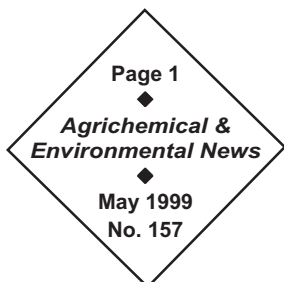


# Agrichemical and Environmental News

A monthly report on pesticides and related environmental issues



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## Water Quality

### *What is being said, what is being done, and what does it all mean?*

Dr. Joan R. Davenport, Soil Scientist, WSU-Prosser

We've all heard the statistics about water. Water covers 90% of the earth's surface. The human body is made up of 90% water. Along with eating five servings of fruits and vegetables, a person should drink eight glasses of water a day. So, with water such an important part of our environment, reports of anything that may result in "unsafe" water have a tendency to make people nervous.

Water quality has been a national issue for a long time. The passage of the National Clean Water Act in the 1980s reinforced concerns about water quality and led to a great number of water quality studies. Many organizations—state and federal, public and private—monitor and report on water quality. Perhaps the most readily available and commonly viewed information is published by the United States Geological Service (USGS) either alone or in conjunction with other agencies.

I had always thought of the USGS as the people to turn to for topographic maps and information about mineral resources. But in the early 1990s, the USGS expanded its focus to include water

monitoring. The national program includes (since 1991) the study of about a third of eastern Washington State. The work in that region has resulted in a number of very colorful and graphically pleasing two- to four-page glossy fact sheets discussing findings on water quality in Washington State. Additionally, in 1998 the USGS wrapped a lot of the information together into a larger circular (#1144) entitled *Water Quality in the Central Columbia Plateau, Washington and Idaho, 1992-95*. The fact sheets focus on facts: what testing was done, what was found, and to what the findings can be attributed. Circular 1144 consolidates the information from the fact sheets and adds some interpretation.

If one was to briefly read this literature, or to read it as a sole source of information about water quality, the impression likely to be left is the following:

Agriculture is destroying water quality by putting nitrate and pesticides in ground water and choking up surface waters with nutrient- and pesticide-laden sediments.

## Water Quality..., cont.

**Dr. Joan R. Davenport, Soil Scientist, WSU-Prosser**

Is this true? Well, let's look at some of the issues addressed by the USGS water quality findings, explore what they say, and discuss current information that may impact the findings. For additional information, you may want to refer to Table 1, which is text taken directly from the "Summary of Major Issues and Findings" section of USGS Circular 1144. (Note: Table 2 provides a listing of current USGS fact sheets on Water Quality for Washington.)

### **Groundwater**

The main, and very strong, finding of the USGS survey is that there is a high concentration of nitrate in groundwater wells in the Columbia Plateau. About 20% of the sampled wells were found with nitrate

levels above the US drinking water maximum acceptable standard of 10 ppm, which is actually lower than the 24% national average found by the USGS (Nolan et al., 1998). This does not mean there is nothing to worry about in central Washington, but it does mean that we are not alone.

Since high nitrate concentrations are linked to areas predominated by agricultural land use, a great deal of research effort is being made to deal with the issue. In Washington, both university and federal research scientists, individually plus in concert with other public and private organizations, are conducting research on issues including fertilizer management practices, land management practices (e.g., cover crops for recycling

potential residual soil nitrate nitrogen), and improved irrigation systems (improved water use efficiency can reduce the potential for nitrate to move below the zone where plants can extract it). Additionally, team efforts involving farmers, local community members, Conservation Districts, and others—in a program called Ground Water Management Areas (GWMA)—are being developed to work toward reducing nitrate contamination risk.

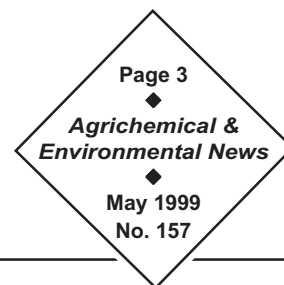
The USGS findings on pesticide contamination of groundwater are far from clear-cut. Although some residues were detected, the concentrations were extremely low. Nothing was detected at a level associated with adverse health effects.

Several issues regarding these findings deserve some thought. One most certainly is detection limits. As analytical equipment

Ground Water Issues		Surface Water Issues	
<b>MAIN POINT</b>	Ground water, the main source of drinking water, is substantially affected by agricultural practices.	<b>MAIN POINT</b>	The health of the aquatic ecosystems is substantially affected by agricultural practices and, in a few streams, by wastewater discharge.
<b>Sub Points</b>	Concentrations of nitrate in many wells exceed the drinking water standard.	<b>Sub Points</b>	Eutrophication, caused by high concentrations of nutrients, is degrading streams.
	Pesticides are frequently detected, although generally at concentrations below drinking water criteria.		Sediment erosion and runoff are degrading streams.
	Radon, a naturally occurring gas, is not increased by agricultural practices. Neither radon nor trace elements are a major concern in the Central Columbia Plateau.		Riparian (streamside) habitat has been seriously reduced, and present-day agricultural practices limit natural recovery of the vegetation.
	Concentrations of agricultural pesticides occasionally exceed criteria for the protection of aquatic life in several streams.		
<b>MAIN POINT</b>	Is ground water quality improving?	<b>MAIN POINT</b>	Is surface water quality improving?
<b>Sub Points</b>	Improvements from best management practices (BMPs) take decades or longer to be seen.	<b>Sub Points</b>	Soil erosion is decreasing as a result of best management practices (BMPs).
	It is difficult to determine trends for pesticides because there are not enough data, but the patterns of detection may give some clues.		Although concentrations of nutrients are commonly still increasing, at some sites they have decreased slightly or begun to level off.

**TABLE 1**  
 Summary points from USGS Circular 1144, Williamson et al., 1998

# Water Quality..., cont.



**Dr. Joan R. Davenport, Soil Scientist, WSU-Prosser**

becomes more technically advanced, smaller and smaller quantities of chemical compounds can be identified and quantified. As pointed out in previous issues of this newsletter, detection alone does not mean that the quantity of compound in question is dangerous to human health (see "Free? Unlikely," December 1998, Issue 152; "Detection Limits and FQPA: How Low Can You Go?" October 1998, Issue 150; "Now You See It, Now You Don't," August 1998, Issue 148).

Another aspect to consider is that the compounds being found are materials that have effectively been banned, including compounds in the chlorinated hydrocarbon family, the group of compounds which includes the well-known insecticide DDT. Registration of the chlorinated hydrocarbon compounds as agricul-

tural pest controls was virtually discontinued by the late 1970s. The USGS interprets finding these pesticides in groundwater as an indication that currently registered pesticides will soon follow. Another interpretation would be that the pesticides currently registered are far less persistent compounds, therefore more likely to degrade before they can be transported to groundwater. One of the many reasons that the chlorinated organocarbon class of compounds is no longer registered for use is their long persistence in the environment. (It was not until more than 20 years after Dieldrin—an insecticide in the same family as DDT— was banned that some of the soil dwelling insect pests that it controlled so effectively started to reoccur as problem pests.)

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Document Title	Document Number	Date Issued
Organic Compounds and Trace Elements in Freshwater Streambed Sediment and Fish from the Puget Sound Basin	Fact Sheet 105-98	Sept. 1998
Soil Erosion in the Palouse River Basin: Indications of Improvement	Fact Sheet 069-98	July 1998
Nutrient Transport in the Major Rivers and Streams of the Puget Sound Basin, Washington	Fact Sheet 009-98	March 1998
Irrigation and Surface-Water Quality in the Quincy and Pasco Basins, Washington	Fact Sheet 080-97	Oct. 1997
Nitrate Concentrations in Ground Water of the Central Columbia Plateau	Open File Report 95-445	June 1997
Pesticides in Public Supply Wells of Washington State	Fact Sheet FS-122-96	June 1997
Pesticides in Public Supply Wells of the Central Columbia Plateau	Fact Sheet 205-96	Oct. 1996
Pesticides and Volatile Organic Compounds in Ground and Surface Water of the Palouse Subunit, Washington and Idaho	Fact Sheet 204-96	Oct. 1996
Organochlorine Pesticides and PCBs in Aquatic Ecosystems of the Central Columbia Plateau	Fact Sheet 170-96	Sept. 1996
Pesticides Found in Ground Water below Orchards in the Quincy and Pasco Basins	Fact Sheet 171-96	July 1996
Agricultural Pesticides Found in Ground Water of the Quincy and Pasco Basins	Fact Sheet 240-95 Revised	July 1996
Are Agricultural Pesticides in Surface Waters of the Central Columbia Plateau?	Fact Sheet 241-95	July 1996

**TABLE 2**  
**USGS Fact Sheets on water quality in Washington State**

Dr. Joan R. Davenport, Soil Scientist, WSU-Prosser

### **Surface Water**

The principal USGS finding regarding surface water quality was an increase in sediment loading. Associated with this were some slight increases in nutrient and pesticide levels. Essentially, the levels of chemicals found were low enough that there is no potential risk from a human health standpoint and only a slight risk to aquatic life.


Sediment loading has been recognized as a serious problem in central Washington. The largest problem is associated with a specific type of irrigation system: furrow irrigation. The higher technology, higher cost sprinkler or drip irrigation systems have significantly reduced sediment loading. The USGS recognizes that changes to the more advanced irrigation systems have helped in reducing sediment load. The findings also recognize that the use of polyacrylamide (PAM) in furrow irrigation systems helps to reduce sediment loading. In the past five years, use of PAM has increased, and this trend is expected to continue. The changes in irrigation water management systems away from furrow are also continuing. The Franklin Conservation District estimates that in Franklin County (one of the counties in the study area) the furrow-irrigated acreage has decreased from about 15% in 1986 to about 7% today—thus 50% of the former furrow acreage would have lower potential for surface water contamination with sediment.

### **Technologies on the Horizon**

The agricultural and scientific communities are aware of the importance of water quality and programs are underway to reduce risk potential. Improvement in water management with center pivot and drip type irrigation systems has the potential to decrease sediment load to surface water as well as to decrease nutrient and pesticide movement to ground water. Prototype systems for further refining these technologies through variable rate water application in center pivots offer potential for further improvements in water management that have both economic (production) and environmental implications. Alternative manage-

ment strategies such as variable rate agrichemical applications and cover crop use for soil surface and nutrient management are being studied by researchers and readily adapted by some growers. And, as previously mentioned, pest control chemicals now in use likely have lower risks associated with them than some of the compounds the USGS water quality survey identified.

### **The Future?**

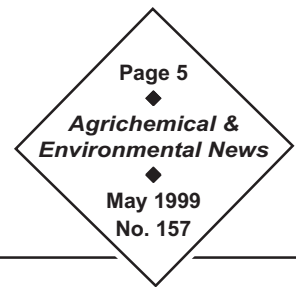
The USGS survey points out something that may seem very apparent, but is often forgotten. Human activities alter the environment. Agriculture is not the only activity that impacts water quality, but in rural, farming areas it is the most likely cause of non-point-source impacts on both surface and ground water quality. However, as we advance our understanding of agricultural systems and improve our management practices, we reduce risk of adversely impacting the environment while continuing to produce food, fiber, and other necessary agricultural products. As our ability to accurately detect chemicals in smaller quantities grows, so does our ability to better understand what risks they may or may not pose. New technologies and conscientious producers will help reduce and better target use of agrichemicals for a future of low risk, high quality water and food. 

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# Riparian Buffers for Salmon Recovery



Linda M. Johnson, Washington State Farm Bureau

Current listings of salmon under the Endangered Species Act have caused major discussions between state and federal agencies regarding the need to restore and enhance riparian buffers along all salmon-bearing, or potential salmon-bearing, water bodies in the state. A large majority of these streams and creeks meander through privately owned agricultural land. Riparian buffers on agricultural land are important to salmon recovery because they

- ① create shade to lower water temperature;
- ② improve water quality by reducing sediments;
- ③ become a source of woody debris that create pools;
- ④ stabilize stream banks; and
- ⑤ reduce chemical and nutrient run-off, such as fecal coliform.

The "Ag Strategy" section of the Governor's salmon plan, "Extinction is Not an Option," focuses on achieving salmon recovery through voluntary measures. Under this plan, agriculture has four years to prove that a voluntary approach can save salmon, at which time a regulatory approach will be implemented if the desired results have not been achieved.

Aldo Leopold—a patron saint of the environmental movement and founder of the Audubon Society—wrote in 1933:

*"Most of what needs doing must be done by the farmer himself. There is no conceivable way in which the general public can legislate crab apples, or grape tangles, or plum thickets to grow up on these barren fence rows, road sides and slopes, nor will the resolution or prayers of the city change the depth of next winter's snow nor cause corn shocks to be left in the field to feed the birds. All the non-farming public can do is provide information and incentives on which farmers may act."*

Farm Bureau agrees with Leopold's statement that farmers should be provided incentives for improving aquatic habitat. However, practices such as planting native vegetation and restoring stream banks are not cheap. These lands include some of the most productive and valuable agricultural lands in the state. To ask a landowner simply to set aside or remove these lands from production could force many farmers out of business.

Have the urban public provided land-use financial incentives to our farmers before?

The answer is yes. Agricultural producers have achieved extraordinary conservation successes over the years with the help of voluntary, incentive-based programs that promote conservation of fragile soils and wetlands, along with protecting water quality and wildlife habitat. There have been good programs, but all too frequently they have been either under funded or hampered by overly burdensome standards. Unfortunately, many of the conservation programs focus on compliance with preordained standards rather than on achieving goals.

Nonetheless, many of our present land-use policies are profoundly anti-agriculture. When a burdensome government regulation forces farm families to quit using a portion of their land, the government is in essence posing a triple tax on the landowners. How? First, farmers lose all production income from the land; second, farmers must continue to pay taxes on this now unusable land, and; third, the farmers must continue to pay mortgage payments on the land being set aside.

Now, with multiple listings of threatened or endangered salmon across Washington, it is critical that we look at developing innovative incentive-based approaches to this problem. The agricultural community believes there are numerous ways that riparian buffers could be established to develop more fish-friendly streams while also allowing agricultural production. Many positive conservation practices have been implemented in farm country for years,

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## ...Salmon Recovery, cont.

Linda M. Johnson, Washington State Farm Bureau

such as planting native shrubs and trees, grassed waterways, and filter strips.

History has shown that one-size-fits-all standards simply don't achieve the best results in terms of conservation practices. The more flexible the rules remain, the more problems farmers will solve. The public needs to respect the wide diversity of our agricultural lands and streams through a diverse, workable solution. If this is allowed, the end result will be a win-win situation with healthier salmon habitat, more food being produced to feed a hungry world, and a healthy state economy.

This article is intended to point out several of the riparian programs available to farmers and to facilitate open discussion on ways that the agricultural community can meet the needs of salmon without sacrificing the farm. Farm Bureau believes we can do both.

The Conservation Reserve Enhancement Program (CREP) is one program that has received a lot of media attention. CREP is a new, voluntary, incentive-based program for farmers and ranchers to establish riparian habitat along spawning areas for salmon and steelhead stocks. In return for planting and maintaining the buffer strips for the length of the contract (10-15 years), farmers will receive rental payments for this idled land from the Natural Resource Conservation Service. CREP is mostly a federally funded program, however, our state provides matching funds.

While this program will not fit the needs of every farmer and rancher in Washington, it does provide one tool for habitat improvement on private property. However, we urge farmers to consider some serious questions before signing up for this program, such as:

*Will there be re-enrollment opportunities after the contract expires?*

*Once land has been planted with trees, will the State Forest Practices Act allow the landowner to either cut or harvest the trees, or does this become a permanent, unusable buffer strip?*

There is hope that CREP will be adjusted to be as flexible as the popular and time-tested Conservation Reserve Program (CRP) for wheat, which was enacted in the 1980s. This type of flexible adjustment will only occur if farmers voice their concerns. More information about this program is available from your local conservation district office. (Local office numbers are available through the Conservation Commission. Access them at (360) 407-6200 or <http://conserver.org/wcc/cds/html>.)

Another incentive-based alternative is USDA's Wildlife Habitat Incentives Program (WHIP). This is a cooperative land-management program, rather than a land-retirement program. WHIP helps landowners protect critically important wildlife habitat by providing both technical assistance and cost-share payments. In addition, if the landowners agree, cooperating state wildlife agencies and nonprofit or private organizations may provide expertise or additional funding to help them enhance a project.

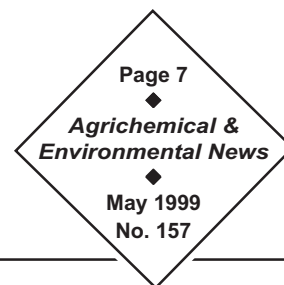
WHIP provides cost-share assistance up to 75 percent of the cost of installing wildlife habitat practices. Cost-share payments may be used to establish new practices or replace practices that fail for reasons beyond the landowner's control. The total cost-share amount cannot exceed \$10,000 per agreement. Call your local conservation district office for details.

Still other areas need more consideration:

Historically, many areas in Washington never had trees or shrubs next to salmon-bearing streams and creeks. Thus, fully forested riparian buffers aren't the only solution to saving salmon. There should be a multitude of ways to approach the needs of salmon, and this will require innovative approaches.

Farmers are natural problem solvers. Once the problem is identified a creative solution is sure to follow. If the goal is to lower stream water temperature, farmers should be allowed to plant trees and shrubs and stabilize stream banks without having to adhere to a predetermined, one-size-fits-all standard

## ...Salmon Recovery, cont.




Linda M. Johnson, Washington State Farm Bureau

for buffer widths. The landowner should determine whether the entire stream needs to have a minimum 50-foot-wide stretch of trees. Perhaps it makes more sense to cluster trees in areas along the creek, just like Mother Nature does. Salmon are resilient by nature and will easily swim to the sections along the creek that have shaded cooler water.

If livestock need to drink at the creek, installing gravel areas in the creek works well. Cattle prefer to drink at more stable areas and will travel several miles to drink from them. This also provides a place where livestock and even vehicles can cross the creek without eroding the banks, compacting streamside soil or damaging streamside vegetation.

Finally, before we embrace wholeheartedly the current thinking on riparian buffers, government fish

biologists need to be reminded that twenty years ago their "best available science" required the timber industry to pull out woody debris from the streams. Years later they discovered their "best science" was wrong. Now, the timber industry spends hundreds of thousands of dollars replacing woody debris. Instead of setting standards and rushing in to implement them, the better idea is to remain flexible in our approaches. Let's give innovative ideas a chance to work, monitor the practices for results, and then adopt those ideas that obtain the best results, rather than rushing to impose unreasonable standards on family farms and possibly forcing them out of business. 

*Linda M. Johnson is Director of Government Relations for the Washington State Farm Bureau. She can be reached at [ljohnson@wsfb.com](mailto:ljohnson@wsfb.com) or (360) 357-9975, ext. 15.*

## Food Safety Farm to Table Conference

Co-sponsored by the Cooperative Extension systems of the University of Idaho and Washington State University, the 7th Annual Food Safety Farm to Table Conference is designed for cooperative extension faculty, agricultural producers, food service managers, veterinarians, HACCP coordinators, food processors, clinical microbiologists, nutrition and health educators, food retailers, and public health professionals.

### Pathogens du Jour

(*Listeria monocytogenes*, *E. coli* 0157, Yersiniosis, and more)

### Effects of Crop and Land Treatments

(heavy metals, manure and compost, shellfish and environmental contaminants)

### Safety of Retail Products

(allergens, meat retailing, the deli case)

### Food Safety Regulation:

#### Benefits, Costs, Media Impact

(benefits and costs of regulation, media and consumer perception, legal perspective)

Pre-registration is required; fee is \$140 postmarked or faxed before May 14; \$165 after. For more information, including a more complete program and transportation and lodging considerations, contact Chris Eder, Cooperative Extension Conference Planning Service, [cecps@cahe.wsu.edu](mailto:cecps@cahe.wsu.edu) or (509) 335-2954.

**May 26–27, 1999**

**Best Western University Inn, Moscow, ID  
WSU Alumni Centre, Pullman, WA**

# Pesticides & Salmon Decline: Missing Link or Red Herring?

Dr. Allan S. Felsot, Environmental Toxicologist, WSU

Pick up any daily newspaper in the Northwest, and you will read at least one or two stories about the plight of the salmon. Salmon is a great symbol of the Northwest's proud cultural heritage and bountiful natural resources. But a kind of gloom spreads across this pride like the dark skies of the coastal Northwest's infamous winters. The diminishing runs of salmon in certain Pacific Northwest rivers and the multiple millions of dollars spent for technological fixes have become metaphors for all that ails modern society. And now the hapless salmon has become a political pawn as opinions diverge about what actions should be taken to preserve its runs in the major tributaries of the Columbia River.

## ***The New Hypothesis on the Block***

The reasons for declining runs of salmon have spread over the years like slime molds on the wet side of the Cascades. To the list of typical factors—dams, climate change, overfishing, and predators—comes the most recent explanation, pesticides. The recently released report, *Diminishing Returns: Salmon Decline and Pesticides* (4), proffers the idea that “there is a plausible basis for considering pesticides as a causative factor in salmon population declines.” The report's author, a former physiologist and hatchery specialist with the Oregon Department of Fish and Wildlife, reaches this conclusion after reviewing the scientific literature on the sublethal effects of pesticides on fish.

Noting sponsorship from the Oregon Pesticide Education Network, some have criticized this report and its timing as a political ploy for a bill wending its way through the Oregon State Legislature. If passed the bill would mandate complete and routine pesticide use reporting to the state by all private and commercial applicators.

Whether *Diminishing Returns* was politically motivated is irrelevant to the issues the report has raised. The report is a literature review and analysis that has put forth a hypothesis. The hypothesis should stand on its own merits or fall because it is flawed. Scrutiny of the hypothesis is therefore required, and fortunately, one can critically read the same literature cited in support of the report's conclusions.

While addressing every point made by *Diminishing Returns* is beyond the scope of this essay, close examination of how its conclusions were reached indicates a problem common among environmental advocacy groups

that review the toxicological literature. In short, the report failed to account for the doses used in the various studies and to cross reference the actual environmental levels of pesticides to which fish are likely to be exposed.

## ***The World According to Diminishing Returns***

To make a case that pesticides might be a “causative factor” in decimating salmon populations, one has to show that pesticides are prevalent where the fish roam. Thus, *Diminishing Returns* uses the abundance of pesticide monitoring data from the U.S. Geological Survey National Water-Quality Assessment Program (NAWQA). Examining five major basins in the Northwest and California, the report shows how many pesticides were examined, how many were detected, and the number exceeding aquatic life criteria.

Promulgated by regulatory agencies, the aquatic life criteria are concentration guidelines, not enforceable standards, aimed to protect the most sensitive species. *Diminishing Returns* emphasized that many pesticides do not yet have established aquatic criteria, but did not bother to report any concentrations in the NAWQA database.

*Diminishing Returns* divided the adverse effects of pesticides on salmon species into acute toxicity and sublethal effects. Large fish kills (acute toxicity) are periodically noted, especially following runoff of certain insecticides immediately after application. As noted in the report, however, acute fish kills are infrequent. Instead, *Diminishing Returns* states, “pesticide contamination at sublethal levels are [sic] probably an even greater danger to salmonid populations because the contamination is poorly regulated, the mortalities go unseen, and the consequences are unknown.”

Delineated sublethal effects included the following:

- ◆ Adverse effects on behavior leading to impaired swimming performance, increased predation on juveniles, changes in water temperature selection, reductions in schooling behavior, interference with seaward migration, interference with seawater adaptation, and decreased migratory returns;
- ◆ Compromised immune systems;

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# ...Salmon Decline: Red Herring? cont.

Dr. Allan S. Felsot, Environmental Toxicologist, WSU

- ◆ Endocrine disruption;
- ◆ Indirect effects such as alterations in habitat or reductions in food supply.

*Diminishing Returns* briefly described each adverse effect by citing studies with specific pesticides, especially if observed in any of the salmon species (which includes the trout). Many of the examples were of pesticides either no longer used or not detected in the western river basins. When data for specific pesticides were not available, adverse effects known from exposures to other industrial chemicals or by-products (e.g., PCBs, dioxins, nonyl phenol) were cited as surrogates. In the case of possible effects on the male endocrine system, studies with mammals were used to speculate possible effects on fish.

## An Alternative View of Pesticide Residue Detections

*Diminishing Returns* presented a table showing forty-nine pesticides detected in the various Northwest river basins. It lamented the fact that less than half of these pesticides have been assigned aquatic life criteria. But does that really matter? More important is: (1) assessing the probability that salmon might be exposed and (2) determining the actual environmental concentrations of the

**TABLE 1**  
**Frequency of Insecticides Detected (as a percentage of all samples collected) in Western Basins (1,3,14,15).**  
**AC=Aquatic Criterion, ppb; CP=Central Columbia Plateau; W=Willamette Basin; ST=San Joaquin-Tulare**

INSECTICIDE	AC	CP	W	ST
azinphos-methyl	0.01	12		12
carbaryl	0.02		18	25
carbofuran	1.75		29	
chlorpyrifos	0.041		21	52
DDE*	0.001			14
diazinon	0.008		35	71
dieldrin*	0.0625			10
ethoprop			15	
fonofos			12	10
lindane	0.08	12		
propargite				20

\*These insecticides were banned in 1974 but low levels still persist in soils and sediments.

pesticides present. The probability of exposure can be estimated from the NAWQA data for each basin by examining the percentage of total water samples collected showing a positive detection. Assuming that we might want to be concerned about any fish having a greater than one in ten chance (i.e., a 10% probability) of being exposed to any one pesticide, I tabulated pesticide detection frequencies 10% or greater in each of the NAWQA basins relevant to salmon habitat. In other words, I focused

on pesticides that were found in at least one out of every ten water samples analyzed.

Several trends emerged to show that western river fish are more frequently exposed to herbicides than insecticides. Twenty herbicides were detected with frequencies of at least 10%, but only three (atrazine, simazine, and diuron) were observed in more than half of the water samples. Eleven insecticides were detected at a frequency of at least 10%, but only chlorpyrifos and diazinon in the San Joaquin-Tulare Basin were detected in more than half of the samples (Table 1). At low parts per billion (ppb) concentrations, insecticides are significantly more hazardous to fish (both acutely and via sublethal effects) than herbicides, so their detections are worth focusing on.

Insecticide detection frequencies clearly showed that the probability of exposures is comparatively low in the Central Columbia Plateau and Willamette basins. In the Central Columbia Basin, slightly more than one in ten water samples showed insecticide presence. Frequency of detection was higher in the Willamette Basin, where up to one in three samples contained carbofuran or diazinon. The greater frequency in the San Joaquin-Tulare Basin reflects agricultural practices which include winter dormant spraying and its subsequent runoff.

## It's Spelled D-O-S-E

Pesticide detection frequencies define the potential for exposure, but they are not indicative of hazard. Like a broken record, I will repeat what toxicologists observe in every experiment where a range of doses are used to examine physiological effects. The magnitude of the effect is directly related to the exposure dose.

The relationship between dose (or concentration) and response is characterized by exposing a group of test organisms to a range of doses. The specific responses could range from simple changes in enzyme activities or behavior to outright mortality. When death is the toxicological endpoint of interest, the experimenter can calculate the LC<sub>50</sub>, defined as "lethal concentration to 50% of the organisms." If behavior is the endpoint, the effective concentration causing a response in 50% of the organisms, or EC<sub>50</sub>, is used.

Based on many studies with insecticides that have a specific mode of toxic action, it is known that susceptible

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## ...Salmon Decline: Red Herring? cont.

Dr. Allan S. Felsot, Environmental Toxicologist, WSU

populations respond to a fairly narrow range of doses. Whether the measured response is enzyme activity, behavior, or death, there are doses that cause no effect at all. Assessing the risk of an adverse effect requires a critical examination of the effective dose in relation to the actual exposure.

### **Sublethal Effects Only Observed at High Concentrations**

*Diminishing Returns* claims that sublethal effects at concentrations significantly lower than the LC<sub>50</sub> are responsible for adversely affecting fish populations. Close examination of the literature used to support these conclusions revealed that for the majority of the adverse effects reported, the concentrations tested were in fact a substantially large percentage of the LC<sub>50</sub> (Table 2). For example, the schooling behavior of juvenile fathead minnows was altered by exposure to a sublethal chlorpyrifos concentration of 47 ppb. The LC<sub>50</sub> of chlorpyrifos is 203 ppb. Thus, the effective concentration tested was about 20% of the

LC<sub>50</sub>, which is not a low concentration as claimed in *Diminishing Returns*. With the exception of carbaryl, the tested concentrations of other pesticides having a direct effect on fish behavior or development were near the level of the LC<sub>50</sub>. Fish exposed to concentrations within a factor of ten of the LC<sub>50</sub> (i.e., 10% or more of the LC<sub>50</sub>), may not die, but they can still become sick and behave erratically without exhibiting visible changes in appearance.

Compared to residue levels actually found in the environment, the concentrations tested were unrealistically high. This comparison is shown in Table 2, which also gives the 95th percentile figure for residue concentration as reported by the NAWQA. For example, the 95th percentile concentration for carbaryl is 0.064 ppb, meaning that 95% of all carbaryl residues detected were less than this value. Thus, even though the concentration of carbaryl associated with a sublethal effect (10 ppb) was only 0.5% of the LC<sub>50</sub> value (i.e., 1950 ppb), the tested concentration was over 150 times greater than nearly all of the carbaryl residues found in water throughout the United States. Thus, the probability of fish being exposed to toxic—even sublethally toxic—levels of carbaryl is extremely low.

### **Lack of Aquatic Life Criteria Is Irrelevant**

A frequent complaint associated with pesticide residue statistics is lack of aquatic life criteria for judging their biological significance. Such concerns are voiced because exceedance of the criteria has been interpreted as possibly resulting in unacceptable adverse effects on aquatic organisms (11). These concerns may be overstated for two reasons. First, the most hazardous pesticides are the insecticides, and most detected at greater than 10% frequency actually do have established criteria (Table 1). More importantly, of all the pesticides detected, exceedance of the criteria is quite infrequent, occurring only for a handful of chemicals in less than 5% of all water samples (Table 3). The second reason that concern is unwarranted comes after consideration of the current knowledge of ecosystem-level effects of the most prevalently detected insecticides, chlorpyrifos and diazinon.

**TABLE 2**

Examples of Sublethal Effects Reported in *Diminishing Returns*.  
 (EC=Effective Concentration; 95=95th percentile concentrations from NAWQA database, <http://water.wr.usgs.gov/pnsp/allsum/>.) All doses parts per billion.

PESTICIDE	EFFECT	FISH SPECIES (AGE)	EC	LC50	95	REF
chlorpyrifos	Impaired swimming	Rainbow Trout (juveniles)	5	8	0.026	7
permethrin	Impaired swimming	Rainbow Trout (juveniles)	7	7	<0.010	7
2,4-DBE	Impaired swimming	Rainbow Trout (yearlings)	2000	~9000	<0.15*	2
2,4-DBE	Increased predation	Sockeye Salmon (fry & smolts)	700	<1000	<0.15*	10
carbaryl	Increased predation	Rainbow Trout (0.5 – 1 gram)	10	1950	0.064	9
chlorpyrifos	Schooling behavior	Fathead Minnow (juveniles)	47	203	0.026	7
permethrin	Schooling behavior	Fathead Minnow (juveniles)	7.2	15.6	<0.010	7
trifluralin	Skeletal deformities	Atlantic Salmon (fry to adults)	250	210**	0.011	13
atrazine	Habitat modification	Blue Gill (fry to adults)	20	42,000	2	8

\*Reported as 2,4-D, the likely degradation product of 2,4-DBE.

\*\*Based on Rainbow Trout.

# ...Salmon Decline: Red Herring? cont.

Dr. Allan S. Felsot, Environmental Toxicologist, WSU

**TABLE 3**  
**Frequency of Exceeding an Established Aquatic Life Criterion for Any Pesticide Detected in Three Western Basins CP=Central Columbia Plateau; W=Willamette Basin; ST=San Joaquin-Tulare**

PESTICIDE	CP	W	ST
atrazine		1.9	
azinphos-methyl	12	1.4	15.8
carbaryl		7.9	9.6
carbofuran		1.4	
chlorpyrifos	4	1.9	10.3
DDE		2.8	22.6
diazinon	<1	30.7	64.4
diuron		11.2	0.6
lindane	<1	0.1	
malathion		0.5	0.6
parathion	<1		
triallate	3		
trifluralin			0.6

## Populations vs. Ecosystems

Ultimately, the ecological risk of pesticides in water must be judged from the perspective of disruption of the ecosystem. From this perspective, any one population becomes less important than the stability of the entire system. While no comprehensive long-term field studies exist to answer questions about ecosystem-level effects, shorter-term ecosystem studies known as mesocosms have been conducted with the insecticides diazinon and chlorpyrifos.

In mesocosm studies, a diversity of aquatic plant, invertebrate and fish species are allowed to establish in large-scale ponds or ditch-like structures. Because the structures are replicated, multiple concentrations of pesticides can be applied to determine a concentration causing no overall effect on the model ecosystem through several life cycles of the resident species. Tests with chlorpyrifos indicate no effects on aquatic invertebrates or fish when concentrations are less than 0.1 ppb (6). Even at 0.2 ppb, invertebrates recover to "normal" levels within several weeks after initial exposure. Mesocosm studies with diazinon show no effects at levels of 2 ppb or less (5). According to the NAWQA database, 95% of all chlorpyrifos and diazinon detections are less than 0.026 and 0.13 ppb, respectively. Thus, experimental studies indicate that even for ecosystem-level effects, the residues in the environment are below levels of biological concern.

Because atrazine herbicide is the most frequently detected pesticide, much attention has been given to studying its ecological effects. A study noted in Table 2 indicated that atrazine phytotoxicity could alter vegetative cover and thereby reduce the availability of invertebrate food for fish. The likelihood of such a significant ecological effect occurring in rivers is extremely remote. The study mentioned was conducted in a closed-system pond, whereas rivers have freely moving water. Furthermore, the vast majority of detections of atrazine in the Northwest are at levels hundreds of times lower than those known to affect aquatic vegetation. Finally, a comprehensive assessment of the ecological risk of atrazine residues in North America concluded that it is safely below any levels of concern (12).

## Conclusions

*Diminishing Returns* claims that pesticide residues are a plausible cause of salmon population declines by virtue of noted sublethal effects at concentrations not acutely toxic (i.e., below the LC<sub>50</sub>). Critical examination of the evidence presented in support of this hypothesis revealed that the concentrations associated with sublethal effects are quite high when viewed as a percentage of the LC<sub>50</sub>. Furthermore, the concentrations reportedly causing sublethal effects were almost always hundreds to thousands of times greater than the actual concentrations present in the environment.

The probability that pesticide residues in the Northwest have adversely affected salmon populations just doesn't seem to hold water given that concentrations are nearly always detected substantially below one part per billion. Compared to the myriad ways humans can reportedly decimate salmon populations, blaming pesticides may be the biggest red herring of them all.



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# WSDA's Farmworker Education Program Past, Present and Future

WSDA Farmworker Education Program Staff

The Washington State Department of Agriculture (WSDA) has maintained a Farmworker Education Program since 1990. The program's goal is to protect Hispanic pesticide users and agricultural workers from hazardous exposure to pesticides. Through pesticide safety, pre-license classes, and other outreach activities, over twelve thousand farmworkers have been taught how to work safely around pesticides and their residues. The Farmworker Education Program has translated a Washington State University (WSU) pesticide safety video into Spanish, held regular radio call-in shows on pesticide safety and education, published a Spanish version of the WSDA newsletter (*Pesticide Notes*), held hands-on applicator training, and recently completed work with WSU to translate the Private Applicator study guide into Spanish.

## **Classes Filled to Capacity**

The program's success has resulted in challenges. With a growing demand for pesticide safety classes given in Spanish, every class is filled to capacity. One fulltime, bilingual training specialist and one clerical support person have performed most of the work outlined above. An added concern is that many individuals come to the Spanish-language pre-license classes ill prepared and lacking basic skills not only in English, but in Spanish as well.

## **Four Statewide Focus Groups**

To face these challenges, WSDA turned to the agricultural community in 1997, conducting four statewide focus groups. In these sessions, growers, foremen, trainers, and other participants gave their opinions and advice regarding WSDA's Farmworker Education Program. The focus groups expressed overwhelming support for the goals and achievements of the program, but also made it clear that much more needs to be done. A more comprehensive and cooperative approach to providing pesticide safety training to Hispanic farmworkers was recommended.

To further explore the issues raised, WSDA set out to understand the educational needs of Hispanic farmworkers in Washington, to learn effective training

methods, and to begin pilot partnerships and educational activities to broaden the availability of Spanish-language pesticide education.

## **Farmworker Questionnaire**

In 1998, WSDA administered a farmworker questionnaire in Spanish to Hispanic farmworkers. The survey focused on three areas: the lower pass rate on the Spanish Private Applicator exam; topic areas for Spanish recertification courses; and impediments to job advancement for Hispanic farmworkers. Over 250 completed questionnaires were returned.

## **Top Three Problems**

Comments included the top three problems or difficulties encountered when taking the Spanish language Private Applicator exam. They were:

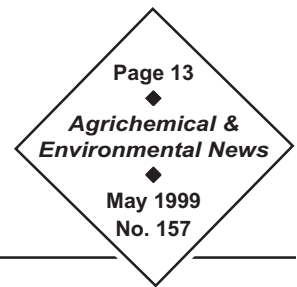
- ❶ "I didn't study enough,"
- ❷ "The test had too many big words that I could not understand," and
- ❸ "I can read and write, but not at the level required for the class and test."

When asked, "What do you think are the most important things for you to study or learn to be able to do your job better or get a better job?" the great majority responded, "ENGLISH." Respondents also reported that the top three recertification topics in which they are most interested are "pesticide safety," "labels," and "use of non-chemical means of control."

## **Addressing the Educational Needs of the Hispanic Farmworker Community**

To better address the needs expressed by the workers, WSDA has developed a 1-1/2-hour pre-license orientation class. WSDA has also worked with WSU to translate the Private Applicator manual into Spanish, revised both the English and Spanish language Private Applicator exam and partnered with the agricultural community to increase training programs

## ...Farmworker Education, cont.



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### WSDA Farmworker Education Program Staff

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for Hispanic handlers and applicators.

The Spanish-language pre-license orientation course provides participants with a realistic picture of the skills required to be successful on the Private Applicator exam. It also informs participants where to go if they need extra help in developing their skills. These classes, implemented this past winter, are being well received by participants.

Jorge Lobos, WSDA's Farmworker Education Specialist, has been working diligently to partner with agricultural associations and educators to increase the number of Spanish language recertification courses. Even as the number of Hispanic Private Applicators increases, there is a tremendous shortage of continuing education courses in Spanish. WSDA hopes to identify and work with licensed Hispanic applicators to assist them in becoming recertification instructors.

Lisa Drittenbas and Tim Stock, WSDA Farmworker Education Program Staff in the Wenatchee area, have also been working to increase the availability of Spanish language pesticide safety training with a focus on the unlicensed pesticide handler/applicator. Research has shown this group to be particularly vulnerable to work-related pesticide exposure.

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### **...hands-on, interactive workshops are the most effective for teaching pesticide safety.**

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In exploring various training programs from other parts of the country, WSDA has learned that hands-on, interactive workshops are the most effective for teaching pesticide safety. "Learning by doing" results in a higher level of comprehension and retention than traditional classroom-style training methods. WSDA is exploring the use of these types of programs. It recently partnered with the agricultural community in Wenatchee to sponsor a hands-on training program for pesticide handlers (see related article, page 10).

### **Advisory Committee Formed**

In order to work more cooperatively with the farming community, a Farmworker Education Advisory Committee was formed. The committee meets regularly in Wenatchee. Participants include foremen, crop advisors, farmers, WSU extension agents, trainers, and other industry representatives. At the meetings, members share and discuss ideas and initiatives, as well as ways to collaborate their efforts. Anyone interested in farmworker education is encouraged to join. Topics discussed have included:

- ① What members and other organizations are doing in farmworker education;
- ② How best to train the farmworker who is most at risk to pesticide poisoning — the non-licensed mixer/loader/applicator;
- ③ The need for a qualified, community-based group of trainers to give practical, hands-on pesticide safety classes in Spanish;
- ④ Topics for recertification courses; and,
- ⑤ Working with agencies and organizations such as AmeriCorps to provide pesticide safety training to all members of the Hispanic farmworker community.

WSDA plans to continue working with the committee and other interested partners to encourage local support for training initiatives. The committee hopes that their efforts will encourage other communities to work together to improve the pesticide safety training opportunities for Hispanic farmworkers. 🍏

*If you would like more information about WSDA's Farmworker Education Program, or would like to become involved with the Farmworker Education Advisory Committee, please call Lisa Drittenbas in Wenatchee at (509) 665-3395, or Margaret Tucker in Olympia at (360) 902-2015.*

# Pesticide Handler Training Goes Hands-On

Lisa Drittenbas and Mike Louisell, Washington State Department of Agriculture

A bilingual pesticide applicator training class received high marks from those taking the two-day class at Wenatchee Valley College in March. With an emphasis on the latest pesticide regulations and safety for workers and the environment, the class attracted thirty-three Spanish-speaking and eight English-speaking persons.

The March 1–2 event was co-sponsored by the Washington State Department of Agriculture, Washington State Horticultural Association, Wenatchee Valley College, and WSU Cooperative Extension.

The training was modeled after a program developed by the University of California, Davis. Coordinators hope to use this class as a pilot program for a larger event, possibly to take place in July at the Chelan County fairgrounds.

In the hands-on workshops, participants worked in groups of ten to twelve people and rotated through four stations: First Aid, Personal Protective Equipment, Mixing and Loading, and Clean-up and Disposal. Each group was led by two bilingual, volunteer trainers using a “learning by doing” approach. Volunteer trainers, experienced in their fields, came from Wenatchee, Cashmere, Orondo, Ephrata, Pasco, Yakima, Royal City, and Vantage.

Comments from the participants included:

*“Very useful. I hope they continue with this method (of teaching),”* and


*“...with this type of training you learn to do a better job and more skillfully.”*

When asked, “What did you learn that will make you a better pesticide handler?” responses included:

*“I learned that pesticides should be treated with care and caution, not fear,”*

*“I learned how to be better protected and prepared to train other people,”* and

*“(I learned) the latest regulations. It refreshed me on a lot of little details that we tend to forget or overlook.”*

The idea for the small-scale workshops in Washington was developed by members of a Farmworker Education Advisory Committee organized in 1997. Committee members include growers, managers, fieldmen, educators, and others who have an interest in farmworker safety and education. If you are interested in becoming a member of this Committee, would like more information about hands-on training or becoming a volunteer trainer, please call Lisa Drittenbas at (509) 665-3395 or Tim Stock at (509) 662-0590. 

## **AENews Submission Policy**

*Agrichemical & Environmental News* welcomes viewpoints that oppose or differ from articles presented in this and other issues. All contributions must relate to agrichemicals and their related environmental and human health effects, and must be timely, well written, and appropriate for the target audience of *AENews*. Those interested in submitting an article may contact these members of the WSU Food & Environmental Quality Lab staff to discuss the applicability of their ideas before submitting.

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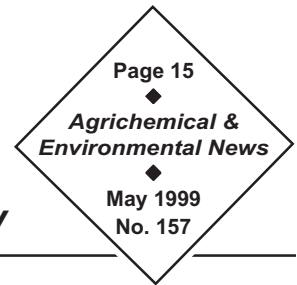
**Sally O’Neal Coates, (509) 372-7378, [scoates@tricity.wsu.edu](mailto:scoates@tricity.wsu.edu).**

The *AENews* Editorial Board reserves the right to reject or edit submissions.

# Pilot Program Using Plays to Educate

*Spanish-language presentations communicate health and safety*

Norm Herdrich, Pacific Northwest Agricultural Safety and Health Center



Providing health education and farm safety training to Hispanic farm workers in the Lower Columbia Basin, Yakima Valley, and Walla Walla areas is the objective of a pilot project funded by the Pacific Northwest Agricultural Safety and Health Center. The pilot program is being conducted by the Center for Farm Health and Safety at Eastern Washington University and is being coordinated by Kathy Pitts, an EWU sociologist.

Community-based theater was selected as a method of providing basic farm health and safety information to the target population. Theater does not require a high level of literacy and is effective in providing information to a group with varying levels of language and literacy skills. The information will be provided in four one-act plays, written and presented in Spanish, each of which addresses several learning objectives.

## **Play #1: *El Regreso De Miguel***

**Primary focus:** family well-being/disease and illness prevention

**Issues addressed** include how illness and certain diseases (such as colds, influenza, and tuberculosis) are spread; how alcohol and/or drugs can affect health and safety, both for the family and in the workplace; and how using good personal hygiene and basic sanitation methods can help prevent illness.

## **Play #2: *El Fuji Magico***

**Primary focus:** pregnancy/prenatal concerns and bringing children to the workplace

**Issues addressed** include how chemicals, lifting, slips, and falls can affect women and their unborn children, as well as the ways these same hazards can affect children of all ages on the job site. It will also identify the reasons prenatal care is important, explain workers' rights concerning access to healthcare and workers' compensation, and help participants improve communication with their physicians (what information they need to provide and what questions they should ask).

## **Play #3: *Dora Evelia***

**Primary focus:** ergonomics, workplace hazards

**Issues addressed** include ladder safety, back injuries, bending, lifting, falls, and actions such as jumping from moving equipment or vehicles. The play will demonstrate proper and improper lifting, bending, and ladder safety, and will show how easily workers can be injured by slipping on things like wet grass and slick or wet floors, as well as by inattention to other simple hazards. It will show the value of proper shoes, clothing, gloves, tools, and other personal protective equipment. It will discuss workers' compensation, show how to report an injury, and explain what workers need to tell and/or ask the doctor.

## **Play #4: *Sueños Y Desafios***

**Primary focus:** pesticides and other chemicals

**Issues addressed** include how chemicals can affect the health of the workers and their families. It will explain how individuals can protect themselves and their families at work and at home by using personal protective equipment, using proper laundering practices for clothes exposed to pesticides, and practicing good personal hygiene. It will discuss the symptoms of exposure, as well as how to report an exposure and what workers need to know when they visit the doctor or clinic.

An integral part of each play will be telling play-goers where they can go to get more information and help, and what kind of information they will need to provide in order to access the resources.

During the first year of the project, a series of focus groups identified the most urgent health and safety needs of Hispanic farm workers and their families.


This information is being used to develop the four one-act plays.

EWU staff have developed working relationships with the Yakima Valley Farm Workers Clinic and the Special Populations Department at Walla Walla Community College. The regional health districts and migrant Headstart offices in Benton, Franklin, Walla Walla and Yakima counties have also assisted in developing the project.

...continued on next page

## ...Using Plays to Educate, cont.

Norm Herdrich, Pacific Northwest Agricultural Safety and Health Center

At the completion of the pilot program, community groups will receive four pre-tested plays and a method of organizing community members and aiding them in the production of each play or program. Local communities will collaborate with Pitts and other EWU researchers to produce four plays in a "fiesta" atmosphere. Growers are being asked to donate food, churches will prepare food, and Latino entertainment groups will perform at each play production. 

*The Pacific Northwest Agricultural Safety and Health Center, funded by NIOSH, is one of eight such centers in the United States. The Center's mandate is to study occupational health and safety issues in farming, forestry, and fishing in the four Region X states of Idaho, Washington, Oregon, and Alaska. Dr. Richard*

*Fenske is the Center Director, Dr. Matthew Keifer is Co-Director, and Sharon Morris is Associate Director. Adrienne Hidy is the Center's Administrator, and Marcy White is the Program Coordinator.*

*The Center for Farm Health and Safety is housed in the Department of Sociology at Eastern Washington University. The Center's director is Dr. Pam Elkind. Other center researchers are Dr. Steve Neufeld, and Dr. Sue Wright. C.J. Tyler-Watson is the Center's outreach program coordinator.*

*This article was prepared by Norm Herdrich, PNASH Outreach Coordinator. To obtain additional information, contact him at (509) 926-1704 or [normh@u.washington.edu](mailto:normh@u.washington.edu).*

## ...Salmon Decline: Red Herring?

continued from page 11

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# 1999 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. Dates and locations are subject to change; confirm with a telephone call to the number listed in the table before participating. For general questions, or if you are interested in hosting an event at your farm, business, or in a central location in your area, contact Clarke Brown at (509) 965-6809 or Roger Ours at (509) 930-6950.

### CONTAINERS MUST MEET THE FOLLOWING CRITERIA:

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

DATE	TIME	LOCATION	CONTACT	PHONE	OTHER
May 17	9 am to 3 pm	Snipes Mtn, Transfer Station	Mark Nedrow	(509) 574-2472	Cardboard Accepted
May 18	8:30 am to 3 pm	Terrace Heights Landfill, Yakima	Mark Nedrow	(509) 574-2472	Cardboard Accepted
May 19	8 am to 12:30	Wilbur-Ellis, Eltopia	Vern Record	(509) 297-4291	
	1 pm to 2:30 pm	Eastern WA Spray, Eltopia	Willis Maxon	(509) 297-4387	
	3 pm to Finished	Air Trac, Pasco	Gerald Titus	(509) 547-5301	
May 20	8 am to 1 pm	Pfister Crop Care, Pasco	Steve Pfister	(509) 297-4304	
	1 pm to Finished	B & R Crop Care, Connell	Chris Eskildsen	(509) 234-7791	
May 21	8 am to 10 am	Broetje's Orchard, Prescott	Joe Shelton	(509) 749-2217	537-4820/749-2107
		Flat Top Ranch, Prescott	Dave Hovde	(509) 547-9682	
	11 am to Finished	Agri Northwest, Prescott	Shawn Edler	(509) 547-8870	(509) 947-1144 cell
May 24	8 am to 12 noon	McGregor's Walla Walla	Gary Burt	(509) 529-6787	
	1 pm to 2 pm	McGregor's Waitsburg	Terry Jacoy	(509) 297-4296	
May 25	8 am to 10 am	McGregor's Dayton	Jim Lemon	(509) 397-4355	
	11 am to 2 pm	Western Farm Service, Pomeroy	Jerry Wilsey	(509) 843-3491	
May 26	8 am to 10 am	McGregor's Pullman	Larry Schlenker	(509) 332-2551	
	11 am to Finished	McGregor's Colfax	Joel Fields	(509) 397-4691	
May 27	8 am to 10 am	McGregor's Palouse	Mike Dial	(509) 878-1321	
	11 am to 1 pm	Cascade Flying Service, Garfield	Doran Rogers	(509) 635-1212	
	2 pm to Finished	Dusty Farm Co-Op, Inc., Dusty	John Stoner	(509) 397-3111	
June 1	8 am to 12 noon	Wilbur-Ellis, Quincy	Dale Martin	(509) 787-4433	
	1 pm to 2 pm	Quincy Flying Service	Richard Weaver	(509) 787-3223	
	3 pm to Finished	The Crop Duster, Ephrata	Martin Shaw	(509) 754-3461	
June 2	8 am to 10 am	Cenex, Almira	Scott Winona	(509) 632-5645	(509) 641-0611 cell
	11 am to 2 pm	Wilbur Airport	Greg Leyva	(509) 647-2441	or Dennis Buddrius (509) 647-5394
	3 pm to Finished	Davenport Airport	Lee Swain	(509) 725-0011	

**“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.”**

# When It's Listed, Listed, Listed on the Label, Label, Label...

Jane M. Thomas, Pesticide Notification Network Coordinator

I recently overheard the following question:

*If a pesticide contains, as its sole active ingredient, a compound identified as being exempt from the requirement for a tolerance, why can't the product be applied to any crop regardless of the label use directions?*

The answer—in the short form—is reminiscent of that age-old paternal response “because I said so.” While no one likes to be told that she has to do something simply because the regulations require it, in truth this really is the answer, the whole answer, and nothing but the answer.

## **The Legal Lingo**

The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) as well as Washington State regulations contain language about following the label use directions. FIFRA Section 12(a)2 states “It shall be unlawful for any person...to use any registered pesticide in a manner inconsistent with its labeling....” This language is mirrored in the Washington Pesticide Control Act where RCW 15.58.150(2)(c) states “It shall be unlawful...for any person to use...any pesticide contrary to label directions....”

So, yes, the regulations stipulate that you must follow the label use directions.

## **Labels—Who Needs 'Em?**

If label compliance is so clear and basic (some of the logic behind the edict follows later), it begs a corollary question: Which products are required to have a label?

One might reasonably conclude that if an ingredient were so innocuous as to be exempt from the requirement for a *tolerance* (defined as “a legally allowable pesticide residue”) that it shouldn't need to be *registered* in the first place and thus wouldn't have a *label* (and directions) to worry about. But being exempt from the requirement for a tolerance doesn't relate to the requirement that a product be registered. The answers lie in the governing authorities' definition of “pesticide.” (See box, “The Letter of the Law.”)

## **When is “Exempt” Not Exempt?**

The fact is, the Environmental Protection Agency (EPA) has exempted some ingredients from the requirement for registration. These are listed in Section 25(b) of FIFRA and include items such as garlic oil, dried blood, mint and mint oil, white pepper, cloves and clove oil, and putrescent whole egg solids. But EPA's perspective isn't shared by Washington Department of Agriculture (WSDA). In Washington, such products must be registered—they are “federally exempt,” but not exempt from registration in the state of Washington.

## **The Spirit of the Law**

The question posed above implies, in its reference to tolerances, that the main concern with pesticide use is in avoiding illegal residues on food or feed. In reality, there's more to safe pesticide use than residues. The underlying premise behind following labels is: “If it hasn't been tested, how can we call it safe?”

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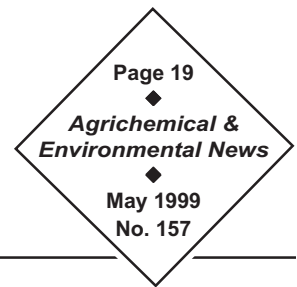
## **The Letter of the Law**

Washington State defines “pesticide” (RCW 15.58.030) as

- a) Any substance... intended to prevent, destroy, control, repel, or mitigate any...pest;
- b) Any substance or mixture of substances intended to be used as a plant regulator, defoliant or desiccant; and
- c) Any spray adjuvant.

This broad definition takes into account many substances that might seem innocuous, and even many that are, in fact, exempt from registration on a federal level.

# ...on the Label, Label, Label, cont.



Jane M. Thomas, Pesticide Notification Network Coordinator

According to Joel Kangiser of WSDA's Pesticide Management Division, EPA studies the use patterns described on proposed product labels to determine if registration shall be granted. Their registration review process revolves around whether use per the label directions will (or won't) be protective of human health and the environment. If a pesticide, exempt ingredient or not, is used in a manner inconsistent with label directions, such use may pose a threat to human health or the environment because this use was not considered when EPA performed its review.

## Who's the Boss?

Here in Washington State, the group responsible for enforcing label direction adherence is the Compliance Branch of WSDA's Pesticide Management Division. Provisions also exist for EPA involvement, but the vast majority of pesticide-related compliance investigations in Washington are conducted and concluded by WSDA.

Cliff Weed, manager of WSDA's Compliance Branch, explained that, typically, WSDA will issue a "Notice of Correction" to first-time offenders in pesticide cases. The Notice of Correction tells the violator what he needs to do, when it must be done, and why.

Less frequently, WSDA will move directly to a civil penalty. These are cases where

- ① there is the probability of human endangerment,
- ② there has been a previous violation of a similar nature,
- ③ a Notice of Correction was issued and the violator has not come into compliance in the prescribed timeframe, or
- ④ there is greater than \$1000 of property damage or minor environmental harm.

For pesticide-related violations, WSDA employs a penalty matrix to determine the amount of any fines


issued. State laws allow WSDA to levy penalties up to \$7,500 per violation. Cliff Weed points out that cases resulting in civil penalties will often involve more than one violation. Of the cases investigated each year, about a third end with some type of action: either a Notice of Correction or a penalty. At this point, the majority result in the issuance of a Notice of Correction. Criminal penalties may also be levied; however, this is very rare. A case of sufficient gravity to merit criminal prosecution likely would be turned over to EPA.

## How Will They Ever Know?

How does WSDA know if something has been applied in accordance with label use directions? Often, such information comes from the records that applicators are required to keep. These records are reviewed in the process of conducting an investigation and they may show something like an application rate of one quart per acre when the label calls for one pint. Statements taken from the parties involved in an incident can also provide documentation of an illegal application. Application to the wrong crop is often picked up because of phytotoxic effects. Finally, residue testing may reveal that a pesticide has been misapplied or has drifted onto a crop for which it is not labeled.

## And Your Point, Jane?

Actually, there are several:

- ① Follow the label—it's the law.
- ② Being exempt from the requirement for a tolerance doesn't relate to the requirement that a product must be registered.
- ③ Follow the label—it's the right thing to do. 

*Jane M. Thomas is the Pesticide Notification Network (PNN) Coordinator for the Pesticide Information Center (PIC) at WSU. For rigorous intellectual discourse, call (509) 372-7493 or e-mail [jmthomas@tricity.wsu.edu](mailto:jmthomas@tricity.wsu.edu).*

# Dear Aggie

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

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*In contrast to the usually more sober contributors to the Agrichemical and Environmental News, Dear Aggie deals lightly 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](mailto:dearaggy@tricity.wsu.edu). Opinions are Aggie's and do not reflect those of WSU.*


**Dear Aggie:**

***Lately we hear nothing but "tolerances," "residues," and "food safety." I'm getting a bit tired of it. What's the fuss? As all responsible growers know, if you follow label use directions, you are guaranteed that the crop you produce will be below the tolerance.***

***Just sign me,***

***Legal Beagle***

Dear Beagle:

Well, sort of...but let's not bark up the wrong tree. Dr. Carol Weisskopf has an interesting story from her days in "sunny" California. In the early 1980s, Dr. W was involved in alfalfa hay sampling and testing for guthion residues. Because of an unusually cold spring, the alfalfa grew more slowly, resulting in a lower dilution, less photodegradation, less thermal degradation, and less volatilization of the guthion. Growers all over the state ended up with hay exceeding the tolerance for guthion residue. 

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## Federal Register Excerpts

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Jane M. Thomas, Pesticide Notification Network Coordinator

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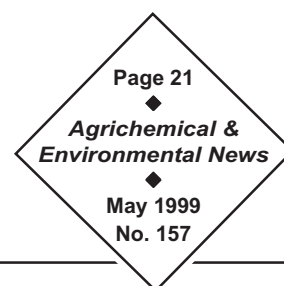
***In reviewing the March postings in the Federal Register, we found the following items that may be of interest to the readers of Agrichemical and Environmental News.***

In the March 3 Federal Register, EPA announced that it had received requests from several registrants to terminate some or all uses for products containing chlorothalonil, dicofol, iprodione, propachlor, and vernolate. With the exception of vernolate, these requests have been submitted in response to additional data requirements and/or risk mitigation measures identified by EPA in the related REDs. The registrants of these chemicals prefer to cancel certain products or uses rather than generate additional data or implement certain mitigation measures.  
(3/3/99 page 10296)

In the March 10 Federal Register, EPA announced the availability of the following RED's for review and comment: dacthal (DCPA), alachlor, methomyl, thiodicarb, and hydramethylnon. Written comments are due to EPA on or before May 10, 1999.  
(3/10/99 page 11870)

In the March 10 Federal Register, EPA announced that the chlorine gas RED was available for review and comment. Written comments are due to EPA on or before May 10, 1999.  
(3/10/99 page 11869) 

# PNN Update



Jane M. Thomas, Pesticide Notification Network Coordinator

The PNN is operated by WSU's Pesticide Information Center for the Washington State Commission on Pesticide Registration. The PNN system is designed to distribute pesticide registration and label change information to groups representing Washington's pesticide users. The material below is a summary of the information distributed on the PNN in the past month.

Our office operates a web page called PICOL (Pesticide Information Center On-Line). This provides a label database, status on registrations and other related information. PICOL can be accessed on URL <http://picol.cahe.wsu.edu> or call our office, (509) 372-7492, for more information.

## Federal Issues

### Label Changes

Gowan has revised the label for its insecticide Imidan 70W. The following is a summary of the changes:

- ◆ Apple: Added mealybug and rosy chafer to the pest list; deleted green apple aphid, rosy apple aphid from pest list.
- ◆ Apricot: Added rose chafer to pest list.
- ◆ Cherry: Added directions for the control of syneta beetle.
- ◆ Grape: Added directions for the control of grape mealybug and vine mealybug.
- ◆ Nectarine, Peaches, Plum and Prunes: Added rose chafer and San Jose scale to the pest list.
- ◆ Plums and Prunes: Added Japanese beetle to the pest list
- ◆ Pear: Added apple maggot, Japanese beetle, mealybug, and rose chafer to the pest list; deleted pear psylla from the pest list.
- ◆ Added use directions for "Walnuts, Filberts, and

Other Nuts" for the control of codling moth, navel orangeworm, and walnut husk fly.

- ◆ Removed language stating that Imidan 70W "may suppress European red and twospotted spider mites" from apple, apricot, cherry, peaches, pear, plum, prune, and nectarines use directions.
- ◆ Alfalfa: Added alfalfa plant bug, fleahopper, grasshopper, and lygus bugs to pest list; deleted adult weevil, alfalfa blotch leafminer, and meadow spittlebug from pest list; changed pea aphid application grazing and cutting restrictions 10 days to 7 days; and changed dilution directions for aerial applications.
- ◆ Deciduous Shade, Ornamental, and Woody Evergreens: Added leafhopper, magnolia leafminer, and mealybug to the pest list.
- ◆ Christmas Tree Plantation: Added gypsy moth to the pest list; deleted scale species.

Gowan has issued a revision to the label for its insecticide Prokil Cryolite 96. The changes are as follows:

- ◆ Deleted the following crops from the label: Lettuce, tomato, cabbage, and collard.
- ◆ Added use directions for Brussels sprouts and potatoes.
- ◆ Brussels sprouts, Broccoli and Cauliflower: Added Diabrotica beetle to the pest list; deleted corn earworm.
- ◆ Cantaloupe, Watermelon, Winter Squash: Added cabbage looper, Diabrotica beetle, flea beetle, and Colorado potato beetle to the pest list.
- ◆ Grape: Deleted the California Only use restriction; added grape berry moth, early season grape leafroller, grapeleaf skeletonizer, and omnivorous leafroller to the pest list.

...continued on next page

Jane M. Thomas, Pesticide Notification Network Coordinator

◆ Peppers: Added armyworm, blister beetle, cabbage looper, flea beetle, hornworm, Colorado potato beetle to the pest list.

◆ Summer Squash: Added use directions for controlling Diabrotica beetle, flea beetle, melonworm, pickleworm, and Colorado potato beetle.

Gowan has revised the label for its insecticide Dimethoate 4. The label changes include adding use directions for various ornamentals including some bulbs, flowers, shrubs, trees, and roses.

Gowan has revised the label for its fungicide Botran 75W. The label changes include:

◆ Adding use directions for sweet potatoes and conifers/Christmas trees (including nursery, greenhouse, container and bare root stock).

◆ For the following crops the application rate is now given as a range rather than a single dosage: apricot, grape, peach, nectarine, plum, prune, and cherry.

### **Manufacturers Use Deletions**

In the March 10 Federal Register, EPA announced that it had received a request from AgrEvo to voluntarily cancel ornamental and Christmas tree use for its product Finale VM Herbicide. Unless this request is withdrawn, these use deletions will become effective September 7, 1999. Anyone wishing to retain these uses should submit their comments to AgrEvo.

### **Manufacturers Product Cancellations**

The purpose of this notification is to clarify information distributed February 4 via PNN Notification 1999-35. This notification discussed Valent's request to EPA to voluntarily cancel the registration for its insecticide Orthene Turf, Tree, & Ornamental Spray WSP. Representatives from Valent have contacted our office and provided the following additional information.

In early 1998, EPA ruled that pesticide registrants were no longer required to separately register water soluble bag/packet formulations; a single product

registration would suffice. The rationale for this is similar to one that allows a single registration to cover a pesticide packaged in several different size containers. EPA is now also allowing for one registration to cover both product sold as loose powder or granules and product sold as water soluble bags or packets. Prior to this ruling, Valent had been maintaining two registrations: EPA Registration # 59639-88 for the Orthene Turf, Tree, and Ornamental Spray WSP and 59639-26 for Orthene Turf, Tree, and Ornamental Spray. Although Valent is in the process of canceling the separate registration for the WSP formulation, it will continue to manufacture both the loose product and the water soluble packets and will register both as EPA # 59639-26: Orthene Turf, Tree, and Ornamental Spray.

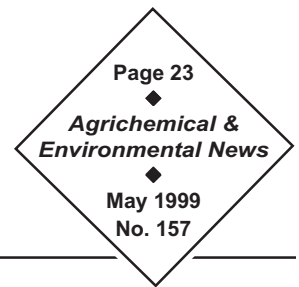
In the March 24 Federal Register, EPA announced that it had received a request from Bayer to cancel the registration for its product Oftanol 5% Granular. This product is labeled for use on the following PNN-related sites: nursery, turf, and ornamental. Unless this request is withdrawn within 180 days of the Federal Register notification, EPA will issue orders canceling this registration. Anyone interested in retaining this registration should contact Bayer.

### **Section 18 Specific Exemptions**

EPA has issued a Section 18 specific exemption for the use of Aliette WDG on succulent peas to control downy mildew. The Section 18 allows for the use of Aliette WDG as a seed treatment and provides for planting 20,000 acres in Whatcom, Skagit, Snohomish, Thurston, Lewis, Cowlitz, Clark, and Grays Harbor counties with treated seed. This exemption expires April 30, 1999.

EPA has issued a Section 18 specific exemption for the use of Orbit 3.6EC to control mummy berry disease in highbush blueberries. This exemption allows for use on 1,600 acres, a maximum of 3 applications per growing season, and a 30-day PHI. This exemption expires June 10, 1999.

# PNN Update, cont.



Jane M. Thomas, Pesticide Notification Network Coordinator

EPA has issued a Section 18 specific exemption for the use of Starane EC to control volunteer potatoes in both field corn and sweet corn. This exemption allows for a single application to field corn and for two applications to sweet corn. A 30-day PHI and 120-day plant-back interval are specified. This exemption provides for use on 50,000 acres of field corn and 65,000 acres of sweet corn in Adams, Benton, Franklin, Grant, Kittitas, Lincoln, Skagit, Spokane, Walla Walla, Whatcom, and Yakima counties and expires August 1, 1999.

EPA has issued a specific exemption for the use of Gustafson's LSP Flowable Fungicide as a seed treatment for lentils to control Ascochyta blight. This exemption, for treatment of enough seed to plant 55,000 acres in Washington, expires June 1, 1999.

On March 5 EPA issued a Section 18 specific exemption for the use of either Esteem 0.86EC or Knack IGR to control pear psylla on pears. This exemption allows for:

- ◆ a single application,
- ◆ use on 24,000 acres,
- ◆ a 45-day PHI, and
- ◆ use until May 21, 1999.

On March 17 EPA issued a Section 18 specific exemption for the use of Rally 40W to control powdery mildew on mint. This exemption allows for 3 applications per growing season, a 48-hour REI, a 30-day PHI, and for use on a maximum 11,225 acres in Adams, Benton, Clark, Franklin, Grant, Kittitas, Lincoln, and Yakima counties. Use under this exemption expires December 31, 1999.

On March 22 EPA amended the Section 18 (file symbol 99-WA-03) previously issued for the use of Goal 2XL on strawberries. The changes are as follows:

- ◆ Item 5: The use period in the original exemption was incorrectly listed as 12/15/98 to 4/15/98. In December EPA corrected this date to 4/15/99. This

amendment extends the use period to 8/15/99.

- ◆ Item 8: This section now states that a 0.05 ppm time-limited tolerance for oxyfluorfen on strawberries that was to expire 4/25/99 will be extended to 4/15/01.
- ◆ Item 11: Report results for this exemption were originally due to EPA by 10/15/99. The amendment changes the report due date to 3/15/00.
- ◆ Item 12: The original 4/15/99 expiration date has been changed to 8/15/99.

On March 25 EPA issued a specific exemption (file symbol 99-WA-18) for the use of Valent's Danitol 2.4EC to control cane borer and stem girdler on currants. The exemption allows for the use of 10.67 ounces per acre, 3 applications per season, and a 21 day PHI. This exemption expires June 15, 1999.

## **Supplemental Labels and Use Recommendations**

Gowan has issued 2ee use recommendations for three of its Imidan formulations: Imidan 70W, 70WP, and 70WSP. The recommendations all carry use directions for controlling elm leaf beetle, birch leafminer, and obliquebanded leafroller in shade and ornamental trees.

Bayer has issued supplemental labels for two of its fungicides. The labels are:

- ◆ Folicur 3.6F: For use on grasses grown for seed to control rusts and powdery mildew.
- ◆ Elite 45DF: For use on grapes to control black rot and powdery mildew.

Du Pont has issued a supplemental label for its product Benlate Fungicide. This label allows for use of Benlate to control Swiss needle cast disease in Douglas fir plantations.

Jane M. Thomas, Pesticide Notification Network Coordinator

### **Miscellaneous Regulatory Information**

WSU's Pesticide Information Center has recently undertaken a review of the RED's put forth by EPA since 1997. The information below is a summary of risk mitigation decisions contained in the RED that appear to be of interest to Washington's agricultural community.

METHOMYL (9/98): To lessen ecological and potential water risks, EPA is requiring:

- ◆ A label statement for potential ground water contamination.
- ◆ A reduction of the single maximum per acre application rate on peaches and commercial sod farms from 1.8 pounds to 0.9 pounds.
- ◆ No methomyl crop use will exceed a single applicaiton rate of 0.9 pounds per acre.
- ◆ Buffer zones of 25 feet (ground application) and 100 feet (aerial application) for applications near water bodies and a buffer zone of 450 feet for aquatic areas when ultra low volume application is made.
- ◆ Reduced maximum seasonal usage on the eight crops for which the most methomyl is sold. The data below is given as the present seasonal usage rate in pounds per acre followed by the new season rate and the percent reduction.

Broccoli (7.2/6.3/12.5)  
 Cabbage (9.0/7.2/20)  
 Cauliflower (9.0/7.2/20)  
 Celery (9.0/7.2/20)  
 Chinese Cabbage (8.1/7.2/11.1)  
 Sweet Corn (7.2/6.3/12.5)  
 Head Lettuce (9.0/7.2/20)  
 Tomato (7.2/6.3/12.5)

WSU's Pesticide Information Center has recently undertaken a review of the RED's put forth by EPA since 1997. The information below is a summary of risk mitigation decisions contained in the RED that

appear to be of interest to Washington's agricultural community.

THIODICARB (9/98): To lessen ecological and potential water risks, EPA is requiring:

- ◆ Reclassification of thidicarb products as RUP's. In Washington these are Rhone Poulenc's Larvin products.
- ◆ Reducing the maximum number of applications on cole crops from 6 to 4 per season , at the maximum rate of 1.0 pound a.i. per acre.
- ◆ Imposing the following buffer zones: 25 feet (ground application) and 100 feet (aerial application) for applications near water bodies and 450 feet for aquatic areas when ultra low volume applications are made.

### **State Issues**

#### **New Registrations**

WSDA has registered two Griffin mancozeb fungicides. These are Manzate 75DF and Manzate 80WP. Both products are labeled for use on the following crops: apple, asparagus, barley, cantaloupe, corn, corn seed crop, crabapple, cranberry, cucumber, dry bulb onion, fennel, field corn, field corn seed crop, flax, grape, honeydew, lawn, melon, oat, pear, popcorn, potato, quince, rye, safflower, sorghum, squash, sugarbeet, summer squash, sweet corn, tomato, triticale, turf, watermelon, and wheat.

WSDA has registered Amvac's K-Pam 540 soil fumigant. This product is labeled for use on cropland.

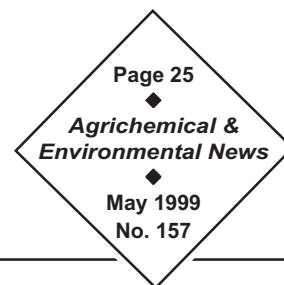
WSDA has registered two Mycotech products for use. Both contain Beauveria Bassiana GHA as their active ingredient. The list of usage sites for each is:

- ◆ Botanigard 22WP: apple, apricot, artichoke, asparagus, bean, beet, blackberry, blueberry, boysen-

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# PNN Update, cont.



Jane M. Thomas, Pesticide Notification Network Coordinator

berry, broccoli, bulb, Brussels sprout, cabbage, carrot, cauliflower, celery, cherry, chickpea, Chinese broccoli, Chinese cabbage, collard, crabapple, cranberry, cucumber, currant, dandelion, deciduous/shade tree, dewberry, dill, eggplant, elderberry, endive, evergreen tree, fennel, flower, garlic, ginseng, gooseberry, grape, horseradish, kale, kiwifruits, kohlrabi, leek, lentil, lettuce, loganberry, mint, melon, mustard, nectarine, okra, olallieberry, onion, ornamental, ornamental ground cover, ornamental tree, parsley, parsnip, pea, peach, pear, pepper, pimento, plum, potato, prune, pumpkin, quince, radish, rape, raspberry, rhubarb, rose, rosemary, rutabaga, salsify, shallot, shrub, soybean, spinach, strawberry, sugarbeet, squash, sweet potato, Swiss chard, tomato, tomatillo, turnip, vine, watermelon, yam, and youngberry.

◆ Mycotrol 22WP: alfalfa, apple, apricot, artichoke, asparagus, barley, bean, beet, blackberry, blueberry, boysenberry, broccoli, Brussels sprout, buckwheat, cabbage, canola, carrot, cauliflower, celery, cherry, chestnut, chickpea, Chinese broccoli, Chinese cabbage, clover, collard, conifer, corn, corn seed crop, crabapple, cranberry, cucumber, currant, dandelion, dewberry, eggplant, elderberry, endive, fennel, field corn, filbert, flax, forest, garlic, gooseberry, grape, grass hay, hop, horseradish, kale, kiwifruits, kohlrabi, leek, lentil, lettuce, loganberry, millet, melon, mustard, nectarine, oat, okra, olallieberry, onion, ornamental tree, parsley, parsnip, pea, peach, pear, pepper, plum, popcorn, potato, prune, pumpkin, quince, radish, rape, raspberry, rhubarb, rutabaga, rye, safflower, salsify, shallot, shrub, silage, sorghum, soybean, spinach, sugarbeet, squash, sunflower, sweet corn, sweet potato, Swiss chard, tomato, triticale, turnip, walnut, watermelon, wheat, yam, and youngberry.

WSDA had registered Micro Flo's fungicide Captan 50 Wettable Powder. This product is labeled for use on the following PNN-related sites: apple, apple post harvest, apricot, blueberry, bulb, cherry, cherry post harvest, flower, greenhouse, nectarine, peach, pear post harvest, plum, prune, rose, shrub, and strawberry.

WSDA has registered two Micro Flo chlorpyrifos formulations. The first, Chlopyrifos 4E-Wheat, is specifically for use on wheat while second, Chlopyrifos 4E AG, is labeled for use on the following PNN-related sites: alfalfa, apple, asparagus, broccoli, Brussels sprout, cabbage, cauliflower, cherry, Chinese cabbage, Christmas tree plantation, collard, conifer nursery, corn, corn seed crop, cranberry, dry bulb onion, field corn, filbert, grape, kale, kohlrabi, mint, nectarine, non-bearing peach, peach, pear, plum, popcorn, prune, radish, rutabaga, sorghum, soybean, strawberry, sugarbeet, sunflower, sweet corn, sweet potato, turnip, and walnut.

WSDA has registered five Tenkoz herbicides. The products, their active ingredients, and labeled usage sites are listed below:

◆ Tenkoz Trifluralin 4 HFP (trifluralin): alfalfa, apricot, asparagus, barley, bean, broccoli, Brussels sprout, cabbage, canola, carrot, cauliflower, celery, collard, cucurbit, dry bulb onion, field corn, flax, grape, hop, kale, bearing and nonbearing kiwi, mustard, nectarine, non-bearing apricot, non-bearing grape, non-bearing nectarine, non-bearing peach, non-bearing plum, non-bearing prune, non-bearing walnut, okra, pea, peach, pepper, plum, potato, prune, radish, safflower, sorghum, soybean, sugarbeet, sunflower, tomato, tree pulp production, turnip, walnut, and wheat.

◆ Tenkoz Buccaneer Herbicide (glyphosate): alfalfa, apple, apricot, asparagus, barley, bean, beet, blackberry, blueberry, boysenberry, broccoli, Brussels sprout, buckwheat, cabbage, canal, cantaloupe, carrot, cauliflower, celery, cherry, chestnut, Chinese cabbage, Christmas tree plantation, collard, conservation reserve program, corn, cranberry, cucumber, currant, dewberry, ditch bank, eggplant, elderberry, endive, fallow land, farm building area around, fencerow, filbert, forest conifer release/site preparation, garlic, golf course, gooseberry, grape, grass seed crop, greenhouse, honeydew, horseradish, industrial site, Jerusalem artichoke, kale, kiwifruits,

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Jane M. Thomas, Pesticide Notification Network Coordinator

kohlrabi, leek, lentil, lettuce, loganberry, melon, millet, muskmelon, mustard, nectarine, noncrop non-agricultural area, oat, okra, olallieberry, onion, ornamental, parsley, parsnip, pasture, pea, peach, pear, pepper, plum, potato, prune, pumpkin, quince, radish, railroad right-of-way, rape, raspberry, recreation area, rhubarb, right-of-way, roadside right-of-way, rutabaga, rye, school outdoor, shallot, sorghum, soybean, spinach, summer squash, sugarbeet, Swiss chard, tomato, tomatillo, triticale, turf, turnip, utility right-of-way, walnut, watercress, watermelon, wheat, winter squash, and yam.

◆ Tenkoz Lo-Vol 4 Solventless Herbicide (2,4-D ethylhexyl ester): aquatic site, barley, corn, ditch bank, fallow land, fencerow, forest conifer release/site preparation, grass seed crop, industrial site, noncrop non-agriculture, oat, pasture, rangeland, roadside right-of-way, rye, sorghum, soybean, turf, and wheat.

◆ Tenkoz Amine 4 (2,4-D dimethylamine): barley, corn, ditch bank, fallow land, fencerow, grass seed crop, impounded water, industrial site, millet, oat, pasture, rangeland, roadside right-of-way, rye, sorghum, turf, orchard floor, golf course, recreation area, soybean, CRP lands, rights-of-way, tree for pulp production, aquatic site, stream, impounded water, tidal marsh, canal, and wheat.

◆ Tenkoz 638 Herbicide (2,4-D, 2,4-D butoxyethyl ester): barley, conservation reserve program, ditch bank, fallow land, fencerow, field corn, golf course, grass seed crop, noncrop non-agricultural area, pasture, popcorn, railroad right-of-way, rangeland, roadside right-of-way, sorghum, soybean, turf, wasteland, and wheat.

WSDA has registered Gowan's insecticide Imidan 70WP. This product is labeled for use on the following crops: alfalfa, apple, apricot, cherry, chestnut, Christmas tree plantation, deciduous/ shade tree, evergreen tree, filbert, grape, nectarine, ornamental tree, pea, peach, pear, plum, potato, prune, and walnut.

WSDA has registered six Griffin products for use. The products, their active ingredients, and labeled usage sites are listed below.

- ◆ Kocide 2000 T/N/O (copper hydroxide): bulb, conifer nursery, deciduous/shade tree, flower, greenhouse nursery, greenhouse ornamental, nursery, ornamental, ornamental tree, turf, and vine.
- ◆ Early Harvest TST Talc Seed Treatment (gibberilic acid, cytokinin): corn, dry bean, sorghum, soybean, and wheat.
- ◆ Atrapa VCP (malathion): ditch bank, grass, grass hay, noncrop agricultural area, roadside right-of-way, and wasteland.
- ◆ Atrapa ULV (malathion): alfalfa, barley, clover, corn, ditch bank, dry bean, field corn, grass, grass hay, green bean, kidney bean, lima bean, navy bean, noncrop agricultural area, oat, popcorn, roadside right-of-way, rye, sweet corn, wasteland, and wheat.
- ◆ Karmax DF Herbicide (diuron): alfalfa, apple, asparagus, barley, blueberry, caneberrries, ditch bank, farm building area around, field corn, gooseberry, grape, grass seed crop, industrial site, mint, noncrop non-specific, oat, peach, pear, railroad right-of-way, red clover, utility right-of-way, and wheat.
- ◆ Lorox DF Herbicide (linuron): asparagus, celery, fencerow, field corn, noncrop agricultural area, parsnip, potato, roadside right-of-way, sorghum, soybean, and sweet corn.

WSDA has registered Gowan's insecticide/miticide Supracide 25WP. This product is registered for use on the following PNN-related sites: apple, apricot, artichoke, cherry, nectarine, peach, pear, plum, prune, safflower, and walnut.

WSDA has registered Gustafson's Allegiance Seed Treatment Fungicide. This product is labeled for use as a seed treatment to control seed rot and damping-off diseases on the following crops: alfalfa, barley, bean, beet, broccoli, buckwheat, cabbage, carrot, cauliflower, chickpea, clover, corn, cowpea, cucumber, cucurbit, dill, eggplant, field corn, grass hay,

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green bean, leafy vegetable, lentil, lima bean, millet, mustard, navy bean, oat, okra, onion, pea, pepper, popcorn, potato, radish, rutabaga, rye, salsify, silage, sorghum, soybean, spinach, sugarbeet, sunflower, sweet corn, sweet potato, tomato, triticale, turf, turnip, vetch, wheat, kale, collard, Chinese broccoli, Chinese mustard, Chinese cabbage, Brussels sprouts, tomatillo, dandelion, burdock, celery, parsnip, and yam. In addition, Gustafson has issued a 2ee use recommendation that provides directions for using Allegiance FL at reduced rates with other fungicides as a seed treatment for peas for Pythium damping-off control.

### **Section 18 Crisis Exemptions**

WSDA has issued a Section 18 crisis exemption for the use of Roundup Ultra on glyphosate-tolerant canola. This exemption allows for two applications per season, use on 15,000 acres, and for use until May 31, 1999.

WSDA has issued a Section 18 crisis exemption for the use of Axiom DF on wheat to control annual ryegrass. The exemption allows for a single application and for use on 50,000 acres in Asotin, Columbia, Garfield, Spokane, Walla Walla, and Whitman counties. Use under this exemption expires May 31, 1999.

On March 25 WSDA issued a crisis exemption for the use of Uniroyal's Dimilin 25W to control pear psylla on pears. This exemption allows for one application per growing season at a rate of 2.5 to 3 pounds per acre and it expires on May 1, 1999.

### **Section 24c Registrations**

WSDA has issued an SLN, WA-990009, to Novartis for the use of its Maxim-MZ Potato Seed Protectant to suppress Fusarium dry rot seed decay, stem canker, tuber black scurf, and silver scurf on seed potatoes. This SLN expires 12/31/04.

On February 25 WSDA issued an SLN, WA-990006, to Zeneca for the use of its Warrior T Insecticide to control lygus bugs in carrot, dill, parsley, and parsnip seed crops. This SLN expires 12/31/03.

On February 26 WSDA issued an SLN, WA-990010,

to Gowan for the use of its insecticide Savey 50WP to control twospotted spider mites on hops. This SLN expires 12/31/04.

On March 2 WSDA issued and SLN, WA-990011, to Gustafson for the use of Top-MZ-CZ to control dry rot, black scurf, and silver scurf on cut potato seed pieces. (Tops MZ-CZ is a mixture of Tops MZ and Curzate 60DF.) This SLN expires 12/31/04.

On March 3 WSDA issued an SLN, WA-990013, to Novartis for the use of its fungicide Mertect LSP on pea seed intended for export. This is a "me-too" registration similar to WA-900029 previously issued to Gustafson for the use of its LSP Flowable Fungicide. This SLN expires 12/31/04.

On March 3 WSDA issued an SLN, WA-990012, to Novartis for the use of its fungicide Mertect LSP as a seed treatment for chickpeas. This is a "me-too" registration similar to WA-900009 previously issued to Gustafson for the use of its LSP Flowable Fungicide. This SLN expires 12/31/04.

On March 16 WSDA issued SLN WA-990014 to Novartis for the use of their fungicide Dividend XL as a seed treatment on barley. This SLN is for the control of barley stripe, general seed rots, Fusarium seed scab, covered smut, Phythium damping-off, and the partial control of take-all, common root rot, Fusarium root rot, Fusarium crown rot, and Rhizoctonia root rot. This SLN expires 12/31/04. Note that this SLN is unique in that it is a registration for a domestic food/feed use and is based on an import tolerance.

### **Section 24c Cancellations**

On February 17 WSDA issued a letter canceling SLN WA-890009. This SLN had previously been issued to Entek for the use of its Enquik Herbicide for primocane suppression and fruit spur removal in caneberries. The SLN is being cancelled at the request of the manufacturer because Enquik has been discontinued.

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On February 8 WSDA issued a letter canceling two SLN's previously issued for the use of Uniroyal's Ded-Weed SULV-Amine. SLN WA-790065 covered use on pasture, rangeland, fence rows, utility rights-of-way, ditch banks, field borders, and fallow land while WA-810002 provided for use on barley, rye, and wheat. The SLN's are being cancelled because Uniroyal has sold this product to Platte and no more of the Uniroyal-labeled Ded-Weed SULV-amine remains in the channels of trade.

### Section 24c Revisions


On March 10 WSDA issued a revision to SLN WA-980005. This SLN had previously been issued to Platte for the use of its Prometryne 4L for weed control on dill. The revision clarifies ground use directions, adds a chemigation prohibition statement, clarifies a statement regarding avoidance of plant injury, and changes the expiration date to 12/31/03.

On March 1 WSDA issued a revision to SLN WA-980022. This SLN had previously been issued to JMS Flower Farms for the use of its JMS Stylet Oil to control powdery mildew on hops. The revision is

limited to changing the expiration date to 12/31/04.

On March 16 WSDA issued a revision to SLN WA-920024. This SLN had previously been issued to DuPont for the use of Sinbar Herbicide for weed control in hybrid poplar plantations. The revision includes changes to the tank mix directions and the addition of a 12/31/04 expiration date.

On March 22 WSDA issued a revision to SLN WA-960002. This SLN had previously been issued to Novartis for the use of its herbicide Beacon for weed control in Kentucky bluegrass seed crops. The label previously specified "spring planted seeding use." This revision expands the allowed label usage to include use on established stands of Kentucky bluegrass seed crops. This SLN expires 12/31/04.

On March 24 WSDA issued a revision of SLN WA-980004. This SLN had previously been issued to Bayer for the use of its Di-Syston 15% Granular Systemic Insecticide to control clover head aphid and mites on clover grown for seed. The revision changes the expiration date to 12/31/03. 

# Tolerance Information

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Chemical (type)	Federal Register	Tolerance (ppm)	Commodity (raw)	Time-Limited		
				Yes/No	New/Extension	Expiration Date
pyriproxyfen (insect growth regulator)	3/3/99 page 10227	0.10	stone fruit (Crop Group 12)	Yes	New	8/31/00
Comment: This time-limited tolerance is being established in response to EPA granting a Section 18 for the use of pyriproxyfen to control San Jose scale in California stone fruit.						
oxirane, methyl-, polymer	3/5/99 page 10567	exempt	see comment	N/A	N/A	N/A
Comment this exemption applies when oxirane, methyl-, polymer is used as an inert ingredient that is applied or used as a dispersant, emulsifier, surfactant, or adjuvant.						
carboxin (fungicide)	3/10/99 Page 11799	0.20	onions, dry bulb	Yes	Extension	6/30/00
Comment: This time-limited tolerance is extended in response to Section 18 exemptions being granted for the use of carboxin to control onion smut on onion seed crops in California and New Jersey						

Tolerance Information						
Chemical (type)	Federal Register	Tolerance (ppm)	Commodity (raw)	Time-Limited		
				Yes/No	New/Extension	Expiration Date
metolachlor (herbicide)	3/10/99 page 1782	0.10 tomatoes 0.60 tomato paste 0.30 tomato puree		Yes	New	4/1/01
Comment: These time-limited tolerances are established in response to PEA granting Section 18 exemptions for the use of metolachlor to control eastern black nightshade in various states.						
azoxystrobin (fungicide)	3/17/99 page 13106	0.01 cattle; fat meat, and mbp 0.01 goat; fat, meat, and mbp 0.01 hogs; fat, meat, and mbp 0.01 horse; fat, meat, and mbp 0.006 milk 0.01 sheep; fat, meat, and mbp 10.00 aspirated grain fractions 1.00 canola 0.30 cucurbits 0.03 potatoes 1.50 stone fruit 0.10 tree nuts 0.20 wheat bran 0.10 wheat grain 15.00 wheat hay 4.00 wheat straw		No	N/A	N/A
maneb (fungicide)	3/17/99 page 13097	0.05 walnuts		Yes	New	12/31/00
Comment: This time-limited tolerance is established in response to EPA granting a Section 18 exemption for the use of maneb to control walnut blight in California walnuts.						
pendimethalin (herbicide)	3/17/99 page 13086	5.00 mint oil 0.10 fresh mint hay		Yes	Extension	5/31/00
Comment: These time-limited tolerances are being extended in response to EPA granting Section 18 exemptions for the use of pendimethalin to control weeds in mint in various states.						
propiconazole (fungicide)	3/17/99 page 13080	12.00 corn, fodder and forage 0.10 corn, sweet 0.10 corn, grain		Yes	Extension	12/31/00
Comment: These time-limited tolerances replace those which expired 12/31/98.						
azoxystrobin (fungicide)	3/24/99 page 14106	6.00 lettuce, head 20.00 lettuce, leaf 25.00 spinach		Yes	New	9/30/00
Comment: These time-limited tolerances are being established in response to Section 18 requests for the use of azoxystrobin to control anthracnose in California lettuce and white rust in Maryland spinach.						
clopyralid (herbicide)	3/24/99 page 14101	2.00 cranberries		Yes	Extension	7/31/01
Comment: This time-limited tolerance is being extended in response to EPA granting Section 18 exemptions for the use of clopyralid to control weeds in cranberries in Oregon, Washington, New Jersey, Wisconsin, and Massachusetts.						
imidacloprid (insecticide)	3/24/99 page 14104	0.20 cucurbits		Yes	Extension	3/31/00
Comment: This time-limited tolerance is extended in response to EPA again granting a Section 18 exemption the use of imidacloprid on cucurbits grown in Hawaii for the control of silverleaf whitefly.						
quinclorac (herbicide)	3/26/99 page 14626	1200.00 aspirated grain fractions 0.70 fat of cattle, goats, hogs, horses, and sheep 1.50 meat by products of cattle, goats, hogs, horses, and sheep 6.00 grain sorghum, grain 3.00 grain sorghum, forage 1.00 grain sorghum, stover 1.00 wheat forage 0.75 wheat germ 0.50 wheat grain 0.50 wheat hay 0.10 wheat straw		No	N/A	N/A
fenbuconazole (fungicide)	3/31/99 page 15304	1.00 blueberry		Yes	Extension	12/31/00
Comment: This time-limited tolerance is being extended in response to EPA again granting Section 18 exemptions for the use of fenbuconazole to control mummy berry disease in blueberries grown in various states.						