, and reference items and standards will be shared.

### 9. Reference Items:

Standards of azoxystrobin and R230310 will be GLP certified. Syngenta Crop Protection or ETL shall supply all references and standards. The purity, lot number, and expiry date of each standard will be documented by ETL.

Data for reference items and standards will be reported to both the Study Director of 02PGA01 and Syngenta Crop Protection, as necessary to completely document the analytical phase for their respective studies.

Magnitude of Residue of Azoxystrobin (Quadris) Applied In-furrow to Potato in 2002

### 10. Communication:

All communications between the Analytical Principal Investigator and the Study Director regarding conduct or reporting of the analytical phase will be documented and retained as study records.

### 11. Records to be Maintained:

Records to be maintained include, but are not limited to, reference item receipt and inventory log, standard solution log, sample receipt and inventory log, storage conditions of standards and samples, balance and instrument logs, data recording sheets, all calculations and chromatograms including data from both failed and successful method validation trials. At the end of the project, all original study-specific raw data will be transferred to ICMS, Inc. archives. Original facility records (freezer temperature logs, balance and instrument logs) and copies of all raw data, transformations or calculations of the raw data, and the final report will be maintained in the archives of Enviro-Test Laboratories.

### 12. Amendments and Deviations:

Any amendments to this Study Plan, including method RAM 243/05, must be communicated to and approved by the Study Director. Any deviations from the Study Plan, analytical facility Standard Operating Procedures, or method revisions must be documented by the Analytical Principal Investigator and communicated to the Study Director.

### 13. Final Report:

The DRAFT report of the analytical results will be prepared and submitted to the Study Director for review. Any comments or suggestions pertaining to the DRAFT will then be addressed by ETL prior to submitting a FINAL report to the Study Director.

### 14. Quality Assurance for Analytical Phase:

The Quality Assurance Unit (QAU) of ETL will conduct inspections/audits of critical phases and the analytical final report to assure compliance to the study plan, OECD GLPs, and ETL SOPs. Audit findings will be reported to the Analytical Principal Investigator, Study Director, ICMS QAU and ETL Management. The final report will contain a signed statement from ETL QAU listing dates of inspections/audits and the dates reported to each party.

### 15. GLP Compliance:

This study is to be conducted in compliance with OECD GLPs as required by PMRA Directive 98-02. The Analytical Principle Investigator will sign a statement of compliance listing any exceptions to GLPs which will be included in the final analytical report

Magnitude of Residue of Azoxystrobin (Quadris) Applied In-furrow to Potato in 2002

Study #02PGA01

16. Authorization:

Gary Coukell, MSc., P.Ag. ICMS Inc. Study Director

Vern Warkentin (Executive Director) Potato Growers of Alberta Sponsor Management

Keith Burch, Dipl. Ag., T.Ag. ICMS Inc. Quality Assurance Unit

Brent Wright, MSc., P Ag. ICMS Inc. Study Director Management

Gord Nelson

Enviro-Test Laboratories (ETL) ETL Management

Gary Bruns, Sc. Enviro-Test Laboratories Analytical Principal Investigator

IS

Anne Beaubien, BSc. Enviro-Test Laboratories ETL Quality Assurance Officer

<u>on 27, 2003</u> Date

765/03

JAU. 22, 2003 Date

Jan 22,2003 Date

Jan. 24, 2003 Date

an 24 03 Date

. 24, 2003 Date



6008, 46th Avenue Taber, Alberta T1G 2B1

Phone (403) 223-2262 Fax (403) 223-2268 e-mail: pga@albertapotatoes.ca www.albertapotatoes.ca

June 12, 2003

Seed Potato Program, AAFRD Crop Diversification Centre North RR6, 17507 Fort Road Edmonton AB T5Y 2Y8

Attention: Patricia McAllister

Re: New Source of Gibberellic acid (GA3) for use on seed potatoes.

Dear Tricia,

We are pleased to advise that the Board of the Potato Growers of Alberta has approved your application for research funding. The approval is in the amount requested, \$3,200.00 and the funds are available to meet the timelines specified in your application. When requesting the funds for the project, please provide an invoice that specifies the amount, GST and to whom payable.

Yours truly,

Vern Warkentin Executive Director

not polyet - Sep + 8/03



6008, 46th Avenue Taber, Alberta T1G 2B1

Phone (403) 223-2262 Fax (403) 223-2268 e-mail: pga@albertapotatoes.ca www.albertapotatoes.ca

June 12, 2003

Seed Potato Program, AAFRD Crop Diversification Centre North RR6, 17507 Fort Road Edmonton AB T5Y 2Y8

Attention: Patricia McAllister

### Re: Russet Burbank line multiplication and evaluation.

Dear Tricia,

We are pleased to advise that the Board of the Potato Growers of Alberta has approved your application for research funding. The approval is in the amount requested, \$1,200.00 and the funds are available to meet the timelines specified in your application. When requesting the funds for the project, please provide an invoice that specifies the amount, GST and to whom payable.

Yours truly,

Vern Warkentin Executive Director

not paid yet - Sep 8/03

Seed Potato Program, AAFRD Crop Diversification Centre North RR6, 17507 Fort Road Edmonton, AB T5Y 2Y8 Submitted by Patricia McAllister Phone: 780-415-2315

The following three projects are being undertaken by the seed potato program at CDC North. The trials are currently in the ground seed and product have been donated by interested parties. I am seeking funding for the labour necessary to maintain, harvest and evaluate the results of the trials.

# Project 1: New source of gibberellic acid (GA3) for use on seed potatoes

**Objective:** Gibberellic acid (GA3) has been proven to be a useful tool in seed potato production by increasing tuber and stem number and decreasing average tuber size without effecting overall yield. Past research at CDCN on the GA3 product Activol proved to be effective but we have been unsuccessful in our attempts to have Activol registered as a seed treatment for use on seed potatoes. If the new generic GA3 product we have introduced into the trial this year proves to be effective we are optimistic that we may be able to get the product registered through the fertilizer act in cooperation with the BC fruit growers who are working to register the product on sweet cherries.

**Scope:** The trial includes Shepody and two FL varieties which have been treated with two different rates (5 and 10 ppm) of three different formulations of GA3 as a liquid seed treatment. We will be evaluating emergence date, vine vigour. stem number, tuber size, tuber yield and overall tuber profile to determine the effectiveness of the product. Seed from this trial will be grown again in 2004 to evaluate residual effect of the GA application.

**Expected Results:** Based on work done using the generic GA3 in sweet cherries, we expect to see similar results from the generic product as we have seen with Activol. Our hope is that these results can be used to have the product registered under the Fertilizers Act and our seed growers will have access to a GA3 product which will help reduce average tuber size in several problem varieties. If there was a desire to have this product registered on commercial production additional residue testing work would be required. Results will be available to growers in spring of 2004 and if we are successful in our bid for registration we could have a registered product by 2005.

Requested Funding: Total funding requested for the 2003 project is \$3200.

OK appurace

OK

## Project 2: Effect of Quadris in-furrow in high organic matter soils

P ...

**Objective:** To examine the effectiveness of Quadris in-furrow application on rhizoctonia stem lesions and black scurf on tubers in high organic matter soils. The majority of Quadris research that has been done in Alberta has been done under southern production conditions and an Edmonton evaluation is merited.

**Scope:** The trial includes the varieties Atlantic and Russet Burbank. The treatments include a Quadris application, a water treatment and an untreated control. Each plot includes 40 seed pieces. Eight to nine weeks post plant 20 plants will be removed and examined for rhizoctonia lesions. The remaining 20 plants will be taken to harvest and tubers will be graded and evaluated for black scurf.

**Expected Results:** Results will be evaluated and considered preliminary data. Additional work may be merited.

**Requested Funding:** Total funding requested for the 2003 project is \$2000.

## **Project 3: Russet Burbank line multiplication and evaluation**

**Objective:** The Alberta Seed Potato Repository contains several lines of the variety Russet Burbank. In 2002 the lines were multiplied under greenhouse conditions and tubers are being grown-out in the field in 2003.

**Scope:** A field grow-out of the different Russet Burbank lines in underway to determine if the different varieties have different characteristics including flesh colour. Tubers produced from this evaluation will be grown-out in 2004 in a replicated field trial where additional observations will be made.

**Expected Results:** Results will be evaluated to determine if differences exist between the different Russet Burbank lines. Information will be provided to growers and if flesh colour differences exist other characteristics will be closely examined to determine which lines should remain in the bank and be distributed to growers.

**Requested Funding:** Total funding requested for the 2003 project is \$1200.

OK OK



Taber, April 16 2004.

Ron Howard Plant Pathologist Alberta Agriculture, Food and Rural Development Crop Diversification Centre South Brooks

### Re: "Evaluating Methods for the control of Seed-Piece Decay, Wilt and dry Rot Caused by *Fusarium* species on Potatoes in Alberta"

Dear Ron

We are pleased to advise that the Board of the Potato Growers of Alberta has approved your application in the amount of, \$15,000.00, and the funds are available to meet the timelines specified in your application.

When requesting the funds for the project, please provide an invoice that specifies the amount, GST and to whom payable.

We appreciate your commitment and dedication to the potato industry.

Yours truly,

Alfonso Parra Technical Director

Project # 629092 New: Renewal: X

### MEMORANDUM OF UNDERSTANDING

Between:

The Potato Growers of Alberta (hereafter referred to as the "PGA")

RECEIVED NUV 2 9 20 5

and

Alberta Agriculture, Food & Rural Development (hereafter referred to as "AAFRD")

<u>PROJECT TITLE</u> decay will once Day roct auged by Figurious species on potatoes in AB Screening isolates of Verticillium albo-atrum, Verticillium dahliae and Colletotrichum coccodes for their sensitivity to seed-treatment fungicides

### **OBJECTIVES**

1) To determine whether isolates of the fungal pathogens that cause verticillium wilt and black dot in potatoes are sensitive or insensitive to some of the common fungicidal seed treatments used to treat cut and whole potato seed prior to planting.

2) To correlate the results of these sensitivity tests to those obtained from similar studies with isolates of *Fusarium* species that cause seed-piece decay, wilt and dry rot on potatoes.

3) To use the information generated in this study to help growers to better manage seed- and soil-borne diseases through the use of fungicidal seed treatments.

### STATEMENT OF WORK

Alberta Agriculture, Food & Rural Development is willing to undertake the specified study for the PGA, which hereby agrees to contribute toward the costs of generating and reporting the information required as described in the attached research proposal.

### PERIOD OF WORK

The research project will commence on or about April 1, 2005 and should be completed by December 31, 2005. A final report will be submitted by March 31, 2006

### **BASIS OF PAYMENT**

As a sponsor of the project, the PGA will provide \$2,500 + GST upon finalization of this memorandum to AAFRD to cover the following estimated costs for the project:

Technical Manpower	\$2,000
Materials & Supplies	\$ 500 🚈
GST (7%)	<u>\$ 175</u>
TOTAL	\$2,675

This budget can be adjusted and used at the discretion of the project manager.

Payment of research project expenditures will be made from funds made available to AAFRD up to the maximum amount of funds received from the.

Upon request, AAFRD will provide a record of revenue and expenditure upon project completion or depletion of funds. Any remaining funds after completion or termination of the project can be used for research at the discretion of the project manager.

### **RESPONSIBILITY OF PROJECT MANAGER**

The project manager for this study is Dr. Ron Howard. He will provide all reports to the sponsor, AAFRD and other parties at the discretion of the sponsor.

The project manager will authorize expenses and submit them to the appropriate AAFRD department for processing payment.

The project manager is not eligible for any manpower funds himself.

### AMENDMENTS OR TERMINATION

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This Memorandum of Understanding may be amended by mutual consent of the parties as evidenced by an exchange of letters.

Either AAFRD or the PGA may terminate this Memorandum of Understanding by providing two weeks notice in writing to the other party.

### NOTICES AND REPRESENTATIVES

Notices for all purposes of or incidental to this Memorandum of Understanding shall be effectively given if delivered personally, or sent by registered or certified mail to the representatives of the parties designated as follows:

The Potato Growers of Alberta:	Alberta Agriculture, Food & Rural Development:
Mr. Vern Warkentin	Dr. Christine Murray
Executive Director	Branch Head
Potato Growers of Alberta	Crop Diversification Centre South
6008 – 46 <sup>th</sup> Avenue	S. Ś. #4
Taber, AB T1G 2B1	Brooks, AB T1R 1E6
Phone: 403-223-2262	Phone: 403-362-1313

The Department of Agriculture, Food & Rural Development, the Potato Growers of Alberta, and other sponsors of the project may use information generated from the project.

The sponsor, the PGA, relinquishes ownership of any materials, supplies and assets purchased with the project funds to Alberta Agriculture, Food & Rural Development, which assigns control to the project manager's departmental division.

The parties affirm their acceptance of the terms of this Memorandum of Understanding by signing below.

Copies bearing original signatures of this Memorandum will be kept by each party.

Dr. Ron Howard, Project Manager

11403

2005 Date

I agree that the project manager named above may supervise this project.

Dr. Christine Murray, Branch Head Crop Diversification Centre South

Mr. Vern Warkentin, Executive Director Potato Growers of Alberta

Date

Nov 2/05 Date

NOTE:

1.0

.

The PGA agreed to pay \$500.00 honorarium to Ron Howard for his presentation at the AGM in 2004. As per speaker's request the \$500 granted will be included into one of the research projects chosen by the researcher.

Alfonso Parra Huo

### Agreement to Speak at the Annual General Meeting

C 1 15 6

Please complete, sign and return two copies of this agreement. One copy will be signed by our representative and returned to you. Your copy of this form is for reporting authorized expenses within 30 days following the conference. Forward the complete form with receipts to the PGA office for reimbursement. Cheques will be made payable to the name listed below and mailed to the address listed below.

Plint	
Name: Dr. Ron Howard Title: Pathologist	
Diversification	
Institution: Crop Development Centre South	
Address: Alberta Agriculture, Food & Rural Dev. Crop Diversification Centre – South SS # 4 Brook <sup>5</sup> , AB., T1R 1E6	
~ 2,	
Phone: (403) 362-1328 Fax: (403) 362-1306	0
Discases: Impact and Hanagement in Processing a	nd lable
Presentation Title: <b>Fusarium <del>sp. rutnology</del> and Control</b>	Polatous
Date and time: Nov. 18, 2004 Speaking time not finalized. PGA Heating	
Location: The Capri Hotel, Red Deer Ab.,	
Compensation will include the following:	
Honorarium: \$500.00 Travel: X Lodging X Meals X	2
List audiovisual aids:	
	22 C

We the undersigned agree to execute this agreemen conditions outlined.	at and accept all the terms and
Signature (Speaker): R.A. Thursdard	Date: Sept. 21, 2004
PGA Representative:	Date:

## Evaluating methods for the Control of Seed-Piece Decay, Wilt and Dry Rot Caused by Fusarium Species on potatoes in Alberta

Researcher:	Ron Howard (AAFRD Brooks)
Term:	One Year

**Objectives:** 

- To measure levels of Fusarium contamination in selected samples of locally and imported seed potatoes for planting in Alberta in 2004.
- To identify the main Fusarium species responsible for seed-piece decay, wilt and dry rot in seed, processing and table stock potatoes in central and southern Alberta.
- To compare effectiveness of registered seed treatments against seed-piece decay.
- To examine production practices on potato farms where outbreaks of Fusarium diseases occurred in 2003 in relation to factors such as see source, crop rotation, seed cutting, pesticide use, in-season crop management, and harvesting, handling and storage practices.

Costs: Total \$55.000.00 PGA\$ 20.000.00 + 2.500.00 in kind Comments:

- The project addresses current problems in the potato industry and is valuable for seed and processing growers.
- Cost of the project for the PGA might be reduced by splitting the cash cost (50%) with the chemical companies or doing less field trials.

## Evaluating Methods for the Control of Seed-Piece Decay, Wilt and Dry Rot Caused by *Fusarium* species on Potatoes in Alberta

## A Research Proposal Submitted to the

Potato Growers of Alberta 6008 – 46<sup>th</sup> Avenue Taber, Alberta T1G 2P1

March 18, 2004



Prepared by

Ron Howard, Plant Pathologist Alberta Agriculture, Food and Rural Development Crop Diversification Centre South SS #4, Brooks, Alberta T1R 1E6

### Background

Seed-piece decay, wilt and dry rot, caused by the fungal pathogen Fusarium, are some of the most damaging diseases affecting potatoes in Alberta. Seed, processing and table stock potatoes are all affected by fusarium diseases. Fusarium spp. can cause a slow decay of potato seed pieces and lead to poor stands and reduced yields. During the growing season, they can attack the vascular system of potato plants, causing them to wilt and die prematurely. At harvest, soil-borne Fusarium spp. can infect tubers through cuts and bruises, leading to extensive dry rot in stored tubers. If infected tubers are used for seed, *Fusarium* spores can be spread during cutting and may predispose the seed to decay in storage or in the field soon after planting. Environmental conditions in storage and in the field can have a marked effect on the severity of fusarium diseases. Cold, dry soil conditions favor fusarium seed-piece decay, while wilt is promoted by hot, dry weather. Dry rot is encouraged by high relative humidities and warm temperatures. The incidence and severity of fusarium diseases were higher than normal in Alberta in 2003. A combination of cool soil conditions at planting, hot, dry summer weather, and warm temperatures at harvest may have favored disease development. Despite the economic importance of fusarium diseases in potatoes in Alberta, relatively little research has been done on improving existing disease management practices for them. Traditional control practices have included selecting clean seed, applying fungicidal seed treatments, planting into warm, moist soil, minimizing bruising at harvest and during subsequent handling, and providing optimal storage conditions. The high incidence of fusarium diseases in many parts of Alberta in 2003 provides a unique opportunity to study the carryover, spread and development of these diseases in the 2004 potato crop and to evaluate the effectiveness of current control practices under moderate disease pressure.

### **Objectives**

- To measure levels of *Fusarium* contamination in selected samples of locally grown and imported seed potatoes destined for planting in Alberta in 2004.
- To identify the main *Fusarium* species responsible for seed-piece decay, wilt and dry rot in seed, processing and table stock potatoes in central and southern Alberta in 2003-04.
- To compare the effectiveness of registered seed treatment fungicides against seed-piece decay compared to one another and to new experimental products that may become available from the major pesticide companies in 2004.
- To assess the relative sensitivity of *Fusarium* isolates collected during field and storage surveys to registered fungicides *in vitro* in order to determine if resistant strains exist.
- To examine production practices on potato farms where outbreaks of fusarium diseases occurred in 2003 in relation to factors such as seed source, crop rotation, seed cutting, pesticide use, in-season crop management, and harvesting, handling and storage practices.
- To use the information generated in this study to critically evaluate and help improve management practices for fusarium diseases in potatoes in Alberta.

### **Project Duration**

This project will be carried out from April 1, 2004 to May 31, 2005 and will involve laboratory, field and storage trials at research facilities in central and southern Alberta.

### Methods

<u>Seed Surveys</u> – Approximately 20 samples of seed potatoes will be obtained from growers or purchased in the marketplace and subjected to testing. These tubers will be from lots destined for seed increase or the production of processing or table potatoes and may include both locally

grown and imported stock. The samples will be comprised of the main varieties used for commercial production in Alberta and will represent different certification classes, e.g. Elite I, II and III. Each sample will consist of ca. 250 tubers. Background information on the production and disease history of each sample will be obtained from the suppliers. Upon receipt, each sample will be split in half, with one portion going into storage and the other into the lab. The stored tubers will be held at 15°C and 95% RH for 6-8 weeks to allow dry rot symptoms to develop. At the end of this time, disease incidence (% tubers infected) and disease severity (proportion of individual tubers affected) will be measured. The *Fusarium* spp. responsible for the decay will be isolated and identified. For the potatoes destined for lab tests, a subsample of 10 tubers will be randomly selected and washed with sterile water. The rinse water will be plated onto selective agar media to determine the populations of surface-borne *Fusarium* spp. These and the remaining tubers will be visually examined for external disease symptoms, cut and rated for the incidence and severity of dry rot and vascular discoloration.

Fusarium Identifications - Subcultures of representative Fusarium spp. will be single-spored, pure cultured and identified using standard taxonomic keys. Presumptive identifications will be confirmed by sending representative cultures to the National Fungal Identification Service, Central Experimental Farm, Agriculture and Agri-Food Canada, Ottawa. Reference cultures will be maintained in soil for in vitro fungicide efficacy trials and future research studies. Seed Treatment Efficacy Trials - Samples of fungicides registered for use against fusarium seed piece decay on potatoes will be obtained from chemical companies or purchased from suppliers. The major fungicide manufacturers will also be asked if they have any potentially effective experimental or unregistered products to evaluate in the proposed field trials. These products will be applied to a seedlot known to be infested with Fusarium. If necessary, a small amount of inoculum of a virulent isolate of F. sambucinum will be placed in the row with the seed pieces at planting to enhance disease pressure. Replicated trials will be planted at the Crop Diversification Centre South, Brooks and in a commercial field in the Edmonton area, wherein the chemical products will be evaluated. Data to be taken during the growing season will include incidence of fusarium seed piece decay, emergence, stem numbers, incidence of fusarium wilt, and tuber yield. Subsamples of tubers will be stored at 15°C and 95% RH for 3-4 months to allow dry rot symptoms to develop. At the end of this time, disease incidence (% tubers infected) and disease severity (proportion of individual tubers affected) will be measured.

In Vitro Sensitivity of Fusarium Isolates to Fungicides – Isolates of Fusarium spp. collected during the various phases of this project will tested for their sensitivity to seed treatment fungicides such as Senator (thiophanate-methyl), Captan (captan), Tuberseal (mancozeb), Maxim PSP (fludioxonil), and Polyram (metiram) in laboratory tests. Fusarium spp. will be plated onto agar plates containing various concentrations of the test fungicides. Radial mycelial growth will be measured a few days after plating, and ED<sub>50</sub> and ED <sub>95</sub> values, i.e. the concentration required to inhibit mycelial growth by 50% and 95%, respectively, will be calculated. These values will be compared with published standards for fungal resistance and susceptibility to these products. <u>Review of Production Practices</u> – A representative sample of seed and commercial potato growers will be surveyed to determine the impact that fusarium diseases had on their operations in 2003. Production information, such as variety, seed source, crop rotation, land preparation, seed cutting, fertilizer and pesticide application, in-season crop management, irrigation, and harvesting, handling and storage practices will be collected. Efforts will be made to correlate these data between farms and identify factors that may have contributed to disease outbreaks.

### **Technology Transfer Plan**

A final report will be prepared and submitted to project sponsors, cooperators and growers. Fungicide efficacy data will be published in the 2005 Pesticide Research Report - Insects and Diseases published by Expert Committee on Integrated Pest Management. Articles will be prepared for the Potato Minute newsletter, and project results will be presented at PGA area, breakfast and/or annual meetings.

### **Project Cooperators**

The following individuals, organizations and companies will be invited to support this research project by providing technical assistance and/or financial/in-kind contributions:

- Agriculture and Agri-Food Canada, Lethbridge Research Centre
- BASF Canada Inc.
- Dow AgroSciences Canada Inc.
- Engage Agro Corporation
- Gustafson Partnership
- Norac Concepts Inc.
- Potato Growers of Alberta
- United Agri-Products Ltd.
- Syngenta Crop Protection Canada Inc.

### **Project Team Members**

- Ron Howard, Sherry Lisowski and David Slomp, AAFRD, CDC South, Brooks
- Michele Konschuh and Simone Dalpe, AAFRD, CDC South, Brooks
- Rob Spencer, AAFRD, Alberta Ag-Info Centre, Stettler
- Tricia McAllister and Tina Lewis, AAFRD, CDC North, Edmonton
- Larry Kawchuk, Agriculture and Agri-Food Canada, Research Centre, Lethbridge
- Piara Bains, Agri-Research Ltd., Edmonton
- Alfonso Parra, Potato Growers of Alberta, Taber
- Lindsye Dunbar, Potato Growers of Alberta, Edmonton

### **Potential Funding Sources**

Sponsoring Organizations	Cash Contributions	In-kind Contributions
AAFRD, Brooks, Taber and Edmonton		\$20,000
AAFC, Lethbridge		\$2,500
Pesticide Companies	\$10,000	
Potato Growers of Alberta	\$20,000	\$2,500
TOTAL	\$30,000	\$25,000

### **Project Budget (Allocation of Cash Contributions)**

•	Wage staff (6.0 months)	\$15,000
•	Materials, supplies & travel	\$ 5,000
•	Custom analytical & research services	\$ 8,000
•	GST (7%)	<u>\$ 1960</u>
		\$29,960



6008, 46th Avenue Taber, Alberta T1G 2B1

Phone (403) 223-2262 Fax (403) 223-2268 e-mail: pga@albertapotatoes.ca www.albertapotatoes.ca

April 28, 2005

Patricia McAllister Seed Potato Program Alberta Agriculture, Food and Rural Development Crop Diversification Centre North 17507 Fort Road Edmonton, AB T5Y 6H3

## Re: "Pre-plant handling of seed and its potential to impact tuber performance and yield."

Dear Patricia:

We are pleased to advise that the Board of the Potato Growers of Alberta has approved your application in the requested amount of \$4,000.00. The funds are available to meet the timelines specified in your application.

When requesting the funds for the project, please provide an invoice that specifies the amount, GST and to whom payable.

We appreciate your commitment to the potato industry.

Yours truly, arkentin

Executive Director



## **Potato Growers of Alberta**

Proposal application for Research funding 2005-2006

### Instructions

To assess the proposals consistently, they must be completed according to the parameters contained in this form. Proposals may be rejected for incomplete information or lack of compliance with the instructions. This application could use other sources of forms only if it will be presented to other funding consortiums.

Please jump between boxes using the "Tab" key and avoid the use of the "enter" key. The PGA Research Committee will set dates for project presentations and result reports.

### Confidentiality

This Proposal is confidential and the information contained in it may not be disclosed with other organizations or research groups.

Team Leader:Patricia McAllister		
Organization:AAFRD	Section/Department:CD0	C North
Address:17507 Fort Road	City:Edmonton	Province:AB
Postal Code:T5Y 6H3	E-mail :tricia.mcallister@	øgov.ab.ca
Phone Number:780-415-2315	Fax Number:870-422-60	96

### 1. Research Team Information

Team Member:		
Organization:	Section/Depar	tment:
Address:	City:	Province:
Postal Code:	E-mail:	
Phone Number:	Fax Number:	

Team Member:		
Organization:	Section/Department:	
Address:	City:	Province:
Postal Code:	E-mail address:	
Phone Number:	Fax Number:	

**Research Proposal** 

Reviewed January 2005

### Potato Growers of Alberta

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### 2. Project Information

Title:Pre-plant handling of seed and its potential to impact tuber performance and yield.

Category of the project (Please check more than one box if necessary):

Pest Management

Water and Irrigation Management

Potato Storage

Potato Breeding

Potato Plant Physiology

Potato Fertility Plant

\_\_\_\_Nutrition/Soil management

Green House

Environment

Potato Marketing and Economics

Potato Cultural Management

Research Location (s): Crop Diversification Centre North

Duration (Y):3 Start Date (YY/MM):04/04Ending Date (YY/MM):07/03

Research Proposal

Reviewed January 2005

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Is the project linked to other applications / Research projects  $Y \boxtimes N$  [(Please identify related projects)] 1.Project:Pre-plant handling of seed and its potential to impact tuber performance and yield.

Team Leader: Patricia McAllister

Start Date:04/04

2.Project: Team Leader:

Start Date:

## Background.

(Max 2000 characters) In 2003 questions a

In 2003, questions arose regarding the handling of seed and the effect of sprout removal on seed performance. AC Glacier Chip appeared to be particularly sensitive to pre-plant handling and in 2004 we received funding from the PGA for a preliminary study to assess the effects of pre-plant handling of seed on overall performance and yield.

The 2004, growing season proved to be very challenging at CDC North. Less then ideal soil conditions at planting combined with extreme weather in early July and snow in early September increased the variation in the data collected and made it difficult to make any firm conclusions on the effects of the pre-plant treatments.

The 2004 data indicates that:

- warming Russet Burbank seed prior to planting resulted in faster emergence, a higher number of stems per plant, higher total yield per plant and a larger number of tubers per plant.

- AC Glacier Chip emerged more quickly when planted with visible sprout development although the removal of sprouts did not appear to effect overall yield.

Potato Growers of Alberta

Reviewed January 2005



- Snowden seed with visible sprout development emerged more quickly then seed that had sprouts removed just prior to planting but all other parameters measured showed little response to the treatments.

Current Research being conducted in Washington State by Dr. Rick Knowles indicates that seed can be manipulated prior to planting to alter the tuber profile in the field. Our proposed research will help us determine if different pre-plant handling regimes can be utilized by different segments of the potato idustry to produce the desired tuber profile.

Objectives (Measurable-Deliverables) (Please use Bullets) (Max 1000 characters) The number of this trial is to evolute three w

The purpose of this trial is to evaluate three varieties for their response to different pre-plant handling regimes and to determine the effect of these regimes on emergence, tuber profile and yield. Results will be compared to the trends observed in the 2004 study.

Economical/Environmental Benefits

(Please mention how the results of this project will benefit potato production economically and environmentally.( Max. 1000 characters) .

Results from this study have the potential to impact all aspects of the potato industry if we are able to develop variety specific pre-plant handling regimes for specific end markets. It will also help us determine if new varieties require special handling regimes (comapred to the stand Russet Burbank) to maximize performance.

Producers are paid for the product that they produce and manipulating seed to produce the desired tuber profile appears to be a pratical and cost effective management tool.

Reviewed January 2005



Methodology Description

(Please describe the scientific process you will follow to achieve project objectives).(Max 2000 Characters) In year one of this study, we plan to plant replicated plots of Russet Burbank, AC Glacier Chip and Snowden at CDC North. Single drop seed will be obtained from an Alberta grower and pre-plant handling treatments will begin in early April. We will repeat the seven treatments used in our 2004 study. These include:

Treatment 1 - warm early April, depsrout 3 weeks later and desprout at planting.

Treatment 2 - warm ealy April, desprout 3 weeks later, plant

Treatment 3 - warm early April, desrpout at planting

Treatment 4 - warm early April, plant

Treatment 5 - warm 3 weeks after initial group, plant

Treatment 6 - warm 4 weeks after initial group, plant

Treatment 7 - remove from cold storage and plant

Data collected throughout the growing season will include emergence, stand, vine vigour and maturity. At harvest we will count the number of stems per plot. Following harvest we will determine yield, tuber number and profile, specific gravity and internal and external defects.

Data will be statistically analysed and results complied to determine if varieties or treatments should be modified for 2006. The 2007 budget includes the addition of two more varieties to the trial.

Research Proposal

Potato Growers of Alberta

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Technology Transfer Plan.

(Please describe the proposed method to communicate findings and results) (Max. 1000 characters) Results of this study will be made available in a preliminary report in late winter 2006 and in a final report upon the conclusion of the study in 2007. The results will be presented directly to growers as part of scheduled PGA meetings.

If final results are conclusive they may be eligible for presentation at Potato Association of America meetings or for publication in a scientific journal format.

### 3. Project Budget

		Year 1	Year 2	Year 3	Total
	Cash	4000	6500		
	In-Kind	2.	1	1	
PGA	Total	4000	6500		10500
Other					
	Cash				
	In-Kind	6000	6000		12000
AAFRD	Total	6000	6000		12000
Other					
	Cash				
	In-Kind	100	200		300
Seed Growers	Total	100	200		300
Other					
	Cash				
	In-Kind				
	Total				1
Other			24 - C		1.
	Cash				

**Research Proposal** 

Reviewed January 2005

Potato Growers of Alberta

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	Total	I			
Total		10100	12700	1	22800
					1
Project Cost Distribution	l	Year I	Year 2	Year 3	Total
Personnel		9700	11400		21100
Travel expenses			500	1	500
Capital goods					
Materials		400	600	1	1000
TOT			200		200
Overhead					
Total		10100	12700	-	22800
*101 (Transference of					
Technology)					
esearch Project Manager					
		Data			

Research Proposal

Reviewed January 2005

Potato Growers of Alberta

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## **RESEARCH TEAM INFORMATION (CONTINUED)**

Team Member: Dr. Jill Thomson		
Organization: Univ. of Saskatchewan	Section/Departmen	nt: Plant Sciences
Address: 51 Campus Drive	City: Saskatoon	Province: SK
Postal Code: S7N 5A8	E-mail: jill.thomso	on@usask.ca
Phone Number: 306-966-5862	Fax Number: 306-	966-5015

Team Member: Dr. Michele Konschuh				
Organization: AAFRD	Section/Department: CDC South			
Address: S.S.#4	City: Brooks Province: AB			
Postal Code: T1R 1E6	E-mail:michele.konschuh@gov.ab.ca			
Phone Number: 403-362-1314	Fax Number: 403-362-1306			

Team Member: Ms. Tricia McAllister				
Organization: AAFRD	Section/Department: CDC North			
Address: RR6, 17507 Fort Road	City: Edmonton Province: AB			
Postal Code: T5B 4K3	E-mail: tricia.mcallister@gov.ab.ca			
Phone Number: 780-415-2315	Fax Number: 780-422-6096			

Team Member: Mr. Ted Harms		
Organization: AAFRD	Section/Departmen	nt: Irrigation Br.
Address: CDC South, S.S.#4	City: Brooks	Province: AB
Postal Code: T1R 1E6	E-mail: ted.harms(	@gov.ab.ca
Phone Number: 403-362-1347	Fax Number: 403-	362-1306

Team Member: Ms. Lori Delanoy		
Organization: AAFRD	Section/Departmen	nt: CDC South
Address: 5011 – 49 Avenue	City: Taber	Province: AB
Postal Code: T1G 1V9	E-mail: lori.delano	y@gov.ab.ca
Phone Number: 403-223-7915	Fax Number: 403-	223-3396

Team Member: Mr. Kal Basu		
Organization: BioVision Seed Labs	Section/Departmen	nt: Plant Pathology
Address: 7225B Roper Road	City: Edmonton	Province: AB
Postal Code: T6B 3J4	E-mail: kalb@biov	vision.ca
Phone Number: 780-436-8822	Fax Number: 780-	437-6875

Team Member: Mr. Hal Reed		
Organization: Taber Home & Farm	Section/Departme	ent:
Address:	City: Taber	Province: AB
Postal Code:	E-mail: hreed@sh	lockware.com
Phone Number: 403-223-8948	Fax Number:	

ð.

Team Member: Mr. Terry Morishita			
Organization: T.M. Enterprises Section/Department:			
Address: Box 236	City: Rosemary	Province: AB	
Postal Code: T0J 2W0	E-mail: tmoris@te	lusplanet.net	
Phone Number: 403-378-4004	Fax Number: 403-	378-4233	

### **ROLES AND RESPONSIBILITIES OF TEAM MEMBERS**

NAME	ROLE	RESPONSIBILITY
Ron Howard	Team Leader	Project coordination;
		Disease management
Larry Kawchuk	Researcher	Diagnostic techniques;
		Strain characterization
Piara Bains	Researcher	Disease management
		(seed and soil treatments)
Jill Thomson	Researcher	Disease management
		(irrigation; green manure)
Michele Konschuh	Researcher	Disease management
		(green manure)
Tricia McAllister	Researcher	Disease management
		(resistance screening)
Ted Harms	Researcher	Disease management
		(irrigation)
Lori Delanoy	Technology Transfer	Disseminate results
Kal Basu	Diagnostic Advisor	Evaluate diagnostic
		methods
Hal Reed	Industry Liaison	General advice
Terry Morishita	Industry Liaison	General advice

### **PROJECT TIMETABLE**

1.14

ACTIVITY	YEAR 1	YEAR 2	YEAR 3
Development of diagnostic tests for Ss	X	Х	
Characterization of Ss strains		Х	Х
Testing for PMTV		Х	Х
Disease management – Resistance screening			Х
Disease management – Seed and soil treatments	X	Х	Х
Disease management – Irrigation	X	Х	Х
Disease management – Green manure	X	Х	Х
Disease management – Crop rotation	X	X	Х
Technology transfer	X	Х	Х

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C	Potato Growers of Alberta Research Tracking						
	Title of Research Application: Determine	tion lutein content yllow-fleshed	potato varieties and yr				
	Name of <u>Researcher: Dr. Michele</u>	Konschuh					
	Employer: Ab. Agriculture						
	Date application was received by PGA_		_				
	Date application was reviewed by PGA_April 3, 2006						
	A) approved	B) declined					
	Project start date:	Project finish date:					
	Total amount requested:	Amount requested per year:	\$5,000-				
	MOU received and signed. Once copy returned to research agency, one copy filed in current year Research Binder						
	A 10 10	Date completed					
	Invoice received: #_5242.0064	Date funds advanced_June 1 / Ode	_Cheque#_4283_\$5,000-				
	Invoice received:#	Date funds advanced	_Cheque#				
	Invoice received:#	Date funds advanced	_Cheque#				
	Invoice received:#	Date funds advanced	_Cheque#				
	Were reports received from the researcher?						
	What was done with the reports?						
	Presented at PGA meeting?	Put on PGA website?	Filed?				
	NOTES:						
C							



Crop Diversification Centre South S.S. #4 Brooks, Alberta Canada T1R 1E6 Telephone 403/362-1300 Fax 403/362-1306

October 22, 2007

Vern Warkentin, Executive Director Potato Growers of Alberta 6008 – 46<sup>th</sup> Avenue Taber AB T1G 2B1

Dear Mr. Warkentin,

### Re: Yellow-Fleshed Potato Project (ACAAF Project #AB0001)

Thank you again for your contributions to the Ag and Food Council project Yellow-fleshed potato project. (ACAAF # AB0001).

The information generated over the past three years enabled us to estimate the quantity of lutein available in an average serving of potatoes and determine the effect of growing location and time of harvest on lutein concentration. Armed with this information, we envision that partners from the potato industry (seed, table market and processing sectors) will use the information to promote potatoes to health-conscious consumers and retailers. While yellow-fleshed potatoes may only be a modest source of lutein, the knowledge that potatoes contain another health-promoting compound may encourage potato consumption or provide good reasons to continue including potatoes in a balanced diet.

A final report on the trial is enclosed. If you require information about the trial, please contact me by e-mail at <u>michele.konschuh@gov.ab.ca</u> or by phone at 403-362-1314. Thank you.

Sincerely

Michele Konschuh, Ph.D. Potato Research Scientist

Encl.

RECEIVED OCT 2 2007

#### Applicant's Name: Michele Konschuh

#### Project Name: Lutein content of yellow-fleshed potatoes

Project#: AB0001

Report for the period \_ April 2005\_to \_March 2006\_

	Budget		Actual	
Revenue Elastation	Cash	in-kind	Cash	In-kind
Funding Agents:	E	C		
CARD	20500		19000	1
Applicant's Contribution		6000	1	6000
Industry Partners		500	3500	600
Provincial Partners	1	<u> </u>		
Other Partners (please list):				
Potato Growers of Alberta	5000		5000	
Tatal	25500	8500	27500	8800
i otai	2000	6300	2/500	6000
GOal 1:				
Growing Potatoes (2005)			1	
CDCN	3250	3000	5000	4000
CDCS	3250	3000	4575	4000
Lacombe	2000	500	3325	1
seed (for all locations)				600
Lutein Analyses				
Facility fees 45 days @ \$350/day	15750		15750	
Supplies	1500		1607	
Overhead and GST	3750			
GST only			1925	
Total	29500	6500	32162	6600

Michele Kinschen Date: Dit 24/02. (print name) ANNA MCELIER Date: Det 24/07 Project Manager ANNA-MCELIER (print name) signature Financial Officer

#### Applicant's Name: Michele Konschuh

Project Name: Lutein content of yellow-fleshed potatoes

Project #: AB0001

Report for the period \_April 2006\_to \_May 2007\_

	Budget		Actual	
Revenue	Cash	In-kind	Cash	In-kind
Funding Agents:		8	S	k -
CARD	20500	(C)	16000	
APF	1	0	1000	
Applicant's Contribution		6000		6000
Industry Partners	3500	500	3500	1200
Provincial Partners	1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.	1.9		L
Other Partners (please list):	1			1 20
Potato Growers of Alberta	5000	S	5000	2
Total	29000	6500	27500	9200
Expenditures				
Goal 1:			2	
Growing Potatoes (2006)				1
CDCN	3250	3000	3385	4625
CDCS	3250	3000	5000	4750
Lacombe	2000	500	2250	600
seed (for all locations)	23	2 B	S	600
Lutein Analyses	8			
Facility fees 45 days @ \$350/day	15750		14350	
Supplies	1500		220	
Overhead and GST	3750			— — — — — — — — — — — — — — — — — — —
GST only	18		1590	
Total	29500	6500	26795	10575

<u>Signature</u> <u>Signature</u> <u>ANNA MUELLER</u> <u>Signature</u> <u>Signature</u> <u>Signature</u> <u>Date:</u> <u>Dif</u> <u>2</u>9/07 <u>2</u>9/07 <u>Dif</u> <u>2</u>9/07 Project Manage Financial Officer
## In-Kind Contributions Tracking Sheet

## Applicant Name: Michele Konschuh

## Project Name: Lutein content of yellow-fleshed potatos grown in Alberta

Project #: AB0001

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Activity Description (eg.					Contributing
Meetings, planning, phoning, writing etc)	Date	Number of Days	Cost per Day	Total value	Organization/funder
Land, facility use, cost of production AAFRD	2005			\$5,000	CDCS + CDCN
Technical AAFRD staff	2005	15	200	\$3,000	CDCS + CDCN
Seed of yellow-fleshed varieties:	2005			\$200	Solanum International
(100+ lbs each variety @ estimated \$0.50 per lb)				\$200	HZPC Americas
				\$200	Parkland Seed Potatoes
Land, facility use, cost of production AAFRD	2006			\$6,000	CDCS + CDCN
Technical AAFRD staff	2006	15	225	\$3,375	CDCS + CDCN
Land use, cost of production - Lacombe	2006			\$600	Scholing's Produce
Seed of yellow-fleshed varieties:	2006			\$200	Solanum International
(100+ lbs each variety @ estimated \$0.50 per lb)				\$200	HZPC Americas
				\$200	Parkland Seed Potatoes
Note:				L	

$\bigcirc$	Potato Growers of Alberta Research Tracking	52				
	Title of Research Application: Re-pla	nt handling of seed, it's	potential to impact tuber perform			
	Name of Researcher: Tricia McAl	llister	and yield			
	Employer: A6. Agriculture					
	Date application was received by PGA_					
	Date application was reviewed by PGA_	April3/06				
	A) approved	B) declined				
	Project start date:	Project finish date:				
	Total amount requested:	Amount requested pe	er year: <u>6,500 ~</u>			
	MOU received and signed. Once copy returned to research agency, one copy filed in current year Research Binder Date completed					
Ô						
0	Invoice received: #	Date funds advanced	Cheque#			
	Invoice received:#	Date funds advanced	Cheque#			
	Invoice received:#	Date funds advanced	Cheque#			
	Invoice received:#	Date funds advanced	Cheque#			
	Were reports received from the research	ner?				
	What was done with the reports?					
	Presented at PGA meeting?	_ Put on PGA website?	Filed?			
	NOTES:					
	0					



6008, 46th Avenue Taber, Alberta T1G 2B1

Phone (403) 223-2262 Fax (403) 223-2268 e-mail: pga@albertapotatoes.ca www.albertapotatoes.ca

April 3, 2006

Patricia McAllister Seed Potato Program Alberta Agriculture, Food and Rural Development Crop Diversification Centre North 17507 Fort Road Edmonton, AB T5Y 6H3

## **Re:** "Pre-plant handling of seed and its potential to impact tuber performance and yield."

Dear Patricia:

We are pleased to advise that the Board of Directors the Potato Growers of Alberta has approved the continuity of your application in the amount requested.

For the period of April 1, 2006 – March 31, 2007 the amount of \$6,500 is available to meet the timelines specified in your application. When requesting the funds for the project, please provide an invoice that specifies the amount, GST and to whom payable.

We appreciate your commitment and dedication to the potato industry.

Yours truly, Varkentir

Executive Director