
Resounding Response to the Washington State Commission on Pesticide Registration's New, Expanded Mandate

One of the few bright spots in agriculture these days is the funding success of the Washington State Commission on Pesticide Registration (WSCPR). In 1995, WSCPR was established to support studies and activities that would result in pesticide registrations for minor uses. This year, the Commission took its mission one step further to start supporting research on non-chemical alternatives and pesticide resistance.

On Monday, May 10, 1999, Governor Locke signed legislation to broaden WSCPR's original mandate. As of July 1, 1999, the Commission received an additional \$1 million per biennium for a total of \$1 million per year to continue its original course and to expand its scope to support research, implementation, and demonstration of any aspect of integrated pest management and pesticide resistance management.

WSCPR's new mandate has been in effect for just five months. The Commission has met to review proposals twice in that time. Twenty-nine requests for funding have been received; 22 of these were proposals for new mandate projects. Since July, \$349,292 has been awarded to 17 of the 22 new mandate requests; seven original mandate projects

have been granted a total of \$125,373. The high volume of new mandate research proposals that have been received in such a short period of time is evidence that the Commission is addressing an unmet need.

WSCPR currently represents the largest single funding source for pest management research in the Pacific Northwest. WSCPR has recently become the largest source of publicly available funds supporting organic research in the United States; \$147,730 has been awarded since July 1999. The next largest benefactor of organic research is the national Organic Farming Research Foundation, which awarded grants totaling \$63,136 in 1999.

Expanding the Washington State Commission on Pesticide Registration's mandate to support research, implementation, and demonstration of any aspect of integrated pest management and pesticide resistance management provides a tremendous opportunity for minor crops in Washington. The State legislature's unanimous vote to increase the Commission's capabilities assures that WSCPR will be an active and integral participant in developing more effective and environmentally sound integrated pest management systems.

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Pest Management for Asian Vegetables

Produce is an important staple in the Asian diet. With a growing population of Asian settlers in the Northeast, local farmers may be able to develop new markets by growing crops desirable to these ethnic groups. Fully understanding the market is critical to choosing the right varieties and crops to grow. Another challenge to the success of such an enterprise is the ability to control pests.

Most Asian vegetables fit in two major plant families - the crucifers, or mustards and cabbages, and the cucurbits, including melons, cucumbers and pumpkins. That makes pest control easy in that insects and diseases that attack the Asian varieties are, for the most part, the same pests that infest standard American varieties. Unfortunately, in some instances the US EPA does not classify the Asian varieties

with similar American varieties, which can limit the pesticides that may be labeled. There is headway being made in this area and new crop grouping schemes allow newer pesticide registrations to include the most common Asian vegetables on the label when listing mustards; heading or non-heading cabbages; melons, pumpkins and gourds, etc.

Some pests are particular challenges to Asian vegetable growers. In Napa, or tight-headed Chinese cabbage, there is Pepper Spot. This is a disease, not a physiological or fertility disorder, and as the name implies, its main characteristic is flecking or stippling created by tiny black lesions. This usually appears first on the inner petioles and leaf veins. In the Northeast, infection most often begins late in the season and does not affect yields. However, though rare

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here, early season or seedbed infections can reduce yields significantly. The greater difficulty for growers is that fall crops may show no symptoms in the field, but up to 20 percent losses have been reported after cold storage.

Pepper Spot is caused by a strain of the Cauliflower Mosaic Virus and is vectored by aphids, most commonly the Green Peach and Cabbage aphids. A similar disease having more severe symptoms and usually seen in the field before harvest is caused by Turnip Mosaic Virus. Turnip Mosaic creates larger, circular lesions. In severe cases, the spots join together. More familiar mosaic symptoms and stunting can occur on other Oriental greens. Control of these two viruses requires reduction of the vectors and of the alternate weed hosts around the edges of fields - both equally difficult. Aphid control with insecticides and stilet oils helps, but transfer of the virus from vector to crop is very rapid. California has reported the most success by cleaning all cruciferous weeds from field edges, isolating seedbeds, and planting successive crops away from each other to reduce the spread from crop to crop. Cruciferous weed hosts include wild mustards as well as common weeds like shepard's purse, pennycress and chickweed. Eliminating these weeds hosts is more difficult here in the Northeast where small field are surrounded by ditches, fence rows or wind breaks. Controlling aphids by spraying insecticides on the field edges may be an easier method to gain control under these conditions.

Downy Mildew, caused by a fungus, and Bacterial Soft Rot are two other diseases that challenge Napa growers. Downy Mildew can infect seedlings and causes severe leaf spotting in cool weather. Initially, spots of white mildew appear on the undersides of leaves with a corresponding yellow spot on the upper surface. Occasionally small black flecks appear resembling Pepper Spot but close inspection will reveal the downy white fungus. As the disease continues, the infected tissues turn light-brown and papery. Soft Rot can occur when bacteria enter the lesions caused by Downy Mildew, as well as damaged tissue scraped by water driven sand.

New Jersey's recommended control strategy for Downy Mildew is regular sprays of fungicides on a 7 to 10 day schedule beginning at the first sign of the disease. Consult your state's pest control recommendations for the proper fungicides to use. Bacterial Soft Rot is reduced by controlling Downy Mildew and avoiding heavy overhead irrigation, especially with big gun systems.

One of the disadvantages of Asian vegetables being from a limited family of vegetables is the reduction of rotation options. Because of the concentration on cruciferous crops, Clubroot is an increasingly difficult pest to control on Asian vegetable farms. This disease is caused by a fungus which creates swimming spores in saturated soils that move to a susceptible host, infect it, and cause the roots to swell. The swelling of the roots limits the plant's ability to move water

and nutrients to the top of the plant and under warm growing conditions, the plant wilts. Irrigating to correct perceived dry soil allows the disease to spread. Long rotations avoiding cruciferous crops reduces the incidence of Clubroot, and sanitation of equipment, especially irrigation systems, reduces the spread from infested fields to clean fields. However, once introduced into a field where crucifers are to be grown, cultural practices are the only tools available to reduce disease severity. This includes improving drainage to minimize saturated conditions, growing to crops on raised beds to increase drainage in the root zone, and maintaining the soil pH at 7.0. There is some evidence that increasing soil organic matter can be antagonistic to this disease.

Insect pests of Asian vegetables are not unlike those of their American relatives. The worm complex, including Cabbage Loopers, Imported Cabbageworm, and especially Diamondback Moth, are equally as difficult to control in Asian cabbages and mustards as in American varieties. Likewise, Cabbage Root Maggot readily attacks Asian crucifers, and Aphids and Thrips are as much a concern because of the disease they vector as the damage they cause. Preplant, transplant and postplant insecticide treatments are recommended to reduce the early season flights and egg laying of Cabbage Maggot flies. Spraying field edges and weed hosts to control Aphids helps reduce the diseases they spread.

Complete coverage, spreader-stickers, and use of the right materials are essential to control the Cabbage Looper, Imported Cabbageworm and Diamondback Moth. Using modified IPM recommendations from the Long Island program, New Jersey growers are urged to scout fields and begin treatments when 20 percent or more non-heading plants are infested with any of the worm species. Once heading begins, treatment should begin at 5 percent infestation. Growers are told to use the higher recommended rates and assess effectiveness quickly after application if Cabbage Looper or resistant Diamond Moths are present. Complete coverage on the undersides of leaves is essential to control newly hatched larvae. Spray coverage is improved with drop nozzles directed over the top and at the sides of each row. Spreader-stickers improve coverage and is recommended, especially to increase the effectiveness of B.t. materials. An increasing selection of new insecticides is becoming available to control worm pests and some new materials may be more effective than older ones, especially where resistant strains of Diamondback Moth are emerging.

As in all pest control recommendations, the label is the law and it is appropriate to consult your state's recommendation guide to find the materials most suitable for your area.

Article by Richard VanVranken
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Fungicide News

In the past few months, IR-4 has submitted a number of petitions to EPA on mefenoxam (metalaxyl), tebuconazole, fludioxonil, and ziram. Mefenoxam petitions included: artichoke, carambola, kiwifruit, papaya, black sapote, caimito, canistel, mamey sapote, mango, sapodilla, sugar apple, sweetsop, atemoya, true custard apple, and lingonberry. Tebuconazole petitions included the entire cucurbit crop group, turnip greens, and hops. The fludioxonil petition was for post-harvest use on stone fruit. Ziram reregistration data was submitted for grapes and tomatoes.

EPA is currently working on a number of myclobutanil petitions (mint for processing, snap beans, caneberries (raspberries, etc.), asparagus, currants, gooseberries, and strawberries). EPA's recently published plan of work indicates that these reviews should be completed and published in the Federal Register by the end of March, 2000. This should avoid the use of a number of Section 18s. Two previously submitted petitions for Switch (cyprodinil + fludioxonil) on strawberries and the onion crop group and the petition for fludioxonil post-harvest use on stone fruit are already under review and have expected Federal Register publication dates very soon.

I attended three important meetings this fall. One of the meetings was a symposium about azoxystrobin and its use in minor crops in Europe. This meeting was put on by Zeneca and they provided significant information regarding the actual molecule, efficacy trials throughout Europe, Zeneca's registration goals, and pathogen insensitivity (resistance). I learned that insensitivity has developed in Taiwan and Japan in cucurbit powdery mildew. Zeneca's analysis of the pathogen genes indicates that these strains have a gene that is unique to these areas. They have evaluated the gene in a range of pathogens and other strains of cucurbit powdery mildew and find that these genes differ significantly from the gene of the sensitive strains. This meeting also provided me with a chance to meet a number of Europeans that are involved in minor crop production and pesticide registration. Cooperation and data-sharing between IR-4 and the organizations for minor crop registration in the U.K. and Germany are likely in the near future. Hopefully, other countries will follow.

In November, a number of IR-4 representatives met with the Department of Pesticide Regulation (DPR) in California.

This meeting followed their review of the reduced residue data program that IR-4 obtained for some uses of azoxystrobin and an insecticide, spinosad, based on their safety. The California DPR indicated some concern about the reductions, so we met to discuss these concerns. The meeting was deemed a success by all parties. We understood their concerns and were able to suggest some ways that we could work together to satisfy everyone. Future requests for reduced residue data programs will be jointly reviewed by EPA and CA-DPR.

The third meeting was held in early December at EPA to discuss plant-back restrictions for myclobutanil. IR-4 submitted petitions for two annual crops: snap beans and strawberries and Rohm & Haas has submitted a petition for the cucurbit crop group. These three crops needed to have a decision made regarding how soon other crops could be planted back in the same area. Rohm & Haas had submitted studies to determine the plant-back period and EPA had come back with a less than desirable review and recommendation. They had indicated the need for a long plant-back period. We felt that these long periods would be too restrictive for growers. Discussion at this meeting allowed EPA to establish a conditional registration for these uses with a shorter, 30-day, plant-back. The registration was conditional based on the submission of additional limited crop rotational studies. EPA also established tolerances for rotational crops. These are essentially inadvertent residues. This may not seem very important, but it was suggested that this procedure be used as a model for future plant-back situations on minor-use chemistry.

IR-4 heads into the new growing season with a great slate of projects. The fungicides have finally reached equality in number of studies per year when compared to the insecticides and herbicides. Herbicides and insecticides have usually had a larger number of studies than fungicides in years past. The exciting news is that we are working at an early stage in the development of BAS 500 from BASF. Six studies will be initiated on BAS 500 this year including, broccoli, and cabbage. Fenhexamid is another fairly new compound that we will be doing quite a bit with in 2000. Projects on fenhexamid include kiwifruit, post-harvest use on stonefruit, caneberries, field and post-harvest on pears, and transplant production of tomatoes and peppers.

Article by Dave Thompson