Potato Progress

Research and Extension for Washington's Potato Industry
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New IPM Tool Available for Washington Growers: Beating Sheet

The potato commission has an ongoing commitment to helping Washington's potato growers adopt and expand integrated pest management (IPM) practices. In 2008 we began offering leafhopper and tuberworm trapping supplies to Washington potato growers free of charge. This July we are beginning a trial run with a new IPM tool, a small hand-held beating sheet for insect sampling (Figure 1). The sheet is mounted on a metal frame, and comes in black only – if this tool is popular in 2009, we may make it available in white for 2010.

Figure 1. The new WSPC beating sheet, to be used for scouting for insects. The sheet is the right width to fit between the rows.

The beating sheet is used by slipping it under the potato canopy between the rows (or next to the base of plants to be sampled), and then striking the plants from above to dislodge insects onto the sheet where they can be counted. Recommendations for specific sampling intensities and treatment thresholds are in development, and we hope to have more information on monitoring with tools like this in the coming few years. In the meantime, if you would like to start learning how to use this tool in your pest management work, please contact the WSPC office at 509-765-8845 or ajensen@potatoes.com for your free beating sheet.

A Multi-Million Dollar Specialty Crop Research Initiative Proposal to Develop High-Phytonutrient Potatoes

Roy Navarre, USDA-ARS, Washington State University, Prosser, WA

In April 2009 we submitted a 3.8 million dollar grant proposal to develop high-phytonutrient potatoes to the USDA Specialty Crop Research Initiative (SCRI). This new grant program requires that 100% matching funds be provided by the applicants and we had over 4.5 million dollars in matching or in-kind support promised, over half of which was pledged by the potato industry. In addition to myself, there are 16 co-investigators representing seven states, reflecting the national nature of our proposal titled "Developing High-Phytonutrient Potatoes for Consumer Health and Farm Sustainability." The SCRI is a new program intended to provide new funding for research focusing on solving critical specialty crop industry issues. Specialty crops contribute over 50% of the national farm gate value but have historically been under-represented in Farm Bill programs and funding. A coalition of 120 specialty crop organizations, including the National Potato Council, were instrumental in creating the SCRI. This competitive grant program will announce which projects were funded in late summer and likely only ~10% of the proposals will be funded from across the entire specialty crop industry, i.e. roughly 90% of proposals will not be funded.

Why direct so much attention to potato phytonutrients? We think addressing demand-side issues is critical for the industry, which has historically been very focused on supply issues. What can be done to increase demand? Is a national strategy to increase demand even in place? For decades potato consumption has steadily been declining in the United States, likely due to multiple reasons including changing demographics and changing lifestyles; for example less cooking, fewer sit-down family dinners, etc. Moreover, recent years have seen substantial negative publicity about the nutritional merit of potatoes and this also threatens demand. It seems highly probable that in the coming years there will be even more attention placed on health and diet because trend analysis strongly suggests consumers will become increasingly interested in the health values of individual foods through media coverage of medical studies and educational programs.

Fortunately potatoes are already a good source of various minerals and vitamins, but have great potential to provide even more phytonutrients. A phytonutrient enriched potato would not only strongly repudiate negative press and positively influence nutritionists, but alter public perception about the nutritional values of potatoes and help reestablish potatoes as a healthful food. In choosing a vegetable to enhance nutritionally, it is difficult to envision one more appropriate than potatoes; given these are the vegetables consumers eat in greatest quantity, and their affordability, even for low-income families. As a staple food, potatoes have a dietary role distinct from sparsely consumed vegetables, fruits and berries, so increasing phytonutrients will uniquely impact public health because of the high per capita consumption.

We propose to develop high-phytonutrient potatoes and bring them to the market within four years, using an approach that encompasses every aspect of this objective from the field and lab to the dinner table. Our project would lead to improved human health by bringing to market a nutritionally enhanced staple food, and will bring greater sustainability to the multi-billion dollar U.S. potato industry. Our approach to boost phytonutrient content will include breeding, germplasm mining, management, and biotechnology. Researchers would develop integrated production and storage management strategies that optimize the nutritional and economic value of potatoes across multiple sites. Studies involving consumer preferences including taste and appearance will be conducted, along with economic analysis to assess profitability. Health-promoting effects of these potatoes will be assessed using human and animal studies. These nutritionally superior potatoes will contain and retain higher amounts of folate, vitamin C, vitamin B1, iron, carotenoids, phenolics, antioxidants, protein, and more. To accomplish this goal a team of diverse researchers was formed with expertise in physiology, breeding, economics, biotechnology, production, cancer research and human health, storage and more. There are 17 primary groups

from 7 states, of whom Rick Knowles, Chuck Brown, Mark Pavek, Boon Chew and Roy Navarre are from the state of Washington.

A high-phytonutrient potato must reach consumers to be effective. We will thus partner with companies that have the resources and expertise to reach consumers and will target both the processed and fresh markets. In addition to the efforts of the researchers, we would have broad participation by companies, growers, state potato commissions, national breeding programs and national potato organizations who have pledged extensive in-kind support. The Washington State Potato Commission played a key role in formulating this proposal and Dr. Andy Jensen provided extensive guidance. Indeed, phytonutrient funding by WSPC over the last several years is what made this proposal possible. In addition the Idaho and Oregon potato commissions also provided key support and researchers from Idaho and Oregon are participants. Roughly half of the team is from the Northwest, the nation's largest potato growing region. Other researchers are from Alaska, Hawaii, Texas and Wisconsin and the proposal's objectives are national in scope.

Besides improving the sustainability of the potato industry, successfully achieving our objectives would impact plant biology and the specialty crop industry by establishing a new benchmark for what science can accomplish to broadly improve the nutritional profile of a crop, with public health the ultimate beneficiary. As mentioned, only a small percentage of proposals will be funded. In the absence of funding, much of the work proposed will proceed, but on a smaller scale and slower pace. Researchers around the world are currently working on maximizing the nutritional potential of potatoes, which shows the scientific community has recognized both the importance and potential of enhancing potato phytonutrients.

Caterpillars (a.k.a. 'worms') on Potatoes

This year the potato commission is funding the second year of a research project on the identification, biology, and pest status of the suite of caterpillars that feed on potato foliage (excluding tuberworm). Some background information follows:

1. Potential caterpillar pests in potato fields include the bertha armyworm, western yellowstriped armyworm, spotted cutworm, variegated cutworm, red backed cutworm, *Lacanobia subjuncta*, alfalfa looper, and cabbage looper.
2. These moths all are highly mobile, and can arrive in potato fields following flights of miles to hundreds of miles.
3. Regional populations vary significantly from year to year. Also, species have varied phenologies, with adult flight, egg laying, and feeding by larvae occurring at different times of the potato-growing season.
4. Larvae of these species vary in their ability to develop on potato. Some do extremely well on potato, while others fare poorly.
5. Most people, including most entomologists, have difficulty separating the different species, whether worms or adult moths. This is further confounded by the fact that over 850 species of moths in this group occur in the state, and about 250 are present in the irrigated areas of central Washington.

We are asking for your help!

As a part of this project, we want to find many infestations of foliage-feeding caterpillars in potatoes. Each outbreak will be studied in the field, and samples will be collected and studied in the laboratory. **If you detect a caterpillar outbreak, please contact Andy Jensen at 509-760-4859 or Alan Schreiber at 509-266-4348.**

Current Late Blight Forecast and Management Recommendations

Dennis Johnson, Plant Pathologist, WSU Pullman

Updated June 30, 2009

Late blight has been reported in a Ranger field southeast of Kennewick. All fields in the Columbia Basin should be monitored regularly for late blight. Those around the Tri-Cities should be monitored several times a week. Please contact Dennis Johnson if you find or suspect any late blight. Reporting late blight is important so the disease can be most efficiently managed throughout the region.

Fields with late blight and fields adjacent to infected fields should be on a 7 day fungicide application schedule. Weather is expected to be dry in the near future and we are not recommending late blight fungicides outside the Tri-Cites area at this time.

Contact Dennis Johnson at 509-335-3753 to confirm or to make late blight diagnosis, and stay in touch with the late blight forecasts updated on this website,

(http://classes.plantpath.wsu.edu/dajohn/Potato/Forecasts.htm)

and the toll free information telephone number, 800-984-7400.

Contact Dennis Johnson at 509-335-3753 to confirm or to make late blight diagnosis.

Good luck this season.

Websites to Watch

Potatoes at WSU, http://potatoes.wsu.edu/ –

This website is a portal to much information from various research and extension programs at WSU including variety trials, growth and development research, the seed lot trials, plant disease management, and insect trapping and monitoring information.

Potato Variety Management Institute, http://www.pvmi.org/ –

Look here for information on new potato varieties released from the Tri-State program.

Washington State Potato Commission, http://www.potatoes.com –

The commission website provides information in many areas relevant to both potato industry members and consumers.

Washington State Potato Conference, http://www.potatoconference.com/ –

The 2010 potato conference is taking shape already, and this website will keep you up-to-date.