COOPERATIVE EXTENSION
Washington State University

Agrichemical and Environmental News

A monthly report on pesticides and related environmental issues

Agrichemical & Environmental News
Issue No. 146
June 1998
Page 1

In This Issue

For comments regarding the newsletter, please contact Catherine Daniels at the WSU Pesticide Information Center, 2710 University Drive, Richland, WA 99352-1671
Phone: 509-372-7495
Fax: 509-372-7460
E-mail: cdaniels@tricity.wsu.edu

The newsletter is available from the Internet via the Pesticide Information Center Web page at http://picol.cahe.wsu.edu

Yet Another Fine Mess

Dr. Carol Weisskopf, Analytical Chemist, WSU

The past several weeks for Food and Environmental Quality Laboratory employees have been more interesting than usual. We became involved in a local well water contamination dilemma that had the potential to become a major public health problem. An employee at the WSU Prosser Irrigated Agriculture Research and Extension Center (IAREC) noticed discoloration of his well water. In trying to determine the cause, the governmental agencies he contacted suggested that he have the water analyzed. Chemical screens can be prohibitively expensive; the cost can be reduced substantially by narrowing down possibilities before sample submission. Experts in a wide variety of fields staff the Prosser station; two went to look at the area around the well. They noticed that some soil on the adjacent property looked peculiar, and that the oddness extended to the roadside.

The IAREC scientists then conducted a very sophisticated test: when they touched the dirt and spat on their hands, the dust turned yellow. Since this is not a typical response from normal soil, they collected some soil and sent it to us.

The First Puzzle

Identification of an unknown is frequently a difficult process. In this case, it was easy. We were assisted by the fact that we were dealing with a colored compound at high concentrations; we could *see* where it was going in various solvents and sample manipulations. It was also one of those days when all of the equipment was working as it should. Gas chromatography-mass spectrometry (GC-MS) of a sample extract produced no significant peaks. GC-MS is used most frequently for compound identification, because it produces a spectrum that can be matched by computer to spectra in libraries. However, a chemical must be volatilized easily into the gas phase for analysis. Liquid chromatography-mass spectrometry (LC-MS) indicated a single compound present at high concentrations with a molecular weight within the range typical of most pesticides. With LC analysis, the chemical only has to dissolve in the liquid phase for analysis. LC-MS is less useful in identifications, because the spectra depend on operating conditions and can vary widely.

...continued on next page

...Another fine mess

For GC-MS identification, we needed to make the chemical volatile. LC-MS indicated that the volatility problem was not the result of an extremely high molecular weight (it wasn't too heavy). Highly polar compounds, such as alcohols and acids, are not very volatile. We knew the unknown was polar because it was water soluble. Because methylation can reduce polarity and increase volatility, we treated the extract with a strong methylating reagent.

GC-MS resulted in a single peak with a spectrum easily matched to one in the library. It will be no surprise to anyone familiar with pesticide colors and properties that our yellow, polar unknown was the herbicide dinoseb. In fact, it was one of the two compounds the IAREC scientists suspected.

Scientific instrumentation is fine, but experience and common sense can get you further, faster and cheaper. Sometimes you just have to spit on your hands. One thing instrumentation <u>can</u> do well is figure out how much of something is there. The soil contained dinoseb at 400 to 600 ppm (0.04 - 0.06%). A sample of water from the well the IAREC employee used contained 500 ppb dinoseb.

Industrial Bio-Test Returns

Dinoseb is classified as a nitrophenol (a type of alcohol). It was also the subject of an EPA emergency suspension of use in 1986 because of its toxicological effects (see next article). The toxicological testing necessary for its original registration, and which had indicated it was safe, was evidently conducted by Industrial Bio-Test Laboratories (*Rachel's Hazardous Waste News*, 12/02/86, http://www.envirolink.org/pubs/rachel/rhwn002b.htm). When doubts arose about studies performed by Industrial Bio-Test, subsequent retesting resulted in the suspension. You may recognize Industrial Bio-Test from my article last month. This lab almost single-handedly caused implementation of EPA's Good Laboratory Practice standards. The potential link between poor toxicity testing and groundwater contamination via improper storage or disposal of suspended products was one consequence of fraudulent laboratory testing I hadn't previously considered. The coincidence between the subject of last month's newsletter column and a player in this month's chemical crisis was remarkable.

Determining the Extent of Contamination

As we were conducting our initial tests, the Washington State Department of Ecology (Ecology) was also focusing on the problem. As one can imagine, the area of groundwater contamination and the number of households with affected wells were of concern. We had received the soil sample on a Monday. By Friday, Ecology delivered eight water samples to us for analysis. One of these samples, taken from a well more than a mile from the first, contained dinoseb at 100 ppb. The residents had also collected a water sample a month before, when they noticed discoloration of their well water, and had stored it in their refrigerator. That water sample was also analyzed and contained dinoseb at 300 ppb.

Pesticides in groundwater are generally found at low concentrations, and analytical methods usually focus on achievement of low detection limits. Detection of dinoseb is not unusual. It was reported in 2% of the Central Columbia Plateau groundwater samples tested between 1992 and 1995 (USGS circular 1144). Concentrations ranged from 0.01 to 1 ppb. The Department of Ecology's own laboratory looks for dinoseb at a detection limit of 0.063 ppb. These low detection limits take time as well as skill. Sometimes it's smarter to be only good enough. We developed a method with a 2 ppb detection limit that was not only fast and accurate but so simple as to be idiot proof. This was our equivalent of spitting on our hands. One of the pleasures of our laboratory work is that we know what the data are to be used for. With a drinking water quality standard of 7 ppb and wells contaminated at 100 to 500 ppb, speed was more important than finesse; our detection limit was good enough. Ecology investigators agreed, and we proceeded with analyses.

Dr. Carol Weisskopf, Analytical Chemist, WSU

The Second Puzzle

During the next eight days we looked at water from 100 wells. Fortunately, at press time only the two originally identified wells had been found to contain dinoseb at a concentration greater than 2 ppb. Because of our ability to give Ecology results from water analyses within 12 to 36 hours, the residents could be notified quickly that their water was uncontaminated. That the first well was contaminated was unsurprising; it was adjacent to a site of high-level soil contamination. The contamination source for the second well, more than a mile from the first, was more confusing. A number of wells between and around the two sites contained no detectable dinoseb. Department of Ecology sleuthing led to a transport hypothesis based on a highly unlikely concatenation of events. A water pipe near the contaminated site broke in winter. The water flowed for more than a month, flooding the site. Contaminated water ran into an empty irrigation canal. The irrigation system was filled with water in preparation for summer. Water flowed down a nearby irrigation diversion pipe and delivered contaminated water directly to the second well, which had a casing in poor condition. This rapid transit system accounting for recent, simultaneous contamination of two isolated wells by a substance that was banned 12 years ago may seem improbable. It has, however, been supported so far by sediment residue data and is probably the way it actually happened.

The story is not yet over. The landowner will clean up the contaminated site. The Department of Ecology will install monitoring wells and continue to monitor the area downstream of the irrigation diversion pipe. However, after a week and two weekends of hard work, Ecology and FEQL cooperation helped solve the contamination riddle and assure affected individuals of the safety of their water.

Dinoseb— Banned But Not Forgotten
The Tale of an Unusually Hazardous Pesticide

Dr. Allan S. Felsot, Environmental Toxicologist, WSU

Any astute student of biology who has had the fortitude to weather a biochemistry class can recite line and verse how a chemical known as dinitrophenol can adversely affect the energy generating reaction in a cell. No cell will live very long under the influence of high concentrations of dinitrophenol. Reduce the dose enough, however, and dinitrophenol can cause a body to burn enough energy to result in weight loss. And so it was during the 1930's that physicians unwittingly prescribed certain types of dinitrophenols as diet pills.

But these chemicals also had uses as pesticides. One chemical form known as DNOC had been discovered and patented in Germany in 1892 as an insecticide. By 1925 it was used as a herbicide and soon fungicidal properties were discovered. Dow Chemical changed the basic structure of dinitrophenol slightly to produce dinoseb, which was marketed in 1948. Dinoseb was widely used as a contact herbicide against broadleaf weeds with many registered uses in numerous minor crops.

Dinitrophenol pesticides cause toxicity the same way in plants, animals, and fungi because all cells contain very similar biochemical pathways for creating energy from the breakdown of sugars. Furthermore, photosynthesis in plants relies on an energy transfer system that is also inhibited by dinitrophenols.

Unfortunately for humans, DNOC and dinoseb have a propensity to be easily absorbed by the skin. Consequently, not only is it considered hazardous following ingestion, its toxicity is equally high from dermal exposure. Indeed, both herbicides are Category I poisons, a class reserved for chemicals with an oral LD_{50} (lethal dose to

...continued on next page

...Dinoseb

50% of test animals) in the neighborhood of 50 milligrams per kilogram of body weight (mg/kg), and a dermal LD_{50} of 200 mg/kg or less. Cases of worker poisoning and deaths have been attributed to the dinitrophenol herbicides. It is rare for chemicals used as herbicides or fungicides to be that acutely toxic.

Given the high toxicity of dinoseb and related dinitrophenols, perhaps the EPA had good reason to ban it in 1986. But acute toxicity alone rarely causes regulatory action to suspend a pesticide. One notable exception was the organophosphate (OP) insecticide Phosdrin, whose registration was suspended following poisoning incidents in Washington State during 1993. Nevertheless, many OP insecticides are considered Category I poisons and are still widely used. The straw that broke the camel's back on dinoseb came in the mid 1980's from studies reporting birth defects in rabbits and rats born to females fed comparatively low doses (10 mg/kg/day) between day 6 and 18 of pregnancy. Other chronic toxicological effects at low doses could be described as endocrine disrupting—abnormal sperm and decreased weight of thyroid gland.

EPA concluded that the doses causing the birth defects and the endocrine disrupting effects were close to worker exposure levels. Thus, under emergency order issued in October of 1986, EPA suspended dinoseb with an intent to cancel its registration. Dinoseb was not associated with cancer nor was it found to cause gene mutations.

Any time a pesticide, banned or not, is found at levels of hundreds of parts per billion (ppb) in wells, a potential health hazard exists that demands immediate attention. Thus, the finding of two wells in the Yakima Valley with dinoseb levels between 100-500 ppb resulted in great concern among the hundreds of homeowners in the vicinity of those wells. Fortunately, dinoseb contamination has been limited to those two wells, but questions were raised of possible effects if dinoseb-contaminated water had been used, even though it was not found at the time of sampling. Obviously, pregnant women should not be exposed to those high levels of dinoseb, but what hazards would others face?

The silver lining in the cloud for dinoseb is that cancer is not considered a hazard. EPA considered the toxic effects of dinoseb to have a threshold, and the agency calculated a "safe" exposure level that depended on the length of time of exposure. Known as health advisory levels, these safety standards range from 300 ppb for a ten-day exposure to a 22-pound child to 10 ppb for a 7-year exposure. For a lifetime exposure, the regulatory level was set to 7 ppb. Thus, exposure to 7 ppb over an average 70-year lifespan would not be expected to produce adverse effects.

Fortunately, no one seems to have been drinking the contaminated water for very long. A public health crisis seems to have subsided, but monitoring of the contaminated wells will have to continue.

Possible New Biopesticides?

Dr. John Brown, Chair, WSU Department of Entomology

Man has never synthesized an insecticide that has a mode of action not found in nature! Most synthetic insecticides have modes of action similar to those found in plants, animals, minerals, and microbes. Certain Chrysanthemum species have defenses against herbivores (pyrethrins). Cryolite is an example of an inorganic element with insecticidal properties. The delta-endotoxin of the *Bacillus Thuringiensis* (*B.t.*) microbe causes insects to stop feeding. Cartap® is an example of an animal defensive secretion with insecticidal properties. Insecticides may also be modeled after some physiologically important factor within an insect itself (insect growth regulators). It should not be surprising that insect chitinases are being considered as possible biopesticides.

Chitinases are enzymes that degrade the chitin contained in an insect's shell-like outer covering called the exoskeleton. An insect's exoskeleton and the thin, threadlike

...continued on next page

Dr. John Brown, Chair, WSU Department of Entomology

filaments of fungi both possess chitin. Chitin and plant cellulose are both composed of repeating sugar units but differ in how these are connected to each other in forming the large complex molecules known as polymers.

Plants have developed chitinases to defend against fungal attack, but these same enzymes could provide resistance to insect attack also. Cereal seeds have substantial (0.01%) amounts of chitinases. These may adequately defend against fungal attack, but they are clearly insufficient to deter an attack from a stored product insect. Plant chitinases may target the chitin in an insect's midgut membrane, rather than the chitin in the insect's skeleton. This membrane can contain as much as 12% chitin. An enzymatic attack on the membrane would result in severe and fatal abrasion of the insect's gut lining; feeding activity would immediately stop. A plant's ability to produce such a feeding deterrent would give it an evolutionary advantage over plants lacking such a mechanism.

Researchers interested in new biopesticides are giving considerable attention to chitinases. Insects are too expensive to be a commercial source, so other sources are being explored.

Drs. Kramer and Muthukrishnan of Kansas State University recently reviewed work on insect chitinases in *Insect Biochemistry and Molecular Biology*. Chitinase from multiple sources has been characterized, and the DNA encoding the enzymes has been cloned. The resulting chitinase genes have been inserted into plants. These transgenic plants are created using technology similar to that used to create plants currently marketed with the *B.t.* delta-endotoxin gene. Transgenic tobacco plants containing chitinase genes from the tobacco hornworm express a chitinase immunologically identical to the hornworm chitinase. Another insect, the tobacco budworm, was fed these chitinase-negative or chitinase-positive tobacco plants. Those budworm larvae feeding and surviving on chitinase-positive leaves weighed only 1/6 as much as the larvae fed chitinase-negative plants (Ding et al. 1997).

Kansas State University researchers incorporated chitinases from *Manduca* (insect), *Serratia* (bacteria), *Streptomyces* (Actinomycete), and *Hordeum* (plant) into a semi-artificial diet fed to the merchant grain beetle. Beetle larvae survived on diets containing chitinases from microbial or plant origin, but they died within a few days after feeding on the diet containing the *Manduca* chitinase (Wang et al. 1996). Chitinase from an insect source seems to have better potential as a bioinsecticide than chitinase from plant or microbial sources.

Chitinases can increase the effect of *B.t.* delta-endotoxin. Chitinases weaken an insect's midgut membrane barrier and enhance the toxicity of *B.t.* Insect chitinase expressed by the transgenic tobacco plant multiplied the effect of sublethal doses of *B.t.* toxin (Ding et al. 1997).

You may see chitinase as an additive to the *B.t.* you purchase in the future. Insect chitinases may, like delta-endotoxin today, eventually be incorporated into transgenic crop plants. Alternatively, Dr. Kramer's laboratory is currently developing a virus expressing an insect chitinase gene for possible direct-spray use in insect control.

References:

Ding. X., B. Gopalakrishnan, L. B. Johnson, F. F. White, X. Wang, T. D. Morgan, K. J. Kramer and S. Muthukrishnan. (1997) Insect resistance of transgenic tobacco expressing an insect chitinase gene. *Transgen. Res.* In Press.

Kramer, K. J. and S. Muthukrishnan. (1997) Insect chitinases: Molecular biology and potential use as biopesticides. *Insect Biochem and Mol. Biol.* 27: 887-900.

Shapiro, M., H. K. Preisler, and J. L. Robertson. (1987) Enhancement of baculovirus activity on gypsy moth (Lepidoptera: Lymantriidae) by chitinase. *J. Econ. Entomol.* 80: 1113-1116.

Wang, X., X. Ding, B. Gopalakrishnan, T. D. Morgan, L. Johnson, F. White, S. Muthukrishnan, and K. J. Kramer. (1996) Characterization of a 46 kDa insect chitinase from transgenic tobacco. *Insect Biochem and Mol. Biol*. 26: 1055-1064.

Will Fiddling With Pesticide Tolerances Fine-tune Dietary Exposure?

After selecting one or two chemicals from a screening of 20,000 and conducting more than 100 chemistry and toxicology tests on them, an agrichemical manufacturer has spent millions of dollars and many years without profit. All this investment leads to the big hurdle before registration—obtaining the tolerance. A tolerance is the amount of pesticide residue legally allowable on a fresh or processed food commodity. Tolerances are not safety standards. Yet, for any one pesticide, when the tolerances for all registered food uses are multiplied by the amount of food eaten in a day, the sum total should not exceed the reference dose (RfD). The RfD, expressed as micrograms of pesticide per kilogram of body weight per day (µg/kg/d), reflects the amount of pesticide that can be consumed each day throughout a lifetime with reasonable certainty that no harm will occur. Thus, when pesticide registrants suggest a tolerance level to the EPA, they consider all current registrations and possible future registrations to avoid exceeding the RfD.

Pesticide Tolerances and the Risk Cup

With passage of the Food Quality Protection Act (FQPA), the RfD has been analogized to the brim of a “risk” cup. Potential exposures that are added to the cup were formerly only from food but now include water and residential use. When the cup is full, or in other words, when the RfD is reached for all possible exposures, no more exposures will be allowed.

EPA has estimated that food contributes 80% of all exposures to pesticide residues over a lifetime, and water and residential use each contribute 10%. When a new pesticide is first proposed for registration, and extensive residue data are not yet available, the EPA will assume that the residues will occur at the level of the registrant’s proposed tolerance. Furthermore, EPA will assume that all the crops to be registered have the residues. This estimation process is known as the Theoretical Maximum Residue Contribution (TMRC). Thus, for compounds of comparatively high toxicity and correspondingly low RfD, high tolerances will tend to fill the risk cup very rapidly when subjected to the TMRC. More space can be made in the risk cup by lowering proposed tolerances.

Real Data Bails Out the Risk Cup

The FQPA encourages EPA to continue its standing policy of bailing out the risk cup by making exposure assessments based on actually measured residue data. Such assessments rely on an anticipated residue concentration (ARC), which can be estimated from registrants’ crop residue studies. Such studies are used to determine the level of residues under the worst of conditions, for example, a doubling of the recommended application rate or harvest of the commodity very close to the time of application. Such residues could approach the tolerance level, but proposed tolerances will always be set at a level greater than the worst case residues, to guard against inadvertent violations when the pesticide is finally registered and widely used.

Another alternative for bailing out the risk cup applies to pesticides with longstanding registrations. During reassessments of the toxicology of these compounds, sometimes the EPA decides that newly discovered hazards demand lower exposures. In other words, the risk cup becomes smaller. However, exposure assessment can be accomplished by examining residues in the food as purchased and consumed. For example, when EPA proposed canceling the registration of the EBDC fungicides (zineb, maneb, mancozeb) during the late 1980s, the pesticide registrants conducted a Market Basket Study. An extensive collection and analysis of foods in the market place showed that EBDC residues in food were too low to fill the risk cup. In this case, adjustment of tolerances was not as important to managing risk as collecting data to more accurately estimate exposure.

Controversy about the use of organophosphate (OP) insecticides has been stirring in the agricultural community, especially among growers of minor crops.The EPA, recently lowered the RfDs for the OPs largely because of the perceived lack of information about

Dr. Allan S. Felsot, Environmental Toxicologist, WSU

effects in children (see *A&EN* issue 143). Furthermore, the FQPA is forcing EPA to consider cumulating the exposure of pesticides with identical mechanisms of toxicity. As a result, possible simultaneous exposure to all OP insecticide residues will be considered when reassessing the tolerance of any one of the active ingredients. Thus, in a short period of time, the risk cup for the OPs became very small. If the risk cup for OPs overflows, can it be bailed out? More specifically, will lowering the tolerances for OP residues create more space in the risk cup?

What Do We Know About OP Insecticide Residues in Food?

To determine the potential for reducing OP exposure in food first requires an accurate assessment of residues in food. Fortunately, we taxpayers have supported residue monitoring through the longstanding Pesticide Program run by the Food & Drug Administration (FDA) and since 1991, the Pesticide Data Program (PDP) run by the U.S. Department of Agriculture (USDA). Both programs serve as independent sources of pesticide residue data that can be used to accurately gauge dietary exposure. With the advent of the World Wide Web, anyone can download recent annual reports as well as residue databases from these government programs (FDA at http://vm.cfsan.fda.gov/~lrd/pestadd.html; USDA at http://www.ams.usda.gov/science/pdp/index.htm).

The FDA regulatory monitoring program is designed to enforce tolerances. The program is not designed to represent statistically the entire United States, but it does include commodities that are consumed in high quantities as well as commodities that receive a lot of pesticide use. Furthermore, FDA regulatory monitoring has been a recurring program since the 1960s and involves a much wider array of commodities than occurs in the USDA PDP. The PDP focuses solely on fresh and processed fruits and vegetables, wheat, and milk. These commodities and their products account for a large part of the American diet.

The USDA PDP involves the cooperation of 10 state department of agriculture laboratories. Food is collected as close to the point of consumption as possible, based on statistically reliable sampling protocols. For example, commodity samples are collected randomly, but the number is apportioned according to state population. The sampling protocol also accounts for different volumes of produce distributed annually from each site. For example, 1,123 samples of any one of 12 commodities were collected from California in 1996, but only 319 were collected from Washington.

The federal pesticide monitoring programs sample thousands of individual food items annually. Insecticides primarily and then fungicides comprise the types of pesticide residues detected in the FDA and USDA programs. Herbicides are infrequently detected. Rates of pesticide detections fluctuate annually. For example, in 1987 about 57% of all domestic foods collected by the FDA had no detectable pesticide residues. In 1996, 49% had no residues. This difference may be explained partly by the improvement in efficiency and sensitivity of analytical technology in the intervening years.

The 1996 PDP results showed no residues detected in 32% of all food samples. This percentage seems much lower than the proportion found by the FDA regulatory program, but PDP commodities are those generally perceived to have the greatest residues. For example, 35% more fruit and vegetable samples are analyzed in the PDP than in the FDA program. The PDP analyzed 340 wheat grain samples, but the FDA analyzed a combination of 185 wheat grain and wheat products. The PDP found only 17% of fresh fruits and vegetable samples and 8% of wheat samples to be residue free. Rates of residue-free produce in the 1996 FDA program were 53% for fruits, 35% for vegetables, and 40% for wheat and wheat products.

The FDA regulatory program does not, like the PDP, cover processed commodities. The PDP reported 61% of the processed fruit and vegetables to be residue free, indicating that processing effectively eliminates some residues.

...continued on next page

...Pesticide Tolerance-Dietary Exposure

Table 1. Five-year trends in azinphos-methyl and chlorpyrifos residues (ppm) recovered from apples (USDA Pesticide Data Program 1996).

Year	% of samples with detections	Mean residue	Highest residue	90th percentile residue	% of Tolerance at 90th Percentile
Azinphos-methyl (tolerance = 2 ppm)					
1992	31.4	0.083	0.62	<0.099	5.0
1993	32.3	N.D.	1.8	0.095	4.8
1994	42.4	0.043	0.29	0.092	4.6
1995	46.3	0.058	0.46	0.110	5.5
1996	54.5	0.043	0.44	0.092	4.6
Chlorpyrifos (tolerance = 1.5 ppm)					
1992	17.6	0.043	0.64	<0.025	1.7
1993	19.3	N.D.	0.36	0.015	1.0
1994	19.2	0.009	0.27	0.013	0.9
1995	22.1	0.011	0.42	0.017	1.1
1996	26.4	0.01	0.23	0.019	1.3

N.D. = No Data

Comparison of Reported Residues and Tolerances

While the data for incidence of residues in food are revealing in regards to the likelihood of our eating a food with pesticide residues, it is not informative of whether a hazard exists. Nor is it helpful to assessing the effect of lowering tolerances on residue distribution and exposure. The actual residues discovered are needed to assess compliance with the established tolerances and to assess dietary exposure.

A tolerance may be violated in two ways--exceeding the magnitude of concentration or containing a residue of a pesticide not registered for the specific commodity. During 1996 the FDA reported an overall violation rate of 1.3% for fruits and 1.1% for both vegetables and grain products. The PDP reported 4% of fruits and vegetables in violation of tolerances, while only 0.3% of wheat samples were violative. Violation rates for imported foods were similar to rates for domestic foods.

In both the FDA and PDP studies, the overwhelming majority of violations occurred solely because no tolerance was established for a particular commodity and pesticide combination. Such data indicate a need for improved management of pesticide use decisions. Design and content of labels may also need improvement, to help growers quickly recognize specifically defined uses of a pesticide formulation. On the other hand, the very infrequent occurrence of residues greater than the tolerance suggests that growers are using the legal application rates.

Reducing Tolerances 10-fold Will Not Affect Dietary Exposure

Some regulatory officials and environmental groups have asserted that lowering tolerances will reduce pesticide exposure and meet the stricter requirements of the FQPA. Close examination of the actual residue data reported in the PDP reports for 1992-1996, however, suggests that lowering tolerances will not accomplish much; the vast majority of detected residues are already far below tolerances. Residues of two of the most frequently used OP insecticides, azinphosmethyl (Guthion) and chlorpyrifos (Lorsban), on apples and peaches, important children's foods, are highlighted to illustrate their magnitude with respect to their tolerances (Tables 1 and 2). The frequency of residue detection on both commodities seems to have increased over the five reporting years. Nevertheless, the majority of apples and peaches contain no detectable insecticide residues.

Dr. Allan S. Felsot, Environmental Toxicologist, WSU

As mentioned previously, however, incidence of detection does not describe hazard. More important is the distribution of actual residue concentrations. Distributions can be described by looking at the proportion of residue concentrations below a certain level. These distributions are categorized as percentiles. For example, 90% of all residue concentrations (i.e., the 90th percentile) of azinphos-methyl on apples were less than 6% of the listed tolerance (2 ppm) during all five years of sampling (Table 1 and 2). No samples exceeded the tolerance level.

The 90th percentile of chlorpyrifos residues on apples did not exceed 2% of the tolerance. Because the tolerance for chlorpyrifos on peaches is so low (0.05 ppm), chlorpyrifos residues approached 20% of the tolerance. One sample of peaches had a chlorpyrifos residue exceeding the tolerance. Fortunately, few peaches had detectable residues (Table 2).

One could argue that tolerances should be decreased by a factor of 100. Resulting tolerance concentrations would require chlorpyrifos residues to be detectable at levels less than currently feasible detection limits and azinophosmethyl residues at levels barely greater than their detection limit. Such demands on analytical capability would decrease confidence in accuracy and precision of the data, confounding the need for actual exposure data to estimate hazard. From the perspective of an analytical chemist, demands to lower tolerances by two or more orders of magnitude seem to be a move to eliminate registrations altogether.

One effect of lowering the tolerances more than 10-fold would be an increased probability that more apples would be categorized as violative. Commodities that are violative cannot be shipped. The only way to achieve residue targets that meet the requirements of a greater than 10-fold lowered tolerance

Table 2. Five-year trends in azinphos-methyl and chlorpyrifos residues (ppm) recovered from peaches (USDA Pesticide Data Program 1996).

Year	% of Samples with Detections	Average Residue	Highest Residue	90th Percentile Residue	% of Tolerance at 90th Percentile
Azinphosmethyl (tolerance=2 ppm)					
1992	12.5	0.150	0.74	<0.05	2.5
1993	21.3	N.D.	0.93	0.091	4.6
1994	19.9	0.031	0.72	<0.02	<1.0
1995	27.8	0.030	0.24	0.045	2.3
1996	33.3	0.036	0.41	0.076	3.8
Chlorpyrifos (tolerance=0.05 ppm)					
1992	N.D.	N.D.	N.D.	N.D.	N.D.
1993	11.4	N.D.	0.180	0.006	12
1994	3.8	N.D.	0.030	N.D.	N.D.
1995	16.3	0.007	0.034	0.004	7.0
1996	17.0	0.006	0.035	0.010	1.9

Decreasing the apple tolerances for azinphos-methyl and chlorpyrifos by 10-fold would not change dietary exposure, because 9 out of 10 detectable residues are already at least 20 times less. On peaches, the tolerance for chlorpyrifos is already close to the reported detection limit (about 0.01 ppm).

would be to substantially reduce application rates. Such actions, however, greatly increase the risk of ineffective pest control. Growers use OP insecticides on orchards because the few registered alternatives are not as effective. To trade the ability to produce a safe food supply economically for no apparent increase in public health benefits hardly seems a rational trade-off.

EPA Pesticide Program Dialogue Committee Testimony

The following written testimony was presented to the Pesticide Dialogue Committee in Alexandria, Virginia on April 16,1998.

Dr. Carl K. Winter is the Director of Foodsafe Program and Associate Cooperative Extension Food Toxicologist in the Department of Food Science and Technology at the University of California Davis, CA 95616

To The Pesticide Program Dialogue Committee

My name is Carl Winter. I am an Associate Extension Food Toxicologist on the faculty of the Department of Food Science and Technology at the University of California at Davis and I direct the University's FoodSafe Program. I hold a Ph.D. in Agricultural and Environmental Chemistry and a B.S. in Environmental Toxicology, both from Davis. In ten years on the faculty of the University of California, my program has focused on pesticide residues, natural food toxins, and risk assessment. During that period, I have not received any funding support from the agricultural, food, or chemical industries.

I also represent the Institute of Food Technologists, a scientific society composed of 28,000 members working in food science, technology, and related professions in industry, academia, and government. I serve the Institute as a designated Food Science Communicator as well as the Chair-Elect of the Toxicology and Safety Evaluation Division. I recently co-authored an Institute Scientific Status Summary on assessing, managing, and communicating chemical food risks which has been distributed to PPDC members as a primer discussing many of the risk assessment issues being considered by this committee such as uncertainty factors, threshold levels, and high-to-low dose extrapolation.

I am here today to address two issues:
1) the extremely low risks posed by pesticide residues in food, and 2) my concerns with the overly conservative risk assessment methods that may be used by the EPA in its interpretation of the FQPA that may lead to scientifically unjustified decisions that could significant and adversely impact agriculture of California and the nation.

I'll start with the second issue first. When the bill was passed in the summer of 1996, I was initially pleased. The spirit of the bill, in my opinion, was to provide greater scientific flexibility in assessing the risks posed by pesticides in food to aid in improved regulatory practices. The bill replaced the rigid and anachronistic zero-risk Delaney Clause with a framework that allowed input of the best possible science into the risk assessment process. After following FQPA developments over the past twenty months, I have become very concerned with the direction of EPA's efforts to implement it. My concerns are that the conservative nature of the assumptions used to calculate risks may result in the development of phantom risks that exist only on paper as a result of stacking or multiplying layers of conservatism; such exaggerations of risk may ultimately lead to unsound regulatory decisions.

Obviously, risk assessment is a complicated process that requires a multitude of assumptions to be made. Most of us in this room today are aware of the 100-fold uncertainty factor that is typically used in the assessment of threshold risks from chemicals such as pesticides that assumes that 1) humans are ten times more sensitive to chemicals than the most sensitive laboratory animals tested and that 2) some humans are ten times more sensitive than the average human. What fewer people are aware of, I believe, is that a variety of lesser-known assumptions are also inherent in the risk assessment process that also may dramatically exaggerate risks. The determination of pesticide use, residue levels, and food consumption estimates typically use conservative assumptions and it is likely that aggregate exposure estimates considering water and residential exposure will also be exaggerated. It is critical to realize that even the No Observed Effect Level (NOEL) from which the reference doses are derived also tend to be conservative. As an example, if a chronic animal toxicology study yielded a NOEL of 10 mg/kg/day and a Lowest Observed Effect Level of 200 mg/kg/day, the "true" NOEL could be anywhere between 10 and 200 mg/kg/day and certainly much higher than 10.

Such exaggerations of risk become even greater when considering cumulative risks from toxicologically-related pesticides such as the organophosphates; in practice, this results in stacking all of the conservatism of the individual pesticide risk assessments, leading to a "super-exaggerated" risk. And, on top of all of this, there's consideration given to applying an additional 10-fold safety factor to the risk assessment of sensitive population subgroups such as infants and children.

In my opinion, the compounding of the various conservative assumptions leads to the generation of phantom risks that exist only on paper but not in reality. What this means is that the proposed "risk cup" is more likely taking on the shape of a medicine dropper.

With all of the focus on the treatment of the uncertainties inherent in the risk assessment process, it is convenient to overlook what is known about pesticide residues in foods. Results from hundreds of thousands of food residue analyses conducted by state and federal agencies and the food industry consistently indicate that the levels of residues, when indeed detected, remain extremely low.

The risks posed by residues are perhaps reflected best by the results of the Food and Drug Administration's Total Diet Study, a comprehensive market basket survey performed annually that analyzes food for residues at the time of consumption. As an example, consider this scenario:

1) Take the typical human daily exposure to a pesticide obtained from the Total Diet Study.
2) Now feed laboratory animals 10,000 times the typical human daily exposure (on the basis of body weight) every day throughout their lifetimes.
3) What happens to the animals?

In general, nothing happens. For any noticeable effects to be observed, animals generally need to be exposed to doses greater than 10,000 times our typical daily dose. Does this prove the safety of pesticide residues? Certainly not. But it does explain why there is strong skepticism among many members of the health community, myself included, over whether pesticide residue controls need to be tightened.

So to summarize, I am concerned that the paths EPA may take in assessing risks according to its interpretation of FQPA may create theoretical phantom risks that exist only on paper. Basing regulatory actions on such exaggerated estimates of risk may have immense consequences. By unnecessarily restricting the uses of many pest control products, there may be risk tradeoffs through substitution of less effective chemicals which could increase worker safety, environmental, and resistance management concerns. Food production and quality may also be affected, leading to lower availability and higher consumer cost for fruits and vegetables. Effects could be dramatic in states such as California, where I live, which is by far the leading agricultural producer in the nation. Almost all of California fruit and vegetable production centers on its 250 "minor" crops which may be most affected by unnecessary pesticide restrictions.

It is hard to argue against the safety of infants and children. As the father of four and six year-old boys, I strive to do everything I can to ensure their health and safety. But if we're really concerned about what they eat, we should encourage their consumption of healthy fruits and vegetables rather than possibly restrict their access due to lower availability and increased cost that may result from regulatory decisions that emanate from exaggerated estimates of risk. It is critical that regulations are based on the best estimates of risk and not the worst.

I appreciate the opportunity to address this committee. If I may be of assistance to the Committee or to the Agency, I welcome such an opportunity. Thank you for your attention.

Container Collection Program

Container Requirements

1. Must be rinsed, so that no residue remains.
2. Must be clean and dry, inside and out, with no apparent odor.
3. Hard plastic lids and slip-on lids must be removed.
4. Glue-on labels may remain.
5. The majority of the foil seal must be removed from the spout. A small amount of foil remaining on the container rim is acceptable.
6. Half pint, pint, quart, one and two-and-a-half gallon containers will be accepted whole.
7. Five gallon containers will be accepted whole, if lids and bails are removed.
8. 30 gallon and 55 gallon containers are accepted if they are cut into pieces **no larger than 15x18 inches**.

****Containers that do not meet the above criteria cannot be accepted.****

Container Collection Dates

Please put these dates on your calendar! Tell others about the program. 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. For more information about plastic pesticide containers contact: Clarke Brown (509) 965-6809 or Steve George (509) 457-3850.

Date & Time	Site	Sponsor	Contact Phone	Comments
June 3 **8a-11a**	Davenport Airport	Western Farm Service	Lee Swain (509) 725-0011	
June 3 **1p-4p**	Wilbur Airport	Western Farm Service	Greg Lyva (509) 647-2441 Dennis Buddrius (509) 647-5394	
June 4 **8a-12**	WSU Tree Fruit Station Wenatchee	North Central Fieldman & Dealers	Jeff Heats (509) 662-1539	
June 5 **8a-12**	Wilbur-Ellis Quincy	Pacific NW Vegetable Association	Dale Martin (509) 787-4433 Ron Turner (509) 7873556	
June 9 **8a-12**	Wilbur-Ellis Eltopia	Lower Columbia Basin Fieldmen & Dealers Assoc.	Greg Jackson (509) 545-1865 Vern Record (509) 297-4291	
June 10 **8a-12**	Tom Dent Aviation Moses Lake	Columbia Basin Crop Consultants Assoc. & Cenex	Tom Dent (509) 765-6926 Heath Gimmestad (509) 765-5617	
June 11 **8a-12**	Wilbur-Ellis Mattawa	Wilbur-Ellis & Wolfkill Feed &Fertilizer	Al Hilliker (509) 932-4988	
June 16 **8a-12**	Cenex Bruce	Bruce Dealers Assoc.	Clarke Brown (509) 965-6809	
June 23 **8a-12**	Bleyhl Farm Service Sunnyside	Bleyhl Farm Service	Gary Herndon (509) 837-6261 Ted Nulliner (509) 966-2363	
July 02 **8a-12**	Colfax Grange Supply	Cenex Land O Lakes	Tammy Haynes (509) 244-2507	
July 03 **8a-12**	Flat Top Ranch, Burbank	Flat Top Ranch	Clarke Brown (509) 965-6908	
July 03 **1p-4**	Broetje Orchards	Broetje Orchards	Joe Shelton (509) 749-2217	
July 20 **9a-3p**	Snipes Mtn Transfer Station	Yakima County	Mark Nedrow (509) 574-2472	Cardboard Accepted
July 21 **8:30a-3**	Terrace Mtn Landfill, Yakima	Yakima County	Mark Nedrow (509) 574-2472	Cardboard Accepted

Washington Pest Consultants Association

Date & Time	Site	Sponsor	Contact Phone	Comments
July 27 8a-12	Wilbur-Ellis, Chelan	Wilbur-Ellis	Brian Hendricks (509) 682-5315	
July 28 8a-12	Wilbur-Ellis, Brewster	Wilbur-Ellis	Brian Hendricks (509) 682-5315	
July 29 8a-12	Wilbur-Ellis, Tonasket	Wilbur-Ellis	Brian Hendricks (509) 682-5315	
July 30 8a-11	NW Wholesale, Orroville	NW Wholesale	Herb Teas (509) 662-2141	
July 30 2p-5	NW Wholesale, Okanogan	NW Wholesale	Herb Teas (509) 662-2141	
July 31 8a-12	Bill Lockwood, Okanogan	Bill Lockwood	Bill Lockwood (509) 422-2617	

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 Steve George at (509) 457-3850.

IPM Publication Focuses on Food Quality Protection Act

Challenges posed by the recently enacted Food Quality Protection Act (FQPA) constitute a major focus of "Integrated Pest Management in the Northeast Region," a new 20-page publication now available from CSREES. The report, developed by the Northeast Research and Education Committee for IPM and funded by CSREES, documents ways that integrated pest management (IPM) equips Northeastern food producers to meet FQPA requirements. It also outlines progress made by Northeastern Extension and research programs—in partnership with producers and consumers—to design and implement successful IPM programs. To obtain a copy of the publication, contact Michael Fitzner, National Program Leader for Integrated Pest Management, CSREES (202-401-4939 or mfitzner@reeusda.gov). The report also will be available soon on the Web (http://www.nysaes.cornell.edu/ipmnet/nerpt98).

The USDA Agricultural Marketing Service (AMS) has recently released the "Pesticide Data Program: Annual Summary Calendar Year 1996." The USEPA uses this information to access dietary exposure to pesticide residues. Copies of this 100-page publication can be obtained by calling the AMS at 703-330-2300 or by faxing your request to 703-369-0678.

Another publication of note is EPA's Status of Chemicals in Special Review." This 54-page publication contains a wealth of knowledge about pesticides that have been or currently are under regulatory review in the Special Review process. This document can be accessed electronically on EPA's Web site at: http://www.epa.gov/pesticides. Printed copies are available from the National Center for Environmental Publications and Information at 800-490-9198 or from the National Technical Information Service at 703-487-4650.

Tolerance Information

On March 25 EPA granted a tolerance exemption for titanium dioxide when it is used as an inert ingredient (UV protectant) in microencapsulated formulations of lambda -cyhalothrin. (Page 14360)

On April 15 EPA granted an exemption from the requirement for a tolerance for residues of canola oil when used as an insecticide in or on all food commodities. (Page 18326)

On April 17 EPA announced it was soliciting comments on proposed guidance clarifying the criteria that pesticide products must meet to be eligible for the "treated articles exemption." The comment period ends May 18, 1998. (Page 19256)

On April 10 EPA established a temporary exemption from the requirement for a tolerance for residues of the insecticide *Bacillus thuringensis* subspecies *tolworthi* Cry9C protein and the genetic material necessary for its production in corn (feed use only), as well as in meat, poultry, milk, and eggs resulting from animals fed such feed. (Page 17687)

Chemical (type)	Federal Register	Tolerance (ppm)	Commodity (raw)	Time-Limited		
				Yes No	new extension	expiration date
spinosad (insecticide)	4/15/98 (18329)	0.20	apples	No	n/a	n/a
		0.50	apple pomace, wet			
		0.40	fruiting vegetables (except cucurbits) group			
		2.00	Brassica (cole), leafy vegetables, head and stem subgroup			
		10.00	Brassica (cole), leafy vegetables, greens subgroup			
		8.00	leafy vegetables (except Brassica) group			
		0.50	milk, fat			
		0.04	milk, whole			
		0.60	sheep, fat			
		0.20	sheep mbyp			
		0.04	sheep, meat			
		0.60	cattle, fat			
		0.20	cattle, mbyp			
		0.04	cattle, meat			
		0.60	goat, fat			
		0.20	goat, mbyp			
		0.04	goat, meat			
		0.60	hogs, fat			
		0.20	hogs, mbyp			
		0.04	hogs, meat			
		0.60	horses, fat			
		0.20	horses, mbyp			
		0.04	horses, meat			

Chemical (type)	Federal Register	Tolerance (ppm)	Commodity (raw)	Time-Limited Yes No	new extension	expiration date
fenoxaprop-ethyl (herbicide)	4/22/98 (19829)	0.05	barley, grain	No	n/a	n/a
		0.10	barley, straw			
rimsulfuron (herbicide)	4/6/98 (16690)	0.05	tomatoes	No	n/a	n/a
clethodim (herbicide)	4/8/98 (17101)	6.00	alfalfa, forage	Yes	New	4/30/2001
		10.00	alfalfa, hay			
		2.00	dry beans			
		1.00	tomatoes			
		2.00	tomato, puree			
		3.00	tomato, paste			
Comment: To support a future permanent tolerance, EPA is requiring that Valent submit additional dry bean, peanut and tomato trials each conducted at the maximum use rates and proposed pre-harvest intervals.						
prometryn (herbicide)	4/10/98 (17690)	0.10	carrots	No	n/a	n/a
flufenacet **(herbicide)**	4/10/98 (17692)	0.40	corn, field, forage	Yes	New	4/30/2003
		0.05	corn, field, grain			
		0.40	corn, field, stover (fodder)			
Comment: This tolerance is being issued as a time-limited tolerance due to some conditions placed on Bayer as part of the initial registration of this chemical.						
cyprodinil (fungicide)	4/10/98 (17699)	0.15	apple pomace, wet	No	n/a	n/a
		2.00	grapes			
		0.10	pome fruit			
		3.00	raisins			
		2.00	stone fruit			
esfenvalerate (insecticide)	4/29/98 (23394)	0.03	eggs, whole			
		5.00	lettuce, head			
		0.30	poultry, fat			
		0.03	poultry, meat			
		0.30	poultry, mbyp (except liver)			
		0.03	poultry, liver			
		10.00	sorghum, fodder			
		10.00	sorghum, forage			
		5.00	sorghum, grain			
		2.50	sugarbeet, pulp			
		0.50	sugarbeet, root			
		5.00	sugarbeet, top			
imidacloprid **(insecticide)**	4/1/98 (15761)	0.20	vegetables, cucurbits	Yes	Extension	3/31/1999
Comment: Extension granted 4/1/98. Tolerance originally in support of a California Section 18.						
bifenthrin **(insecticide)**	4/1/98 (15763)	1.00	vegetables, cucurbits	Yes	Extension	4/30/1999
Comment: Extension granted 4/1/98. Tolerance originally in support of a California Section 18.						

...continued on next page

...Tolerance

Chemical (type)	Federal Register	Tolerance (ppm)	Commodity (raw)	Time-Limited		
				Yes No	new extension	expiration date
propiconazole (fungicide)	4/20/98 (19408)	1.00	cranberry	Yes	Extension	7/31/1999
Comment: Extension granted 4/20/98. Tolerance originally in support of a Wisconsin Section 18.						
clopyralid (herbicide)	4/29/98 (23392)	2.00	cranberry	Yes	Extension	1/31/2000
Comment: Extension granted 4/29/98 in response to EPA granting Section 18 exemptions in Massachusetts, Washington, and Oregon.						
tebufenozide (insecticide)	4/29/98 (23390)	1.00	apples	Yes	Extension	12/30/1999
		2.00	apple, pomace			
		0.05	milk			
		0.02	cattle, meat			
		0.02	sheep, meat			
		0.02	goat, meat			
		0.10	fat			
		0.02	kidney			
		1.00	liver			
		0.10	meat by products			
		0.02	horse, meat			
Comment: Extension granted 4/29/98 in response to EPA granting a Section 18 exemption for apples in various states.						

PNN Update

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

Manufacturers' Use Deletions

- In the April 17, 1998, Federal Register, EPA announced it had received a request from Novartis to remove sunflower and nursery stock uses from the labels for both Supracide 25WP and Supracide 2E. Unless this request is withdrawn, these deletions will become effective October 14, 1998. Anyone interested in retaining these uses should submit their comments to Novartis.

- In the April 17, 1998, Federal Register, EPA announced it had received a request from Drexel to remove the following uses from the label for its insecticide Endosulfan 3EC: alfalfa (grown for fodder), artichoke, barley, oat, rye, wheat, pea seed, safflower, sugarbeet, and sunflower. Typically, EPA allows for a 180-day comment period; however, in this case, anyone interested in retaining these uses must submit comments within 30 days. Comments may be sent to Drexel.

- In the April 17, 1998, Federal Register, EPA announced it had received a request from Valent to remove pasture and rangeland uses from the labels for both Orthene 75S and Orthene 75 WSP. Unless this request is withdrawn, these deletions will become effective October 14, 1998. Anyone interested in retaining these uses should submit comments to Valent.

Section 18 Specific Exemptions

- On April 22, 1998, EPA issued a Section 18 specific exemption for the use of Confirm 2F to control blackheaded fireworm on cranberries. This exemption is for use on 800 acres in Grayland, Long Beach, and Lynden counties. It expires 7/31/98.

- On April 22, 1998, EPA issued three Section 18 specific exemptions for the use of Tattoo C (98-WA-30), Acrobat MZ (98-WA-29), Curzate 60 DF and Manex C-8 (98-WA-28) to control late blight on potatoes. These exemptions expire 4/21/99.

- On April 24, 1998, EPA issued a Section 18 specific exemption (file symbol 98-WA-09) for the use of Novartis' fungicide, Mycoshield Agricultural Terramycin to control fire blight in apples grown in both Washington and Idaho. This exemption allows for the use of Mycosheild on 3,500 acres in Washington. It expires 8/1/98.

State Issues

Section 18 Crisis Exemptions

- On March 27, 1998, WSDA issued a Section 18 crisis exemption for the use of Rally 40W on hops to control powdery mildew. The exemption, for use on 32,214 acres, remains in effect until November 1, 1998.

- On April 17, 1998, WSDA issued a Section 18 crisis exemption for the use of Orbit 3.6EC to control mummy berry on highbush blueberries. This exemption, for use on 1,500 acres, remains in effect until June 10, 1998.

- On April 21, 1998, WSDA issued a Section 18 crisis exemption for the use of Brigade WSP to control weevils in red raspberries. Use under this crisis exemption begins immediately. The exemption expires August 10, 1998.

New Registrations

- WSDA has issued a new registration to Drexel for its insecticide Endosulfan 3EC. This product is registered for use on the following sites: alfalfa, apple, apricot, artichoke, barley, bean, blueberry, broccoli, Brussels sprouts, cabbage, carrot, cauliflower, celery, cherry, Christmas tree plantation, collard, conifer, cowpea, cucumber, cucurbit, dry bean, eggplant, evergreen tree, grape, green bean, greenhouse ornamental, greenhouse tomato, kale, lettuce, melon, mustard, nectarine, non-bearing cherry, non-bearing peach, non-bearing plum, oat, ornamental, ornamental tree, peach, pear, pepper, plum, potato, prune, pumpkin, rye, safflower, shrub, spinach, squash, strawberry, sugarbeet, sunflower, sweet potato, tomato, walnut, and wheat.

- WSDA has issued a registration to Oster for its insecticide Oster Fly & Tick Spray Equine Collection. This product is registered for use on horses.

- WSDA has issued registrations for two herbicides for use on turf. The first is Perfection Professional Feed & Weed Mini 20-5-10 (MCPP dimethylamine, dicamba dimethylamine, and 2,4-D dimethylamine). The second is Scotts Turf Builder with Halts Crabgrass Preventer 28-3-5 (pendamethalin).

- WSDA has issued two new registrations to Agri Laboratories for products containing coumaphos. The

...continued on next page

...PNN Update

first, Co-Ral Equine & Livestock Dust, is registered for use on cattle, horse, and swine. Co-Ral 1% Dust is registered for use on cattle and swine.

● WSDA has issued three new product registrations to Agri Laboratories for its products containing permethrin. The products are registered for use on the following PNN-related sites:

Permethrin Dust for Livestock - cattle, horse, and swine
Back Side - cattle and sheep
Back Side Plus - agricultural production buildings, cattle, and sheep

● WSDA has issued three new registrations for products for use on turf. The registrations are as follows:
Defend 4F Turf Soil Fungicide (WA Cleary) - PCNB
Yardmaster 4LG Dandelion Control (Cenex/Land O Lakes) - 2,4-D dimethylamine
Yard Master Lawn Weed Killer (Cenex/Land O Lakes) - dicamba dimethylamine & 2,4-D dimethylamine

Section 24c Registrations
● On March 26, 1998, WSDA issued SLN WA980013 to Platte Chemical for the use of its herbicide Amine 4 2,4-D Weed Killer to control broadleaf weeds in cottonwood/poplar trees grown for pulp. This is a "me-too" registration similar to WA940032, previously issued to Wilbur Ellis, and WA950037 issued to Rhone-Poulenc. The new registration expires 12/31/98.

● On March 27,1998, WSDA issued SLN WA980012 for the use of Drexel's Endosulfan 3EC to control aphids in alfalfa seed crops. This SLN expires on 12/31/98.

● On April 7,1998, WSDA issued SLN WA980010 for the use of Rodeo Emerged Aquatic Weed and Brush Herbicide for control of cordgrass (Spartina). This SLN is only for use by applicants approved under WSDA's Spartina Eradication and Control Program. This SLN expires 12/31/98.

● On April 3, 1998, WSDA both cancelled SLN WA940024 and issued a continuance in the form of SLN WA980014. The SLN being cancelled, WA940024, had been issued to Mt. Adams Orchard Corp. It had allowed the use of Merck's Mycoshield Agricultural Terramycin to control fire blight on pears. The new SLN, WA980014, is also issued to Mt. Adams Orchard Corporation and is for the use of Novartis' product, Mycoshield Agricultural Terramycin. SLN WA980014, specifically for use in Klickitat and Skamania counties, expires 12/31/98.

● On April 24, 1998, WSDA issued SLN WA980018 to Novartis for the use of Tilt to control leaf and glume blotch diseases on wheat. This SLN allows for the application of Tilt on wheat up to Feckes Growth Stage 10.5 (full head emergence). The SLN expires 12/31/98.

Section 24c Cancellations
● On March 26, 1998, WSDA announced that Platte Chemical was canceling SLN WA970014. This SLN had previously been issued for the use of Carbaryl 4L for fruit thinning in apples. The SLN is being cancelled because Platte is revising its Carbaryl 4L label to include this use.

● On April 3, 1998, WSDA issued a letter cancelling SLN WA880009. This SLN had previously been issued for the use of Du Pont's insecticide Vendex 50 WP on raspberries. DuPont requested the SLN cancellation because this use has been incorporated onto a supplemental label. Please note that the supplemental label carries a 7-day preharvest interval (PHI), while the PHI on the SLN was given as 3 days.

Section 24c Revisions
● On March 27, 1998, WSDA issued a revision to SLN WA97022. This SLN had previously been issued to Drexel for the use of its product Carbaryl 4L on apples for fruit thinning. The revision includes removal of the expiration date and changes to the pollinator protection information and the precautions.

● On March 30, 1998, WSDA issued a revision to SLN WA900012. This SLN had previously been issued to BASF Corporation for the use of its herbicide Basagran to control broadleaf weeds in alfalfa grown for seed. The SLN has been revised to comply with EPA's 1994 bentazon Reregistration Eligibility Decision (RED).

- On April 7, 1998, WSDA issued a revision to SLN WA960022. This SLN had previously been issued to Rohm & Haas for the use of its fungicide Dithane DF on the following vegetable seed crops: leek, onion, arugula, beet, carrot, coriander, broccoli raab, Brussels sprouts, cabbage, cauliflower, Chinese cabbage, Chinese mustard, collard, kale, kohlrabi, rutabaga, turnip, mustard, radish, rape, spinach, dill, endive, lettuce, parsley, parsnip, and Swiss chard. The revision removes the expiration date.

EPA issues respirator compliance policy statement

The National Institute for Occupational Safety and Health (NIOSH) has developed changes to the regulations at 42 CFR Part 84 that set forth certification standards for non-powered air-purifying particulate respirators. EPA has determined that all 42 CFR part 84 respirators meet or exceed all 30 CFR part 11 respirator (hereinafter part 11 and part 84 respirators) requirements, and that respirators certified under part 84 will be considered the equivalent of a respirator certified under part 11. EPA will allow pesticide handlers to use either part 11 or part 84 respirators to satisfy non-powered, air-purifying respirator requirements for pesticide applications. The agency will publish an amendment to 40 CFR 156.212 to reflect the NIOSH changes in particulate respirator designations and a Pesticide Registration (PR) Notice to direct registrants on how to modify product labels.

Dear Aggie

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

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

<u>In the newspapers recently, I've read about how wine and beer may have beneficial health effects, especially in preventing cancer. Are there any other possible benefits?</u>

As a matter of fact, there may be another reason to drown your stress in fermented beverages. Researchers in Japan have been studying grape seed extracts for their anti-ulcer activity. Grape seed extracts contain a group of chemicals called procyanidins, which are included in red wine and grape juice. The extracts can be fed to rats whose stomach linings have been irritated by an acidified ethanol solution to produce an ulcer-like condition. The ulcer injuries were greatly reduced by the grape seed extracts. Good-bye milk, hello Washington State Merlot! (Source: J. Agric. Food Chem., 1998, vol. 46, p. 1460)

<u>DDT is still in the environment and never breaks down. Is that true?</u>

Actually, DDT does break down in soil, plants, and animals into several products. The one of most concern is DDE, which has one less chlorine. Unfortunately, DDE is stored in body fat but is slowly transformed and excreted from the body. In soil and sediments DDE has been believed not to breakdown. However, new research from Michigan State University, indicates that microbes in deep marine sediments can change DDE into DDMU. That's good news because DDMU is not considered a priority hazardous pollutant. Furthermore, if taken up by animals, it can be rapidly broken down and excreted. Even man-made chemicals can't fool Mother Nature. (Source: Science, 1998, v. 280, p. 722)