



Potato Progress

Research and Extension for Washington's Potato Industry

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Monitoring of Wireworm Larvae in Potatoes

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As a kid I played with click beetles that I found while digging in soil or at the front porch light. Click beetles are so named because they flip into the air with an audible click when placed on their backs. Unknown to me at the time was the fact that some are important pests of crops because their larvae live in the soil and feed on roots and tubers. In the Pacific Northwest, it appears to be mainly one species of wireworm in the genus *Limoni* that is damaging to potato tubers. Problems with this pest are often on ground planted to potato following other crops such as corn or wheat. At the USDA Yakima Agricultural Research Laboratory, we are trying to learn as much as possible about the biology and life history of these insects in order to improve integrated pest management (IPM) tools and strategies available to growers.

The simplest form of IPM, called first level IPM, involves monitoring for pests to determine if they are present. Rather than applying pesticides "just in case", they are used in response to the detection of the pest. This approach reduces costs and pesticide use, because the grower saves money by not spraying when there is no evidence of the pest. A more sophisticated version uses monitoring to determine if an economic injury threshold (the pest abundance at which the cost of the pesticide application is surpassed by the possible damage by the pest if not controlled) has been reached. Our objective is to reduce both grower costs and pesticide use while not increasing risks from pest attacks.

For wireworms on potato, there is no easy or reliable way to monitor either the presence of the insects or the population density that might relate to crop risk. In most cases, pesticide applications are made as a preventive action or are made in response to damage in a preceding season. Monitoring for wireworms in the soil may be done by sifting through soil samples and there are no methods for monitoring the adult beetles. At the present time, first level IPM is generally not an option for managing wireworms on potato.

Much of our current research on wireworms is focused on developing sampling methods that growers can use in first level IPM approaches. Some of our most promising results have been with chemical attractants for detecting the presence of wireworm larvae in soil. Tonya Hinajosa at the Yakima USDA laboratory developed a glass plate assay for us,

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in which the wireworm leaves a visible track through a thin layer of sand as it makes its way to a food source. Using this assay, we found that there is strong (fast and direct) attraction of wireworms to such things as germinating grain seeds, pieces of potato or carrot, and to dampened rolled oats. We have determined that much of this attraction by wireworms is in response to the release of carbon dioxide from these materials.

The trick now is to come up with a slow-release formulation for carbon dioxide that can be used to make a useful bait. Fortunately for us, researchers at Colorado State University have been working on something similar for use against the corn rootworm, and have shared a list of materials and chemicals that can produce or generate carbon dioxide. One way or another, we hope soon to have cheap bait formulations that can be planted in the ground in a pattern and then pulled up at a later date for sampling of wireworm larvae.

Mustard Green Manure Field Day for Potato Growers

Potato growers can learn about mustard green manures at an October 16th field day, at 10am at the Dale Gies farm, 1.5 miles west of Rd M on Rd. 5 SE. Gies, who has been using mustard cover crops for six years, will be on hand to discuss the management of the mustard and the benefits he has seen. Attendees will also have the opportunity to see the mustard crop in the field and hear the results of WSU on-farm research. For more information, contact Andy McGuire, with WSU Cooperative Extension, at 754-2011 ext. 413.

Potato Tuber Rot Samples

Tuber rots were a serious problem in storage last season, particularly *Pythium* and pink rot. One of the research projects funded this year by the WSPC will be testing samples of three rot diseases of potato for sensitivity/resistance to mefenoxam, the active ingredient in Ridomil Gold. Dr. Debra Ann Inglis will be collecting samples of *Pythium*, pink rot (*Phytophthora erythroseptica*), and late blight (*P. infestans*) from throughout Washington this season.

Dr. Inglis requests your help in collecting tuber rot samples. She has prepared Potato Tuber Rot Kits which can be used to FedEx samples to her in Mt. Vernon. WSU will pay the cost of the shipment. Tuber Rot Kits can be obtained directly from Dr. Inglis, from the WSPC office, or from the extension offices in Pasco and Ephrata. Please contact Andrew Jensen at the WSPC office, or Debra Inglis (360-848-6134) with questions/comments.

