

Digging for Alternatives:



An Analysis of Potato Pest Management Research at Two Northwest Land Grant Universities

By Richarda Ruffle and Jennifer Miller

November 2002



A publication of the ■ Northwest Coalition for Alternatives to Pesticides

We gratefully acknowledge the support of:

- Carolyn Foundation
- Wallace Genetic Foundation
- Fanwood Foundation
- The members and supporters of NCAP



We appreciate the contributions the following individuals made to this report:

- Amelia Abromaitis
- Caroline Cox
- Norma Grier
- Neva Hassanein
- Brandon Hasty
- Jeff Rast
- Jan Scher
- Cinda Williams



Cover photo:

- Jay Ericson

Photo credits:

- Neva Hassanein
- Paul Jones
- Jennifer Miller
- U.S. Department of Agriculture



We sincerely thank each university researcher who talked with us and shared his or her knowledge of and perspectives on potato pest management. The participation of researchers at the University of Idaho and Washington State University was integral to the production of this report.

We would also like to thank the Washington State Potato Commission for its friendly assistance in providing information on the university research projects it funds, as well as the University of Idaho Grants and Contracts office and the Aberdeen Research and Extension Center for the information they provided on research projects and proposals.

Richarda Ruffle was a Doris Duke Foundation fellow in Environmental Studies at The University of Montana. Jennifer Miller, Ph.D. is the sustainable agriculture program coordinator for the Northwest Coalition for Alternatives to Pesticides. This report was derived from Richarda Ruffle's thesis, which was prepared for the degree of Master of Science in Environmental Studies at The University of Montana in 2002.

Digging for Alternatives:

An Analysis of Potato Pest Management Research at Two Northwest Land Grant Universities

By Richarda Ruffle and Jennifer Miller

November 2002

To order additional copies contact:

Northwest Coalition for Alternatives to Pesticides

P.O. Box 1393

Eugene, OR 97440-1393

(541) 344-5044; fax (541) 344-6923

or download the report from our web site

www.pesticide.org

Table of Contents

I. Executive Summary	3
II. Introduction	6
III. Potato Consumption and Production	7
IV. Interviews of Potato Pest Management Researchers	9
Methods	
Findings	
Problems Growers Face	
Perspectives on Conventional Research	
Perspectives on Chemical Efficacy Testing	
Perspectives on IPM Research	
Perspectives on Variety Development Research	
Perspectives on Alternative Research	
Researchers' Funding Sources	
V. Analysis of Pest Management Projects Funded by Potato Commissions	15
Methods	
Findings	
VI. Conclusions	18
VII. References	20

I. Executive Summary

Potato farming in the Northwest is highly productive; over half of the US potatoes are grown in Idaho and Washington alone. One way in which high production levels are obtained is through the use of chemicals. In fact, potatoes are the most pesticide-intensive crop grown in the Northwest, using five times the poundage of pesticides per acre compared to apples.

“Are land grant universities providing adequate alternative potato pest management solutions?”

Pest problems on potatoes can be addressed through a number of different practices from those relying heavily upon pesticides to those taking a biologically based non-chemical approach. With the intensive use of pesticides in potato production as compared to all other crops grown in the Northwest, it is apparent that growers commonly use chemicals to treat pest problems.

Questions remain as to the reason for such intensive chemical use in potato production. Do growers not implement alternative pest management practices, or is there a lack of information due to inadequate research on alternative non-chemical controls? Land grant universities, the largest source of publicly funded agriculture research in the country, conduct research on potato pest management. Are land grant universities providing adequate alternative potato pest management solutions?

This report focuses on determining the potential for an increase in research on

alternative potato pest management solutions. Eighteen researchers from the University of Idaho and Washington State University were interviewed to assess the status of potato pest management research at these two land grant universities. Researchers were asked to share their perspectives on the major problems facing potato growers today, to explain their research approach for solving pest problems, and to describe their funding sources and accessibility of funds.

Information was also obtained through analysis of researchers' project proposals and projects funded by the

Idaho and Washington state potato commissions.

Major Findings

1. While researchers described a variety of problems confronting potato growers, they overwhelmingly expressed concern for the economic well being of the growers. Researchers noted that the major financial obstacle for growers in the Northwest is overproduction leading to low prices. They also included pesticide resistance and specific pest problems as major concerns. Researchers consider these factors while shaping their research programs.

2. The researchers study different methods of pest control in potato production, from pesticide-intensive methods to non-pesticide biologically based methods.

- **Almost half of the researchers study conventional pesticide-intensive pest controls.** Among this group of researchers, a common sentiment is that

growers and the potato industry are dependent on chemicals for continued high yields. These researchers see their role as helping farmers retain current uses of pesticides or providing access to new ones. Many of the conventional-oriented researchers asked, “Why change what works?” These researchers shared their hesitation to move away from conventional pest management because chemicals maintain high yields and productivity.

- **Nearly two-thirds of the researchers study integrated pest management (IPM) controls.** For these researchers, IPM is one way of incorporating economics into pest management research. IPM takes into consideration an economic threshold for pest damage prior to spraying pesticides. During the interviews, researchers identified a wide range of practices as IPM. The lack of a precise IPM definition means

that the practice of IPM is subject to much interpretation, and therefore does not always translate into reduced pesticide use.

- **Few researchers currently study alternative non-pesticide controls.** These researchers and others expressed an interest in expanding their focus on alternative pest control methods, but a number of barriers currently prevent them from proceeding. For example, researchers believe that alternative techniques in potato pest management are currently too expensive for growers, and thus they look to IPM to determine solutions within an economic threshold. Some researchers claimed that alternatives do not work as well as pesticides for maintaining high yields on intensively farmed land. Another main concern researchers expressed is the fear that growers and the public may disapprove of research on

N. Hassanein



USDA/D. Wilson



alternative projects, perceiving them to be “snake oils.” Additionally, researchers described the extreme difficulty of obtaining funding for research on alternative practices.

3. Researchers in potato pest management receive funding primarily from three sources: government programs, potato commissions and private corporations.

Researchers noted a difference in the ease of securing funds for research on conventional versus alternative pest management practices. Grant applications to investigate alternatives are more time-consuming and competitive than conventional grant applications.

- **State potato commissions are a major source of funding for most researchers, but only 7% of the funded projects study alternative pest management practices.** Potato commissions are organizations established under state law and run by growers and

processors. An analysis of projects funded by the Idaho and Washington state potato commissions over the past six years showed that the commissions primarily fund research with a conventional or IPM approach (71% of projects), with little emphasis on alternatives (7%).

4. The current state of potato production in the Northwest calls for an increase in research on alternative pest control techniques. Interviews with researchers indicated that although there is currently limited research on alternative potato pest management practices at these universities, there is interest among researchers for an increase. In order to achieve an increase in research on alternative techniques, it is important to address the obstacles perceived by the researchers themselves and to define a strategy to overcome these barriers.

II. Introduction

According to the United States Department of Agriculture, the average American consumes 152 pounds of potatoes per year (USDA NASS, 2001). The Northwest produces over half of the US potatoes; in the year 2000, Idaho produced 30% of the country's potatoes, Washington produced 20% and Oregon produced 6% (USDA NASS, 2001). This intensive potato production in the Northwest comes with high costs to human health, ground and surface water, and farmers' financial positions. Many of these impacts are associated with the widespread use of pesticides in potato production. In 2001, 10.4 million pounds of pesticides were applied to potatoes in Idaho and Washington alone (USDA NASS, 2002).

For over three decades, environmental and consumer organizations, many farmers, and concerned activists have outwardly criticized the extensive use of pesticides in this country's food production system. The continued extensive use of pesticides in

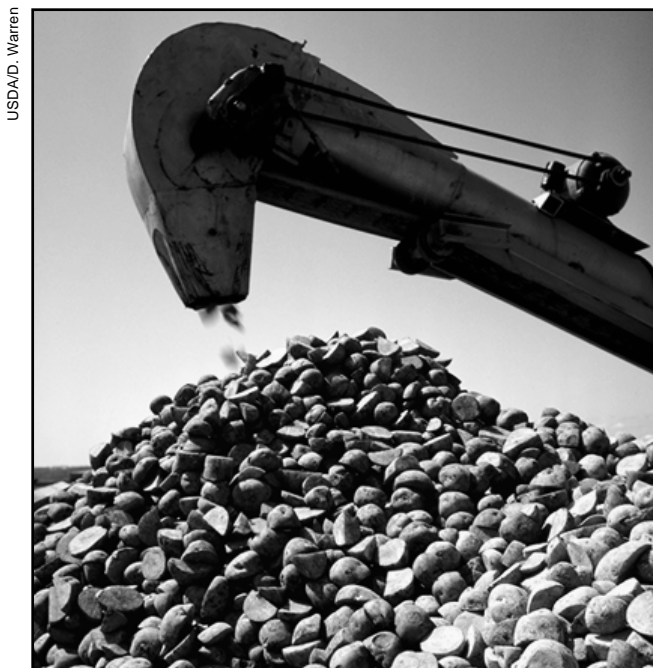
potato production could be due to a lack of growers implementing alternative non-chemical practices and/or a lack of information on alternative practices due to insufficient research.

This report focuses on potato pest management research conducted at two research institutions in the Northwest: the University of Idaho and Washington State University. Both universities are part of the land grant university system, the largest system for publicly endorsed agricultural research in this country. Increased research on alternative pest control methods could provide environmentally friendly and cost effective controls. Land grant universities must be held accountable for researching and producing alternative pest control methods.

This report is an analysis of the current research strategies at prominent Northwest land grant universities to control potato pests. The objectives of this report are:

- 1) to analyze the types of potato pest management research projects at the University of Idaho and Washington State University,
- 2) to document researchers' assessments of potato pest management research and the potato industry, and
- 3) to assess opportunities for increasing research on alternative potato pest control methods.

The research focuses and perspectives of researchers working in potato pest management at the University of Idaho and Washington State University portrayed in this report are derived from interviews and an analysis of research abstracts and proposals.



USDA/D. Warren

III. Potato Consumption and Production

The Northwest region of the United States boasts the largest potato producing area in the country. In the year 2000, Idaho with 413,000 acres and Washington with 175,000 acres were the number one and two potato-producing states in the country, respectively (USDA NASS, 2001).

The average per capita consumption for the different types of potato products in the United States is presented in Table 1. Two-thirds of the potatoes consumed by Americans have been processed in some way (Table 1). Farmers use different potato growing practices for the fresh market versus the processing market. Due to the large production and consumption of processed potato products, the processing industry plays a role in shaping the potato industry.

Potatoes have myriad insects, weeds and diseases that can create major problems

in the field and in storage. Northwest potato production relies heavily on the use of pesticides, and potatoes are the most pesticide-intensive crop grown in the region. Potatoes are treated with both more pounds of pesticides overall and more pounds of pesticides per acre than any other crop produced in the Northwest. Potatoes use five times the poundage of pesticides per acre as compared to apples and 62 times the poundage of pesticides per acre as compared to wheat (Gianessi, 2000). Pesticides are used at many stages of the potato production process beginning with treatment of the seed-piece, a slice of potato containing an “eye” or bud that will grow



Table 1. Annual Per Capita Potato Consumption in the US

Potato Product	Pounds Consumed	Percent of Total
Frozen (French fries, hash browns, etc.)	62 lbs	41 %
Fresh	49 lbs	32 %
Dehydrated	20 lbs	13 %
Potato chips	19 lbs	13 %
Canned	2 lbs	1 %
Total	152 lbs	100 %

*Source: USDA NASS (2001)

Table 2. Typical Pesticide Treatments on Northwest Potatoes

<u>Application</u>	<u>Purpose</u>
Pre-Emergence	
Seed-Piece Treatment	Obtain disease-free seed potatoes
Soil Fumigant	Control for nematodes and diseases
Insecticides	Control for nematodes and wireworms
Growing Season	
Herbicides	Control for weeds
Insecticides	Kill aphids to control leaf-roll virus
Fungicides	Prevent outbreaks of diseases such as late blight
Pre-Harvest	
Desiccants	Kill the potato vines to harden potato skins, thus preventing scuffing or bruising of potatoes during mechanical harvest
Storage	
Sprout Inhibitors	Prevent potatoes from sprouting while in storage
Fungicides	Prevent outbreaks and spread of fungal diseases while in storage

**Sources: Adapted from Rowe (1993) and an interview with Extension Educator (2001).*

into a new potato plant. Table 2 illustrates typical pesticide treatments for pest management in potato production.

Such frequent applications of pesticides are not uncommon in potato production, yet are not without costs to human health, the environment, and farmers' financial positions.

- Even after preparing potatoes for eating by washing and peeling, residues of one or more pesticides were detected in 81% of potatoes tested by the US Department of Agriculture during a five-year period in the 1990s (Baker et al., 2002).
- Three herbicides, EPTC, metribuzin and pendimethalin, have been detected

in ground and surface water during residue testing conducted in potato-growing regions of both Washington and Idaho (Clark et al., 1998; Williamson et al., 1998). The most recent data indicate these three herbicides are still widely used to grow potatoes today (USDA NASS, 2002).

- A typical farm growing Russet Burbank potatoes in southeastern Idaho spends 37% of its operating costs per acre on pesticides and fertilizers (Patterson and Smathers, 2001).

IV. Interviews of Potato Pest Management Researchers

A. Methods

Eighteen researchers conducting studies on potato pest management at the University of Idaho and Washington State University were interviewed. Two different methods were used to select these researchers. The first nine researchers interviewed in fall 2001 were affiliated with the University of Idaho, working at the Moscow, Idaho campus or extension offices or research stations throughout the state. These researchers were chosen using a “snowball method” by asking each researcher interviewed to recommend another. The other nine researchers were chosen based upon information received from the research offices at the University of Idaho and Washington State University. From this

information, those researchers with the greatest funding levels and/or the most research projects in potato pest management were selected and interviewed in spring 2002.

A total of 13 researchers were interviewed from the University of Idaho and five from Washington State University. The researchers cover a wide geographic range in Idaho and Washington and work at various facilities from research stations to extension offices to campuses. They also span a range of expertise, studying issues related to pest management in potato production from insects to fungi to weeds. The interviews ranged from 25 minutes to an hour, and seven were conducted in-person, while the other eleven were conducted over the phone.

Researchers were asked to share their perspectives on the current problems experienced by potato growers in the Northwest, describe their studies of pest problems in potatoes and their funding sources, and share information on any other areas which they believed influenced their research. Researchers were



J. Miller

Table 3. Categories used to define research focus

Category	Definition used in this report
<i>Conventional</i>	Research on pesticides as solutions to pest management problems.
<i>Chemical Efficacy Testing</i>	Research on pesticide effectiveness and environmental impacts. Tests are conducted on recently introduced products or just prior to commercial availability.
<i>Integrated Pest Management (IPM)</i>	Research on pest management systems that rely on scouting fields for pest population levels, tracking weather conditions and applying pesticides once economic thresholds are surpassed. IPM systems range widely between those relying heavily upon pesticides to systems that have minimal or limited use of pesticides.
<i>Variety Development</i>	Research on potato genetics to develop new varieties that are more resistant to pest problems. The research covered in this report utilized traditional breeding techniques to develop new varieties.
<i>Alternative</i>	Research on biologically based pest management techniques that do not use synthetic chemicals to solve pest problems.
<i>Basic</i>	Research on pest problems to understand underlying interactions, which does not intend to provide an immediate solution.
<i>Unable to categorize</i>	Available information was insufficient to permit categorization.

assigned to categories that reflected their research focus based upon how they described their research. The following categories were used to describe the types of pest management research conducted by the interviewed researchers: conventional, chemical efficacy, integrated pest management (IPM), variety development, and alternative (Table 3). Often more than one category was used to describe a researcher’s focus. Some researchers also provided abstracts and/or reports of their recent studies, which complemented the data obtained from the interviews.

B. Findings

Researchers shared their perceptions of problems facing potato growers, the differ-

ent types of research strategies conducted to solve pest problems, and the availability of research funds.

Problems Growers Face

Researchers expressed overwhelming concern for the economic well-being of the growers. Researchers noted the instability of the potato industry and the inconsistency of prices.

According to researchers, the three main problems facing potato producers in the Northwest are:

- 1) **overproduction leading to low prices,**
- 2) **pesticide resistance, and**
- 3) **specific pest problems.**

Researchers would also like to see farmers spending less money on chemical inputs and receiving greater returns for potato crops.

Perspectives on Conventional Research

Researchers accept conventional pest management as necessary to potato production. Of the 18 researchers interviewed, eight conduct research with a conventional focus (Table 4). Examples of such research include testing new pesticides before they are out on the market and making pesticides a major part of pest management plans. Some perspectives of researchers conducting conventional research are as follows:

- Researchers noted that growers and the potato industry itself are dependent on chemicals for continued high yields, and promoting an alternative technique could negatively impact the current level of productivity and potato quality.
- Researchers see their role as helping farmers retain current uses of pesticides or providing access to new ones.
- Researchers are hesitant to move away from conventional pest management because chemicals work.

Perspectives on Chemical Efficacy Research

Researchers believe they can help growers by testing new pesticide products.

Six of the 18 researchers conduct chemical efficacy tests (Table 4). This is an important aspect of research on pesticides in land grant universities. Researchers study the

“If IPM is not economically viable or if it does not represent a reasonable level of efficiency, [growers] cannot adopt it!”

— a potato pest management researcher

chemical on a sample plot in order to assess various aspects of the pesticide, such as effectiveness or impacts on the environment. The pesticide company in turn provides researchers with funds and chemical

product to conduct these studies. Most researchers claim this helps them better address the needs of growers by being able to explain how to use certain chemicals and offer advice to the growers regarding the best and newest chemical options. Researchers noted that these chemicals are “softer” on the environment in accordance with stricter government regulations, making them less dangerous than in the past. Therefore, researchers perceive a shift is happening in the entire chemical industry towards environmentally friendly and “safer” chemicals.

Perspectives on Integrated Pest Management Research

Researchers note the importance of incorporating economics into pest management research. Integrated pest management (IPM) takes into consideration an economic threshold for pest damage prior to spraying pesticides. Eleven of the 18 researchers conduct research with a focus on IPM (Table 4). One researcher observed about her colleagues, “Hardly anyone is traditional anymore.” She followed by claiming that all researchers do some type

of integrative management research that looks at options other than chemicals. According to another researcher, the deciding factor of whether an IPM project will be successful is whether it will work for the farmer. He asserted, “If IPM is not economically viable or if it does not represent a reasonable level of efficiency, [growers] cannot adopt it!” Growers’ feasibility both economically and in regards to labor input is a primary consideration for researchers when they approach IPM projects.

Researchers have multiple perspectives of IPM systems ranging from those relying heavily upon pesticides to systems that have minimal or limited use of pesticides. During the interviews, researchers identified a wide range of

practices as IPM. The lack of a precise IPM definition means the practice of IPM is subject to much interpretation.

Perspectives on Variety Development Research

Researchers believe new potato varieties can solve pest problems. Three of the 18 researchers work on variety development (Table 4). According to researchers, variety development is an important area to be considered in potato pest management. Many of the researchers referred to variety development as the most promising answer in pesticide reduction.

Researchers believe new potato varieties can promote economic opportunity. They noted that variety development is not only an important component in potato pest management, but it can also be a crucial step in diversifying the potato industry and creating greater market niches for a larger group of farmers. One researcher studying the market feasibility for eight different varieties of specialty potatoes noted, “Yes, people want these different varieties, but supermarkets aren’t going to take the risk of having them in their market.” She described the overhaul within the apple industry when stores went from carrying only red delicious apples to eight different kinds. Her concern returned to potatoes, and she asked, “Can we do something like that for the potato market?”

Perspectives on Alternative Research

Few researchers are studying alternatives to pesticides as their major research focus. Two of the 18 researchers currently conduct research with an alternative emphasis (Table 4). One researcher

P. Jones



A demonstration plot testing alternative potato crop rotations to reduce pesticide use.

Table 4. Profiles of interviewed researchers studying potato pest management at the University of Idaho (UI) and Washington State University (WSU)

<u>Researcher/ University</u>	<u>Subject Area</u>	<u>Research Category</u>	<u>Funding Sources</u>
Researcher 1/ UI	Weeds	Chemical Efficacy, Conventional, IPM	IPC, NRI, Pesticide Co.
Researcher 2/ UI	Plant Pathology	Chemical Efficacy, Conventional	IPC, Pesticide Co.
Researcher 3/ WSU	Plant Pathology	Chemical Efficacy, Conventional	Pesticide Co., WSPC
Researcher 4/ WSU	Entomology	Conventional, Interest in Alternatives	WSPC
Researcher 5/ UI	Entomology/ Plant Pathology	Conventional, IPM	IPC, USDA
Researcher 6/ UI	Breeding	IPM, Variety Development	ARS, CSREES, IPC
Researcher 7/ WSU	Weeds	Chemical Efficacy, Conventional, IPM	ARS, SARE, WSPC
Researcher 8/ WSU	Plant Pathology	IPM, Interest in Alternatives	NPC, Pesticide Co, WSPC
Researcher 9/ UI	Plant Pathology/ Storage	Conventional, IPM, Interest in Alternatives	IPC, NPC
Researcher 10/ UI	Weeds	IPM	SARE
Researcher 11/ UI	Plant Pathology	Variety Development	ARS, IPC
Researcher 12/ UI	Breeding	Variety Development	CSREES, IPC
Researcher 13/ UI	Entomology	Alternatives, Chemical Efficacy	IPC, Pesticide Co.
Researcher 14/ UI	Plant Pathology	Chemical Efficacy, IPM	IPC, Pesticide Co.
Researcher 15/ UI	Cropping Systems	IPM, Interest in Alternatives	IPC, SARE
Researcher 16/ UI	Extension Educator/Researcher	Conventional	IPC
Researcher 17/ UI	Sustainable Agriculture	Alternatives, IPM	SARE
Researcher 18/ WSU	Horticulture	IPM	CSREES, WSPC

Acronym Key:

ARS: USDA Agricultural Research Service; **CSREES:** USDA Cooperative State Research, Education, and Extension Service; **IPC:** Idaho Potato Commission; **NPC:** National Potato Council; **NRI:** USDA National Research Initiative; **Pesticide Co.:** Companies that manufacture and sell pesticides; **SARE:** USDA Sustainable Agriculture Research and Education Program; **USDA:** United States Department of Agriculture; **WSPC:** Washington State Potato Commission

noted the emerging support for alternative research projects saying, “The word is out there and there is interest in getting sustainable work done.” Four researchers expressed interest in conducting more alternative studies (Table 4), although none of these four had a significant emphasis reflected in his or her research agenda. In fact, researchers noted that the difficulty in obtaining funding is one of the major barriers to increasing alternative research. A common comment from those who do alternative research was that if more funding were available, more alternative research would be done.

The four researchers interested in conducting alternative research projects

expressed the following reasons for not currently pursuing research on alternative pest management practices:

- Researchers noted that any project, whether it is alternative or not, needs to be cost effective, and alternative projects tend to be costly to conduct.
- Many researchers believe that alternative techniques in potato pest management are currently too expensive for growers, and thus they look to IPM to determine solutions within an economic threshold.
- Researchers claimed that alternatives do not work as well as pesticides for

maintaining high yields on intensively farmed land.

- Researchers expressed a concern that growers and the public may disapprove of research on alternative projects, perceiving them to be “snake oils.”

Researchers’ Funding Sources

Researchers receive funding for potato pest management research primarily from three sources: government programs, potato commissions, and private corporations. These sources include federal and state government programs through the United States Department of Agriculture (USDA), including the Cooperative State Research, Education and Extension Service (CSREES), Agricultural Research Service (ARS), and the Sustainable Agriculture Research and Education (SARE) program. Other major sources of funding are grower- and processor-run organizations

including the National Potato Council (NPC), the Idaho Potato Commission (IPC), and the Washington State Potato Commission (WSPC). It is also common for researchers to obtain funding through private corporations such as Syngenta, Valent, and Dupont.

Researchers noted a difference in the ease of securing funding for conventional versus alternative research, with grants to investigate alternatives being more time-consuming and competitive and pesticide research grants being less difficult. A common theme among the interviews was researchers’ emphasis on the importance of funding. As one researcher stated, “Funding is key.” Researchers also noted a difference in the ability to obtain funding for conventional versus alternative research. For example, the Sustainable Agriculture Research and Education (SARE) program was formed under USDA to enable researchers to conduct projects that focus on sustainable agricultural techniques and that take a holistic approach to agricultural research. According to many of the researchers, these grants are difficult to obtain because they are extremely competitive and require a rigorous application process. In comparison, grants from chemical corporations are much easier to obtain, according to the researchers. One researcher noted that chemical corporations sometimes write the grants for the researchers.

USDA



V. Analysis of Pest Management Projects Funded by Potato Commissions

A. Methods

Potato commissions are organizations established under state law and run by growers and processors. Commission budgets are funded by a fee levied on potatoes that is paid by growers and processors. Through promotion, marketing and research, these organizations work to maintain high yields and consumer support in the interest of improving financial positions for growers and processors. The Idaho Potato Commission (IPC) receives funding from fees levied on all Idaho grown potatoes. Growers pay 6 cents per hundredweight of potatoes sold and commercial buyers pay 4 cents per hundredweight (Idaho Code §22-1211). These funds provided IPC with a 2000 budget of \$11 million and a 2001 budget of \$10.2 million (Griffel, 2001). Similarly, the Washington State Potato Commission (WSPC) is funded mainly by a “levied annual assessment,” which is paid by growers.

The primary functions of the potato commissions are the marketing and sales of potatoes, as well as creating a “potato image” for their state. The IPC statute reads, “The commission shall plan and conduct a campaign for commodity advertising, publicity and sales promotion to increase the consumption of potatoes and may contract for any advertising, publicity

and sales promotion service” (Idaho Code §22-1208). This marketing emphasis is apparent from its website and promotional information. The marketing strategies range from selling potato dolls to offering recipes or supporting athletic races and other community activities. Similarly, the WSPC mission reads: “The main function of the Washington State Potato Commission is to work toward the enhancement of marketing opportunities through promotion, advanced production and cultural practices through research...” (Washington State Potato Commission, 2001).



To determine the types of potato pest management research funded by the Idaho and Washington state potato commissions, project proposals funded by these commissions over the past six years were analyzed. The IPC funds projects in seven different research categories, and only projects in the pest management/control category were selected for analysis. Research proposals were received from the IPC researcher liaison at the University of Idaho and from the grants and contracts office at the University of Idaho. Information from research proposals funded by the WSPC was received from the research coordinator for the WSPC. The research coordinator searched all the projects funded by WSPC over the past six years and selected research proposals investigating pest management. Forty-

three projects from the WSPC and 57 from the IPC were analyzed, for a total of 100 projects analyzed. In most cases, the information provided was sufficient to categorize each research proposal using the definitions described in Table 3. If not, projects were assigned to the “unable to categorize” category.

B. Findings

Most researchers contacted receive funding from either the Idaho or Washington potato commissions. Thus, the potato commissions play an important role in

shaping the type of research conducted at these land grant universities.

The state potato commissions concentrate their funding on research that supports conventional and IPM production systems, with little emphasis on alternatives. Analysis of project types funded by the WSPC over the past six years reveals an emphasis on conventional research with 49% of the funded projects in this category and 19% of the projects for IPM (Table 5). In comparison, the IPC takes a somewhat more balanced approach; conventional research represents 35% of the projects and IPM research represents 39% of the projects

Table 5. Potato Pest Management Projects Funded by the Washington State Potato Commission (1997-2003)

<u>Research Category</u>	<u>97-98</u>	<u>98-99</u>	<u>99-00</u>	<u>00-01</u>	<u>01-02</u>	<u>02-03</u>	<u>Total</u>	<u>Percent</u>
Conventional	2	3	4	5	4	3	21	49%
IPM	3	2	0	0	1	2	8	19%
Alternative	0	0	0	0	1	0	1	2%
Basic	0	2	3	3	0	1	9	21%
Unable to categorize	0	2	0	0	0	2	4	9%
Projects per year	5	9	7	8	6	8	43	100%

Table 6. Potato Pest Management Projects Funded by the Idaho Potato Commission (1997-2002)

<u>Research Category</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>	<u>2000</u>	<u>2001</u>	<u>2002</u>	<u>Total</u>	<u>Percent</u>
Conventional	3	3	3	1	4	6	20	35%
IPM	4	2	2	5	5	4	22	39%
Alternative	2	3	0	0	1	0	6	11%
Basic	1	1	1	0	3	1	7	12%
Unable to categorize	0	0	0	0	0	2	2	3%
Projects per year	10	9	6	6	13	13	57	100%

Table 7. Idaho Potato Commission's Funding Levels for Potato Pest Management Research (1997-2002)

<u>Research Category</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>	<u>2000</u>	<u>2001</u>	<u>2002</u>	<u>Total</u>	<u>Percent</u>
Conventional	\$64,760	\$130,438	\$88,040	\$43,000	\$70,871	\$101,852	\$498,961	34%
IPM	\$144,023	\$19,975	\$79,625	\$155,598	\$139,808	\$47,968	\$586,997	40%
Alternative	\$62,214	\$118,540	-	-	\$5,634	-	\$186,388	13%
Basic	\$10,600	\$11,600	\$49,600	-	\$65,855	\$14,000	\$151,655	10%
Unable to categorize	-	-	-	-	-	\$43,305	\$43,305	3%
Funding per year	\$281,597	\$280,553	\$217,265	\$198,598	\$282,168	\$207,125	\$1,467,306	100%

(Table 6). Neither the IPC nor the WSPC, however, has a significant focus on funding alternative research projects; alternative research projects represented only 2% and 11% of the funded WSPC and IPC projects, respectively. An analysis of all 100 projects funded by the WSPC and the IPC combined over the past six years shows that 41% are of a conventional focus, 30% take an IPM approach, and 7% study alternatives.

On a dollar basis, the Idaho Potato Commission funds alternative research at a lower level than conventional or IPM research. The number of projects funded in a particular research category does not necessarily translate into a financial commitment to that research category. A high number of projects funded at low levels would not signify a strong financial commitment to the research area, just as a few projects funded at high levels would not mean a lack of financial commitment. To determine whether the number of projects under each research category was representative of the funding allocated to each category, the dollar amounts were tabulated (Table 7). Information on dollar amounts was only available for projects funded by the IPC. Interestingly, the percentage of projects and percentage of dollars in each

category were quite similar. Conventional research represented 35% of the projects and 34% of the dollars, IPM research represented 39% of the projects and 40% of the dollars, while alternative research represented 11% of the projects and 13% of the dollars.

Overall, pest management research is only a minor commitment for state potato commissions. While the IPC supports Idaho potato pest management researchers, it is important to note that research is not the primary function of the commission. In the year 2000, \$11 million was collected by the IPC. Of this, only 4.1% (\$450,628) was used to fund research projects and 1.8% (\$198,598) supported pest management/control research projects specifically. In the year 2001, \$10.2 million was collected by the IPC, and 5.2% (\$533,447) funded research projects and 2.8% (\$282,168) supported pest management/control research projects.

VI. Conclusions

Eighteen researchers from the University of Idaho and Washington State University were interviewed regarding their research on pest management in potatoes. They commented on the major problems potato growers face in the Northwest, the current needs of the potato industry and their research focuses. In addition, potato pest control research projects funded by the Idaho Potato Commission and the Washington State Potato Commission over the past six years were evaluated according to the type of research strategy employed. The following points emerged from the interviews with researchers and from analysis of pest management projects:

- a. Economic viability is central to potato pest management research.
- b. Research on alternative pest control methods represents a small portion of the pest management research being conducted, and some researchers are interested in doing more.
- c. Some researchers hold negative

opinions about the value of researching alternatives.

- d. Researchers characterized a wide range of research projects as IPM approaches, from projects with a heavy reliance on pesticides to those with minimal or limited use of pesticides.
- e. Funding opportunities and availability are important factors determining the projects researchers pursue.
- f. Funding for alternative research is difficult to obtain, while funding for research on pesticides can be relatively easy to secure.
- g. Every land grant university researcher contacted received funding from a state potato commission.
- h. IPM occupies the second largest percentage (30%) of the combined pest management research projects funded by the Idaho Potato Commission and the Washington State Potato Commission compared to conventional projects (41%).
- i. The potato commissions make small funding commitments to alternative pest control projects.

USDA/G. Alexander



USDA/D. Warren

Considering the perspectives and potential barriers expressed by the researchers interviewed, the main points to incorporate in a strategy to increase alternative pest control research at land grant universities are:

To be compelling, research on alternative practices must have economic viability as a central focus. Researchers expressed that their major concern was for growers' economic situation. Any strategy to increase the research into alternative pest control methods must stress that these solutions consider growers' costs.

More funding opportunities for alternative research must be developed.

Researchers expressed their desire for more funding opportunities in alternative pest control management. As more researchers become interested in pursuing alternative controls, sufficient research dollars must be made available.

State potato commission funding offers both opportunities to secure more dollars for alternative research and an accessible process for researchers to obtain funding. State potato commission funding targeted to potato researchers is available each year. An effort to encourage state potato commissions to increase their funding for alternative projects would provide opportunities for those researchers interested in expanding their work on alterna-

tives. Such environmentally sensitive and proactive efforts by potato commissions would also enhance their images.

These dimensions of a strategy to increase research on alternative potato pest management techniques will require careful planning and collaborative efforts. The current state of potato production in the Northwest calls for an increase in alternative pest control techniques. With rising costs of pesticides for growers and greater public awareness of residues in water and food, an increase in alternative research is necessary in order to offer farmers solutions to these problems.

“With rising costs of pesticides for growers and greater public awareness of residues in water and food, an increase in alternative research is necessary in order to offer farmers solutions to these problems.

“A strategy to help facilitate this increase must incorporate the perspectives of all involved, from potato growers, processors, pest management researchers, and consumers.”

A strategy to help facilitate this increase must incorporate the perspectives of all involved, including potato growers, processors, pest management researchers, and consumers. From the interviews with researchers at the University of Idaho and Washington State University, it is apparent that there is potential for an increase in alternative pest control research.

VII. References

- Baker, B.P., C.M. Benbrook, E. Groth III, and K. Lutz Benbrook. 2002. Pesticide residues in conventional, integrated pest management (IPM)-grown and organic foods: insights from three US data sets. *Food Additives and Contaminants*. 19(5):427-446.
- Clark, G.M., T.R. Maret, M.G. Rupert, M.A. Maupin, W.H. Low, and D.S. Ott. 1998. Water quality in the Upper Snake River Basin, Idaho and Wyoming, 1992-95: U.S. Geological Survey Circular 1160. Available at: <http://water.usgs.gov/pubs/circ/circ1160/index.html>.
- Extension Educator, University of Idaho. Interview by Richarda Ruffle, 16 November 2001. Idaho. Tape recording.
- Gianessi, L.P. 2000. National Pesticide Use Database: 1997. National Center for Food and Agricultural Policy. Washington, DC. Available at: <http://www.ncfap.org/database/default.htm>.
- Griffel, M. 2001. Industry Updates. *Potato Grower*, November, p. 34.
- Idaho Code. 1967. Title 22, Chapter 12: *Potato Commission*. Retrieved on February 6, 2002 at <http://www.state.id.us/idstat/TOC/idstTOC.html>.
- Patterson, P.E. and R.L. Smathers. 2001. South district Russet Burbank commercial potatoes: fumigation and on-farm storage. Southeastern Idaho Crop Costs and Returns Estimate. EBB4-Po6-01. University of Idaho College of Agriculture Cooperative Extension System. Available at: http://www.ag.uidaho.edu/aers/publications/Crops_CARE/district4_2001/EBB4-Po6-01.pdf
- Rowe, R.C. 1993. Potato health management: A holistic approach. In *Potato Health Management*, ed. R.C. Rowe. St. Paul, Minnesota: American Phytopathological Society.
- USDA NASS (National Agricultural Statistics Service). September 2001. Potatoes 2000 Summary. Available at: <http://usda.mannlib.cornell.edu/reports/nassr/field/ppo-bbp/pots0901.pdf>.
- USDA NASS (National Agricultural Statistics Service). May 2002. Agricultural Chemical Usage 2001 Field Crops Summary. Available at: <http://usda.mannlib.cornell.edu/reports/nassr/other/pcu-bb/agcs0502.pdf>.
- Williamson, A.K., M.D. Munn, S.J. Ryker, R.J. Wagner, J.C. Ebbert, and A.M. Vanderpool. 1998. Water quality in the Central Columbia Plateau, Washington and Idaho, 1992-95. U.S. Geological Survey Circular 1144. Available at: <http://water.usgs.gov/pubs/circ/circ1144/>.
- Washington State Potato Commission. "Washington State Potato Commission Mission Statement." Retrieved on October 16, 2001 at: <http://www.potatoes.com/display.cfm/89/?IDList=21,92>

For more information...

Northwest Coalition for Alternatives to Pesticides

P.O. Box 1393
Eugene, OR 97440-1393
(541) 344-5044; fax (541) 344-6923

NCAP's office in Idaho

Jennifer Miller
Sustainable Agriculture Program Coordinator
219 North Straughan Ave.
Boise, ID 83712
(208) 850-6504; fax (208) 433-1827

www.pesticide.org