COOPERATIVE EXTENSION
Washington State University

Agrichemical and Environmental News

A monthly report on pesticides and related environmental issues

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Hard-copy subscriptions are $15 a year. Mail check to above address, ATTN: Sally O'Neal Coates, Editor.

Input Needed Now for 2001 IR-4 Projects

Dr. Douglas Walsh, State Liaison Representative, USDA/IR-4 Project

The Food Quality Protection Act (FQPA) of 1996 changed the landscape of food safety and pesticide use. We are now in year four of the FQPA era. Revised risk assessments of pesticides—for better or worse—are being ground through the regulatory system. In many cases, pesticide uses are being curtailed or dramatically restricted. As the U.S. Environmental Protection Agency restricts the use of key pesticides, registration of alternative products becomes even more important. To increase the availability of crop protection chemistries for minor crop producers, the Interregional Research Project Number 4 (IR-4) was established in 1963. IR-4 is a federal/state/private cooperative that aspires to obtain clearances for pest control chemistries on minor crops. (For a complete description of IR-4's workings see "IR-4: Developing and Delivering Pest Management Solutions for Minor Crop Producers," *AENews* No. 162, Oct. 1999.)

Prioritization Workshop in September

On September 11–13, 2000, the IR-4 prioritization workshop for year 2001 projects will take place in Orlando, Florida. Requests to IR-4 are many and the number of projects that can be funded and completed is limited.

Your Participation is Encouraged

As the Washington State Liaison to the IR-4 program and as a Commissioner on the Washington State Commission on Pesticide Registration, I need to know the pest control needs and concerns among the diverse agricultural producers of Washington State. This spring, I listed new pest control chemistries with registration potential on the *AENews* website **(http://www2.tricity.wsu.edu/aenews/April00AENews/NewProducts.html)**. In this month's electronic newsletter (see URL below), you will find a con-

***See this month's electronic* AENews *for a list of projects already proposed for IR-4 consideration for 2001*:**
http://www2.tricity.wsu.edu/aenews/Aug00AENews/Aug00AENews.htm/

...continued on next page

IR-4 Input, cont.

Dr. Douglas B. Walsh, State Liaison Representative, USDA/IR-4 Project

densed list of IR-4 projects that have already been proposed for the year 2001. This list is also provided in this PDF version of the newsletter, beginning on page 15.

Submit a PCR Form

The first step toward making a pesticide need known is to submit a Pesticide Clearance Request form (PCR) to IR-4. Anyone can submit a PCR; parties in Washington State can obtain them from me. I can assist interested parties in prompt submission of the form and I can help bring those needs to the attention of IR-4 at the September meeting.

Individuals or groups wishing to initiate review of a particular crop-chemistry combination should look over the proposed list on the website mentioned at the bottom of page 1. If the crop-chemistry of interest is not already listed, contact me right away. On the other hand, don't hesitate to contact me if the project has been submitted by another state. Projects that have been requested by multiple states are more likely to be received positively by IR-4.

Washington State has a strong reputation for being proactive in pest control efforts. This is facilitated through communication between agricultural producers and university specialists. Please make your pest control needs and concerns known to me.

Dr. Douglas B. Walsh is the Washington State Liaison Representative for IR-4. His office is located at WSU in Prosser. He can be reached at (509) 786-2226 or ***dwalsh @tricity.wsu.edu****.*

Free Pesticide Disposal

The Washington State Department of Agriculture (WSDA), in cooperation with local agencies, will collect unusable pesticides from businesses and organizations at the locations and dates shown. Herbicides, fungicides, insecticides, rodenticides, fumigants, antibacterial materials, adjuvants, and other types of pesticides are accepted. Businesses and organizations are usually expected to pay disposal fees for these materials, but this program is offered at no cost to help landscapers, exterminators, farmers, and others remove these materials from their premises.

DATE	LOCATION	SIGN-UP DEADLINE
September 18	Seattle	August 11
September 19	Bremerton	August 11
September 20	Centralia	August 14
September 21	Vancouver	August 14
October 17	Moses Lake	September 6
October 19	Orondo	September 6

Those wishing to participate in the pesticide disposal program must sign up in advance by calling WSDA at (360) 902-2056. Note the sign-up deadlines. Interested parties calling after the sign-up deadline may be accommodated on a space-available basis or at a future collection event.

The Waste Pesticide Program has operated in Washington State since 1988. Nearly seventy regional collection events have been held, and over 900,000 pounds of unusable pesticides have been collected from over 3250 participants.

"Show Us the Data!"

FEQL's New Chemist Looks Ahead

Dr. Vincent R. Hebert, Analytical Chemist, WSU

During my short time in Washington State (six days as of this writing), I have been amazed at the interest in environmental and agricultural issues expressed by people from various backgrounds. Washington citizens are not only interested in the sensitive issues immediately facing their state's agricultural production, they are knowledgeable about them and apparently eager to talk!

Two days ago, I stopped in the town of Starbuck on my way to visit Palouse Falls. There, I had the opportunity to listen to two local residents engage in a lively discussion on the 4(d) "take" rule of the Endangered Species Act (ESA) and its potential implications for regional agriculture. These gentlemen informed me that the National Marine Fisheries Service's (NMFS's) interpretation of "take" with respect to threatened and endangered steelhead and salmon populations could have major implications on current pesticide use and irrigation practices in the Columbia and Snake river basins. *(ED. NOTE: In short, under the NMFS interpretation, you don't have to kill a species to "take" it—a variety of disturbances can be defined as "taking.")* One of their major concerns was whether the proper use of currently registered herbicides, insecticides, and fungicides would be impacted by this rule. Because I lack familiarity with this issue, I could not offer an opinion. Instead, I asked, "If you knew that sound scientific information were available to address pesticide practices in the Snake and Columbia river basins, would you feel more comfortable with the decision-making process?" Without hesitation, they both said, "Show us the data!"

...healthy skepticism is not merely a good thing, it is essential...

I believe that healthy public skepticism is not merely a good thing, it is an essential element in the democratic process. It is the catalyst for research in pursuit of accurate information, which in turn is the foundation for sound legislation. Providing sound scientific information to the public and to state and federal regulatory agencies will be my principal mission at the Food and Environmental Quality Lab (FEQL)—information that will assist in making informed judgments in environmental policy while protecting the rich diversity and productivity of Washington's agriculture.

The passage of the Food Quality Protection Act (FQPA) in 1996 dramatically changed the U.S. Environmental Protection Agency's (EPA's) mandate. Where EPA was once charged with the rather nebulous task of weighing benefits against risks, now they are required to establish exacting pesticide residue tolerances based on new and complex safety factors designed to protect the most sensitive population groups. With this change comes enormous pressure to develop and maintain a diverse arsenal of integrated pest management tools for protecting the environment for future generations while ensuring the quality of the food supply. My work to expand the Good Laboratory Practices (GLP) program here at the FEQL will be an integral component in meeting the requirements of state and federal regulators so they can address these challenges. Combined with the efforts of commodity grower groups and the Interregional Research Project Number 4 (IR-4), my work here will provide information that will accelerate needed registrations of alternative chemistries for the diverse crops in this state.

Meanwhile, the next time I'm in Starbuck, I hope I can assuage some local skepticism (or at least add to the knowledge base) by being more informed. Once my boxes are unpacked and my program is up and running, I'll be able to say that sound scientific information is indeed available, or at least under development, to address the food and environmental quality concerns as well as the agricultural production concerns of our citizens. But if the questions turn to politics, I'll say, much as Sergeant Joe Friday of *Dragnet* might have said, that I provide "Just the facts!"

Dr. Vincent Hebert is the new Analytical Chemist at WSU's Food and Environmental Quality Lab. Once his boxes are unpacked, he can be reached at ***vhebert@tricity.wsu.edu*** *or (509) 372-7393.*

Precision Ag Center Introduced at WSU

Dr. Joan R. Davenport, Soil Scientist, WSU

The most recent Washington State biennial budget included funding to both the University of Washington (UW) and Washington State University (WSU) for a program called the Advanced Technology Initiative (ATI). Included in the ATI were funds to WSU earmarked for the advancement of precision agriculture technologies, and to UW for efforts in precision forestry. This article explains how WSU has used its funding to establish a Center for Precision Agriculture Systems; UW's Precision Forestry Cooperative will be discussed in a forthcoming issue.

CPAS Established

ATI funds led to the establishment of the Center for Precision Agriculture Systems (CPAS) under the interim directorship of Dr. Denny Davis (WSU Department of Biosystems Engineering). Just as precision agriculture is a little different approach to farming (1, 2), CPAS began as a center that was a little different from others at WSU. Initially, CPAS could have been described as a "virtual center"—a center without a charter, a permanent director, or a physical home. One by one, we have chipped away at these items.

On April 13, 2000, the Washington State University Faculty Senate approved CPAS. The center now has a charter and is officially recognized as a center within the WSU system. The mission, goal, and objectives of CPAS are provided on page 5.

Initial Efforts

WSU involvement in precision agriculture began years before the Advanced Technology Initiative. In 1993, WSU-Prosser faculty members worked collaboratively with USDA/ARS scientists at Prosser developing yield monitoring equipment for potatoes. The project evolved over time to include partnerships with the agricultural industry in the Columbia Basin. Along a similar path, WSU-Prosser faculty developed a project on precision agriculture in grapes in the mid-1990s. The potato and grape projects continued to expand. Motorola became interested in developing technologies for precision agriculture and approached WSU because of the efforts already in place and the diversity of crops grown in Washington State. The arrival of the ATI funds further expanded the programs. Between Motorola and ATI funds for the center, the grape and potato projects have expanded to involve WSU faculty members in Prosser, Tri-Cities, and Pullman.

CPAS established a presence as a Pacific Northwest precision agriculture leader by sponsoring the Western Precision Agriculture Conference, held in Pasco February 15 and 16, 2000. The conference was well attended and hosted speakers from all around North America.

Leadership in Place

A key part of making CPAS a true center for precision agriculture is establishing strong leadership. A joint university-industry committee conducted a national search for the center's director. From a pool of sixteen applicants, three top candidates were interviewed. Dr. Francis J. Pierce, a soil scientist from Michigan State University who has long been active in precision agriculture, will be coming to WSU to serve as the Center Director in September 2000. Dr. Pierce plans to be active in precision agriculture research efforts and to participate in numerous outreach and administrative activities.

With a charter in place and a director on the way, CPAS is well on its way to being less of a virtual center and more of a tangible one. Dr. Pierce has chosen to locate the center at the WSU Irrigated Agriculture Research and Extension Center (IAREC) in Prosser.

Looking Ahead

A little more than a year after funding was made available, WSU's new Center for Precision Agriculture Systems has been established and is operational. The next steps will be to build on what CPAS has already started: conducting and supporting research to advance agricultural systems; being involved in outreach and educational activities to enhance training in and awareness of precision agriculture tools; and building relationships with the agricultural industry in the state of Washington. In partnership with the

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Precision Ag Center, cont.

Dr. Joan R. Davenport, Soil Scientist, WSU

local agricultural industry, CPAS can continue to build Washington's role as a leader in precision agriculture.

*Dr. Joan Davenport is an Assistant Professor and Soil Scientist at Washington State University's IAREC located in Prosser. She can be reached at (509) 786-2226 or **jdavenp@tricity.wsu.edu**.*

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1. Davenport, J. R. 1998. Precision Agriculture: Futuristic farming may be closer than you think. Agrichemical and Environmental News 145:1-3.

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Mission, Goal, and Objectives of the Center for Precision Agricultural Systems (CPAS)

Mission

To foster collaborative research, education, and outreach programs that create practical technologies and management systems for precision agriculture. These systems:

(a) support competitive production of Washington's agricultural commodities,
(b) stimulate the state's economic development, and
(c) protect the region's environment and natural resources.

Goal

The goal of the center is to catalyze cooperative, interdisciplinary efforts for development and implementation of precision food production technologies that will consistently propel the industry, across the state and beyond, to markedly higher levels of product quality and profitability while maintaining sustainability and embodying social responsibility. Center efforts will create knowledge, management strategies, and technologies that support precise control of food production—from breeding through nurturing and harvest, storage and processing, and delivery to the consumer. An important part of the center's goal is to enhance traditional agricultural businesses and to stimulate new businesses and economic development supporting precision agricultural systems. New business opportunities will be created in agricultural and processing equipment, electronic sensors, software, and agronomic consulting arenas. Precision food production technologies will open a new era of food production and consumer protection, perhaps as significant worldwide as the green revolution of the past generation.

Objectives

The center's objectives are intended to create and implement a wide variety of research-based and information-intensive technologies needed for precision agricultural systems. Six specific objectives define important elements of the technology development process:

❶ Definition of requirements (multi-disciplinary) for viable solutions to important agricultural system problems.

❷ Identification and origination of concepts useful to development of selected precision agricultural technologies and systems.

❸ Synthesis and development of concepts into usable technologies that meet stated system requirements.

❹ Implementation, testing, validation, and refinement of technological products in production agricultural systems.

❺ Facilitation of technology transfer to support commercial production of new precision agricultural technologies.

❻ Development of educational programs that support adoption and successful use of precision food production technologies.

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Food Safety Conference Teems with Information

Sally O'Neal Coates, Editor of Research Publications, WSU

Day Two, Part Two

The eighth Food Safety: Farm to Table Conference was held May 16 and 17, 2000, in Moscow, Idaho. Sponsored by the cooperative extension systems of Washington State University (WSU) and University of Idaho (UI), the conference brings together representatives of academia, industry, and government for an annual look at current issues in food safety. Last month, we covered Day One of the conference, featuring topics including food safety in produce, antimicrobial use in livestock, control of *Listeria* at the packing plant, and tracking foodborne illness outbreaks. This month, we cover Day Two.

Matters Manurial

Dr. Sandy McCurdy, Extension Food Safety Specialist with UI, introduced the first speaker of the second morning. Vicki Bess, President of BBC Labs, an independent microbiology lab, spoke about reduction of pathogens in compost and manure.

Bess first gave a primer on compost, showing slides and explaining how compost differs from mulch, manure, and other substances in that it has been biologically digested to stabilize nutrients and to kill pathogens and weed seeds. Key to this process is the heat naturally produced by a correct composting operation.

Three Composting Styles
Pros and Cons

WINDROW

The most common style of composting, the windrow method—essentially leaving the composting material in a long, mounded row—involves a great deal of turning. It takes longer than mechanical methods and has potential to re-inoculate the compost with pathogens at the time of turning. Pathogens can be reduced by more frequent turning.

STATIC PILE

Composting in a large, static pile (with or without forced aeration) is inexpensive, because no turning is required, but the coolest areas of the pile take a long time to reach optimum temperature.

MECHANICAL COMPOSTING

While quite effective, this method is expensive. Typically, it takes place in a closed vessel.

Pathogens in compost, explained Bess, are a function of the level of pathogens present in the source (potentially pathogenic sources include sewage sludge, animal manure, municipal solid waste, and green waste) and the source material's response to the mechanisms of pathogen destruction in the composting process. These mechanisms include competition, antibiosis, and, of course, heat. An accepted heat standard for pathogen control is 131˚F for fifteen consecutive days in windrow composting. For good weed seed kill, Bess recommends higher temperatures (140˚F to 150˚F) in the West.

For pathogen reduction in manure (as opposed to compost), again the source composition must be considered. Air drying aids in reduction, but the pathogens can be very persistent. Cornell University is currently exploring the addition of sodium carbonate, but the jury is still out on its effectiveness.

It's a Small Planet After All

Next, Dr. Steven Harper, Director of Research and Development at Small Planet Foods, gave an update on U.S. organic regulations and standards.

National organic regulations were first proposed in 1997. After a considerable amount of wrangling and dissention in the ranks, a revised set of federal organic regulations was proposed on March 13, 2000. The comment period for these proposed regulations closed June 12, 2000. Revised regulations, taking comments into account, could be made public as

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Food Safety Conference Part 2, cont.

Sally O'Neal Coates, Editor of Research Publications, WSU

soon as September, 2000. Congress then has a sixty-day veto period, after which the proposed regulations may become law. Roughly speaking, this could occur as soon as the end of this calendar year.

The March proposal reflected a number of consumer-driven "hot-button" issues including the exclusion from "organic" designation of genetically modified (GM) crops, products treated with sewage or biosludge, and irradiated products. The proposal also included lists of allowed synthetic and prohibited natural substances with respect to production, processing, and livestock. It provided for state and private certifiers to conduct annual reviews of growers and processors, and gave certifiers the right to de-certify.

For a plant product to be certified organic, no prohibited substances may have been used on that land for three years prior to the subject harvest. Livestock for slaughter must be organically raised from birth, whereas livestock for milk production must be under organic management for one year. Organic management excludes use of hormones and antibiotics. (Future concerns may include standards for wild-caught fish and organic aquaculture.)

Four different labels will be used on processed foods under the proposed regulations:

- "100% Organic."
- "Organic" (95+% organic).
- "Made with Organic (Specific Ingredient)" (50 to 95% total organic content).
- If less than 50% organic content, the word "organic" may only appear on the label in the ingredient list in conjunction with the specific organic ingredient.

Note that the federal organic standards apply to product *production processes*, not measurable properties of the resulting product. Certifiers will be auditing *practices*, not testing *content*.

More information on organic standards can be found on the Internet at **http://www.ams.usda.gov/nop**, **http://www.ota.com**, and **http://www.omri.org**.

Food Safety Regulation Update

Dr. Barbara Rasco of WSU's Food Science and Human Nutrition Department presented an update on U.S. food safety regulations. While GM crops weren't on the agenda until the afternoon session, this highly topical issue had been rearing its head throughout the morning, and continued to dominate in this presentation. Dr. Rasco discussed the widely divided public perception of transgenics, sharing "urban myth" anecdotes from the United Kingdom—a leading nation in GM fearmongering. The outright untruths in European supermarkets and the over-the-top consumer reactions incited a great deal of eye-rolling and groaning amongst conference participants. Science-based or not, current perception and policy trends seem to be leading toward increased regulatory oversight of GM crops, labeling of products containing GM ingredients, and segregation of GM-containing from GM-free products. Such regulation may well prove a nightmare to implement and enforce, and is already causing economic fallout in the areas of insurance, finance, law, and transportation.

While many regulations make life tough for agricultural producers, others are designed to protect them. Laws are being enacted, for example, to provide recourse for victims of agricultural terrorism, whether that terrorism takes the form of physical crop sabotage or disinformation dispersal. Verbal attacks (both intentional, like the Alar scare, and inadvertent, such as Oprah Winfrey's mad cow disease comments) have led to the evolution of "veggie libel laws," which hold that free speech must be correct speech, shifting the burden of proof to the complainant when food is alleged unsafe.

Dr. Rasco's powerful and fast-paced presentation imparted a great deal of information, raised a number of controversial issues, and was certainly a better pre-lunch choice than last year's *Yersinia*-related pig disembowelment slides.

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Food Safety Conference Part 2, cont.

Sally O'Neal Coates, Editor of Research Publications, WSU

Putting Biotech in Perspective

In the afternoon, Dr. Alan McCurdy, WSU Chair of Food Science and Human Nutrition, kicked off the official biotechnology segment of the conference by introducing Dr. James Cook. Dr. Cook, a plant pathologist and member of the National Academy of Sciences, holds an Endowed Chair in Wheat Research at WSU. He put things in perspective by reminding us that biotechnology is a very old science—it's simply the use of biological systems to achieve specific ends, as is done in winemaking and cheesemaking. The evolution of applied genetics to production agriculture is, in his view, a natural one.

Of course, Dr. Cook was preaching to the choir—or at least a very sympathetic congregation—when he enumerated potential benefits of GM crops, including:

- Lower load of pesticides in the environment each year.
- Soil conservation: more low-disturbance (no-till) cropping systems.
- May conserve non-agricultural land for other uses, such as recreation.
- Safer for farmworkers than working around conventional pesticides.
- More profit.

As Dr. Cook elegantly outlined some of the beneficial properties that can be conferred upon crops through application of GM technology—broad-spectrum herbicide resistance, insecticidal properties, virus resistance, enhanced nutrition—it seemed impossible to deny the benefits. Yet, an hour earlier, as Dr. Rasco presented the tidal wave of public pressure against GM crops, it seemed impossible to envision a near future when these many benefits would be embraced by the public.

But...Is It Safe?

Dr. Stephen Taylor, head of the Food Science and Technology Department at the University of Nebraska, addressed the safety of bioengineered food products. He became involved in the study of splicing Brazil nut genes into soybeans because of his background in food allergies. Giving detailed examples of this project and others, Dr. Taylor exploded the myth that "no testing takes place" on transgenics. As Dr. Allan Felsot has explained so eloquently in these pages (see his "Insecticidal Genes" series in *AENews* Nos. 167-170), extensive safety assessment has taken place on every GM crop and testing is ongoing.

Dr. Taylor detailed the three phases of the U.S. safety assessment process: Phase One, assessment of the gene and crop themselves; Phase Two, a detailed look at biological and agronomic equivalence; and Phase Three, assessment of the product in its food, feed, and environmental applications. He broke each phase into subcomponents, offering examples of actual test results on a variety of products. He pointed out the many pitfalls in conducting rigorous science and communicating it to a cynical public, and the difficulty in shedding light on bad science. The inherent "Catch-22" is the fact that you can prove non-safety, but you can't prove safety.

Many Issues in Just Two Days

A tremendous amount of ground was covered at this two-day conference. As with any good forum on science and policy, it raised more questions than it answered. In the end, several things were clear. For one, GM crops are controversial, and that controversy is not going away quickly or easily. Two, most of the conference's distinguished presenters had mastered Microsoft PowerPoint, a claim that could not be made in 1999. And three, most conference attendees learned a new word ("manurial"), though one we're not likely to toss around at cocktail parties.

Those wishing further information on the 2000 Food Safety: Farm to Table Conference can contact Conference Co-Chair Carolyn Bohach at (208) 885-5906 or **cbohach@uidaho.edu** or committee member Val Hillers at (509) 335-2970 or **hillersv@wsu.edu**.

Sally O'Neal Coates is the Editor of Agrichemical and Environmental News. *She can be reached at* ***scoates@tricity.wsu.edu*** *or (509) 372-7378.*

Regulating Herbicide Tolerant Plants

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Dr. Allan S. Felsot, Environmental Toxicologist, WSU

The following is excerpted from an upcoming* AENews *article by Dr. Felsot on crops genetically engineered for herbicide tolerance. Watch for "Herbicide Tolerant Genes," Parts 1, 2, and 3, in future issues beginning in September.

One of the most common complaints about transgenic crop technology stems from the perception that little safety testing was done prior to commercial release of the engineered cultivars. In fact, the risks of genetically engineered herbicide tolerance were assessed by three federal regulatory agencies, APHIS (USDA Animal and Plant Health Inspection Service), FDA (Food & Drug Administration), and EPA (Environmental Protection Agency). Although APHIS, FDA, and EPA consult with one another, each plays a distinct role in regulating transgenic crops and other biotechnology products.

APHIS is charged by the Federal Plant Pest Act and the Plant Quarantine Act with ensuring that new crops or other organisms do not become agricultural pests when they are released into the field. Companies developing new products or importing biological control organisms, for example, must convince APHIS that the novel introductions will not have adverse agricultural impacts. These companies must show how the organisms will be contained in the testing process and after introduction into production systems. After assessing available data about the organism—in this case, the transgenic crop—APHIS determines whether further regulation is required (1).

Under authority of Section 402 of the Federal Food Drug and Cosmetic Act (FFDCA), the FDA regulates foods for natural toxins (e.g., solanine levels in potatoes) and unavoidable contaminants (e.g., mercury, lead, dioxins). Under the Food Additive Amendment to the FFDCA (Section 409), the FDA also can regulate intentionally added substances that could make the food injurious. The FDA considers section 409 of the FFDCA to give it authority to treat the gene products (i.e., proteins) from genetically modified food organisms as food additives. Whether invoking section 402 or 409, the FDA requires the manufacturer to show that a new food is unlikely to cause harm. For transgenic crops, the manufacturer must show the new crop is substantially equivalent to the old crop (2).

EPA derives its authority from FIFRA (Federal Insecticide, Fungicide and Rodenticide Act) to regulate pest control substances, including transgenic crops that produce a pest control effect. The gene product of a transgenic crop with pesticidal properties is treated as a pesticide residue and thus regulated under Section 408 of the FFDCA as amended by the Food Quality Protection Act (FQPA) of 1996. EPA decides whether a tolerance is needed for residues appearing in the harvested crop or if residues can be exempted. In all cases, the legislative mandate behind regulation is a reasonable certainty that no human or environmental harm would accrue from exposure to a chemical in the crop or from deployment of the pest control technology. In the case of herbicide tolerant crops such as Roundup Ready products, the protein produced from the genetic engineering process is not pesticidal, therefore EPA did not need to establish a tolerance. Thus, APHIS and FDA shared the main responsibility for approving field trials of herbicide tolerant crops and safety of consuming the harvested commodity. However, because glyphosate (Roundup) would be used in fields while crops were growing, EPA had to assess the safety of the glyphosate residue tolerance and approve label changes.

Dr. Allan S. Felsot is an Environmental Toxicologist with WSU's Food and Environmental Quality Lab (FEQL), and a frequent contributor to this newsletter. He can be reached at ***afelsot@tricity.wsu.edu*** *or (509) 372-7365.*

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2. Food and Drug Administration. 1992. Statement of policy: foods derived from new plant varieties. Federal Register 52(104):22984-23005.

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2000 Pesticide Container Recycling Schedule

Washington Pest Consultants Association

Washington Pest Consultants Association organizes an annual series of collection dates and sites for empty pesticide containers. The table below shows dates for mid-August through September; dates through October are available in the electronic version of *AENews* at **http://www2.tricity.wsu.edu/aenews**. Dates and locations are subject to change; use the contact names and telephone numbers provided to confirm. For general questions, or to host an event at your farm, business, or in a central location in your area, contact Northwest Ag Plastics representative Clarke Brown at (509) 965-6809 or David Brown at (509) 469-2550 or **dbrownwash@msn.com**. More information on pesticide waste and container recycling is available on the Internet at **http://pep.wsu.edu/waste/wd.html**.

CONTAINERS MUST MEET THE FOLLOWING CRITERIA:

• Rinsed—no residue remaining • Clean and dry, inside and out, with no apparent odor •
• Majority of foil seal removed from spout (small amount remaining on rim OK) •
• Half-pint, pint, quart, one and two-and-a-half gallon containers accepted whole •
• Hard plastic lids and slip-on lids removed • Five-gallon containers accepted whole if lids and bails removed •
• 30 and 55-gallon containers accepted whole if above criteria is met •

DATE	TIME	LOCATION	SPONSOR	CONTACT	PHONE
Aug. 8	8a-11a	Dayton	McGregor's	Doug Wendt	(509) 382-4704
	1p-4p	Waitsburg	McGregor's	Terry Jacoy	(509) 337-6621
Aug. 9	8a-11a	Eltopia	Wilbur Ellis	Vern Record	(509) 297-4304
	1p-3p	Pasco	Pfister Crop Care	Steve Pfister	(509) 297-4304
	4p-5p	Pasco, Kahlotus Rd.	Air Trac	Gerald Titus	(509) 547-5301
Aug. 10	8a-10a	Eltopia	Eastern Wa Spray Service	Willis Maxson	(509) 297-4387
	11a-2p	Connell	B&R Crop Care	Chris Eskildsen	(509) 234-7791
	4p-6p	Othello	B&H Ag Chemical	Larry Hawley	(509) 488-6576
Aug. 11	8a-11a	Othello Airport	Conner Flying Inc.	Mark Conner	(509) 488-2921
	2p-5p	Moses Lake	Moses Lake Air Service	Perry Davis	(509) 765-7689
Aug. 14	8a-11a	Quincy	Wilbur Ellis	Dale Martin	(509) 787-4433
	1p-3p	Quincy	Quincy Flying Service	Richard Weaver	(509) 787-3223
Aug. 15	8a-10a	Royal City	Cenex	Ted Freeman	(509) 346-2213
	11a-1p	Royal City	Saddle Mountain	Mike Pack	(509) 346-2291
	2p-5p	Mattawa	Wilbur Ellis	Al Hilliker	(509) 932-4988
Aug. 16	8a-11a	Ephrata	The Crop Duster	Martin Shaw	(509) 754-3461
	1p-3p	White Trail	The Crop Duster	Martin Shaw	(509) 754-3461
Aug. 21	8a-11a	Toppenish	Western Farm Service	Steve Laws	(509) 865-2045
	1p-4p	Harrah	Husch & Husch	Allen Husch	(509) 848-2951
Aug. 22	8a-11a	Cowiche	D&M Chemical	Dee Gargus	(509) 678-5750
Sept. 5	8a-11a	Chelan	Northwest Wholesale	Herb Teas	(509) 662-2141
Sept. 6	8a-11a	WenatcheeTree Fruit Station	Fieldmen's Assoc.	Floyd Stutzman	(509) 669-0420
Sept. 11	9a-11a	St John	Gossard Aviation Inc.	Wesley Gossard	(509) 648-3722
	1p-3p	Pine City	Reed Aviation	Pete Reed	(509) 523-3950
Sept. 12	8a-10a	Warden	Kilmer Crop Dusting	Terry Kilmer	(509) 349-2491
	11a-1p	Bruce	Simplot	Chuck Spytex	(509) 488-2132
	3p-5p	Othello	South Saddle Orchard	Mike Macy	(509) 539-5836
Sept. 14	8a-11a	Zillah	Bleyhl Farm Service	Ray Oversby	(509) 829-6922

"Our industry does not want pesticide containers to become a waste issue. If we take the time to clean and recycle these products, we can save money, show that the industry is responsible in its use of pesticides, and reduce inputs to the waste stream."

HRH QBL Speaks Out: Non-Anom Nominees

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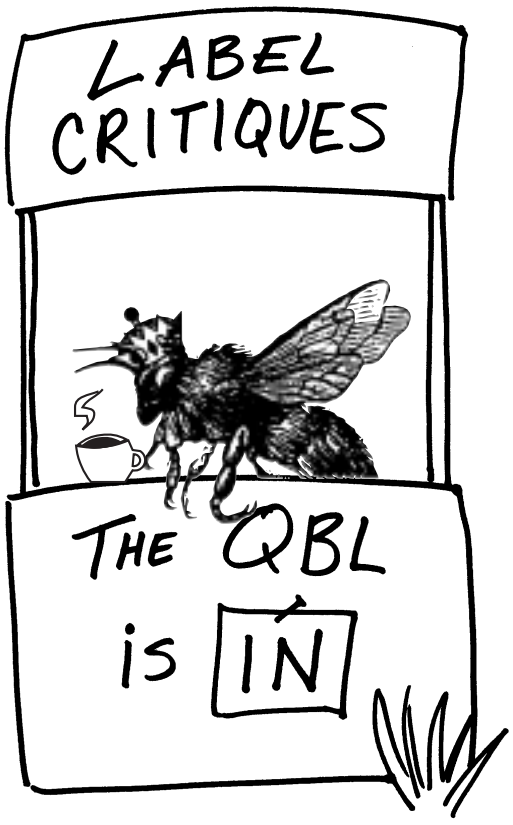
Aug. 2000
No. 172

Jane M. Thomas, Pesticide Notification Network Coordinator, WSU

In an ongoing effort to force a job offer from the Environmental Protection Agency (EPA), Her Royal Highness The Queen Bee of Labels (HRH QBL, a.k.a. WSU's Jane M. Thomas) takes time out of her busy Royal Schedule periodically to point out oddities and aggravations on pesticide labels. It is the QBL's Opinion Most High that if she were in charge of all things label, a few RULES, combined with swift and thorough consequences for transgressors, would whip the whole pesticide label business into shape in a matter of weeks. Until such time as EPA sees the light and appoints HRH QBL to her rightful position, The Queen shall content herself with commentary, including nominations for the Non-Anom Awards, a new industry standard for particularly pathetic, aggrievedly awful, and terribly tacky pesticide labels. For background on this ongoing saga, see "If I Were the Queen of Labels,"* AENews *No. 169, May 2000. For details on the Non-Anoms, see "QBL II,"* AENews *No. 171, July 2000.*

Alas, the file cabinets at the Pesticide Information Center at Washington State University indeed contain a treasure trove of potential "Non-Anom" award winners.* Following are but two of the pearls of profundity that crossed my desk this month. Sound the trumpets, please!



First, in the **Most Glaring Error** category, is Pace International's Deadline-40 label. It contains the following language in the use directions: "Seed Grasses: alfalfa, clover, flowers, grasses and vegetables grown for seed." Now, why would a registrant include flowers and vegetables in a listing of seed grasses? A quick Royal Inquisition revealed that the label should have read "seed crops" not "seed grasses." What was EPA thinking when they saw seed grasses followed by flowers and vegetables? Speaking of grasses…methinks someone in the loop is, indeed, inhaling.

The second entrant this month comes under the **Most Confusing Language** category. It's an entry shared by two: Regal Chemical Company's Systec 1998 and Systec 1998 WDG labels. Both contain the following wording under the use directions for "Ornamentals (Field and Greenhouse)": "…may be used to control the listed diseases on noncommercial bearing…fruit trees…." One wonders how bearing fruit trees could be included as a field and/or greenhouse ornamental. In a state of high(ness) confusion, HRH The QBL called the registrant and was informed that this language was intended to allow use on homeowner fruit trees. Under "Ornamentals (Field and Greenhouse)?" We don't think so. Maybe in Georgia, but that's not the way it is in Washington! Here ornamental is ornamental and bearing is bearing and ne'er the twain shall meet.

Watch future issues of *AENews* for more Non-Anom nominations and feel free to submit your favorites to HRH The QBL at **jmthomas@tricity.wsu.edu**.

**For those readers new to these pages, "Non-Anom" is short for "Non-Anomaly." When the QBL first began pointing out breathtakingly queer labels, she considered calling them "Label Anomalies." But since "anomaly" is defined as "a departure from the regular arrangement, general rule, or regular practice," and the QBL holds that pesticide labels seem to follow NO general rules or practices, she has dubbed this dubious distinction "Non-Anomaly," or "Non-Anom."*

PNN Update

Jane M. Thomas, Pesticide Notification Network Coordinator

The Pesticide Notification Network (PNN) is operated by WSU's Pesticide Information Center for the Washington State Commission on Pesticide Registration. The system is designed to distribute pesticide registration and label change information to groups representing Washington's pesticide users.

PNN notifications are available on our web page. To review those sent out in June, either access the PNN page via the Pesticide Information Center On-Line (PICOL) Main Page, **http://picol.cahe.wsu.edu/,** or directly, at **http://www.tricity.wsu.edu/~mantone/pl-newpnn.html**.

We hope that this new electronic format will be useful. Please let us know what you think by submitting comments to Jane Thomas at (509) 372-7493 or **jmthomas@tricity.wsu.edu**.

Dear Aggie

Providing answers to the questions you didn't know you wanted to ask

In contrast to the usually more sober contributors to the Agrichemical and Environmental News*, Dear Aggie deals lightheartedly with the peculiarities that cross our paths and helps decipher the enigmatic and clarify the obscure. Questions may be e-mailed to Dear Aggie at* ***dearaggy@tricity.wsu.edu****. Opinions are Aggie's and do not reflect those of WSU.*

Dear Aggie,

I recently heard about several neighborhood pets being accidentally poisoned by strychnine. As the owner of the world's sweetest 100-pound, free-range dog, I am concerned that my dog may be poisoned by someone trying to control gophers in the neighborhood. Is strychnine readily available to homeowners?

Since I don't want anyone to know that I am so irresponsible as to let my pooch wander the neighborhood, please just sign me Petrified Pet Owner.

Dear Pet-Rified,

There is an interesting story to tell about strychnine. Most commercial strychnine poisons are federally designated as restricted-use pesticides (a.k.a. RUPs) and are labeled as such. In Washington State, strychnine is also listed in WAC 16-228-1230 (2) as a state restricted-use product. Thus, distribution, sale, and use of all strychnine should be limited. However, Section 3 of WAC 16-228-1230 states that the state restricted-use requirements do not apply to home and garden products. In fact, there are several home and garden strychnine products currently registered for use in Washington and not federally designated as RUPs. This matter was recently brought to WSDA's attention, and efforts are underway to change the regulations. In the meantime, your neighbor may lawfully put your pet at risk. And, sorry to be the one to break the news, but none of the proposed regulations address your neighbor's ability to purchase strychnine products in bordering states or over the Internet. So put that in your trap and bait it.

Federal Register Excerpts

Compiled by Jane M. Thomas, Pesticide Notification Network Coordinator

***In reviewing the June postings in the Federal Register, we found the following items that may be of interest to the readers of* Agrichemical and Environmental News.**

In the June 1 Federal Register, EPA published a guidance document on applying data requirements for the establishment or continuance of tolerances for pesticide residues in or on imported foods. EPA is soliciting input on the guidance put forth in this notice. (Page 35069)

In the June 2 Federal Register, EPA announced its proposal to revoke tolerances for methyl parathion on: apples, artichokes, beets (greens alone), beets (with or without tops), birdsfoot trefoil forage, birdsfoot trefoil hay, broccoli, Brussels sprouts, carrots, cauliflower, celery, cherries, collards, grapes, kale, lentils, kohlrabi, lettuce, mustard greens, nectarines, peaches, pears, plums (fresh prunes), rutabagas (with or without tops), rutabaga tops, spinach, tomatoes, turnips (with or without tops), turnip greens, leafy Brassica vegetables (cole), and vetch. In addition, EPA proposes to amend the tolerances for beans peas to cover the dried commodities only. (Note that methyl parathion may still be used on lentils. Residues on lentils are covered by the tolerance for peas, dried.) Comments on this proposed action were to have been submitted to EPA on or before August 1, 2000. (Page 35307)

In the June 7 Federal Register, EPA announced that it had received a request from Roses, Inc. (who represents rose growers throughout the US) for an exemption from some of the restricted entry provisions of the Worker Protection Standards for rose harvesters. This exemption would allow harvesters to enter greenhouses to cut roses before the REIs have expired. This request is for a five year exemption and is similar to an earlier exemption granted by EPA that was in effect from 12/8/96 to 10/4/99. Comments on this request must be submitted to EPA on or before August 7, 2000. (Page 36134)

In the June 14 Federal Register, EPA announced that the revised risk assessment and related documents for dicrotophos are available for review and comment. Comments should be submitted to EPA on or before August 14. These documents are available on the Internet at **http://www.epa.gov/pesticides/op/dicrotophos.htm**. (Page 37371)

In the June 22 Federal Register, EPA issued a final rule revising the tolerances for azinphos-methyl by revoking specific tolerances and modifying specific other tolerances. The changes presented in this final rule become effective September 20, 2000. With this action EPA has done the following: Revoked the tolerances for sugarcane; apricots; artichokes; barley, grain; barley, straw; beans (dry); gooseberries; grass, pasture (green); grass, pasture, hay; kiwi fruit; oats, grain; oats, straw; peas, black-eyed; rye, grain; rye, straw; soybeans; wheat, grain; wheat, straw; pomegranates; sugarcane bagasse; citrus pulp, dried; and soybean oil. EPA also revoked 13 meat, milk, poultry and egg (MMPE) tolerances and is removing the tolerance for nectarines because its is covered by the tolerance for peaches. EPA has also reduced several tolerances as follows: apples, crabapples, pears, and quinces from 2.0 ppm to 1.5 ppm; cranberries from 2.0 ppm to 0.5 ppm; grapes from 5.0 ppm to 4.0 ppm; and potatoes from 0.3 to 0.2 ppm. (Page 38748)

In the June 23 Federal Register, EPA announced that the revised version of the pesticide science policy document entitled "Guidance for Refining Anticipated Residue Estimates For Use in Acute Dietary Probabilistic Risk Assessment" is now available. EPA has also incorporated into this document two other policy documents that were previously issued for public comment: "Guidance for the Conduct of Bridging Studies for Use in Acute Dietary Probabilistic Risk Assessment" and "Guidance for the Conduct of Residue Decline Studies for Use in Acute Dietary Probabilistic Risk Assessment." An electronic copy of this document is available on the web at the following URL: **http://www.epa.gov/fedrgstr/EPA-PEST/2000/June/Day-23/o-p15917.htm**. (Page 39147)

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Federal Register Excerpts, cont.

In the June 28 Federal Register, EPA announced that the preliminary human health and ecological risk assessments were available for oxamyl, tri-allate, and etridiazole (terrazole). There is no formal comment period for these risk assessment documents; however, EPA has indicated that comments submitted within the next 30 days will most likely be considered. These documents are on the Internet at **http://www.epa.gov/pesticides/reregistration/**. (Page 39898)

In the June 30 Federal register, EPA announced that it was soliciting comments on the pesticide draft science policy paper "Proposed Guidance on Cumulative Risk Assessment of Pesticide Chemicals That Have a Common Mechanism of Toxicity." Comments on this document must be submitted to EPA on or before August 28, 2000. Electronically, this document is available under the Science Policies information at URL: **http://www.epa.gov/pesticides/**. (Page 40644)

Tolerance Information

Tolerance Information						
Chemical Type	Federal Register	Tolerance (ppm)	Commodity (raw)	Time-Limited		
				Yes/No	New/ Extension	Exp. Date
imidacloprid (insecticide)	06/08/00 pg. 36367	3.50 1.00	prunes stone fruit (Crop Group 12)	Yes	New	12/31/01
Comment: These tolerances are being established in response to EPA granting Section 18 emergency exemptions for the use of imidacloprid for aphid control in Pennsylvania, West Virginia, New York, and New Jersey.						
cyprodinil (fungicide)	06/12/00 pg. 36790	5.00	strawberries	Yes	Extension	05/31/01
Comment: This time-limited tolerance is being extended in response to EPA again granting a Section 18 emergency exemption for the use of cyprodinil to control gray mold on South Carolina strawberries.						
cloquintocet-mexyl (herbicide safener)	06/22/00 pg. 38757	0.10 0.10	wheat; grain & forage wheat; hay & straw	No	N/A	N/A
clodinafop-propargyl (herbicide)	06/22/00 pg. 38765	0.50 0.10	wheat; straw wheat; grain, forage, & hay	No	N/A	N/A
prallethrin (insecticide)	06/26/00 pg. 39304	1.00	see below	No	N/A	N/A
This tolerance is for residues of prallethrin in or on all food items in food handling establishments where food and food products are held, processed, prepared, and/or served.						

Proposed IR-4 Projects for 2001

This table presents a condensed list of potential IR-4 projects already proposed for 2001. See related article on page 1 of this PDF version of this newsletter. The table is organized by chemistry group (fungicides, herbicides, insecticides), then by crop. Each chemistry group also includes a section labeled "Performance Trials." Where IR-4 historically looks at residue data, items in the Performance Trials section are requests for efficacy data (in the case of herbicides, performance trials look for phytotoxicity). Any questions may be addressed to IR-4 State Representative Liaison Dr. Douglas B. Walsh at **dwalsh@tricity.wsu.edu**.

FUNGICIDES			
Chemical	**Crop**	**Control Spectrum**	**State**
fludioxonil	apple	*Penicillium expansum, P. solitum, Botrytis cinerea, Pezicula malicorticis*	WA
fenhexamid	apple (post harvest)	gray mold	CA
imazalil	apricot (post harvest)	brown rot, Botrytis rot (post harvest)	SC, NJ, IL, AL, TX, OK, NY
cyprodinil + fludioxonil	asparagus	Stemphylium purple spot	MI
cyprodinil + fludioxonil	bean (dry)	white & gray molds	NY
trifloxystrobin	bean (dry)	white & gray molds	NY
cyprodinil + fludioxonil	bean (lima)	white & gray molds	NY
dimethomorph	bean (lima)	*Phytophthora* spp. (downy mildew)	DE, ON, BC
propamocarb-hcl	bean (lima)	*Phytophthora* spp. (downy mildew)	DE
cyprodinil + fludioxonil	bean (snap)	white & gray molds	NY
fluazinam	bean (snap)	white & gray molds	NY
trifloxystrobin	bean (snap)	white & gray molds	NY
harpin	blueberry	mummyberry, *Botrytis, Alternaria*	MI
tebuconazole	blueberry	rust, Septoria leaf spots	FL, SC
dimethomorph	broccoli	downy mildew	AZ, TN, CA,
fenhexamid	broccoli	gray mold, Botrytis blight, *Botrytis cinerea*	WA
zoxamide	broccoli	*Peronospora parasitica* (downy mildew)	AZ
dimethomorph	cabbage	downy mildew	OR, TN, CA
azoxystrobin	cabbage, chinese	powdery mildew	TX
myclobutanil	cabbage, chinese	powdery mildew	TX
harpin	caneberry	mummyberry, *Botrytis, Alternaria*	MI
ferbam	caneberry (blackberry)	blossom, foliar stem diseases	SC, AL, MS, NC, OR, SC
mefenoxam + copper	caneberry (raspberry)	downy mildew	WA, CA, OR
myclobutanil	caneberry (raspberry)	rust sp., powdery mildew	VA, OH, TN, WV, WA, PA, OR, SC, GA
tebuconazole	carrot	*Alternaria, Sclerotinia, Rhizoctonia*	NY
quinoxyfen	cherry	powdery mildew	WA
imazalil	cherry (post harvest)	brown rot, Botrytis rot (post harvest)	SC, NJ, IL, AL, TX, OK, NY
tebuconazole	coriander	*Cercospora,* powdery mildew	TX
trifloxystrobin	coriander	*Alternaria, Cercospora,* powdery mildew	TX
ferbam	cranberry	fruit rots, twig blight, fairy ring	WI, MA, WA
cyprodinil + fludioxonil	cucumber	Alternaria leaf blights	NC
fenhexamid	cucumber	gray mold, Botrytis blight, *Botrytis cinerea*	WA
chlorothalonil	gingseng	Alternaria blight, downy mildew	NC, KY, TX, SC, WI, GA
fenhexamid	gingseng	*Botrytis*	MI

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Proposed IR-4 Projects, cont.

FUNGICIDES, cont.			
Chemical	**Crop**	**Control Spectrum**	**State**
acibenzolar	grape	downy mildew, leaf spot	MI
dimethomorph	grape	*Plasmopara* (downy mildew)	GA
ferbam	grape	black rot	NY, OH, MI, MO, AR, SC, MS
famoxate + cymoxanil	hops	hop downy mildew	WA
fosetyl-al	hops	hop downy mildew	WA
chlorothalonil	lentil	anthracnose, *Ascochyta*	ND, WA, ID
cyprodinil + fludioxonil	lettuce (head & leaf)	*Alternaria, Septoria, Botrytis, Sclerotinia*	FL, OR, OH
fenhexamid	lettuce (head & leaf)	gray mold, Botrytis blight, *Botrytis cinerea*	WA
myclobutanil	lettuce (head & leaf)	powdery mildew	AZ, MI
zoxamide	lettuce (head & leaf)	*Bremia lactucae* (downy mildew)	AZ, CA, WA
propiconazole	mushroom	diseases	HQ
propiconazole	mushroom	competing fungi	VA
imazalil	nectarine (post harvest)	brown rot, Botrytis rot (post harvest)	SC, NJ, IL, AL, TX, OK, NY, GA
fenhexamid	onion	*Botrytis*	TX, MI
trifloxystrobin	onion	Botrytis & Alternaria foliar blights	MI
cyprodinil + fludioxonil	onion (green & dry bulb)	*Botrytis, Alternaria, Sclerotinia*	TX
azoxystrobin	parsley	*Alternaria, Septoria*	FL, OR, TX
cyprodinil + fludioxonil	parsley	*Alternaria, Septoria*	FL, OR, OH
myclobutanil	parsley	powdery mildew	TX
tebuconazole	parsley	powdery mildew, Alternaria leaf spot	TX
trifloxystrobin	parsley	*Alternaria, Cercospora* , powdery mildew	TX
hymexazol	pea (succulent)	common root rot	MN
imazalil	peach (post harvest)	brown rot, Botrytis rot (post harvest)	SC, NJ, IL, AL, TX, OK, NY, GA
sodium tetrathiocarbonate	pear	oak root fungus, nematodes, general soil replant problems	CA
fenhexamid	pear (post harvest)	gray mold	CA, WA
ferbam	plum	cherry leafspot, brown rot	SC, MI
imazalil	plum (post harvest)	brown rot, Botrytis rot (post harvest)	SC, NJ, IL, AL, TX, OK, NY, GA
PCNB	radish	scab, clubroot	NC,MI, VA, OK, SC, OR
chlorothalonil	rhubarb	Ramularia leaf & stalk spot	WA, OR
BAS 500	spinach		CA, OR
mefenoxam	spinach	white rust	TX, SC, CA, TN, OK
zoxamide	spinach	white rust, downy mildew	TX, TN, CA, OH, NJ, NC, CO
cyprodinil + fludioxonil	squash	Alternaria leaf blights	NC
fenhexamid	squash	gray mold, Botrytis blight, *Botrytis cinerea*	WA
zoxamide	squash	*Phytophthora*	MI
quinoxyfen	squash (winter)	powdery mildew	NC
acibenzolar	strawberry	downy mildew, leaf spot	MI
cyprodinil + fludioxonil	strawberry	*Botrytis, Colletotrichum*	GA, SC, OR, CA, MI, NY, TN, NC, CT
harpin	strawberry	leaf spot, *Botrytis*	MI
iodomethane	strawberry	fumigant treatment	CA
fenhexamid	tomato	*Botrytis*	MI, CA, WA
fenhexamid	tomato	gray mold, Botrytis blight, *Botrytis cinerea*	WA
mefenoxam	turnip (roots & tops)	*Phytophthora*	TN, GA

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Proposed IR-4 Projects, cont.

FUNGICIDE PERFORMANCE TRIALS			
Chemical	**Crop**	**Control Spectrum**	**State**
azoxystrobin	asparagus	Stemphylium purple spot	MI
fludioxonil	asparagus	Fusarium crown and root rot	MI
propamocarb-hcl	bean	Pythium root rot	WA, OR
azoxystrobin	blueberry	mummyberry, Alternaria fruit rot, Phomopsis stem canker, anthracnose fruit	MI, SC, GA, IN, OR, DE, NC
kresoxim-methyl	blueberry	Alternaria fruit rot, *Botrytis, Phomopsis,* mummyberry	MI, SC, GA, IN, NC
serenade	blueberry	*Alternaria, Botrytis*	OR, MI
azoxystrobin	broccoli	foliar diseases, downy mildew, *Alternaria*	TX, OR
azoxystrobin	cabbage	foliar diseases, downy mildew, *Alternaria*	TX, NY
azoxystrobin	cabbage, chinese	white rust	CA
copper hydroxide	cabbage, chinese	white rust (albugo)	HI
azoxystrobin	caneberry (blackberry)	many pathogens	GA, SC, DE
kresoxim-methyl	caneberry (blackberry)	many pathogens	GA, SC
azoxystrobin	caneberry (raspberry)	many pathogens	GA, SC, DE
kresoxim-methyl	caneberry (raspberry)	many pathogens	GA, SC
BAS 500	carrot	*Alternaria, Cercospora*	MI
sodium tetrathiocarbonate	cherry	nematodes, Phytophthora root rot, oak root fungus	CA
acibenzolar	coriander	bacterial leaf spot	FL, OR
azoxystrobin	coriander	*Alternaria, Cercospora,* powdery mildew	TX
propiconazole	coriander	*Alternaria, Cercospora*	TX
BAS 500	cucumber	*Phytophthora*	TN, MI
acibenzolar	lettuce (head & leaf)	bacterial leaf spot	FL, OR, CA
azoxystrobin	mint (fresh)	*Pythium,* Rhizoctonia foliar blight	FL
oxamyl	mint (fresh)	root lesion mint nematode	FL
propiconazole	mint (fresh)	Rhizoctonia foliar blight	FL
BAS 500	onion	*Alternaria, Botrytis,* downy mildew	MI
azoxystrobin	pea (succulent)	downy mildew, *Phytophthora* spp., *Colletotrichum*	HQ
propiconazole	radish	*Septoria* (early blight)	CA, OR
BAS 500	squash	*Phytophthora*	TN, NC, MI
BAS 500	strawberry	broad spectrum disease control	TN
kresoxim-methyl	strawberry	*Phomopsis, Septoria, Colletotrichum, Rhizoctonia,* anthracnose	GA, SC, NC
serenade	strawberry	*Botrytis,* bacterial leaf spot	MI, OH, NC
chlorothalonil	tomato	*Botrytis cinerea*	MI, GA, CA
kresoxim-methyl	tomato	Septoria & Alternaria foliar blights, fruit rots	MI
azoxystrobin	turnip (roots & tops)	white rust	TX, FL

HERBICIDES			
Chemical	**Crop**	**Control Spectrum**	**State**
bentazon	apple	yellow nutsedge	VA, NC, NJ, NY
clethodim	apple	annual & perennial grasses	CA, TN, CO, ID, NY
fluroxypyr	apple	woody perennial broadleaf weeds	NC, SC, GA, WA, TN
halosulfuron	apple	nutsedge, broadleaf weeds	NC
isoxaben	apple	weeds	WA
sulfentrazone	apple	nutsedge, broadleaf weeds	NC

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Proposed IR-4 Projects, cont.

HERBICIDES, cont.			
Chemical	**Crop**	**Control Spectrum**	**State**
pyridate	asparagus	broadleaf weeds	WA
glyphosate	bean (dry)	desiccation & late season weed control to improve harvest efficiency	WI, NY, WA, MI, ND, ID, SD
clethodim	bean (lima)	annual & perennial grasses	FL, TN, NC, WA, MS
clethodim	bean (snap)	annual & perennial grasses	NY, FL, PR, TN, AR, NC, OR, TX
azafenidin	blueberry	annual weeds	MI, SC, NC, ME, OR, TN
clethodim	blueberry	annual & perennial grasses	FL, AR, OR, WA, MS, GA, TN, ME, NY
metolachlor	blueberry	nutsedge	OR, VA, OK, AR, NY, SC, NC, WA, MS
thiazopyr	blueberry	annual & perennial broadleaf weeds and crabgrass	SC, NC, CA, TN
rimsulfuron	blueberry (lowbush)	weeds	ME
clomazone	broccoli	annual weeds, velvet leaf	WI, WA, OR, AR, GA, NC, KY, TN, VA, TX
metolachlor	broccoli	galinsoga, pineapple weed	OR, NJ, NC, OK, NY, KY, TN, AR
sulfentrazone	broccoli	annual broadleaf weeds	AZ
sethoxydim	buckwheat	annual grasses	MN, ND, WA
metolachlor	cabbage, chinese	weeds	OR, HI, OK, FL, MI
2, 4-D (amine)	caneberry (raspberry)	broadleaf weeds	OR, VA, WA
clethodim	caneberry (raspberry)	grass weeds	OR, WA, NY
glufosinate	caneberry (raspberry)	primocane suppression	OR, WA
thiazopyr	caneberry (raspberry)	horseweed, fleabane, nutsedge	CA, OR
glyphosate	canola	harvest aid/spot treatment	ND, GA
glyphosate	canola	annual & perennial grass, broadleaf weeds	ND
pendimethalin	canola	annual grass, broadleaf weeds	ND, NM
thifensulfuron-methyl	canola	annual broadleaf weeds	ND
clethodim	cherry	annual grasses	CA, OR, ID, NY
clopyralid	cherry	canada thistle, goldenrod, wild aster	NJ, CA, OR, WA
2, 4-DB	clover	weeds	OH, WA, GA, VA, NY, CA, NC
imazamox	clover (seed)	annual weeds	CA
oxyfluorfen	clover (seed)	weeds	CA, VA, WA, OR
glufosinate	cranberry	perennial weeds	MA
nicosulfuron	cranberry	weeds	MA
rimsulfuron	cranberry	asters, narrow-leaved goldenrod, buttercup, yellow loosestrife, yellow nutsedge	MA
triclopyr	cranberry	woody perennial weeds	MA
triflusulfuron-methyl	cranberry	buttercup, yellow loosestrife, lotus, silverleaf, aster, sedges	MA
oxyfluorfen	cucumber	broadleaf weeds	NY, TN, PR, AR
paraquat	cucumber	weeds	NC, MI, FL, AR, CA, OK, NY, GA, TN

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Proposed IR-4 Projects, cont.

HERBICIDES, cont.			
Chemical	**Crop**	**Control Spectrum**	**State**
pyrithiobac	cucumber	broadleaf & grassy weeds	TX
sethoxydim	cucumber	annual grasses	MD
halosulfuron	grape	nutsedge, broadleaf weeds	NC
sulfentrazone	grape	nutsedge, broadleaf weeds	NC
sethoxydim	grasses	annual & perennial grasses	OR
norflurazon	grasses (bermuda)	crabgrass, goosegrass, broadleaf signal grass	GA
clethodim	grasses (fescue)	reduce stem formation by killing the vernalized growing plant	MO
terbacil	grasses (seed)	rattail fescue, downy brome, annual bluegrass, volunteer seedling	OR
carfentrazone-ethyl	hops	weeds	WA
oryzalin	hops	annual weeds	WA
clethodim	lettuce (head)	annual & perennial weeds	TX, CA
ethephon	lettuce (head)	inhibitor of head formations	CA
glyphosate	lettuce (head)	weeds	MI, OR
asulam	mint	annual grasses, common groundsel	WA
ethalfluralin	mint	weeds	WA
sulfentrazone	mint	weeds	WA
flumioxazin	onion	annual weeds	MI, CO, NY
dimethenamid-p	onion (green)	broadleaf weeds	OR
clethodim	pea (dry)	annual & perennial grasses	WA, OR
clomazone	pea (dry)	broadleaf & grassy weeds	SD
MCPA	pea (dry)	weeds	SD, MN, NY, WI, ND, MI, WA
sulfentrazone	pea (dry)	broadleaf weeds	ND, SD
paraquat	pea (pigeon)	annual & perennial weeds	FL
clethodim	pea (succulent)	annual & perennial grasses	NY, FL, AR, TX, WA, OK
halosulfuron	pea (succulent)	broadleaf weeds	NY
sulfentrazone	pea (succulent)	weeds	NY, WI, IL, WA, GA, MS
clethodim	peach	annual grasses	CA, TN, ID, NY
clopyralid	peach	Canada thistle, goldenrod, wild aster	NJ, VA, CA, OR, NC, MS, WA
glyphosate	peach	weeds	CA, NY
halosulfuron	peach	nutsedge, broadleaf weeds	NC
sulfentrazone	peach	nutsedge, broadleaf weeds	NC
clethodim	pear	annual & perennial grasses	CA, ID, NY
fluroxypyr	pear	woody perennial broadleaf weeds	NC, SC, GA, WA
clethodim	plum	grasses	ID, NY
clopyralid	plum	Canada thistle, goldenrod, wild aster	NJ, VA, CA, OR
halosulfuron	potato	broadleaf weeds	NY, ID, TN, CA, CO, WA, FL
sulfentrazone	potato	broadleaf weeds	ND, CO, NY
halosulfuron	pumpkin	nutsedge	TN, IL, TX
pendimethalin	pumpkin	annual weeds	TX
bensulide	radish	purslane, pigweed, lambsquarters, nettle weeds	CA, OR, TN
dimethenamid-p	radish	broadleaf weeds	OR
bensulide	radish, oriental	weeds	CA
fluroxypyr	spinach	broadleaf weeds	NJ
linuron	spinach	chickweed, winter annual broadleaf weeds	MD, TX

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Proposed IR-4 Projects, cont.

HERBICIDES, cont.			
Chemical	**Crop**	**Control Spectrum**	**State**
dimethenamid-p	squash	annual grasses, pigweed, black nightshade, annual broadleaf weeds	OR, ON, QC, BC
ethephon	squash	promote maturity	TN, MA
oxyfluorfen	squash (summer)	broadleaf weeds	NJ
paraquat	squash (summer)	weeds	NC, FL, OR, NY, TN, OH, MS
pyrithiobac	squash (summer)	broadleaf & grass weeds	TX
sulfentrazone	squash (winter)	nightshade, pigweed, lambsquarters weeds	OR, IL
glyphosate	strawberry	weed control	MD, WV, AR, CA, WA, OR, FL, LA, MI, MD, NH, NY
glyphosate	strawberry	weeds	TN, NC, MI, TX
prohexadione calcium	strawberry	reduce runner growth & increase yield	FL
2, 4-D (amine)	strawberry (annual)	broadleaf weeds	NC
oxyfluorfen	strawberry (annual)	broadleaf weeds	TN, OK, UT, OR, NC, VA, AR, FL
pendimethalin	strawberry (annual)	weeds	CA
bensulide	strawberry (perennial)	broadleaf weeds	NC
bromoxynil	sweet corn	broadleaf weeds	WI, NY
oxyfluorfen	sweet corn	weeds	CA
bensulide	turnip (roots)	weeds	MD
dimethenamid-p	turnip (roots)	broadleaf weeds	OR
paraquat	watermelon	weeds	NC, WA, OR, NY, PR, TN, TX, AR
sethoxydim	watermelon	annual grasses	MD, ON, BC
HERBICIDE PERFORMANCE TRIALS			
azafenidin	asparagus	weeds	MI, NY
sulfentrazone	bean (dry)	early season weeds	MN, ND
pyridate	broccoli	broadleaf weeds	VA, WI, FL, TN
oxyfluorfen	broccoli, chinese	weeds	FL, AZ
pyridate	cabbage	annual broadleaf weeds	WI, VA
carfentrazone-ethyl	cabbage	broadleaf weeds	TX
clopyralid	cabbage, chinese	broadleaf weeds	NJ, NY
pendimethalin	cabbage, chinese	weeds, grasses	TN, NY, ON, QC, BC
oxyfluorfen	caneberry (blackberry)	primocanes	VA, CA
chlorimuron ethyl	cranberry	saw brier, white violet, aster	MA, OR, WA
nicosulfuron	cranberry	weeds	MA
rimsulfuron	cranberry	asters, narrow-leaved goldenrod, buttercup, yellow loosestrife, yellow nutsedge	MA
triflusulfuron-methyl	cranberry	buttercup, yellow loosestrife, lotus, silverleaf, aster, sedges	MA
sulfentrazone	lentil	broadleaf weeds	ND, SD
sulfentrazone	onion	broadleaf weeds	TX
carfentrazone-ethyl	onion (dry bulb)	broadleaf weeds	TX
metolachlor	parsley	annual grasses, broadleaf weeds	FL, TX, GA, MD
metolachlor	pea (pigeon)	weeds	FL, AR
prometryn	pea (pigeon)	weeds	FL
metribuzin	pea (succulent)	broadleaf & grass weeds	NY, WA, OR, MS, WI
metolachlor	pumpkin	annual grasses, hairy galinsoga, yellow nutsedge, broadleaf weeds	NY, MS, TN, GA, TX, ON, QC, BC
sulfentrazone	pumpkin	weeds, pigweed	IL, MS, TX, GA, TN

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Proposed IR-4 Projects, cont.

HERBICIDE PERFORMANCE TRIALS			
Chemical	**Crop**	**Control Spectrum**	**State**
metolachlor	squash	grasses, broadleaf weeds	TX, QC, ON, BC
sulfentrazone	strawberry	annual weeds	MI, CA, PA
triflusulfuron-methyl	strawberry	weeds	CA
metolachlor	turnip greens	weeds	AR, OR, TX, TN, CO
metolachlor	turnip greens	plantback restrictions	TN, GA
halosulfuron	watermelon	nutsedge, broadleaf weeds	AR, MD, NC, TX, TN

INSECTICIDES			
Chemical	**Crop**	**Control Spectrum**	**State**
methoxyfenozide	alfalfa	beet armyworm, alfalfa caterpillar	CA
spinosad	alfalfa	Lepidoptera larvae, beet worm, bollworm, alfalfa caterpillar	TX
tebufenozide	alfalfa	Lepidoptera larvae	TX
buprofezin	apple	scales	TN, TX
fenpropathrin	barley	thrips, cereal leaf beetle, aphids	ID
pymetrozine	barley	aphids	ID
bifenthrin	bean (dry)	mites, lygus, Lepidoptera, aphids	WA, CO, ID
cyromazine	bean (dry)	leafminers	CA
zinc phosphide	bean (dry)	rodents, esp. mice	OK, GA
cyromazine	bean (snap)	leafminers	GA, TN, TX, FL, MS
methoxyfenozide	bean (succulent)	Lepidoptera larvae	TN, OR
ethyl acetate	beehives	Africanized honey bees	TX
para-dichlorobenzene	beehives	wax moth	GA
tebufenpyrad	beehives	parasitic mites	MD
fenpropathrin	blueberry	Japanese beetle, cranberry fruitworm, blueberry maggot, cherry fruitworm	MI
thiamethoxam	blueberry	Japanese beetle, blueberry aphid, rose chafer	MI
thiocloprid	blueberry	Japanese beetle, cranberry fruitworm, blueberry maggot, cherry fruitworm	MI
endosulfan	cabbage	onion thrips, western flower thrips	TX
naled	cabbage	diamondback caterpillar	FL, NC, CA, DE, TX
pyriproxyfen	cabbage	onion thrips, western flower thrips	TX
spinosad	cabbage	onion thrips, western flower thrips	TX
imidacloprid	caneberry	aphid, whitefly, leafhopper	CA, NC, WA, OR, PA
abamectin	caneberry (raspberry)	two spotted spider mites	CA, SC, DE, NC, WA
bifenazate	caneberry (raspberry)	spider mites	MI
endosulfan	canola	aphids, seed pod weevil, fleabeetle	KY
phosmet	canola	cabbage seed pod weevil	ID
methoxyfenozide	carrot	Lepidoptera larvae	CO, OR, WA
bifenazate	cherry	european red mites, two spotted spider mites	MI
buprofezin	cherry	San Jose scale	CA
diflubenzuron	cherry	leafminers	OR
thiamethoxam	cherry	plum curculio	ID, OR, WA, WI, MI
thiocloprid	cherry	cherry fruitworm, cherry fruitfly, plum curculio	MI

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Proposed IR-4 Projects, cont.

INSECTICIDES, cont.			
Chemical	**Crop**	**Control Spectrum**	**State**
emamectin	cranberry	black headed fireworm, spotted fireworm, *Sparganothis* fruitworm	MA
methoxychlor	cranberry	reregister	RE
bifenazate	cucumber	two spotted spider mites	NJ, TX, WI, ON, QC
emamectin	cucumber	pickleworm	NC, TN
hydramethylnon	grape	ants	CA
pyriproxyfen	grape	grape berry moth	MI
methoxyfenozide	grasses	Lepidoptera larvae, fall armyworm, southern armyworm	TN, FL, LA
pyrethrin + pbo	grasses (pasture)	mosquito (adult)	CA
spinosad	grasses (pasture)	fire ants	GA, TX
cyfluthrin	grasses (timothy)	armyworms	CA
methoxyfenozide	mint	cutworms, loopers	WA
pyridaben	mint	spider mites	FL, ID, OR
dichlorvos	mushroom	reregister	RE
methoxychlor	mushroom	reregister	RE
pyriproxyfen	onion (dry bulb)	onion thrips, western flower thrips	TX
thiamethoxam	onion (dry bulb)	soil-dwelling insects	TX, WA, OH, OR, ID, CO
emamectin	onion (green)	beet armyworm, European corn borer, Lepidoptera larvae	NJ
thiamethoxam	onion (green)	onion root maggots	CA, OR, CO, NJ
pyridaben	pea (blackeyed)	thrips	AR
bifenthrin	pea (dry)	stinkbug, beetle sp., Lepidoptera complex	ID
methoxyfenozide	pea (dry)	Lepidoptera larvae	WA, TN
methoxyfenozide	pea (edible podded)	Lepidoptera larvae	TN
esfenvalerate	pea (pigeon)	pod borer	PR
indoxacarb	pea (southern)	Lepidoptera larvae	AR
pyriproxyfen	pea (southern)	thrips	AR
methoxyfenozide	pea (succulent shelled)	Lepidoptera larvae	HQ
dimethoate	pea (succulent)	aphids, leafminers, thrips	WA, OR
buprofezin	peach	aphids, scales	TN, CO
thiocloprid	peach	cherry fruitworm, cherry fruitfly, plum curculio	MI
buprofezin	pear	scales	TN, CO
buprofezin	plum	aphids, scales	TN, CO
cyfluthrin + tebupirimfos	potato	wireworm	NC, ID
cyfluthrin	spinach	Lepidoptera larvae, grasshoppers	AR, OK
endosulfan	spinach	onion thrips, western flower thrips	TX
bifenazate	squash (summer)	two spotted spider mites	NJ, WI, TX
lambda-cyhalothrin	strawberry	adult root weevils	WA
methoxyfenozide	strawberry	beet armyworm, cutworms, corn earworm	CA, NC
methyl anthranilate	strawberry	bird repellent	FL
buprofezin	tomato	whitefly	VA
zinc phosphide	turnip (roots & tops)	rodents, esp. mice	AR, GA, FL
methoxyfenozide	turnip greens	Lepidoptera larvae	OK, CA
zeta cypermethrin	turnip greens	cabbage looper, diamondback moth caterpillar, beet armyworm, fall armyworm	TX, GA, CA

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Proposed IR-4 Projects, cont.

INSECTICIDE PERFORMANCE TRIALS			
Chemical	**Crop**	**Control Spectrum**	**State**
imidacloprid	blueberry (high bush)	blueberry maggot	MI
diflubenzuron	broccoli	Lepidoptera larvae	GA, OR, TN
fipronil	broccoli	root maggots, fleabeetles	NJ, OH, TX
thiamethoxam	broccoli	soil-dwelling insects	TX
diflubenzuron	cabbage	Lepidoptera larvae	GA
fipronil	cabbage	root maggots, fleabeetles	NJ, OH, TX
thiamethoxam	cabbage	soil-dwelling insects	TX, NY, TN, OR, CO
thiodicarb	cabbage, chinese	Lepidoptera, fleabeetles	KY, CA
petroleum oils	caneberry (blackberry)	scales, mites, aphids	GA, OR, MS, AR
petroleum oils	caneberry (raspberry)	scales, mites, aphids	OR, GA, AR
fipronil	carrot	root maggots, fleabeetles	NJ, OH, TX
thiamethoxam	cucumber	soil-dwelling insects	TX
imidacloprid	onion (dry bulb)	onion maggot	NY
endosulfan	pea (pigeon)	*Heliothis* pod borer, leafhopper	FL
Beauveria bassiana	potato	wireworm	TN
fipronil	radish	root maggots, fleabeetles	NJ, OH, TX
thiamethoxam	spinach	soil-dwelling insects	OK, TX
thiamethoxam	squash (summer)	soil-dwelling insects	TX
abamectin	tomato	root-knot nematodes	VA
thiamethoxam	watermelon	soil-dwelling insects	TX