Potato Progress

Research and Extension for Washington's Potato Industry
Published by Washington State Potato Commission www.potatoes.com
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Volume IV, Number 5 *April 16, 2004*

Group 11 Fungicides; Too good to be true?

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A new class of fungicides has emerged as a disease management tool in the world's agriculture. These new fungicides are classed as Group 11 or Quinone Outside Inhibitors (QoI). They are synthetic adaptations of a natural compound, strobilurin A, which was isolated from the fungus *Strobilurin tencellus* that grows on pine cones.

If a grower made up a wish list for the perfect fungicide, the description would be close to a Group 11 fungicide:

*They are effective against a select but broad group of fungi.
*They are effective for many crops.
*They inhibit spore germination and mycelial growth.
*They have translaminar activity, which means the fungicide can move through the leaves from upper to lower surfaces.
*The active ingredients are considered a "reduced risk" compounds by the EPA.

This class of fungicides has been registered for a wide variety of vegetables and fruits. On potato, Group 11 fungicides are specifically registered for management of early blight, late blight, black dot, powdery mildew, rhizoctonia canker, and silver scurf (Table 1).

Does all this sound too good to be true?

The problem with Group 11 fungicides is that they are at a high risk for the development of fungicide resistance. A high probability of fungicide resistance occurs when a fungicide is site specific or has a single mode of action. This is the case for Group 11 fungicides which target a single site (mitochondria) in the fungal cell that specifically controls respiration. These fungicides affect this site, which basically 'chokes' the cell to death. This is a different mode of action from other fungicides, which is good because it extends our options for disease control. Some other fungicides have multi-site modes of action that make them less at risk for fungicide resistance development. Fungicide resistance is a potential problem with Group 11 fungicides.

How can a grower manage fungicide resistance when using these fungicides?

1. It is imperative to manage against fungicide resistance before there is a problem!
2. Apply only limited number of Group 11 fungicides during a season. Number of applications should not exceed three (3) in the Columbia Basin. Usually the labels limit applications on

potatoes to six per season. This maximum may be excessive from a fungicide resistance management and economic viewpoint.

3. It is important not to use these fungicides sequentially, i.e. back to back, unless a label allows it for a specific disease. Group 11 fungicides should be alternated and/or mixed with a class of fungicides with a different mode of action such as chlorothalonil or EBDC. Therefore you should not sequentially apply Quadris then Headline followed by Tanos for late blight since they are all Group 11 fungicides.
4. Use these fungicides in an integrated program of disease management by alternating with other classes of fungicides, applying cultural and sanitation control practices, scouting for disease, growing resistant cultivars, and using proper crop rotations.

An example of misuse of Group 11 fungicides would be using them repeatedly over the growing season for late blight protection or as curatives when disease levels are high. As protectants, they are no better than the less expensive chlorothalonils and EBDCs (mancozeb, metiram). The late blight hotline (1-800 984-7400) and website www.wsu.edu.8080/~djohnsn/ are good resources for keeping current on late blight forecasts and management recommendations.

The strobilurins and other Group 11 fungicides are great tools for the potato industry, and by employing good disease management practices we should be able to prolong their usefulness.

Table 1: Group 11 fungicides (QoI) registered on potatoes.

Group 11 chemical class	Brand name	Manufacturer
Azoxystrobin	Amistar	Syngenta
Azoxystrobin	Quadris	Syngenta
Pyraclostrobin	Headline	BASF
Trifloxystrobin	Gem	Bayer CropScience
Trifloxystrobin	Flint	Bayer CropScience
Famoxadone	Tanos	Dupont

Washington Potato Seed Lot Trial

Commercial potato seed samples for planting at the 2004 Washington Seed Lot Trial are welcomed from the potato industry. Two to three hundred whole **(single drop)** seed is an acceptable sample size. This seed should not be treated with insecticide or fungicide. Seed tubers need to be uniformly small (not larger than 4 oz) because no seed cutting is done and a cup-type planter is used. Samples may be delivered to the WSU Othello Research Unit, south on Booker Road from State Highway 26 about five miles east of Othello. Alternatively, sample pickup can be arranged by calling your WSU Extension Office at 509.545.3511 or 509.754.2011. Sample tags may be obtained by calling your extension office or the Potato Commission at 509.765.8845.

The remaining planting date for 2004 is:
4th (Late) May 4

Seed Corn Maggot Surveys to be Conducted in Potatoes This Year

BE ON THE LOOKOUT FOR MAGGOTS in your potato fields this year. There is a fly species that has an immature or larval form (the maggot) that can cause major direct damage to potato seedlings and may also transmit diseases such as stem soft rot and *Fusarium*. The seed corn maggot (*Delia platura*) adult is a gray fly that is slightly smaller and more slender than a house fly. Potato growers in the Royal Slope, Mattawa, and Southern Columbia Basin areas have suffered from maggot infestations in recent history. The maggot problems have varied in location and intensity over the past several years. As little is known about the biology, distribution, damage, and impact of seed corn maggot on Washington potatoes, researchers from Washington State University in Prosser and the Agricultural Development Group based in Eltopia will be conducting surveys in areas identified by growers as having maggot infestations this year. Information gathered will serve as a basis for a research program designed to develop tools for potato growers to control these pests.

WHAT IS KNOWN ABOUT SEED CORN MAGGOT comes from studies on onion, corn, beans, and other vegetables in the Pacific Northwest. The adult flies lay eggs on the soil surface near germinating plants. Larvae hatch and feed on the developing seedlings. Mature larvae pupate in the soil. These flies go through several life cycles in a year. The maggots are known to prefer soils high in organic matter. For example, Washington onion growers who plowed under their wheat cover crop as a green manure experienced severe maggot infestations. Also, spreading manure on a field will increase the chances of an infestation. Other factors that promote maggot problems are using fields that were previously pastures or were very weedy or when the crop was planted in cool, wet soil using reduced tillage.

POSSIBLE CONTROL METHODS FOR MAGGOTS, based on strategies used in other crops, would involve cultural practices such as delayed planting, disking of green manure cover crops well in advance of planting, and avoiding the use of manure, and applications of insecticides. However, until more is known about the habits of these maggots in potatoes, it is premature to conduct research on control tactics for seed corn maggot in potatoes.

CONTACT US WHEN YOU SPOT A SUSPECT MAGGOT INFESTATION IN YOUR FIELD. Researchers will come out and conduct an investigation of the field, making notes of the nature and extent of the damage and the field's cultural and insecticidal history. In addition, insect specimens and disease samples (if present) will be collected for identification.

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WSPC Metam Sodium Questionnaire

Metam-sodium (Vapam, VPM, Soil-Prep, Nemasol, Metam) is a soil fumigant used in potato production for control or suppression of nematodes, soil dwelling insects, and soil diseases, such as, Verticillium Wilt. Metam-sodium is currently under re-registration review by the EPA.

The Washington State Potato Commission (WSPC) is working with the USDA facilitated Metam-Sodium Task Force to help provide accurate information on risks, benefits, and use patterns of metam sodium for potato production. **We ask that all users of metam sodium complete this questionnaire.** We will use the data to help make sure that regulatory decisions are based on sound information.

1. Do you use metam sodium: grower ____ or applicator ___?

2. Do you apply metam sodium yourself? _____
   What safety precautions (protective clothing, respirators, practices) do you utilize?
   _____

3. Application method(s) you use? _____

4. How is the soil surface sealed? _____

5. Average use rate _____ gallons per acre.

6. Pest control target(s)? _____

7. Do you have effective pest control strategies available that are alternatives to metam sodium, if so, what are they? _____
   _____

8. Frequency of application (yearly, every 2 years, 3 years)? _____

9. How close together are fields being treated with metam sodium within a 48-hour period?
   Contiguous _____; 100 yards _____; ¼ mile _____;
   ½ mile _____; ¾ mile _____; 1 mile _____ (check all that apply)

10. Additional Comments? _____

11. Name and Contact Information (optional) _____

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