Occupational health and safety laws to prevent toxic exposures: a comparative analysis of agriculture and industry in Washington State

Megan K. Schuknecht

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ABSTRACT

The Washington State Constitution guarantees equal protection under the law for all citizens. It also directs the legislature to pass laws to protect workers from dangerous employment. In 1973, the Washington legislature passed the Washington Industrial Safety and Health Act (WISH Act), which instructed the director of Washington's Department of Labor and Industries (L&I) to adopt rules to ensure that all employers in the state provide *safe and healthful* working environments for all workers.

Agriculture is a dangerous industry, nationally and in Washington. The extensive use of toxic pesticides on Washington’s crops presents one serious occupational hazard for farm workers. Approximately 185,000 predominantly Hispanic migrant and seasonal farm workers are employed in Washington each year. Cultural, racial, and socio-economic indicators suggest that farm workers may be considered as a class of citizens, an essential determination to gain standing for an equal protection lawsuit.

Under WISHA, the state’s occupational health and safety program, L&I has adopted rules, codified in the Washington Administrative Code (WAC), to protect employees from hazards and discrimination in the workplace. All employers in the state, *except* agricultural employers, at a minimum must comply with the Safety and Health Core Rules (Core Rules). Agricultural employers must comply with a unique set of rules called the Safety Standards for Agriculture. About thirty other industries also must comply with industry-specific standards, but in each case these standards *expand* on the protections provided by the Core Rules. The specific rules for agriculture, however, provide *fewer* protections than the Core Rules. Several other health and safety rules are meant to protect workers from general and specific air contaminants, specific carcinogens, and other hazardous chemicals. Applicability varies, but all industries are subject to variations of most of these rules.

Because a unique set of occupational safety and health laws governs agriculture, it appears that farm workers do not receive the same protections against exposure to toxic chemicals or substances as other workers in the state receive. This paper will address two primary areas of legal responsibility for employers: training and right-to-know laws, and engineering controls and personal protective equipment required to prevent exposures. It will compare laws pertaining to these two categories that are applicable to agriculture with those applicable to other industries in order to determine whether farm workers in Washington State work in a safe and healthful environment and whether they receive equal protection under the law with regard to protections against toxic exposures.
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A specific set of occupational safety and health rules, applicable only to agriculture, provides workplace protections for farm workers in Washington State. Although there are several sets of such rules that are specific to particular industries in the state, agriculture is the only industry that is exempt, to some extent, from core health and safety rules. This distinction exists, in part, because of the federal regulatory structure for protecting workers. At the federal level, the Occupational Safety and Health Administration (OSHA) is responsible for ensuring the safety and health of most of America's workers; occupational protections for farm workers, however, fall under the jurisdiction of the U.S. Environmental Protection Agency (EPA). Under mandates highly prone to conflict, the EPA is responsible both for registering pesticides and for protecting farm workers from the effects of pesticide exposure.

A different regulatory structure exists at the state level in Washington. In 1973, the legislature passed the Washington Industrial Safety and Health Act (WISH Act), which instructed the director of the Washington State Department of Labor and Industries (L&I) and overseer of WISHA, the state's occupational safety and health program, to ensure that employers provide safe and healthful working environments for all workers in the state, including farm workers. However, in 1995 the legislature directed WISHA to adopt safety standards applicable only to agriculture, stating that Washington's farms would benefit from safety rules that were easily referenced and agriculture-specific. Also, the WISH Act, more than any other policy, is meant to fulfill a requirement of the state
constitution that directs the legislature to pass laws to protect workers from dangerous employment. The state constitution also guarantees equal protection under the law, forbidding the legislature from passing laws that provide privileges to one class of citizens and not another. Given these constitutional and legislative protections, the primary goal of this research paper is to provide legal comparisons that can be used to determine whether farm workers in Washington are provided with a safe and healthful working environment and whether they receive equal protection under the law, particularly with regard to protections from exposure to hazardous chemicals used in their workplaces. The following overview of the agriculture industry, nationally and in Washington, and a brief outline of the regulatory history will provide a context for this analysis.

BACKGROUND ON AGRICULTURE AND PESTICIDES

National

Agriculture is one of the most hazardous industries in the United States. According to the National Institute for Occupational Safety and Health (NIOSH), "Farmers are at high risk for fatal and nonfatal injuries, work-related lung diseases, noise-induced hearing loss, skin diseases, and certain cancers associated with chemical use and prolonged sun exposure" (1997, 1). Illness and injury resulting from occupational exposure to toxic pesticides is of particular concern. As one report notes, "Farmworkers, and often their children, are regularly exposed to pesticides in many ways: mixing or applying pesticides; planting, weeding, thinning, irrigating, pruning, harvesting, and
processing crops; or living in or near treated fields” (Reeves, Katten, and Guzmán 2002, 4).

The human health effects of such exposures are well documented (US GAO 2000; Zahm, Ward, and Blair 1997). Acute effects may include nausea, vomiting, dizziness, headaches, blurred vision, fatigue, drowsiness, skin rashes, seizures, and death. The chronic effects are more difficult to document and require more study, but exposure to highly toxic pesticides has been linked to various cancers, neurological disorders, respiratory diseases, and reproductive problems.

Nationally, the EPA estimates that the number of pesticide poisonings among agricultural workers is about 20,000 acute cases a year, based largely on incomplete data from California’s monitoring program, but other sources have estimated the number of acute cases to be as high as 300,000 per year (Blondell 1997; US GAO 1993). The huge range in estimates is due to inadequate monitoring and the high probability that many cases go unreported because poisoned workers do not seek medical care. Furthermore, these estimates fail to take into account the very real possibility that farm workers may suffer chronic effects from pesticide exposure.

A 1993 report by the U.S. General Accounting Office (GAO), the independent investigative arm of Congress, concludes that although there are many federal and state reporting systems, surveys, and other data sources that provide some information on acute pesticide-related illnesses, outside of some special research studies there is little information available on delayed onset or chronic health effects related to pesticide exposure. The study further notes, “Without a valid and reliable means of monitoring,
there is no way to spot problems that may arise with the use of different pesticides or to
determine whether risk assessment and management practices successfully prevent
hazardous exposure" (7). In reference to the lack of a reliable means of monitoring, a
later study conducted by the U.S. GAO stated that, "Six years later, we have found that
this problem remains largely unaddressed" (2000, 11).

**Washington State**

In Washington State, which is the focus of this study, agriculture is a major
industry. In 2002, the value of agricultural production in the state was $5.56 billion.
Washington was the top producer in the nation of apples, sweet and tart cherries, Concord
and Niagara grapes, pears, hops and red raspberries. Apples represented 19 percent of
the state's total agricultural production and accounted for 60 percent of the total national
apple crop. Over five billion pounds of apples were harvested in the state on 164,000 acres and had a value of just over $1 billion (USDA 2003).

Agriculture is also a hazardous industry in the state. Washington has a particularly
high rate of occupational injury and illness for workers involved in fruit and tree nut
production – 54 percent higher than the rate for such workers nationally (US BLS, cited
in Ford 2000). Mounting evidence from recent studies conducted just in the state of
Washington shows that field workers and their families, in addition to pesticide handlers,
are at high risk for chemical exposures (Curl et al. 2002, Fenske et al. 2000, Loewenherz

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1 Effective July 7, 2004, the GAO's legal name became the Government Accountability Office.
Fruit Trees and Pesticides

Fruit trees and grapes are both labor-intensive crops and growers rely heavily on seasonal and migrant labor to assist with such tasks as pruning, harvesting and packaging. For the most part, growers also rely heavily on pesticides to bring fruit crops to harvest. For example, in 2001 growers used over 50 different chemicals on Washington’s total apple crop (USDA 2002). Several of the most commonly used - and most toxic - pesticides are in the organophosphate or carbamate class of chemicals. Although not limited to agricultural use, organophosphates are the most likely to cause acute pesticide poisonings (NRDC 2000). Several of these high-use pesticides are on the Pesticide Action Network’s (PAN) list of “bad actor” pesticides (Orme and Kegley, 2004). Toxic pesticides on the list are at least one of the following: known or suspected carcinogens, reproductive or developmental toxicants, neurotoxic cholinesterase inhibitors, known groundwater contaminants, or pesticides with high acute toxicity. Examples of some of the PAN bad actor chemicals that are used extensively in Washington orchards include: the herbicides norflurazon and paraquat; the insecticides azinphos-methyl, carbaryl, and chlorpyrifos; and the fungicide myclobutanil (Orme and Kegley 2004; USDA 2002).

Orchards, though, do not have a monopoly on bad actor pesticides, which are also used extensively on other crops in the state, such as asparagus, raspberries, onions, peas, and sweet corn (USDA 2002-2003).

Farm Workers

There are approximately 289,000 migrant and seasonal farm workers and their dependents in Washington State. Of those, approximately 185,000 are farm workers
employed in field agriculture, nursery and greenhouse work, and food processing; approximately 92,000 are children and youth under the age of 20, some of whom may be farm workers (Larson 2000).

A seasonal farm worker is defined as “An individual whose principal employment [51% of time] is in agriculture on a seasonal basis, who has been so employed within the last twenty-four months” (U.S. Code PHSA, as cited in Larson 2000, 2). According to the U.S. Code, the definition for a migrant farm worker is the same with the added clause that such a worker “establishes for the purposes of such employment a temporary abode” (U.S. Code PHSA).

Farm workers face a variety of troubling social and economic conditions. The latest report based on information from the National Agricultural Workers Survey (NAWS) “finds that farmworker wages have stagnated, annual earnings remain below the poverty level, farmworkers experience chronic underemployment, and that the farm workforce increasingly consists of young, single males who are recent immigrants” (US DOL 2000, vii). Poverty, language, culture, and geography may all play a role in how farm workers are treated and in their decisions about whether or not to seek medical care, particularly if they suspect their illness is due to exposure to pesticides. Among all farm workers interviewed in 1997-98 for the NAWS, 52 percent lacked work authorization (US DOL 2000). Undocumented workers are unable to vote and are less likely to voice concerns about working conditions for fear of reprisal. Most do not have health insurance.

By comparison, in 2003 the state’s two largest goods producing industries, construction and manufacturing (excluding food manufacturing), employed approximately 164,000 and 180,000 people respectively (WSESD 2004).
and the workers may be geographically disperse and not part of the fabric of a community, thus making it harder for them to unite against oppressive conditions.

**Legal Milieu**

Under the authority of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), the EPA promulgated the federal Worker Protection Standard (WPS) in 1992; it was fully implemented in 1995, and revised in 1996. The regulation is designed to reduce the risk of pesticide poisonings and illness among agricultural laborers and establishes requirements for pesticide safety training, notification of pesticide applications, the use of personal protective equipment, restricted entry intervals following pesticide applications, availability of decontamination supplies, and access to emergency medical assistance.

The Washington State Department of Agriculture (WSDA) has been designated by the EPA to oversee the WPS and is subject to EPA oversight. However, L&I has jurisdiction over the health and safety of agricultural workers who may be exposed to pesticides in the course of their work, provided the exposure occurs in the course of an employer-employee relationship. (If the exposure is due to drift from another orchard or farm, WSDA has primary jurisdiction.) Despite the fact that WISHA, under L&I, has primary responsibility for ensuring the health and safety of workers in Washington, including those who work with pesticides, L&I is not subject to EPA oversight. Because pesticide exposure can negatively impact human health, the Washington Department of Health (DOH) is also involved in investigations of violations of the WPS. To avoid duplication and conflicting requirements, in 1996 the three state agencies signed a Memorandum of Understanding (MOU) (WIM #96-11-M) to work together and adopted identical versions of the protection standard. The original MOU was replaced and

In industries other than agriculture, workers are protected under the federal Occupational Safety and Health Act (OSHA) of 1970, which is enforced by the Occupational Safety and Health Administration (OSHA). The OSHAct requires employers to comply with occupational safety and health standards and to provide workplaces free from serious recognized hazards. WISHA establishes state jurisdiction over worker safety and health as provided for under the OSHAct.

Industrial workers receive greater protection under OSHA standards, with regard to toxic exposures, than agricultural workers receive under the WPS. Both standards mandate the use of personal protective equipment, worker notification or warnings, safety training, and access to chemical labels. L&I only recently adopted a rule to require monitoring of cholinesterase enzyme levels for farm workers at risk for organophosphate or carbamate poisoning resulting from pesticide applications. Initially under this rule, at a minimum, employers must provide monitoring for any employee who handles organophosphate or N-methyl-carbamate pesticides for fifty or more hours in any consecutive thirty day period. The rule went into effect on February 1, 2004, granting farm workers the protection of medical monitoring that other industrial workers who work with toxic substances have had for years (WA L&I 2003a; WA L&I 2003b; Tri-City Herald 2003). In addition to requiring medical exposure monitoring for employees who work with hazardous substances, the OSHA standard also requires the use of engineering controls (such as enclosed mixing and loading systems) as a first option for protecting workers, mandates medical surveillance if an exposure occurs, and sets
measurable exposure limits for workers. In contrast, the WPS recommends the use of engineering controls but only requires protection from spray, even though closed cabs for spraying pesticides may be feasible; requires only emergency assistance rather than surveillance following a toxic exposure; and requires only restricted entry intervals following a pesticide application, rather than set exposure limits. Furthermore, agricultural employers are only required to provide personal protective equipment to pesticide handlers, not to every farm worker who may be exposed to pesticides.

The Washington Constitution guarantees equal protection under the law for all residents of the state, and state legislative policy requires all employers to provide a safe and healthful working environment for their workers. This paper explores whether farm workers and pesticide handlers receive the same protections against hazards and overexposure to toxic chemicals as individual workers do and whether those protections are enough to guarantee a safe and healthful working environment. Chapter 2 provides a descriptive summary of the state constitutional amendments, legislative policies, and agency rules relevant to this analysis. The next chapter discusses possible dimensions for a legal comparison and explains the scope and methodology of the chosen strategy for comparison. Chapter 4 analyzes the rules and policies that pertain to training and the use of engineering controls and personal protective equipment in agriculture, with a heavy emphasis on the rules found in the WPS, and compares them to analogous regulations in industry. Based on this analysis, the final chapter summarizes the findings; presents some conclusions on whether farm workers work in a safe and healthful environment and receive equal protection under Washington State law; and makes some recommendations.
for better protecting farm workers and pesticide handlers from exposures to toxic pesticides.
CHAPTER 2

SUMMARY OF RELEVANT STATUTES AND RULES

To determine whether farm workers receive equal protection under the law, it was necessary to conduct a thorough review of several laws pertaining to occupational safety and health in Washington State. This study did not undertake a comprehensive examination of all health and safety laws, but rather focused on laws intended to protect the health of workers, with an emphasis on protections from toxic exposures. In addition to providing a brief overview of the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), this chapter provides a brief summary of the primary articles of the state constitution, legislative policies, and administrative rules analyzed within the scope of this study. It covers the two sections of the Washington Constitution referenced in the introduction and three statutes: the Washington Industrial Safety and Health Act, the Washington Pesticide Application Act, and the Washington Pesticide Control Act. It also provides brief overviews of numerous agency rules, codified in the Washington Administrative Code, that provide occupational health and safety protections to workers in the state. With the exception of constitutional requirements, Table 1 provides a summary of Washington laws, including statutes and administrative rules, covered in this chapter.
Table 1. Summary of relevant Washington statutes and agency rules.

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The WSDA’s Worker Protection Standards (WPS) can be found in WAC 16-223. This chapter contains the federal WPS, which is also found in WAC 296-307. Because L&I and WSDA have adopted the same version of the WPS, and because L&I is the primary enforcement agency, this research consistently refers only to WAC 296-307 rather than both WPS rules.

**FEDERAL INSECTICIDE, FUNGICIDE AND RODENTICIDE ACT (7 USC § 135 et seq.)**

Passed in 1972, the current version of FIFRA requires any person distributing or selling any pesticide to register with the U.S. Environmental Protection Agency (EPA). Registration is granted if the pesticide is effective as claimed, meets federal standards for labeling, and will not cause unreasonable risks to humans or the environment, taking into
account environmental, social, and economic costs and benefits. Although states may also register pesticides for use within the state, they may not alter federal pesticide labels in any way. Labels include chemical information, statements on hazards to humans and the environment, personal protective equipment requirements, agricultural use requirements, directions for storage and disposal, and more.

WASHINGTON CONSTITUTION

Washington State has strong language in its constitution mandating both equal protection for all citizens and protection for workers from occupational-related illness and hazards. The Washington Constitution states: “No law shall be passed granting to any citizen, class of citizens, or corporation other than municipal, privileges or immunities which upon the same terms shall not equally belong to all citizens, or corporations” (Article I, Section 12). To emphasize the importance of constitutional requirements, Article I goes on to state: “The provisions of this Constitution are mandatory, unless by express words they are declared to be otherwise” (Section 29). The state Constitution does not refer to the costs, benefits, or feasibility of enacting laws but simply prohibits providing greater protection or advantages for one citizen or group over another. The Washington Constitution also specifically directs the legislature to protect workers in hazardous occupations: “The legislature shall pass necessary laws for the protections of persons working in mines, factories and other employments dangerous to life or deleterious to health; and fix pains and penalties for enforcement of the same” (Article II, Section 35). As noted in the introduction, agriculture is indeed a dangerous industry and workers face a high risk of chemical exposures that are deleterious to health.
Given these constitutional requirements, do farmworkers qualify as a “class of citizens” deserving of equal protection? Courts generally use a three-tiered approach to analysis under the equal protection clause. Strict scrutiny is applied when a legislative classification involves a fundamental right or creates a suspect classification, such as race or national origin. Middle-tier scrutiny is applied to semi-suspect classifications, such as gender and illegitimacy. The final level of scrutiny is rational basis review; under this level of scrutiny the government need only show that the classification in question serves a legitimate state interest. Because the vast majority of farm workers in Washington are Hispanic, federal and state case law indicates that they constitute a racial class and at least mid-tier scrutiny is appropriate to apply to farm workers in the state.  


Washington Industrial Safety and Health Act (RCW 49.17)

In 1973, the Washington legislature passed the Washington Industrial Safety and Health Act (WISH Act) to ensure safe and healthful working conditions for every man and woman working in the state (RCW 49.17). The WISH Act requires the standards of the State’s industrial safety and health program to equal or exceed the standards dictated by the federal Occupational Safety and Health Act of 1970 (7 USC § 651 et seq.). According to the WISH Act’s definitions, “‘safety and health standard’ means a standard which requires the adoption of use of one or more practices, means, methods, operations, or processes reasonably necessary or appropriate to provide safe or healthful employment.

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3 For specific legal cases and a brief history pertaining to equal protection for farm workers in Washington, see Evergreen Legal Services, letter to the Honorable Mike Lowry, Governor, State of Washington, May 11, 1993.
and places of employment" (RCW 49.17.020 (7)). In the 1990s, the legislature required that an agriculture safety standard be adopted, stating that farming operations would benefit from safety rules that were specific to agriculture and easily referenced. The legislature also exempted agricultural employers from the general industry safety standard for all rules that were not specifically cited in the agriculture standard (RCW 49.17.041).

**Protection from Hazards, Posting Requirements, and Protection from Discrimination**

The Department of Labor and Industries (L&I) administers WISHA, as the industrial safety and health program is known. In developing rules and regulations under the WISH Act, the legislature further required the director of L&I to:

(4) Provide for the promulgation of health and safety standards and the control of conditions in all work places concerning gases, vapors, dust, or other airborne particles, toxic materials, or harmful physical agents which shall set a standard which most adequately assures, to the extent feasible, on the basis of the best available evidence, that no employee will suffer material impairment of health or functional capacity even if such employee has regular exposure to the hazard dealt with by such standard for the period of his working life; any such standards shall require where appropriate the use of protective devices or equipment and for monitoring or measuring any such gases, vapors, dust, or other airborne particles, toxic materials, or harmful physical agents; and

(7) Provide for...the posting where appropriate by employers of informational, education, or training materials calculated to aid and assist in achieving the objectives of this chapter. (RCW 49.17.050).

The WISH Act mandates that employers provide work places free from recognized hazards that are likely to cause serious injury to their employees (RCW 49.17.080); allows a representative of the employees of a given work place to accompany the director or other state employee during a physical inspection (RCW 49.17.100); and forbids
discrimination against any employee who files a complaint or testifies about any health or safety provisions mandated by the WISH Act (RCW 49.17.160)

Recordkeeping

The WISH Act also mandates that employers make and keep records necessary to enforce health and safety standards, as prescribed by the director of L&I. Going a step further, it also requires that:

The director shall issue regulations requiring employers to maintain accurate records of employee exposures to potentially toxic materials or harmful physical agents which are required to be monitored or measured. Such regulations shall provide employees or their representatives with an opportunity to observe such monitoring or measuring, and to have access to the records thereof. Such regulations shall also make appropriate provisions for each employee or former employee to have access to such records as will indicate his own exposure to toxic materials or harmful physical agents.... (RCW 49.17.220)

Under this subsection, an employer is responsible for notifying any employee who has been exposed to toxic materials in concentrations that exceed those prescribed by any safety and health standard and for conveying the corrective action being taken to prevent further exposures.

Labeling and Protective Equipment

The legislature also requires safety and health standards to prescribe the use of labels or other forms of warning for hazards, as well as proper conditions and precautions of safe use or exposure. Where appropriate, the rules must also prescribe protective equipment and technological controls to be used in connection with a given hazard (RCW 49.17.240). The final pertinent section of the WISH Act, for the purposes of this research, requires the director to compile industrial safety and health statistics and to adopt rules based on the results of agency investigations into industrial accidents (RCW 49.17.260).
Washington Pesticide Application Act (RCW 17.21)

“The application and the control of the use of various pesticides is important and vital to the maintenance of a high level of public health and welfare both immediate and future, and is hereby declared to be affected with the public interest,” begins the Washington Pesticide Application Act (RCW 17.21). The legislature enacted this policy, administered by the Washington State Department of Agriculture (WSDA), in order to protect the immediate and future health and welfare of residents of the state.¹

There are several types of pesticide users regulated under this law. According to the Act’s definitions, “Commercial pesticide applicator’ means any person who engages in the business of applying pesticides to the land of another” (RCW 17.21.020). This designation can also apply to handlers⁵ on agricultural establishments, but the exemptions to the applicator requirement in WSDA rules make it unlikely that most pesticide handlers who are farm employees will possess a license. Both private and commercial applicators are required to obtain a license to apply pesticides, though the act allows “competent” individuals without a license to apply restricted use pesticides as long as they are under the direct supervision of a licensed pesticide applicator.⁶⁷ When pesticides

¹ A revised version of the act will go into effect on January 1, 2005, and that is the version cited in this paper.
⁵ The Pesticides (Worker Protection Standard) for agriculture defines “handler” as “a person…who is employed for any type of compensation by an agricultural establishment or commercial pesticide handling establishment of which WAC 296-307-130 [Standards for pesticide handlers] applies and who is: mixing, loading, transferring, or applying pesticides; … [or] assisting with the application of pesticides...” (WAC 296-307-11005). Several other activities also fall under this definition.
⁶ Restricted use pesticides are regulated by the U.S. Environmental Protections Agency (EPA) and are restricted to use by a certified pesticide applicator or someone under the direct supervision of a certified applicator. See the U.S. EPA Web site, Pesticides: Regulating Pesticides (2003).
are being applied to agricultural crops, “direct supervision” does not mean that the licensed pesticide applicator has to be physically present; rather, it only requires that he or she be “available if and when needed” (RCW 17.21.020). However, when restricted use pesticides are being applied under any non-agricultural circumstance by an uncertified person, direct supervision “means direct on-the-job supervision and shall require that the certified applicator be physically present at the application site and that the person making the application be in voice and visual contact with the certified applicator at all times during the application” (RCW 17.21.020).

**Washington Pesticide Control Act (RCW 15.58)**

The Washington Pesticide Control Act was also enacted for the purpose of protecting the health and welfare of the people of Washington (RCW 15.58.020). It mandates that the director of the WSDA require applicants for pest control consultant’s licenses to pass a written test demonstrating their knowledge of pesticide laws and regulations; pesticides hazards; and pesticide use, application, and disposal protocols.

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7 Washington has registered additional pesticides as restricted use. State-only restricted use pesticides are not designated as such on pesticide labels, which are developed according to federal guidelines.

8 According to federal law, pesticides may be unclassified, or classified for restricted use or for general use. The EPA does not usually classify products for general use and products that are not restricted remain unclassified (CFR 40 § 152.160). According to FIFRA, a pesticide is considered a restricted use pesticide if it has the potential to cause unreasonable adverse effects on the environment or poses a hazard to the applicator or other persons. Restricted use pesticides may only be applied by certified applicators or under the direct supervision of a certified applicator, as described in FIFRA. The FIFRA language is similar to Washington’s, stating: “Unless otherwise prescribed by its labeling, a pesticide shall be considered to be applied under the direct supervision of a certified applicator if it is applied by a competent person acting under the instructions and control of a certified applicator who is available if and when needed, even though such certified applicator is not physically present at the time and place the pesticide is applied” (7 USC § 136).
WSDA is also responsible for pesticide registration in Washington, and requirements for registration are found in this Act. The EPA is responsible for federal pesticide registration under the FIFRA and the Code of Federal Regulations (CFR), and, in most cases, pesticides cannot be registered in Washington unless they are first registered by the EPA. However, Washington also requires the registration of minimum risk pesticides that are exempt from federal regulation.

Most pesticides are toxic products, rather than by-products of industrial practices. Companies that wish to have their products registered in the state must pay a registration fee, and the state is making money by allowing for the use and sale of these toxic products. State registration, though, does not address the safety of these products. As long as users follow the requirements found on pesticide labels approved at the federal level, they are in compliance with the law. For all practical purposes, then, federally-required pesticide labels are the supreme law when it comes to determining acceptable pesticide exposure risks and protecting human health.

**AGENCY RULES: WASHINGTON ADMINISTRATIVE CODE (WAC)**

WISHA uses two types of standards to regulate workplace health and safety: horizontal standards and vertical standards. Horizontal standards are general safety and health standards that all employers must comply with, and vertical standards are industry-specific and apply to about thirty industries in Washington, including agriculture. In every industry but agriculture the vertical standards expand on and provide greater protection than the horizontal standards. In the case of agriculture, however, employers are exempt from a few of the horizontal standards, most notably the Safety and Health
Core Rules. The result is that farm workers are denied some of the protections afforded every other worker in the state. The WSDA also has agency rules that apply to agriculture, and, although most do not apply to farm workers and pesticide handlers, a few have bearing on the analysis in this thesis. A general discussion of the standards relevant to the analysis follows.


The General Occupational Health Standards apply to all employers in Washington and are meant to protect the health of employees and create healthy workplaces. This chapter includes requirements for protecting employees from carcinogens and air contaminants in general, as well as from specific carcinogens and air contaminants, such as benzene, lead, methylenedialinine, and thiram, which will be referenced in this paper. Some sections, such as the ones on general air contaminants and on respiratory protection, apply only to agriculture. (Requirements for respiratory hazards and respiratory protections for other industries can now be found in WAC 296-841 and -842.)


The Safety Standards for Construction are vertical standards that apply to any work place where construction, alteration, demolition, or maintenance or repair work is

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9 As part of its ongoing effort to incorporate all health and safety requirements into one volume, L&I, as directed by the legislature, has proposed to incorporate several of the requirements found in WAC 296-62 into WAC 296-307, the Safety Standards for Agriculture. Some sections that are applicable to industries other than agriculture have been incorporated into the Safety and Health Core Rules (WAC 296-800), the Respiratory Hazards rule (WAC 296-841), and the Respirators rule (WAC 296-842). The tentative effective date for the revised Safety Standards for Agriculture is February 1, 2005 (WA L&I 2004).
being carried out, no matter what the scale of the job site is. If any of the provisions of these vertical standards conflict with any of the horizontal health and safety standards, the provisions of the vertical standards prevail. The Safety Standards for Construction were chosen for comparison because, like the Safety Standards for Agriculture, they are vertical standards. Also, the construction industry features work sites that are diverse in nature and scale, and employs seasonal and Hispanic workers, thus presenting a “workplace” scenario that is more similar to those of agricultural establishments than most industries. In 2000, 1.4 million Hispanic workers made up seventeen percent of the construction workforce nationally, and only agriculture employs more Hispanic workers. Fifty-seven percent of Hispanic construction workers were not U.S. citizens in 2000 (Center to Protect Workers’ Rights 2002).


As required by the legislature, L&I developed rules specific to agriculture. The Safety Standards for Agriculture are vertical standards that apply to all agricultural operations in the state with one or more employees. These standards currently consist of thirty sections and encompass everything from hand tools and electricity to temporary worker housing and personal protective equipment. Although agriculture is exempt from some horizontal standards, the Safety Standards for Agriculture do provide many of the same protections that are afforded other workers. However, there are some fundamental differences and exceptions to the rules, and those are the primary focus of this research. The Pesticides (Worker Protection Standard) (WPS) section of the Standards (WAC 296-307-107 to -13055) contains the federal Worker Protection Standard as developed by the
Environmental Protection Agency (40 CFR, Part 170). A few revisions have been made to the federal language in order to be consistent with Washington law, but the state WPS must be at least as strict as the federal version. This section includes the primary rules for protecting workers from hazardous chemicals, though the Standards include additional sections that are relevant to this analysis. These will be discussed in greater detail in the following chapter.

**Safety and Health Core Rules, WAC 296-800 (2002)**

The Safety and Health Core Rules (Core Rules) are the fundamental health and safety rules that apply to most employers in the state. These 26 horizontal rules outline basic employer and employee responsibilities for safe workplaces and include rules for accident prevention programs, safety committees and safety meetings, first aid, personal protective equipment, portable ladders, and other rules that are relevant to most employers. The introduction to the chapter notes that the Core Rules “should cover almost everything small, nonmanufacturing employers need for a safe and healthful workplace” (WAC 296-800-100). Other employers, of course, must comply with these Core Rules, but they also may have to comply with industry-specific vertical standards or substance-specific rules, such as those for lead and benzene. Despite the fact that they are horizontal standards, the Safety and Health Core Rules do not apply to agriculture.

**Respiratory Standards, WAC 296-841 (2004)**

The Respiratory Standards apply to all employers whose employees are or could be exposed to a respiratory hazard. Employers are required to evaluate hazards and implement control measures. The rules contain a table that lists permissable exposure
limits (PELs) for air contaminants (WAC 296-841-20025, Table 3). The table also notes substances that may present a hazard if absorbed through the skin, and employers must determine if personal protective equipment is necessary to prevent dermal exposure to the hazard.

**Respirators, WAC 296-842 (2004)**

This new rule applies to all industries except agriculture. It requires employers to have a written respirator program and provide effective training, and it includes provisions for maintenance of respirators and medical evaluations. Because agriculture and all other industries in the state were regulated, until recently, under the same rules for respiratory protection, respirator requirements were not included as part of this analysis. However, given its importance in protecting workers from respiratory hazards, the rule is cited here.

**General Pesticide Rules, WAC 16-228 (2003)**

The General Pesticide Rules cover pesticide registration and licensing, as well as complaints, penalties, and recordkeeping requirements for dealers and applicators. A list of state restricted use pesticides is found here (WAC 16-228-1231), and this chapter also contains requirements for obtaining a pesticide applicator license. There are separate rules for private pesticide applicators (i.e. those applying pesticides to agricultural crops) and all other pesticide applicators, including commercial applicators, structural pest inspectors, and pest control consultants, among others.
Table 2 summarizes the laws discussed in this chapter, noting the regulatory agency, workers served, and intended protections. Clearly, a complex web of laws and regulations exists to attempt to protect workers from toxic hazards encountered on the job. The fundamental question that this research seeks to answer is whether that web provides equal protection and a safe and healthful working environment for agricultural workers as compared with other workers, as required by the Washington Constitution.

One obvious difference is that agricultural employers have been exempted from certain standards, such as the Core Rules. In other cases, protective standards exist but are preempted by federal pesticide labeling laws. In still other cases, there is a question as to whether existing safety and health standards are enforceable, and, if they are, if they are being enforced in a way that truly prevents occupational exposures to hazards. Are these special circumstances for agricultural employers sufficient to conclude that farm workers do not have equal protection under the law? A closer look is required, hence, the purpose of this research.
Table 2. Overview of regulatory structure for occupational safety and health rules.

<table>
<thead>
<tr>
<th>Hazard Addressed</th>
<th>Pesticides</th>
<th>Air Contaminants (General)</th>
<th>Air Contaminants (Specific)</th>
<th>Chemical and Respiratory Hazards (including some pesticides)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applicable agency rules</td>
<td>- Safety Standards for Agriculture (WISHA) (WAC 296-307)</td>
<td>- General Occupational Health Standards (Rules for: Respiratory Protection; Air Contaminants) (WISHA) (WAC 296-62, Parts E and H)</td>
<td>- General Occupational Health Standards (Rules for: Air Contaminants, Specific) (WISHA) (WAC 296-62, Part I)</td>
<td>- Safety and Health Core Rules (WAC 296-800)</td>
</tr>
<tr>
<td></td>
<td>- General Pesticide Rules (WSDA) (WAC 16-228)</td>
<td></td>
<td></td>
<td>- Respiratory Hazards (WAC 296-841)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>- Respirators (WAC 296-842) (All WISHA)</td>
</tr>
<tr>
<td>Applicable statutes</td>
<td>- WISH Act</td>
<td>- WISH Act</td>
<td>- WISH Act</td>
<td>- WISH Act</td>
</tr>
<tr>
<td></td>
<td>- Washington Pesticide Control Act</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Washington Pesticide Application Act</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enforcement agency</td>
<td>- L&amp;I</td>
<td>- L&amp;I</td>
<td>- L&amp;I</td>
<td>- L&amp;I</td>
</tr>
<tr>
<td>Industry covered</td>
<td>- Agriculture</td>
<td>- Agriculture</td>
<td>- All industries (exception: the lead rule does not apply to agriculture or construction)</td>
<td>- All industries except agriculture</td>
</tr>
<tr>
<td></td>
<td>- Pesticide applicator businesses</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Specific hazard covered</td>
<td>- General use and restricted use pesticides</td>
<td>- Any of hundreds of substances listed as respiratory or dermal hazards in the Air Contaminants rule.</td>
<td>- Thiram, lead, benzene, formaldehyde, MDA</td>
<td>- Any of hundreds of substances listed as respiratory or dermal hazards in the Respiratory Hazards rule.</td>
</tr>
<tr>
<td>Workers of concern</td>
<td>- Farm workers</td>
<td>- Any agricultural employee, including farm workers and pesticide handlers</td>
<td>- Workers in any industry where these five specific substances are used</td>
<td>- Any non-agricultural employee who is or could be exposed to these substances</td>
</tr>
</tbody>
</table>
CHAPTER 3

SCOPE AND METHODOLOGY

The purpose of this research is to begin to examine the question of whether or not farm workers in Washington State receive equal protection under the law, particularly with regard to occupational protections from toxic hazards. In order to make such a determination, this paper primarily makes facial comparisons between various health and safety laws, with an occasional reference to how those laws are applied and enforced.

In order to refine my research topic, I conducted preliminary semi-standardized interviews with employees of the Washington State Department of Agriculture (WSDA), pesticide reform activists, farm worker advocates and lawyers, a farm worker union representative, scientists, and a public health educator with the Washington Department of Health (DOH). These interviews helped me understand the legal framework that protects workers in the state from occupational hazards. They also helped me identify areas of concern and satisfaction within that framework regarding protecting farm workers from toxins and other hazards. I refined my understanding of occupational health and safety laws and their strengths and weaknesses by reviewing the federal Occupational Safety and Health Act, the federal Worker Protection Standard (WPS) for agriculture, and literature related to implementation of these laws.

Once I understood that Washington has primacy for implementing and enforcing both U.S. Occupational Safety and Health Administration (OSHA) rules and the federal Worker WPS, I reviewed Washington statutes and rules that pertain to occupational health and safety. Based on a thorough review of the Safety Standards for Agriculture
(WAC 296-307), the General Occupational Health Standards (WAC 296-62), and the Safety and Health Core Rules (296-800), as well as my interviews and a literature review, I identified seven primary areas of concern within the Safety Standards for Agriculture, and with the WPS in particular. These areas of concern are: inadequate training, lack of engineering controls, lack of specific exposure limits, poor enforcement, potential for retaliation if an exposure is reported, the inability of the standards to protect workers from the most toxic pesticides, and general safety and sanitation concerns for farm workers.

To address these concerns and determine whether all workers receive equal protection under the law, I next identified the categories of legal responsibility that would serve as a good basis for comparison between industry and agriculture (Table 3). Each category includes several dimensions for comparison. These are dimensions that an employer may need to address in order to fulfill his or her legal obligations with regard to preventing toxic exposures in the workplace.

From these seven major areas of legal responsibility, I selected two areas on which to focus my research: (1) training and right to know, and (2) engineering controls and personal protective equipment. I selected these two areas because they emerged as primary areas of concern during my preliminary interviews and literature review and because I necessarily had to limit the scope of my study. Enforcement also emerged as a primary area of concern. However, given the difficulty and complexity of accessing enforcement records, that several rules related to agricultural health and safety are simply unenforceable, and that some analysis of enforcement was already being done, I decided to focus on the two primary areas of concern cited previously.

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<table>
<thead>
<tr>
<th>Legal Responsibilities</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Training and Right to Know</td>
<td>• Frequency</td>
</tr>
<tr>
<td></td>
<td>• Degree of chemical specificity</td>
</tr>
<tr>
<td></td>
<td>• Training requirements for trainers</td>
</tr>
<tr>
<td></td>
<td>• Documentation requirements for training</td>
</tr>
<tr>
<td></td>
<td>• Access to chemical information</td>
</tr>
<tr>
<td></td>
<td>• Age of workers</td>
</tr>
<tr>
<td>Engineering controls and PPE (basic principles of industrial hygiene)</td>
<td>• Closed mixing/loading systems; closed cabs for applications</td>
</tr>
<tr>
<td></td>
<td>• Personal protective equipment (PPE)</td>
</tr>
<tr>
<td></td>
<td>- Chemical suits</td>
</tr>
<tr>
<td></td>
<td>- Respirators</td>
</tr>
<tr>
<td></td>
<td>- Gloves</td>
</tr>
<tr>
<td></td>
<td>- Goggles</td>
</tr>
<tr>
<td></td>
<td>- Aprons</td>
</tr>
<tr>
<td></td>
<td>- Boots</td>
</tr>
<tr>
<td></td>
<td>- Etc.</td>
</tr>
<tr>
<td></td>
<td>• Decontamination change rooms</td>
</tr>
<tr>
<td></td>
<td>• Showers</td>
</tr>
<tr>
<td></td>
<td>• Removal/washing standards for PPE</td>
</tr>
<tr>
<td>What happens when an exposure occurs</td>
<td>• Workers’ compensation benefits</td>
</tr>
<tr>
<td></td>
<td>• Maintenance of position, salary and seniority</td>
</tr>
<tr>
<td></td>
<td>• Medical assistance</td>
</tr>
<tr>
<td></td>
<td>• Burden of proof</td>
</tr>
<tr>
<td></td>
<td>• Adequacy of investigation</td>
</tr>
<tr>
<td></td>
<td>- Availability of bilingual investigators</td>
</tr>
<tr>
<td></td>
<td>- Chemical sampling</td>
</tr>
<tr>
<td></td>
<td>- Interview methodology used with employers</td>
</tr>
<tr>
<td></td>
<td>- Interview methodology used with employees</td>
</tr>
<tr>
<td></td>
<td>- Fate of undocumented workers</td>
</tr>
<tr>
<td>Specific exposure limits</td>
<td>• Blood levels</td>
</tr>
<tr>
<td></td>
<td>• Inhalation levels</td>
</tr>
<tr>
<td></td>
<td>• Dermal levels</td>
</tr>
<tr>
<td></td>
<td>• Available science</td>
</tr>
<tr>
<td></td>
<td>• Protection for children</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Legal Responsibilities</th>
<th>Dimensions</th>
</tr>
</thead>
</table>
| Enforcement                                | • Access to information  
|                                            | • Number of inspectors  
|                                            | • Frequency of inspections  
|                                            | • Frequency and amount of fines  
|                                            | • Age of workers  
|                                            | • Recordkeeping requirements  
| Protection from the most toxic chemicals   | • Drift regulations  
|                                            | • Detectable toxic residues in soil/dust/workplace  
|                                            | • Registration requirements  
| General safety and sanitation              | • Restrooms  
|                                            | • Drinking water  
|                                            | • Handwashing facilities  
|                                            | • Rest and meal breaks  
|                                            | • Requirements for preventing heat stress  
|                                            | • Ladders  
|                                            | • Electricity  
|                                            | • Safety committees  
|                                            | • First aid and accident prevention programs  

Next, I examined the Safety Standards for Agriculture in detail and identified all rules that pertain to pesticide training and information, engineering controls, and personal protective equipment. The Pesticides (Worker Protection Standard) section contained within the agricultural standards applies only to hired farm workers and pesticide handlers; it excludes farm owners and their immediate family members, and private and commercial pesticide applicators licensed by the state (WAC 296-307). Within the WPS, there are two sets of standards: one for workers and one for pesticide handlers. According to the WPS:

‘Worker’ means any person, including a self-employed person, who is employed for any type of compensation and who is performing activities
relating to the production of agricultural plants on an agricultural establishment to which WAC 296-307-120 [Standards for workers] applies. (WAC 296-307-11005)

Handlers are also workers. “Handler” refers to any person who is employed for compensation by an agricultural establishment or a commercial pesticide handling establishment who is mixing, loading, transferring, or applying pesticides. The term handler also covers employees doing numerous other tasks, such as entering a greenhouse before the inhalation exposure level listed on the pesticide label has been met or entering a treated area to remove tarpaulins after a soil fumigant has been applied (WAC 296-307-11005). In addition to reviewing the agricultural standards, I looked at the General Occupational Health Standards to see if there were additional health and safety requirements pertinent to agricultural employers (WAC 296-62). Although most of the rules contained therein apply to all workers in the state, as noted in the previous chapter the rules are in the process of being changed; the Respiratory Protection and general Air Contaminant rules now apply only to agriculture (WAC 296-62-071 to -07295; WAC 296-62-075 to -07515).

After identifying key rules that apply to pesticide training and protections for workers, my original intention was to compare them with specific rules that apply to another large industry in the state, such as aerospace manufacturing (WSES, no date). However, the way the standards are structured made such an approach infeasible. WISHA has primary responsibility for ensuring the health and safety of all workers, but both horizontal and vertical standards are used. There are vertical standards that apply specifically to agriculture but not to the aerospace industry. Industries such as construction, mining, laundries, firefighting, and ship building, for example, do have
vertical standards. The crucial difference, though, is that the existence of vertical standards does not give those industries a blanket exemption from the Core Rules and other industry-wide rules; however, in the case of agriculture the vertical standards do exempt the industry from the Core Rules. Even if I had elected to compare the agricultural standards purely with another industry's vertical standards, for most health and safety topics I would have been comparing agricultural standards with the Core Rules and the Respiratory Hazards rule, which also applies to all industries except agriculture. Another crucial difference is that other vertical standards address tasks that are specific to that industry. In the case of agriculture, neither the application of pesticides nor worker exposure to toxic substances is particular to the industry, though the work environment may be somewhat unique.

Given the difficulties of an industry-to-industry comparison, I chose instead to compare the relevant agricultural health and safety standards with several other general industry standards in order to illustrate the different approaches taken with regard to protection from occupational exposures to toxic substances. As noted above, these standards apply to all workers and include the Safety and Health Core Rules, Respirators, and the standard for Respiratory Hazards, which includes numerical exposure limits for air contaminants for all industries except agriculture (WAC 296-800, -842, -841).

Because training for all pesticide applicators who are not considered handlers is regulated by the WSDA, I also compared the agricultural standards for pesticide handlers.

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10 It is interesting to note that both the General Occupational Health Rules and the Safety and Health Core Rules refer to health, whereas the title for the agricultural standards refers only to safety.
with the requirements of the Washington Pesticide Application Act (RCW 17.21), the Washington Pesticide Control Act (RCW 15.58), and the General Pesticide Rules (WAC 16-228). In this case, the bulk of the requirements pertaining to my study are included in the statutes rather than the WSDA agency rules. All pesticide applicators must follow pesticide labeling requirements with regard to PPE; therefore, my comparison with these rules extends only to legal responsibilities related to training.

Finally, I compare the agricultural standards with the individual standards for specific hazardous substances: benzene, lead, methylenedianiline (MDA), and thiram. These individual standards are included in the Air Contaminants (Specific) section of the General Occupational Health Standards, which apply to all workers in the state (WAC 296-62). Thiram is a fungicide and is the only pesticide registered in the state that is regulated by occupational health and safety standards that are substance-specific. Benzene, lead, and MDA are used for a wide variety of industrial purposes and overexposure to any of the three can have severe consequences on an individual’s health. Specific, detailed rules designed to educate workers and protect them from overexposure to these three hazardous substances exist primarily because such rules are required under OSHA. However, numerous pesticides are also extremely hazardous, as I will discuss. By comparing these specific standards with the rules for agriculture, I sought to determine whether agricultural employees are receiving equal protection under the law with regard

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11 Formaldehyde is also regulated as a specific air contaminant (WAC 296-62-07540). Also, about 20 substances used in industry are regulated as general or specific carcinogens; however, OSHA is the source of these rules, so not a single pesticide is among them (WAC 296-62-073 to -07477). Due to the limited scope of this research, specie requirements for carcinogens are not discussed in this paper.

12 The Thiram rule has been in effect since 1981, before the Safety Standards for Agriculture and the federal WPS were enacted and before PELs for thiram were included in the Air Contaminants section of the General Occupational Health Standards (WAC 296-62-075).
to hazard education and protection from exposure to hazardous substances. Following a brief overview of each of these specific toxins, I will further explain their relevance to my particular study.

**Thiram**

In addition to being used in pesticide formulations, thiram is used as a vulcanizing agent in the rubber industry. In agriculture, thiram is used extensively to treat seeds and also as a foliar treatment on apples (Thiram 2004). It is a high volume chemical, with production in the U.S. exceeding one million pounds annually (Environmental Defense 2003). The acute rating from the EPA product label for thiram is slightly toxic. It is not known if thiram is carcinogenic, but it is both a reproductive and a developmental toxin according to EPA’s Toxic Release Inventory (Orme and Kegley 2000-2004). Despite the fact that thiram is the only pesticide in the state to be regulated individually, only a few references to the Thiram rule will be made, where relevant, in this analysis. The rule is far less detailed than the rules for other specific air contaminants, and the WPS now provides *most* of the protections originally outlined in the Thiram rule (WAC 296-62-07519).

**Benzene**

Benzene is an aromatic hydrocarbon that was found both as an active ingredient and an “inert” ingredient in pesticide formulations until the late 1980s, but it is not currently registered for use. However, benzene may still be found in pesticides as an impurity resulting from the manufacturing process. Benzene has been used extensively as a gasoline additive and as a solvent in the chemical and drug industries (ATSDR 1997).
Exposure may occur through inhalation or dermal exposure. Benzene is a known carcinogen and a developmental and reproductive toxin.

**Lead**

Lead is a naturally occurring metal with many industrial uses. It is used in the production of batteries, medical equipment, electronic circuitry, and ammunition. The amount of lead used in many products, such as paint, solder, and gasoline, has been reduced or eliminated over the past three decades due to concerns about the impact of lead and lead compounds on human health and the environment (ATSDR 1999).

Exposure to lead can occur through ingestion or inhalation. Lead poisoning can affect almost every system of the body; is known as a developmental, neurological, and reproductive toxin; and is considered by EPA to be a probable human carcinogen.

Although the negative health impacts of lead overexposure were known for decades, if not centuries, a significant body of scientific evidence “proving” such impacts was not available until the 1970s (Lewis 1985). Today, because excessive exposure to lead is a leading cause of workplace illness, OSHA has made reducing lead exposure a high strategic priority. Because the states cannot implement standards that are weaker than federal occupational health and safety standards, Washington also has strong standards to protect workers from exposure to lead (WAC 296-62-07521).

**Methylenedianiline (MDA)**

MDA is produced commercially by the condensation of aniline and formaldehyde. In the construction industry, MDA is used as a corrosion inhibitor and

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13 However, in 1927, Surgeon General Hugh Cumming was concerned enough about adding tetraethyl lead to gasoline that he set a voluntary mixing standard for the oil industry to follow. Despite his early concerns, lead was not completely eliminated from gasoline in the U.S. until 1996 (ATSDR 1999).
primarily sprayed on exterior surfaces, such as concrete structures, floors and pipes. Exposure may occur through inhalation, ingestion, dermal absorption, or eye contact.

MDA is an animal carcinogen and a possible human carcinogen (ATSDR 1998). Chronic exposure to MDA may cause damage to the liver, kidneys, blood, and spleen (WAC 296-62-076 WAC). In Washington, detailed health and safety rules for MDA exist, and they are cited specifically in the vertical standards for the construction industry (WAC 296-076 and 296-15).

The negative health implications of overexposure to benzene, lead, and MDA are well documented, and such documentation is a primary reason why OSHA and WISHA now require employers who use these substances to follow strict safety rules to protect their employees. In addition, employers must also identify every other hazardous air contaminant that is used in the workplace and observe set short term exposure limits (STELs) for each individual contaminant. If dermal exposure to such contaminants is identified as a hazard, employees must also provide protection against dermal exposure.

As with the specific substances cited above, as well as many other workplace toxins, overexposure to highly toxic pesticides can also result in a litany of illnesses and health problems. Many agricultural pesticides used in Washington are known carcinogens, teratogens, or developmental or reproductive toxins (Table 4). Exposure to agricultural chemicals may also cause symptoms of acute toxicity, including skin rashes, dizziness, nausea, and vomiting. Despite these known hazards, there are no health and safety rules for individual pesticides, with the exception of thiram, nor is there any reference to specific exposure limits in the WPS. Employers must comply with
requirements for personal protective equipment, respirators, and restricted-entry intervals as indicated on the label of a particular pesticide; however, the labels do not include permissible exposure limits (PELs) and neither pesticide handlers nor other workers are required to receive chemical-specific information about each pesticide used at any given agricultural establishment. Rather than measuring actual exposure, agricultural employers are considered to be in compliance – and assumed to be protecting their workers from overexposure without any required use of PPE – as long as they observe the restricted-entry interval on a given pesticide label. However, restricted-entry intervals are not necessarily set to protect human health and this method does not take into account exposure to multiple pesticides. Recent studies indicate that orchard thinners, harvesters, and pruners are at particularly high risk for pesticide exposure despite the observance of restricted-entry intervals (Coronado et al. 2004; Simcox et al. 1999). Other industries in Washington are required to protect their workers from dermal exposure based on numeric standards. By citing science related to pesticide exposure as I compare the agricultural rules with those for lead, benzene, and MDA, I hope to illustrate how workers who use those substances are receiving greater protection than farm workers who also are using extremely hazardous substances in the workplace.

Finally, I contrast the requirements of the Respiratory Hazards rule, which sets exposure limits for hazardous substances, with the lack of regulation required of pesticide registrants (i.e., chemical manufacturers). Almost all pesticide formulations contain “inert” ingredients. Despite their benign label, these ingredients are not chemically, biologically, or toxicologically inert, and many are also found as active ingredients in pesticides. These so-called inert ingredients commonly make up twenty, fifty, eighty, or
even ninety-five percent of a pesticide product's ingredients by weight, yet, for the most part, these ingredients do not have to be identified on pesticide labels. Trade secret laws protect pesticide manufacturers from having to disclose the presence of most inert ingredients; however, the identity of some inert ingredients can be found out through Freedom of Information Act requests.

Through these methods of comparison, this thesis will begin to address the question of whether farm workers, as a class, receive equal protection under the law. Comparisons do not exist for all administrative rules, and in the following section rules and industries are only cited as appropriate. Also, this study is not comprehensive and it is important to remember that many other dimensions of the laws discussed here are relevant to the issue of equal protection. However, by focusing on training requirements and provisions for engineering controls and PPE, I hope to address some of the areas of greatest concern for farm worker health and safety.
Table 4: Pesticides used in Washington and associated toxicity and health effects. Washington air contaminant and dermal hazard designation are also noted.a, b

<table>
<thead>
<tr>
<th>Active Ingredient and CAS Number</th>
<th>WA Regulated Air Contaminant</th>
<th>WA Dermal Hazard</th>
<th>EPA Acute Toxicity Rating</th>
<th>Carcinogen</th>
<th>Cholinesterase Inhibitor</th>
<th>Developmental or Reproductive Toxin</th>
<th>Suspected Endocrine Disruptor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alachlor 15972-60-8</td>
<td>No</td>
<td>No</td>
<td>Slight</td>
<td>Likely (high doses)(^d) Yes(^e,f)</td>
<td>No</td>
<td>Yes(^g)</td>
<td>Yes</td>
</tr>
<tr>
<td>Atrazine 1912-24-9</td>
<td>Yes</td>
<td>No</td>
<td>Slight</td>
<td>Not likely(^d) Yes(^g)</td>
<td>No</td>
<td>Not listed</td>
<td>Yes</td>
</tr>
<tr>
<td>Azinphos-methyl 86-50-0</td>
<td>Yes</td>
<td>Yes</td>
<td>Highly toxic</td>
<td>Not likely(^d) Yes(^f)</td>
<td>Yes</td>
<td>Not listed</td>
<td>Not listed</td>
</tr>
<tr>
<td>Captan 133-06-2</td>
<td>Yes</td>
<td>No</td>
<td>Highly toxic</td>
<td>Probable(^d) Yes(^f)</td>
<td>No</td>
<td>Not listed</td>
<td>Not listed</td>
</tr>
<tr>
<td>Carbaryl 63-25-2</td>
<td>Yes</td>
<td>No</td>
<td>Moderately toxic</td>
<td>Possible(^d) Yes(^f)</td>
<td>Yes</td>
<td>Not listed</td>
<td>Yes</td>
</tr>
<tr>
<td>Chlorothalonil 1897-45-6</td>
<td>No</td>
<td>No</td>
<td>Highly toxic</td>
<td>Likely(^d) Yes(^f)</td>
<td>No</td>
<td>Not listed</td>
<td>Not listed</td>
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<tr>
<td>Chlorpyrifos 2921-88-2</td>
<td>Yes</td>
<td>Yes</td>
<td>Moderately toxic</td>
<td>Not likely(^d) Yes(^f)</td>
<td>Yes</td>
<td>Not listed</td>
<td>Yes</td>
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<tr>
<td>Diazinon 333-41-5</td>
<td>Yes</td>
<td>Yes</td>
<td>Moderately toxic</td>
<td>Not likely(^d) Yes(^f)</td>
<td>Yes</td>
<td>Yes(^g)</td>
<td>Not listed</td>
</tr>
<tr>
<td>DCPA 1861-32-1</td>
<td>No</td>
<td>No</td>
<td>No consensus value</td>
<td>Possible(^d) No</td>
<td>No</td>
<td>Not listed</td>
<td>Not listed</td>
</tr>
<tr>
<td>Dimethenamid-P 163515-14-8</td>
<td>No</td>
<td>No</td>
<td>Moderately toxic</td>
<td>Not listed(^d) No</td>
<td>Not listed</td>
<td>Not listed</td>
<td>Not listed</td>
</tr>
</tbody>
</table>

\(^a\) Pesticide use data gleaned from the agricultural statistics (USDA 2002-2003); this table is not comprehensive, but presents a sample of pesticides used in WA.  
\(^b\) Unless otherwise noted, all other data in this table is from Pesticide Action Network's Pesticides Database (Orme and Kegley 2002-2004).  
\(^c\) Suspected endocrine disruptors appear on at least two of the following: Illinois EPA list, Keith list, Colborn list, or Benbrook list.  
\(^d\) Human carcinogenic potential according to the EPA's List of Chemicals Evaluated for Carcinogenic Potential.  
\(^e\) U.S. Toxic Release Inventory carcinogen.  
\(^f\) California Proposition 65 known carcinogen.  
\(^g\) U.S. Toxic Release Inventory developmental toxin.
<table>
<thead>
<tr>
<th>Active Ingredient and CAS Number</th>
<th>WA Regulated Air Contaminant</th>
<th>WA Dermal Hazard</th>
<th>EPA Acute Toxicity Rating</th>
<th>Carcinogen</th>
<th>Cholinesterase Inhibitor</th>
<th>Developmental or Reproductive Toxin</th>
<th>Suspected Endocrine Disruptor&lt;sup&gt;h&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimethoate 60-51-5</td>
<td>No</td>
<td>No</td>
<td>Moderately toxic</td>
<td>Possible&lt;sup&gt;d&lt;/sup&gt;</td>
<td>Yes</td>
<td>Yes&lt;sup&gt;g&lt;/sup&gt;</td>
<td>Not listed</td>
</tr>
<tr>
<td>Disulfoton 298-04-4</td>
<td>Yes</td>
<td>Yes</td>
<td>Highly toxic</td>
<td>Not likely&lt;sup&gt;d&lt;/sup&gt;</td>
<td>Yes</td>
<td>Not listed</td>
<td>Not listed</td>
</tr>
<tr>
<td>Endosulfan 115-29-7</td>
<td>Yes</td>
<td>Yes</td>
<td>Highly toxic</td>
<td>Not likely&lt;sup&gt;d&lt;/sup&gt;</td>
<td>No</td>
<td>Not listed</td>
<td>Yes</td>
</tr>
<tr>
<td>Ethylene Oxide 75-21-8</td>
<td>Yes</td>
<td>No</td>
<td>Highly toxic</td>
<td>Probable&lt;sup&gt;d&lt;/sup&gt;</td>
<td>Yes&lt;sup&gt;f&lt;/sup&gt;</td>
<td>No</td>
<td>Not listed</td>
</tr>
<tr>
<td>Mancozeb 8018-01-7</td>
<td>No</td>
<td>No</td>
<td>No consensus value</td>
<td>Probable&lt;sup&gt;d&lt;/sup&gt;</td>
<td>Yes&lt;sup&gt;8,9&lt;/sup&gt;</td>
<td>No</td>
<td>Yes&lt;sup&gt;g,l&lt;/sup&gt;</td>
</tr>
<tr>
<td>Metam sodium 6734-80-1</td>
<td>No</td>
<td>No</td>
<td>Highly toxic</td>
<td>Probable&lt;sup&gt;d&lt;/sup&gt;</td>
<td>Yes&lt;sup&gt;f&lt;/sup&gt;</td>
<td>No</td>
<td>Yes&lt;sup&gt;g,l&lt;/sup&gt;</td>
</tr>
<tr>
<td>Myclobutanil 88671-89-0</td>
<td>No</td>
<td>No</td>
<td>No consensus value</td>
<td>Unlikely&lt;sup&gt;d&lt;/sup&gt;</td>
<td>No</td>
<td>Yes&lt;sup&gt;g,l,k&lt;/sup&gt;</td>
<td>Not listed</td>
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<tr>
<td>Pendimethalin 40487-42-1</td>
<td>No</td>
<td>No</td>
<td>Slightly toxic</td>
<td>Possible&lt;sup&gt;d&lt;/sup&gt;</td>
<td>No</td>
<td>Not listed</td>
<td>Not listed</td>
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<tr>
<td>Permethrin 52645-53-1</td>
<td>No</td>
<td>No</td>
<td>Slightly toxic</td>
<td>Possible&lt;sup&gt;d&lt;/sup&gt;</td>
<td>No</td>
<td>Not listed</td>
<td>Yes</td>
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<tr>
<td>Phosmet 732-11-6</td>
<td>No</td>
<td>No</td>
<td>Moderately toxic</td>
<td>Suggestive&lt;sup&gt;d&lt;/sup&gt;</td>
<td>Yes</td>
<td>Not listed</td>
<td>Not listed</td>
</tr>
<tr>
<td>Resmethrin 10453-86-8</td>
<td>No</td>
<td>No</td>
<td>Slightly toxic</td>
<td>Not listed&lt;sup&gt;d&lt;/sup&gt;</td>
<td>No</td>
<td>Yes&lt;sup&gt;g,k,l&lt;/sup&gt;</td>
<td>Not listed</td>
</tr>
<tr>
<td>Simazine 122-34-9</td>
<td>No</td>
<td>No</td>
<td>Slightly toxic</td>
<td>Possible&lt;sup&gt;d&lt;/sup&gt;</td>
<td>No</td>
<td>Yes&lt;sup&gt;f&lt;/sup&gt;</td>
<td>Not listed</td>
</tr>
<tr>
<td>Trifluralin 1582-09-8</td>
<td>No</td>
<td>No</td>
<td>Slightly toxic</td>
<td>Possible&lt;sup&gt;d&lt;/sup&gt;</td>
<td>No</td>
<td>Not listed</td>
<td>Yes</td>
</tr>
</tbody>
</table>

<sup>h</sup> Suspected endocrine disrupters appear on at least two of the following: Illinois EPA list, Keith list, Colborn list, or Benbrook list.

<sup>1</sup> California Proposition 65 female reproductive toxin.

<sup>2</sup> U.S. Toxic Release Inventory reproductive toxin.

<sup>3</sup> California Proposition 65 male reproductive toxin.

<sup>4</sup> California Proposition 65 developmental toxin.
CHAPTER 4

FINDINGS

This chapter will compare Washington occupational safety and health standards that have direct bearing on the two categories chosen for comparison: right to know and training; and engineering controls and personal protective equipment (PPE). The first section of this chapter will examine agricultural standards related to training and a worker’s right to know about toxic substances used in the workplace and compare them with standards required in other industrial settings. With regard to right to know and training, this chapter will address: notification and signage requirements, frequency of training, degree of chemical specificity taught during training, certification requirements for trainers, training documentation requirements for employers, and access to information about toxic substances and exposures in the workplace. The second part of this chapter will compare regulations pertaining to the use of engineering controls and PPE in workplaces where employees may be exposed to hazardous substances. It will also address post-application dimensions that can influence exposure, such as requirements for decontamination rooms and provisions for laundering. Though the engineering and PPE requirements are addressed second, the legal comparisons made in that section provide the strongest support for an equal protection argument.

RIGHT TO KNOW AND TRAINING

Washington’s occupational health and safety standards require that employers provide safety training, including access to material safety information, for workers who
may be exposed to toxic or hazardous substances in the workplace. However, the quality and degree of training and information provided varies across industries and, to some extent, substances.

**Notification and Signage**

**Agricultural Pesticides**

The Worker Protection Standard (WPS) establishes requirements for agricultural workers and pesticide handlers that serve as one layer of protection to prevent workers from being exposed to excessive levels of toxic pesticides. Workers have the right to know when a pesticide application is taking place; importantly, the WPS mandates that during a pesticide application no one other than an appropriately trained and equipped handler is allowed or may be directed to enter the area being treated.

Agricultural employers are required to inform workers about pesticide applications according to pesticide product labeling. The federally-mandated labeling may require oral notification, the posting of warning signs, or both. However, notice of a pesticide application need not be given to a worker if the agricultural employer can assure that the employee will not enter or work in the treated area, or in any area within one-quarter mile of the treated area, during the application period or during any restricted-entry interval. These regulations are meant to protect farm workers from direct exposures, but they do not ensure protection for workers or their families, particularly those who live near the fields (Curl et al. 2002, Simcox et al. 1995). Other regulations require that farm operators follow pesticide label instructions when using pesticides in and around housing, but they do not require that farm worker housing be located more than one quarter mile...
from agricultural fields (WAC 296-307-16175). This presents an inherent problem: if a
grower tries to follow the law, and if farm workers or their families are living within one
quarter mile of a field, where are workers supposed to live and sleep when pesticide
applications occur and restricted-entry intervals are in effect? The families of farm
owners are also at increased risk of exposure if their dwelling is located close to fields or
orchards where pesticide applications are taking place. One study in Washington that
looked at the likely exposure of children in agricultural families to agricultural chemicals
stated that the majority of farm family residences sampled (which included 22 farm
worker residences) were located within 200 feet of an operating apple or pear orchard
(Simcox et al. 1995).

The WPS also includes several specific requirements for posted warning signs,
including requirements for size, background colors, wording, and graphics. Below is an
example (included in the standards) of a warning sign that meets the stipulated
requirements, with the exception of the overall size requirement:

![Figure 1. Pesticide Application Warning Sign (WAC 296-307-12025)]
There is no requirement that posted warning signs include the specific name of the pesticide, the date of application, or the restricted-entry interval for the applied pesticide. The regulations do little to encourage employers to add such information, stating “Additional information such as the name of the pesticide and the date of application may appear on the warning sign if it does not detract from the appearance of the sign or change the meaning of the required information” (WAC 296-307-12025 (3)(a)).

The signs must be visible from all usual points of worker entry, including along borders adjacent to labor camps, at each access road, and at each footpath or walking route that enters the treated area. However, if there are no usual points of worker entry, employers are allowed to post the signs only at the corners of the treated areas or in another location that affords maximum visibility.

Regulations for oral warnings differ slightly from those for posted warnings. Oral warnings must inform workers of the location and description of the treated area. In addition, such warnings must include the time during which entry is restricted and provide instructions not to enter the treated area until after the restricted-entry interval has expired. Oral warnings provide slightly more detailed information to workers but, as with posted warnings, they are not required to provide workers with chemical-specific information.

The WPS does require that, when workers are present, if a pesticide has been used on the agricultural establishment or a restricted-entry interval has been in effect within the last thirty days, then specific information about the pesticides used, including the active ingredient and restricted-entry interval, must be displayed in a central location (WAC 296-307-12030). The date, time, and area to be treated must also be included.

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Most employers may make this information readily available, but there is no prohibition against posting this information in a manager’s office or other locations where intimidation could prevent farm workers from accessing the information. Also, workers may have no knowledge of when new information is posted, since employers are not required to inform their employees of changes to the central posting information. On larger farms, one central posting location is not adequate to inform all employees about specific pesticides used on that establishment.

A pesticide safety poster must be displayed in the same location. Interestingly, the poster puts a lot of responsibility on workers, stating: “Avoid getting on your skin or into your body any pesticides that may be on plants and soil, in irrigation water, or drifting from nearby applications” (WAC 296-307-12045(2)(a)(i) It is hardly possible for an individual worker to control drift, and workers who are supposed to avoid getting pesticides on plants onto their skin are generally not provided with PPE.

**General Chemical and Respiratory Hazards**

The Respiratory Hazards rule and the Core Rules do not specifically require posting of signs when hazardous substances are in use in the workplace. However, employers are required to inform employees about which hazardous chemicals are used in the workplace (WAC 296-800) and to determine if any employee is or could be exposed to an airborne substance that exceeds a permissable exposure limit (PEL) (WAC 296-841). Employers must institute controls to meet PELs, but if an employee’s exposure level exceeds the PEL, employers must inform the employee within five business days. Of course, the only way to know if the PEL is being exceeded is by taking air samples or conducting medical monitoring.
Specific Air Contaminants

WISHA standards for specific air contaminants have stricter, more informative requirements regarding signage. For example, in locations (with the exceptions of farms and construction sites) where employees may be exposed to levels of lead higher than the PEL, employers must post the following warning sign:

WARNING
LEAD WORK AREA
POISON
NO SMOKING OR EATING
(WAC 296-62-07521, 14(b)(i))

In work areas regulated for benzene, signs must read:

DANGER
BENZENE
CANCER HAZARD
FLAMMABLE-NO SMOKING
AUTHORIZED PERSONNEL ONLY
RESPIRATOR REQUIRED
(WAC 296-62-07523, 10(a)(i))

In industries where workers may be exposed to methylenedianiline (MDA), employers must display the following sign at the entrances or accessways to regulated areas:

Danger
MDA
May Cause Cancer Liver Toxin
Authorized Personnel Only
Respirators And Protective Clothing
May be Required To Be Worn In This Area
(WAC 296-62-07621 (l)(a))

All of these examples refer to required signage for specific air contaminants as noted under the General Occupational Health Standards. Similar substance-specific requirements exist for other contaminants and suspected carcinogens. Although the signs vary in the degree of information they provide, at a minimum each sign informs
employees about the specific substance being regulated. Table 5 provides a summary of notification and signage requirements covered thus far.

One practical reason for different posting requirements for agriculture is that it is quite difficult to post signs at every point of entry to an unenclosed space, such as a field or orchard. Exclusion from chemically-treated fields serves as the primary protective measure for farm workers, yet in many other industrial occupations workers cannot be excluded from the location where chemicals are used or applied. If we accept that there are inherent differences between an agricultural field and other industrial settings, the key questions really become those of enforcement and validity of labeling requirements: are farm workers being excluded from treated fields at all times and are restricted-entry intervals and personal protective equipment requirements strong enough to protect worker health?
<table>
<thead>
<tr>
<th>Dimension</th>
<th>Workers</th>
<th>Substance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Farm Workers&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Benzene</td>
</tr>
<tr>
<td></td>
<td>Pesticide Handlers&lt;sup&gt;b&lt;/sup&gt;</td>
<td>Lead</td>
</tr>
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<td></td>
<td>General Chemical and Respiratory Hazards</td>
<td>MDA</td>
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<td>Notification of Use</td>
<td>Right to know about pesticide applications</td>
<td>Right to know about its use in the workplace</td>
</tr>
<tr>
<td></td>
<td>Right to know about pesticide applications</td>
<td>Right to know about its use in the workplace</td>
</tr>
<tr>
<td></td>
<td>Right to know about hazardous substance use</td>
<td>Right to know about its use in the workplace</td>
</tr>
<tr>
<td></td>
<td>Right to know about its use in the workplace</td>
<td></td>
</tr>
<tr>
<td>Signage</td>
<td>Central posting of application required</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>Not pesticide specific</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No date of application</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No re-entry interval</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No requirements based on farm size</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Specific information must be posted in a</td>
<td></td>
</tr>
<tr>
<td></td>
<td>central location</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Central posting of application required</td>
<td>Chemical specific</td>
</tr>
<tr>
<td></td>
<td>Not pesticide specific</td>
<td>Posted at entry to use location</td>
</tr>
<tr>
<td></td>
<td>No date of application</td>
<td>Posting required at all times</td>
</tr>
<tr>
<td></td>
<td>No re-entry interval</td>
<td>References respirators</td>
</tr>
<tr>
<td></td>
<td>No requirements based on farm size</td>
<td>Authorized personnel only</td>
</tr>
<tr>
<td></td>
<td>Specific information must be posted in a</td>
<td></td>
</tr>
<tr>
<td></td>
<td>central location</td>
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<tr>
<td></td>
<td>Central posting of application required</td>
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<td>Not pesticide specific</td>
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<td>No date of application</td>
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<td>No re-entry interval</td>
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<td>No requirements based on farm size</td>
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<td>Specific information must be posted in a</td>
<td></td>
</tr>
<tr>
<td></td>
<td>central location</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup> Farm worker: any person employed for compensation who is performing activities related to agricultural production, with the exception of crop advisors.

<sup>b</sup> Pesticide handler: any person employed for compensation who is working directly with pesticides for the purpose of agricultural production. This term excludes private applicators (generally, farm owners) and licensed commercial pesticide applicators.
Training Requirements

For Farm Workers

According to the WPS, the term “worker” refers to any person employed for compensation who is performing activities related to agricultural production, with the exception of crop advisors (WAC 296-307-11005). Although pesticide handlers are included in this definition, stricter additional requirements apply to those working directly with pesticides, as will be discussed later.

Information and Chemical Specificity

The pesticide safety training requirements for agricultural workers are weaker than those required by other industries that use toxic substances in the workplace. The WPS training standards for farm workers require trainers to cover the potential acute hazards of pesticide exposure, routes of exposure, signs and symptoms of common types of pesticide poisoning, decontamination procedures, first aid, and the like, but they do not require that any chemical-specific information be given to the workers at any time. Additionally, employers must comply with employer chemical hazard communication requirements (WAC 296-307-550). An employer’s written Chemical Hazard Communication Program must include a list of all hazardous chemicals present in the workplace, a description of how Material Safety Data Sheets (MSDSs) will be obtained and maintained, and a description of how they will train and inform employees about hazardous chemicals. MSDSs contain information such as synonyms for the substance, PELs, health hazard data, and emergency first aid procedures. Employers are not required to share MSDSs (i.e., chemical-specific information) with farm workers but must keep the MSDSs in a central location that is accessible to employees.
The requirements for accessing MSDSs do not appear to take into account circumstances unique to agriculture and farm employees. MSDSs must be readily accessible to employees when they are in their work areas; for employees who work in more than one geographical location, they must be accessible via voice communication or a laptop computer. The rules address barriers to immediate access to electronic MSDSs, such as power outages and deficient user knowledge to operate the equipment, but they do not address barriers to hard copies, such as language barriers, illiteracy, sprawling farms with only one central posting location, or the potential intimidation factor for workers who are only able to access MSDSs in a farm’s central office, which may be in the employer’s home.

Employers must provide farm workers with effective information on occupational chemical hazards at the time of their initial job assignment, and they must provide information whenever a new physical or health hazard related to chemical exposure is introduced. Unless every pesticide is treated as having equivalent physical and health impacts (which is not true), these two requirements conflict with the WPS. The WPS says that any worker who has been trained during the past five years and possesses a WSDA-approved WPS worker training card is considered trained, whereas according to the Chemical Hazard Program Communication rule, farm workers should be trained about chemical hazards whenever they begin work on a new farm or whenever a new chemical is applied to a crop. One could argue that the same pesticides are being used on various farms, but without any documentation of training on specific pesticides, this is impossible to know.
A note in the Employer Chemical Hazard Communication rule points out that WISHA PELs may be stricter than OSHA PELs and directs employers to refer to the WISHA table of PELs for the appropriate exposure limits to be covered during training. This implies that chemical-specific training must be done, but there is nothing in the WPS that requires chemical-specific training, no references to exposure limits, and no regulatory language that could be interpreted as mandating chemical-specific training for farm workers. Furthermore, pesticide labels do not include PELs.

These training requirements are not strong enough to inform workers about potential chemical hazards on the job. Every pesticide has different symptoms of pesticide illness, different handling requirements, and different toxicological information. As one example of how these rules fail workers, despite the fact that in 2003 Washington apple, grape, pear, and sweet cherry growers alone used more than 350,000 pounds of azinphos-methyl, an EPA Toxicity Category I pesticide, not a single farm worker had to receive chemical-specific information and training on this pesticide (USDA 2004). The same is true for the thousands of pesticides registered for use in Washington State (with the exception of thiram), compounds which have a wide variety of effects, symptoms of exposure, and antidotes to poisoning.

As another example, farm workers who want to conceive a child may be exposed to pesticides that are known reproductive toxins, such as diazinon or metam sodium. However, these workers need never be informed that these pesticides are in use on an agricultural establishment, much less that they are reproductive toxins. Laborers who may be exposed to lead, however, which is also a reproductive toxin, must be informed of the hazards of occupational exposure to lead as part of their training. If farm workers
received the same degree of chemical specific training as other laborers, they could choose to work on an establishment that does not use pesticides that are reproductive toxins.

**Frequency and Documentation**

Typical farm workers (that is, those not performing any early-reentry duties) must only receive pesticide safety training every five years. The WPS does not require employers to document the training. Inspectors for WISHA and WSDA have nothing to verify whether and how training was conducted except the word of the employer. The WPS puts it this way: "...if the handler employer assures that a handler possesses a Washington state department of agriculture-approved Worker Protection Standard worker training card, then the requirements [for training according to this section] will have been met" (WPS 296-306-12040 (4)(a)). In other words, the employer said the worker was trained; therefore, it must be true.

**Qualifications for Trainers**

The requirements are also lax regarding who may qualify as a pesticide safety trainer. Chapter 296-307-12040 (3)(d) WAC states that the person conducting the training must meet at least one of the following criteria:

1. Be currently certified as an applicator of restricted-use pesticides under chapter 17.21 RCW; or
2. Be currently designated as a trainer of certified applicators or pesticide handlers by the Washington state department of agriculture in accordance with chapters 15.58 and 17.21 RCW.

\[14\] Remember, RCW 15.58 is the Washington Pesticide Control Act and sets policy for pesticide dealer licenses, structural pest inspector licenses, and public pest control consultant licenses. RCW 17.21 is the Washington Pesticide Application Act and details requirements for commercial pesticide applicator, commercial pesticide operator, and private pesticide applicator licenses.
(iii) Have completed a pesticide safety train-the-trainer program approved by the Washington state department of agriculture in accordance with chapters 15.58 and 17.21 RCW; or

(iv) Satisfy the training requirements in WAC 296-307-13025(3).

Being certified as an applicator (i above) is not equivalent to being certified to teach the same skills. This is comparable to saying that anyone who successfully completes a Red Cross first aid/CPR course is qualified to teach those skills to others, without receiving certification for teaching.

For Pesticide Handlers

The term “pesticide handler” means a person who is employed for compensation by an agricultural establishment or a commercial pesticide handling establishment and who is mixing or applying pesticides, performing tasks as a crop advisor during any pesticide application or restricted-entry interval, cleaning equipment that may contain pesticide residues, or doing any number of other tasks directly related to handling pesticides. Owners of agricultural establishments and crop advisors are exempt from pesticide handler standards. Though considered to be handlers, persons who apply pesticides under the supervision of a crop advisor also are exempt from some of the provisions of the WPS. The implications of those exemptions will be discussed in greater detail throughout this chapter.

Training Requirements and Chemical Specificity

The pesticide safety training requirements for pesticide handlers are weaker than those required by other industries that use toxic substances in the workplace. The training required to become a handler is only slightly better than that provided to other workers (WAC 296-307-13025). In addition to the materials covered for all workers, training for
handlers must cover the format and meaning of information found on pesticide labels, safety requirements for the handling and transport of pesticides, and environmental concerns such as drift, runoff, and wildlife hazards. Employers must assure that handlers either read the product labeling or understand all labeling requirements prior to working with any pesticide, but trainers are not required to provide chemical-specific information during training. Employers are required to develop a written Chemical Hazard Communication Program, and agricultural employers must meet the same requirements for pesticide handlers as they do for farm workers, as noted in the previous section.

**Frequency and Documentation**

As with workers, handlers are only required to undergo training every five years. The WPS does not require nor encourage employers to document the training. Rather, similar to the rule for worker training, the WPS states that “...if the handler employer assures that a handler possesses a Washington state department of agriculture-approved Worker Protection Standard handler training card, then the requirements [for training according to this section] will have been met” (WAC 296-07-13025(4)).

**Qualifications for Trainers**

Three types of individuals are allowed to conduct trainings for pesticide handlers: (1) those designated as trainers of certified applicators or pesticide handlers by the Washington State Department of Agriculture (WSDA), (2) those who have completed a sanctioned pesticide safety train-the-trainer program, and/or (3) those who are certified as applicators of restricted-use pesticides. Again, it seems inappropriate for the latter to be allowed to train other individuals without additional training. Pesticide handlers are not required to undergo any testing to ensure that they understand the training material.
For Private Applicators

According to the Washington Pesticide Application Act:

‘Private applicator’ means a certified applicator who uses or is in direct supervision of the use of any pesticide classified by the EPA or the director as a restricted use pesticide, for the purposes of producing any agricultural commodity...on land owned or rented by the applicator or the applicator’s employer.... (RCW 17.21.020)

In other words, this definition primarily covers owners of agricultural establishments and any of their immediate employees who are certified as pesticide applicators (i.e., the definition does not cover applicators who are for hire). A licensed private applicator may supervise pesticide handlers employed on the same agricultural establishment of which he or she is the owner or an employee.

Training Requirements and Chemical Specificity

The General Pesticide Rules require private applicators to pass a written exam with a minimum score of seventy percent, but they do not give any details about what must be included on the exam (WAC 16-228-1546). However, the Washington Pesticide Application Act stipulates that certification standards “…shall be relative to hazards of the particular type of application, class of pesticides, or handling procedure” (RCW 17.21.126).

Frequency and Documentation

Licenses are valid for the calendar year in which the exam takes place plus the following calendar year (WAC 16-228-1546).\textsuperscript{15} Recertification is required every five years. Private applicators can get recertified by obtaining a minimum of twenty

\textsuperscript{15} This conflicts with WAC 16-228-1530, which states that all pesticide licenses shall expire on the December 31st following their issuance.
recertification credits every five years, with no more than eight credits allowed per year, or by meeting the examination requirements for every category in which the licensee operates (RCW 17.21.128).

Applicants for private applicator licenses must be at least 16 years old (RCW 17.21.132). Because all applicators must apply for a license and pass the required exam, the state has a record of all certified applicators.

Qualifications for Trainers

There are no particular references to trainers for private applicators, though recertification courses must be approved by WSDA.

For All Other Applicators and Operators

This category includes commercial pesticide applicators, commercial pesticide operators, and private-commercial pesticide applicators. Commercial pesticide applicators apply pesticides to the land of another, commercial pesticide operators are employees of commercial pesticide applicators who use or supervise the use of any pesticide, and private-commercial applicators use or supervise the use of restricted-use pesticides to the lands of another for purposes other than agricultural production (RCW 17.21.020).

Training Requirements and Chemical Specificity

All non-private pesticide applicators and operators required to be licensed must pass a written exam in all categories in which they operate, such as soil fumigation, turf and ornamental weed, aquatic, agricultural insect and disease, etc. (WAC 16-228-1545).¹⁶

¹⁶ There are a total of 24 license classifications.
Applicants must score a minimum of seventy percent on the exam. All applicants, except structural pest inspectors, must pass a “laws and safety” exam that includes, at a minimum, the following:

The state and federal laws governing pesticide uses and application techniques; safe use of pesticides; general pesticide labeling comprehension; environmental fate of pesticides; and appropriate storage and disposal of pesticides and their containers. (WAC 16-228-1545)

The Washington Pesticide Application Act stipulation on certification standards also applies in this case (RCW 17.21.126).

Frequency and Documentation

Licenses are valid for the calendar year in which the exam takes place plus the following calendar year (WAC 16-228-1545). Recertification is required every five years. Applicators in this category must either receive a minimum of forty recertification credits every five years, with no more than fifteen credits allowed per year, or meet the necessary examination requirements for every category in which the applicator wishes to remain licensed (RCW 17.21.128).

Candidates for applicator licenses in this category must be at least 18 years old (RCW 17.21.132). Because applicators must apply for a state-issued license, the state has a record of all certified applicators.

Qualifications for Trainers

There are no particular references to trainers for private applicators, though recertification courses must be approved by WSDA.

17 Structural pest inspectors have separate examination requirements.
General Chemical and Respiratory Hazards

*Information and Chemical Specificity, Duration and Frequency, Qualifications for Trainers, and Recordkeeping*

The Safety and Health Core Rules (Core Rules) require all employers to conduct a hazard assessment and to “Protect workers from the hazard of contact with, or exposure to, chemical agents” (WAC 296-800-11040). If workplaces have chemical hazards, the Employer Chemical Hazard Communication rule first directs employers to consider using less hazardous chemicals (WAC 296-800-170). As in agriculture, employers must develop a written Chemical Hazard Communication Program that includes a list of all hazardous chemicals present in the workplace and a description of how they are going to train and inform employees about the hazardous chemicals. MSDSs must be obtained for each chemical used and be readily accessible each work shift by employees in their work areas (WAC 296-800-170). Employees must be provided with *effective* information on hazardous chemicals at the time of their initial job assignment, and they must be trained whenever a new physical or health hazard related to chemical exposures is introduced (WAC 296-800-170). Employers are not required to document the training, though the rules recommend it and include a sample training documentation form. Employers may conduct the training.

The Core Rules have one recordkeeping requirement related to a worker’s right to know that differs greatly from the agricultural standards. WAC 296-800-180 requires employers to preserve and provide access to MSDSs as exposure records for at least thirty years. Employers must note where and when the chemical was used and inform their employees annually about their right to access the exposure records. In the
introduction to the rule, L&I claims that “The preservation of and access to exposure records is necessary to improve detection, treatment, and prevention of occupational diseases.” Yet, this rule is not applicable to one of the largest work forces in the state.

**Specific Air Contaminants**

*Information and Chemical or Substance Specificity*

In contrast to agriculture, other industries that use particularly toxic substances have much stricter standards with regard to training requirements and knowledge of chemical or substance specificity. In addition to meeting the requirements of the Core Rules and Respiratory Hazards standard, employers are required to notify any employee who is or could be exposed to specific chemical hazards and carcinogens in the workplace.** Individual rules exist to regulate benzene, lead, and MDA, and employees have the right to know about the presence of these specific substances in the workplace. Furthermore, as part of training, employers are required to go over the MSDS for any of these three substances used in the workplace.

The specific standard for the pesticide thiram represents a unique case. In addition to complying with the requirements of the WPS, the thiram standard requires employers to comply with additional rules. The training must cover the specific nature of the health hazard(s) from exposure to thiram, the specific types of operations which could result in exposure, necessary protective steps to prevent exposure, the purpose and limitations of PPE, and the necessity for good personal hygiene (WPS 296-62-07519). The primary
differences between these requirements and the requirements for farm workers in the WPS are that specific chemical health hazards must be shared and protective devices must be discussed. The WPS training requirements make no references to PPE for farm workers.

*Frequency and Documentation*

Employees who may be exposed to lead are required to complete a training program at least annually (WAC 296-62-07521 (13)(a)). Likewise, employers must provide employees with training at the time of their initial assignment to any work areas where benzene exposure may occur, and if exposures are above the numerical action level employees must be provided with training at least annually thereafter (WAC 296-62-07523 (10)(c)(i)). Employers whose employees may be exposed to MDA face similar requirements; employees must be trained at the time of initial assignment and at least annually thereafter (WAC 296-62-076 (3)(a)). Furthermore, any employee exposed to lead, benzene, or MDA has the right to access all written training materials relating to employee training programs. Employers who use thiram must cover the thiram rules at a worker's first training and annually thereafter, but there is no requirement to provide written training materials (WAC 296-62-07519(3)(f).

Although training documentation is not addressed in the lead standard, it does require employers, if asked, to provide all materials related to their training programs to the director of L&I. Also, given that lead is widely recognized as a human health hazard,

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18 It is unlikely that most agricultural employers would use benzene or MDA on their agricultural establishments; however, if they do, they also must comply with the specific rules for these specific air contaminants.

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employers are required to monitor exposures for each employee and conduct medical surveillance for employees who are exposed to high levels of lead; the records required for these two activities must include detailed information pertaining to each employee’s exposure history and records must be maintained for forty years, or for the duration of employment plus twenty years, whichever is longer (WAC 296-62-07521). The requirements for benzene and MDA are similar (WAC 296-62-07523 and -076). Training documentation is not required for thiram.

Qualifications for Trainers

For lead, benzene, MDA, and thiram, the regulations indicate only that employers must conduct safety training for these substances. There are no specific requirements for who must do the training. However, these employers are providing information on the properties and exposure effects of one specific substance; the training does not need to encompass the properties and exposure effects of thousands of registered agricultural pesticides, or even several classes of chemicals that have similar properties and effects. Table 6 provides a summary of key points related to training in various industries. For more discussion of the implications of these comparisons, see the following chapter.
Table 6. Summary of training requirements.

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Farm Workers (^a)</th>
<th>Pesticide Handlers (^b)</th>
<th>Pesticide Applicators (^c)</th>
<th>General Chemical and Respiratory Hazards</th>
<th>Benzene Lead MDA</th>
<th>Thiram</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Frequency / Requirements of Training</strong></td>
<td>- Every five years - Workers must be at least 14 years old (^d)</td>
<td>- Every five years - No license required - Handlers must be at least 16 years old</td>
<td>- Annual license required - Written exam - Recertification credits or exam every five years - A private applicator must be 16; public applicators 18.</td>
<td>- At time of initial job assignment - Whenever a new hazard is introduced - Workers must be at least 18</td>
<td>- At time of initial assignment and at least annually thereafter - Workers must be at least 18</td>
<td>- At time of initial assignment and at least annually thereafter - Workers must be at least 16 (if an agricultural use)</td>
</tr>
<tr>
<td><strong>Chemical Specificity</strong></td>
<td>Not chemical specific</td>
<td>Not chemical specific</td>
<td>Chemical specific</td>
<td>Chemical specific</td>
<td>Chemical specific</td>
<td>Chemical specific</td>
</tr>
<tr>
<td><strong>Certification requirements for trainers</strong></td>
<td>Trainers must be WSDA certified; complete a train-the-trainer program; or be certified applicators</td>
<td>Trainers must be WSDA certified; complete a train-the-trainer program; or be certified applicators</td>
<td>Must be WSDA certified</td>
<td>No requirements</td>
<td>No requirements</td>
<td>No requirements</td>
</tr>
<tr>
<td><strong>Documentation requirements for employers</strong></td>
<td>None</td>
<td>None</td>
<td>Annual license is provided by the State</td>
<td>Recommended</td>
<td>None, but does require extensive exposure records</td>
<td>None</td>
</tr>
</tbody>
</table>

\(^a\) Farm worker: any person employed for compensation who is performing activities related to agricultural production, with the exception of crop advisors.

\(^b\) Pesticide handler: any person employed for compensation who is working directly with pesticides for the purpose of agricultural production. This term excludes private applicators (generally, farm owners) and licensed commercial pesticide applicators.

\(^c\) This category includes private applicators (farm owners), and certified pesticide applicators who apply pesticides to agricultural or public or private lands as part of a business. It does not include commercial pesticide operators, who may apply pesticides without a license as long as they are under the direct supervision of a certified pesticide applicator.

\(^d\) Exception: children aged 12 and 13 may hand-harvest berries, bulbs, cucumbers, and spinach.
On their face, clearly there are some significant differences between occupational safety and health training and right-to-know laws that apply to agriculture and those that apply to other industries in the state of Washington. But are these differences enough to determine that farm workers are not receiving equal protection under the law?

Washington has one of the strongest occupational health and safety programs of any state, yet the fact that pesticides are regulated by EPA rather than OSHA results in inconsistencies in how toxic substances are regulated in the workplace. Given that requirements on federal pesticide labels have primacy over state laws, a brief discussion of pesticide use and exposure possibilities in Washington will help illustrate how these particular laws fail to protect farm workers and to provide them with a safe and healthful work environment.

Under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), “A State may regulate the sale or use of any federally registered pesticide or device in the State, but only if and to the extent the regulation does not permit any sale or use prohibited by this subchapter” (7 U.S.C. § 136v(a) (2004)). However, if a state decides to limit the uses of a specific pesticide beyond federal limitations or requires additional safety measures for that pesticide, such requirements may not be added to the label of the pesticide in question. FIFRA prohibits any alteration to federal pesticide labeling, saying, “[A] State shall not impose or continue in effect any requirements for labeling or packaging in addition to or different from those required under this subchapter” (7 U.S.C. § 136v(b)). Another huge problem with federal pesticide labeling laws is that they do not require pesticide manufacturers to divulge the names of so-called inert ingredients included in their pesticide formulations, except in a few limited circumstances.
Pesticides contain both “active” and “inert” ingredients. While the former is what produces the effect that the manufacturer claims for the product, the latter are added to help the product function in a certain way (e.g., stick, disperse, etc.). The EPA has published lists of thousands of inert ingredients that are used in pesticide products and divides them into five categories: (1) inert ingredients of toxicological concern; (2) potentially toxic inert ingredients/high priority for testing inerts; (3) inerts of unknown toxicity; (4) minimal risk of inert ingredients; and (5) inert ingredients for which EPA has sufficient information to reasonably conclude that the current use pattern in pesticide products will not adversely affect public health or the environment. The first three lists alone contain almost two thousand ingredients.

Only ingredients on the “inert ingredients of toxicological concern” list must be included on pesticide product labels and identified as toxic ingredients.19 So although agricultural employers are required to follow pesticide product labeling with regard to employee notification, farm workers do not have the right to know about the hundreds of other toxic chemicals they may be exposed to throughout the course of an agricultural season – even if those ingredients are regulated as dermal or respiratory hazards under Washington law. It is beyond the scope of this research to delve into the thousands of ingredients that the EPA has yet to analyze (despite the fact that EPA has registered the pesticide products in which they are found, without an analysis of the impacts of those ingredients on human health and the environment). However, at a glance it is possible to

19 Since the EPA implemented this rule in 1987, the number of ingredients on the list of toxicological concern has decreased from fifty-seven to eight substances. No new highly toxic inerts have been added to the list (i.e. used in registered pesticides) since the rule went into effect.
see that Washington State regulates some of these inert ingredients when they are used in other applications. For example, EPA's list of potentially toxic inert ingredients contains several substances that are regulated under Washington's Respiratory Hazards standard, which requires employers to evaluate and control employee exposures, including cresol (cresylic acid), diethanolamine, mesityl oxide, methyl isobutyl ketone, nitromethane, toluene, and xylene, to name just a few (WAC 296-841, Table 3). Given the difficulty of identifying inert ingredients in most pesticides, it is impossible to know if most of these ingredients are found in pesticides that are registered in Washington. However, several pesticides that are registered in the state (including non-agricultural pesticides) do contain inert ingredients that are regulated as Respiratory Hazards (WAC 296-841, Table 3) in Washington, including xylene range aromatics (also an EPA inert of toxicological concern), cyclohexanone, and triethylamine (Table 7). Due to the paucity of information on inert ingredients, the information in Table 6 represents only a few of the thousands of possible inert ingredients that are found in products registered in Washington.

The Respiratory Hazards standard is meant to protect employees from respiratory and dermal hazards in the workplace; employers must determine the form of the hazard, evaluate employee exposure, and inform any employee who may be exposed to the hazard. Pesticide labels may be used to determine employee exposure; however, because the hazards are not always identified, as the information on inert ingredients makes clear, it is impossible to determine when an evaluation of employee exposure is necessary.

Although agricultural employers are not required to share any chemical-specific information about pesticides directly with their employees, at least agency rules, on their face, make it clear that employees have the right to access MSDSs, which include such
critical information as first aid measures and hazards identification information.

However, because most inert ingredients are not regulated, and thus are not disclosed on pesticide labels, there is not even the pretense of informing farm workers about these particular hazardous substances being used in their workplace. Farm workers should have the right to know when they may be exposed to such chemicals, just as other workers in the state have such a right.
Table 7: Inert ingredients found in pesticides registered in Washington State and regulated as respiratory hazards in all industries.\textsuperscript{a,b,c}

<table>
<thead>
<tr>
<th>Active Ingredient</th>
<th>Pesticide Name</th>
<th>EPA\textsuperscript{d} Registration Number</th>
<th>Inert ingredient / identified respiratory hazard</th>
<th>CAS Number\textsuperscript{e}</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbaryl</td>
<td>Sevin80s</td>
<td>264-36</td>
<td>Kaolin</td>
<td>1344-95-2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chorothalonil</td>
<td>Bravo 500</td>
<td>50534-8</td>
<td>Calcium silicate</td>
<td>1344-95-2</td>
</tr>
<tr>
<td></td>
<td>Bravo 720</td>
<td>50534-188</td>
<td>Phosphoric acid</td>
<td>7664-38-2</td>
</tr>
<tr>
<td></td>
<td>Daconil 2787 Flowable Fungicide</td>
<td>50534-9</td>
<td>Calcium silicate</td>
<td>1344-95-2</td>
</tr>
<tr>
<td>Clopyralid</td>
<td>Curtail M</td>
<td>62719-86</td>
<td>Cyclohexanone</td>
<td>108-94-1</td>
</tr>
<tr>
<td></td>
<td>Confront Herbicide</td>
<td>62719-92</td>
<td>Xylene range aromatic solvents</td>
<td>121-44-8</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Triethylamine</td>
<td></td>
</tr>
<tr>
<td>2,4-D</td>
<td>AB Navigate</td>
<td>71368-4</td>
<td>Crystalline silica</td>
<td>14808-60-7</td>
</tr>
<tr>
<td></td>
<td>Barrage HF</td>
<td>5905-529</td>
<td>Petroleum distillates\textsuperscript{f}</td>
<td>91-20-3</td>
</tr>
<tr>
<td></td>
<td>Bonide Poison Ivy Killer</td>
<td>228-186-4</td>
<td>Naphthalene</td>
<td>1330-20-7</td>
</tr>
<tr>
<td></td>
<td>Brushmaster</td>
<td>2217-774</td>
<td>Xylene</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Gordon’s Orchard Master Broadleaf Herbicide</td>
<td>2217-703</td>
<td>Dimethyamine</td>
<td>124-40-3</td>
</tr>
<tr>
<td></td>
<td>Super Trimec Broadleaf Herbicide</td>
<td>2217-758</td>
<td>Diethanolamine</td>
<td>111-42-2</td>
</tr>
<tr>
<td></td>
<td>Weedone Lo Vol 6</td>
<td>71368-3</td>
<td>Ethylene glycol</td>
<td>107-21-1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Naphthalene</td>
<td>91-20-3</td>
</tr>
<tr>
<td>Dimethoate</td>
<td>Dimethoate 4 E.C.</td>
<td>5905-493</td>
<td>Butoxyethanol</td>
<td>111-76-2</td>
</tr>
<tr>
<td>Permethrin</td>
<td>Permanone Multi-Purpose 10% EC</td>
<td>432-1132</td>
<td>Aromatic 100 (petroleum distillate)</td>
<td>1330-20-7</td>
</tr>
<tr>
<td>Resmethrin</td>
<td>Scourge Insecticide</td>
<td>432-667</td>
<td>Butylated hydroxytoluene</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Aromatic 150 petroleum solvent</td>
<td>128-37-0</td>
</tr>
<tr>
<td>Triclopyr</td>
<td>Garlon 3A</td>
<td>62719-37</td>
<td>Triethylamine</td>
<td>121-44-8</td>
</tr>
<tr>
<td></td>
<td>Confront F</td>
<td>62719-92</td>
<td>Triethylamine</td>
<td>121-44-8</td>
</tr>
</tbody>
</table>

\textsuperscript{a} Technically, of course, these ingredients are not regulated in agriculture because pesticide labels do not identify them.


\textsuperscript{c} There is very little information available on inert ingredients; this table gives only a glimpse of the possible ingredients that are regulated in other industries in Washington as dermal or respiratory hazards.

\textsuperscript{d} U.S. Environmental Protection Agency pesticide registration number.

\textsuperscript{e} Chemical Abstracts Service number.

\textsuperscript{f} Multiple other pesticides that have 2,4-D as the active ingredient also include petroleum distillates and diethylamine as inert ingredients.
ENGINEERING CONTROLS AND PERSONAL PROTECTIVE EQUIPMENT

All employers in Washington are required to use engineering controls, if feasible, and to provide personal protective equipment (PPE), as appropriate, in order to protect their employees from respiratory and dermal exposures to hazardous substances and activities. In addition, depending on the particular hazard and industry, employers may be required to provide decontamination change rooms and showers, and to enforce specific removal and washing standards for PPE.

Engineering Controls

As of January 1, 2004, the Respiratory Hazards standard requires employers in all industries except agriculture to “Determine the form of the hazard, such as dust, mist, gas, oxygen deficiency, or biological agent” (WAC 296-841-20005). The Respiratory Hazards standard defines “exposed” or “exposure” as:

The contact an employee has with a toxic substance, harmful physical agent or oxygen deficient condition, whether or not protection is provided by respirators or other personal protective equipment (PPE). Exposure can occur through various routes of entry, such as inhalation, ingestion, skin contact, or skin absorption. (WAC 296-841-300)

The comparable standard for agriculture does not include a definition for exposure, but it does cite various forms of air contaminants that must be controlled, stating:

In the control of those occupational diseases caused by breathing air contaminated with harmful dusts, fogs, fumes, mists, gases, smokes, sprays, vapors, or aerosols the goal must be to prevent atmospheric contamination. You must use, if feasible, accepted engineering control measures (for example, enclosure or confinement of the operation, general and local ventilation, and substitution of less toxic materials).... (WAC 296-62-07102)
Reinforcing these general requirements, specific standards exist to protect workers from occupational exposures to particular air contaminant hazards, including lead, benzene, MDA, and thiram. Also, the Respiratory Hazards (non-agriculture) and Air Contaminants (agriculture) rules list PELs for hundreds of other specific substances, including some pesticides, and both also indicate the chemicals for which dermal exposure must be controlled.

**General Chemical and Respiratory Hazards**

*Non-agricultural industries*

In all industries except agriculture, the Core Rules require employers to do a hazard assessment for PPE and to document that assessment (WAC 296-800). They specify that exposure to hazardous chemicals and toxic substances can occur through inhalation, ingestion, skin contact, absorption, or related means. If exposure to a specific chemical or toxicant is possible, at a minimum employers must reduce exposures below numeric PELs as found in the Respiratory Hazards rule (WAC 296-841-200).\(^2\) If dermal exposure presents a hazard, employers must provide protection against it. Both sets of rules cited here stress the importance of reducing exposure hazards before considering the use of PPE. The Core Rules, for example, state that “PPE alone should not be relied on to provide protection for your employees. PPE should be used after all other reasonable means of reducing hazards have been carried out” (WAC 296-800-16005). It directs employers to take active steps to eliminate hazards, such as by reducing hazardous materials or processes and applying engineering controls to reduce or eliminate hazards.

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\(^2\) Some pesticides are included in this rule and can be found in “Table 3: Permissable Exposure Limits for Air Contaminants.”
Specific Air Contaminants

In industries where exposure to specific air contaminants is possible, the requirements for engineering controls frequently are more explicit. The lead standard, which applies to all industries except construction and agriculture, is one example (WAC 296-62-07521). During the early 1970s, employers were required to develop and implement written compliance programs to reduce lead exposure below the PEL solely through work practice and engineering controls and were given a number of years to comply (WAC 296-62-07521 (6)(c)). Today, regarding methods of compliance, the standard requires that:

Where any employee is exposed to lead above the permissable exposure limit for more than thirty days per year, the employer shall implement engineering and work practice controls (including administrative controls) to reduce and maintain employee exposure to lead...except to the extent that the employer can demonstrate that such controls are not feasible. (WAC 296-62-07521 (6)(a)(i)).

If an employee is exposed to above the PEL for less than thirty days per year, employers must implement engineering controls to reduce exposures to 200 μg/m³ and then may use other means, such as respiratory protection, to further reduce exposure (WAC 296-62-07521 (6)(a)(ii)).

The standards for benzene (WAC 296-62-07523 (6)) and MDA (WAC 296-62-07613 (1-2)) also require employers to use engineering controls and work practices as the primary means to reduce employee exposure to at or below specific PELs, and they require employers to implement a written compliance program to reduce exposures by these means. If benzene is used in a workplace fewer than thirty days each year, a combination of controls may be used, including respiratory controls; however,
engineering and workplace controls must be used, if feasible, if any exposures above 10 ppm may occur (WAC 296-62-07523 (6)). The thiram rule makes no reference to engineering controls.

The industry requirements for lead, benzene, and MDA make three primary points. First, employers are required to conduct hazard assessments. Second, employers must first to try to reduce hazardous exposures through feasible engineering controls. Third, employers must meet numeric exposure standards, whether the hazardous substance is regulated as a specific air contaminant or as a general respiratory hazard.

**Agriculture**

Because agricultural employers must comply with the General Occupational Health Standards, they too are required to use, if feasible, accepted engineering control measures (WAC 296-62-07102). However, this requirement is not mentioned or reinforced in the vertical Safety Standards for Agriculture as it is in other vertical industry standards. In practice, most agricultural employers do not use available engineering controls, such as closed cabs and closed systems for mixing and loading pesticides, despite their availability and proven feasibility. California has required employers to provide closed systems for any employees who mix or load liquid pesticides in EPA Toxicity Category 1 since the 1970s (CCR 3-6-6746). This is a feasible technology, and it is associated with reduced exposures for workers (Rutz and Krieger 1992). The EPA has also acknowledged that more protections are necessary for workers who are exposed to highly toxic organophosphate pesticides, which are used in enormous quantities each year on Washington crops. For example, a Pesticide Registration Notice issued in September 2000 stated:
In a number of cases the OP [organophosphate] risk assessments show that, even with maximum feasible personal protective equipment (PPE) and engineering controls, including all provisions currently required by the Worker Protection Standard, risks to workers still exceed the Agency’s levels of concern. For the purposes of occupational risk mitigation described in this notice, EPA anticipates that many occupational scenarios will require the use of some type of engineering controls. (US EPA 2000)

Despite high risks posed to human health or the environment, under FIFRA the EPA may register a pesticide after “taking into account the economic, social and environmental costs and benefits of the use of any pesticide” (7 U.S.C. § 136(bb). Before implementing agency rules, Washington also requires cost-benefit analyses to be conducted under the Administrative Procedures Act (RCW 34.05) and the Regulatory Fairness Act (RCW 19.85), which assesses the economic impact of rules on businesses in the state with fewer than fifty employees. Yet, EPA has recognized the risks to human health and the environment of many registered pesticides, and the Washington Constitution requires that the legislature protect workers in hazardous occupations, economic costs notwithstanding. While EPA re-evaluates OP pesticides by class or on a case-by-case basis, workers continue to be exposed to unsafe levels of toxic pesticides. Farm workers should not have to bear the cost of development of such hazardous products, of industry reliance on them, or of regulatory irresponsibility.

The scope and diversity of agricultural working conditions cannot be used as an argument to preclude the use of engineering controls. The construction industry also

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21 Although the cost-benefit model of risk assessment is too complex to discuss here, many scholars, farm worker advocates, and pesticide reform activists have raised questions about how such assessments are conducted (Montague 1999, O’Brien 2002). If the full health and ecological risks of a pesticide are not known, as evidenced by the data gaps for chronic health and environmental effects of exposure, how can a full accounting of the costs be done?
involves work on a variety of scales, with sundry working conditions - from small indoor remodeling projects to huge outdoor projects - and diverse employees, including migratory and immigrant laborers. Yet the “Occupational Health and Environmental Control” section of the Safety Standards for Construction is quite strict (WAC 296-155, Part B-1). It states:

Exposure of employees to inhalation, ingestion, skin absorption, or contact with any material or substance at a concentration above those specified in the General Occupational Health Standards, WAC 296-62-07515 shall be avoided. (WAC 296-155-160 (1))

This reiteration of the general occupational rule emphasizes the numerical standards, in direct contrast with the rules for agriculture. Although agricultural employers are required, supposedly, to abide by the General Occupational Health Standards, including numerical standards for respiratory exposures, this requirement is not mentioned in the Safety Standards for Agriculture. The construction subsection goes on to require that administrative or engineering controls be implemented first, before employers may resort to protective equipment, and states that any equipment or technical measures used to reduce exposure to air contaminants be approved by a competent industrial hygienist.

**Personal Protective Equipment**

The Core Rules list basic responsibilities for all employers, with the exception of agricultural employers, regarding the provision of PPE to employees and define PPE as “an item or items used to protect the eyes, face, head, body, arms, hands, legs, and feet such as goggles, helmets, head covers, gloves, rubber slickers, disposable coveralls, safety shoes, protective shields, and barriers” (WAC 296-800-160). Any eye or face protection must meet American National Standards Institute requirements (ANSI) (WAC
Standards pertaining to certain industries or hazards may require an employer to provide additional PPE safeguards. The agriculture standards include general provisions for PPE for farm workers, and more specific provisions for PPE for pesticide handlers only (WAC 296-307-100 and -130).

Because until recently the rules for respirator usage were found in the General Occupational Health Standards (WAC 296-62-071) and applied to all industries in the state, rules for respiratory protection are not part of this analysis. These rules still apply to agriculture, but the rules for all other industries are now found in Respirators (WAC 296-842). Although a rule-by-rule comparison has not been done, the rules for agriculture are much more detailed than rules found in the WPS, and the two sets of rules appear to be similar.

**Non-Agricultural Industries**

*General Chemical Hazards and Respiratory Hazards*

The Core Rules require employers to conduct a hazard assessment to determine if PPE is necessary to protect employees (WAC 296-800-16005). In the standard, the Washington Department of Labor and Industries (L&I) notes that: “PPE alone should not be relied on to provide protection for your employees. PPE should be used after all other reasonable means of reducing hazards have been carried out.” The notes direct employers to take active steps to eliminate hazards, such as by applying engineering controls and reducing the use of hazardous materials. The Core Rules also require employers to document their hazard assessment for PPE, provide appropriate PPE at no cost to employees, train employees to use PPE and document the training, and keep PPE in safe and good condition (WAC 296-800-160). The Respiratory Hazards rule also requires
employers to first use feasible controls to protect employees from exposures and gives examples of several possible control methods (WAC 296-841-20010).

Specific Air Contaminants

Lead

In the case of lead, as in agriculture, employers are also required to provide respirators and appropriate PPE to employees. (The construction industry, like agriculture, is exempt from the lead standard, but the industry's vertical standards address lead exposure specific to the industry (WAC 296-155-176)). Two major differences between the agriculture and lead standards are that the lead standard has no exceptions to the PPE rules and it has stronger, more specific provisions for the cleaning and replacement of PPE. According to the lead standard:

(i) The employer shall provide the protective clothing required in subdivision (8)(a) of this section in a clean and dry condition at least weekly, and daily to employees whose exposure levels without regard to a respirator are over 200 μg/m³ as a TWA [time-weighted average].

(ii) The employer shall provide for the cleaning, laundering, or disposal of protective clothing and equipment required by subdivision (8)(a) of this section....

(vi) The employer shall inform in writing any person who cleans or launders protective clothing or equipment of the potentially harmful effects of exposure to lead.

(WAC 296-62-07521 (8)(b)

Employers must also provide change rooms, assure that there are separate storage facilities for protective work clothing and street clothes, provide shower facilities, and require any employees who work in areas where their airborne exposure to lead is above the PEL to shower after each shift. Employers must also assure that employees do not
leave the workplace wearing anything that was worn during the work shift (WAC 296-62-07521 (10) (b-c)).

_Benzene_

The benzene standard includes specific requirements for respiratory protection, and mandates that employers provide protective clothing and PPE to employees at no cost in order to limit their dermal exposure to liquid benzene (WAC 296-62-07523). The benzene standard provides much more guidance for respiratory protection than for PPE, but at a minimum employers must meet the requirements for PPE called for in the Core Rules. The benzene standard does not contain provisions for change facilities, showers or the laundering of PPE; however, the Core Rules mandate change rooms and showers for employees working with chemicals that may cause an occupational illness (WAC 296-800-23065 and -23070).

_MDA_

The MDA standard includes detailed provisions for providing respiratory protection (WAC 296-62-07615). It also requires employers to provide PPE to employees at no cost, including when employees are subject to dermal exposure of MDA (WAC 296-62-07617). Employers must provide change rooms and shower rooms (WAC 296-62-07619), and they “shall ensure that no employee takes MDA-contaminated work clothing or equipment out of the change room, except those employees authorized to do so for the purpose of laundering, maintenance, or disposal” (WAC 296-62-07617 (2)). As with lead, the MDA standard includes much stricter requirements for cleaning and replacement of PPE, stating, in part:
(a) The employer shall provide the employee with clean protective clothing and equipment. The employer shall ensure that protective work clothing or equipment required by this paragraph is cleaned, laundered, repaired, or replaced at intervals appropriate to maintain its effectiveness.

(c) The employer shall ensure that laundering of MDA-contaminated clothing shall be done so as to prevent the release of MDA in the workplace.

(d) Any employer who gives MDA-contaminated clothing to another person for laundering shall inform such person of the requirement to prevent the release of MDA.

(e) The employer shall inform any person who launders or cleans protective clothing or equipment contaminated with MDA of the potentially harmful effects of exposure.

(f) MDA-contaminated clothing shall be transported in properly labeled, sealed, impermeable bags or containers.

(WAC 296-62-07617 (3))

**Thiram**

The thiram rule requires that clothing be worn to reduce skin contact with thiram. It requires impervious clothing for applicators, as well as for nursery workers who may be exposed to thiram, and states that only impervious gloves may be worn by workers. Additionally, a barrier cream must be supplied to workers who have thiram skin irritations. Dust masks must be worn when planting large seedlings to prevent mouth and face contact. The rules state that clothing worn by workers must be washed or changed every other day. Regarding decontamination, floors where thiram is used must be vacuumed or washed, not just dry swept. Again, all agricultural establishments that use thiram must also comply with the WPS and the rest of the agricultural safety standards. The primary difference between these rules and the WPS is that employers must require workers to use PPE in situations where there is potential exposure to thiram. The WPS makes no reference to discussing or supplying PPE for workers.
Agriculture

The Safety Standards for Agriculture address PPE requirements for farm workers. As with the Core Rules, employers must provide PPE at no cost to employees, maintain the equipment in a clean and reliable manner, and train employees in the use of PPE.

Agricultural employers, however, are not required to document the training, and there are no references to eliminating hazards or applying engineering controls. The strong language used in the Safety Standards for Agriculture makes it clear that these employers have tremendous responsibilities with regard to PPE. As an employer:

You must ensure that employees are protected from injury or impairment of any bodily function that might occur through absorption, inhalation or physical contact of any substance, vapor, radiation, or physical hazard. Wherever appropriate, you must ensure that employees use protective clothing; respiratory devices; shields; barriers; and adequate protective equipment for eyes, face, head, and extremities. (WAC 296-307-10005 (1)).

This language is not included in the WPS section of the standards, which is based on the federal WPS and generally assumes that if employers are following federal pesticide labeling requirements then their workers are receiving adequate protection from occupational exposures (WAC 296-307, Part I).

Despite the additional mandate in Washington’s rules, cited above, in actual practice few farm workers in Washington are provided with PPE. Yet, clearly the potential for and reality of farm worker exposure exists, even if employers follow labeling requirements and observe all restricted-entry intervals. Recent studies, for example, indicate that farm workers experience high levels of exposure to toxic...
pesticides long after the restricted-entry interval for a given pesticide has passed (Coronado et al. 2004; Simcox et al. 1999; Thompson et al. 2003). Most of these workers are not provided with PPE to prevent injury or impairment that occurs through absorption, or any other means, and no numerical standards must be met. Their children are also likely to be exposed to agricultural pesticides when contaminated PPE is brought into the home, through drift, or through other exposure pathways that have yet to be identified (Curl et al. 2002; Flower et al. 2004; Loewenherz et al. 1997; Simcox et al. 1995).

The WPS section provides additional requirements for PPE with regard to exposures to pesticides in the workplace. The relevant subsection applies only to pesticide handlers, and provides a clear definition of PPE, with specific references to pesticides:

Personal protective equipment (PPE) means devices and apparel that are worn to protect the body from contact with pesticides or pesticide residues, including, but not limited to, coveralls, chemical-resistant suits, chemical-resistant gloves, chemical-resistant footwear, respiratory protection devices, chemical-resistant aprons, chemical-resistant headgear, and protective eyewear. (WAC 296-307-13045 (2)(a))

Most references to PPE in the WPS refer only to protections for pesticide handlers, not farm workers. In fact, the WPS only clearly mandates that employers provide PPE to farm workers in one specific and particularly hazardous situation — that of workers performing short-term activities in treated fields while a restricted-entry interval is in effect (WAC 296-307-12020 (3)).

The WPS does provide more PPE protections for pesticide handlers than for workers, requiring that “When personal protective equipment is specified by the labeling
of any pesticide for any handling activity, the handler employer shall provide the
appropriate personal protective equipment in clean and operating condition to the
handler" (WAC 296-307-13045 (3)). The standard includes specifications for chemical-
resistant equipment and respirators, and includes exceptions for handling tasks conducted
within closed systems or in enclosed cabs.

As in other industries, agricultural employers must make sure that PPE required
for early entry workers (i.e., those who enter the fields while a restricted-entry interval is
in effect) is used correctly and that it is inspected on a daily basis for leaks, tears and
other damage. Workers must have a clean place to store their regular clothing, apart from
any pesticide-use areas. Employers also must provide a decontamination site; this
includes enough running water, soap and single-use towels for washing purposes, but the
standard does not require employers to provide shower facilities for farm workers.

There are two important differences between the PPE requirements for agriculture
and for other industries that use hazardous chemicals. The first lies in the laundering
requirements for PPE. With regard to cleaning and laundering PPE for farm workers, the
agricultural standard requires that:

(iii) Personal protective equipment that cannot be cleaned properly is
disposed of in accordance with any applicable federal, state, and local
regulations.

(iv) All personal protective equipment is cleaned according to
manufacturer’s instructions or pesticide product labeling instructions
before each day of reuse. In the absence of any such instructions, it shall
be washed thoroughly in detergent and hot water....

(vi) Personal protective equipment contaminated with pesticides is kept
separately and washed separately from any other clothing or laundry.

(vii) Any person who cleans or launders personal protective equipment is
informed that such equipment may be contaminated with pesticides, of the
potentially harmful effects of exposure to pesticides, and of the correct
way(s) to handle and clean personal protective equipment and to protect themselves when handling equipment contaminated with pesticides. (WAC 296-307-12020 (f))

It does not require employers to launder the PPE. Yet, a later subsection states: “The agricultural employer shall not allow or direct any worker to wear home or to take home personal protective equipment contaminated with pesticides” (WAC 296-307-12020 (h)). If employers are not required to launder the PPE and employees are not supposed to take contaminated PPE home with them, how is the PPE of farm workers to be maintained in a clean and reliable condition?

Furthermore, many orchard workers live in temporary worker housing during the course of a growing season, and it is unlikely that they will have daily access to a washing machine. Because many workers also live in poverty, it is also unlikely that they will have a fresh change of clothes daily. The Temporary Worker Housing rules of the Safety Standards for Agriculture require that a farm operator “Provide one laundry tray or tub or one mechanical washing machine for every thirty persons” – hardly a requirement that will encourage daily washing of pesticide contaminated clothing and a far cry from the requirements of other industries (WAC 296-307-16150).

The second major difference in PPE requirements is that early entry workers are exempt from the normal decontamination and emergency assistance provisions of the WPS when they are working under the direct supervision of a certified crop advisor. Yet, “Direct supervision does not require that the crop advisor be physically present at all times…” (WAC 296-307-120 (2)(a)). Other industries do not have such exceptions, and there is no reason why such an exception should exist in agriculture. The normal decontamination and emergency assistance provisions of the WPS should apply to
workers one hundred percent of the time – after all, it is a “standard” – particularly because early re-entry workers face a high possibility of exposure if not properly protected.

Surprisingly, the language in the WPS that refers to cleaning and maintenance of PPE is not exactly the same for early entry workers and pesticide handlers. However, restricted-entry intervals are in effect exactly because there is a significant recognized human health hazard that exists during any mandated restricted-entry interval. Employers must make sure that handlers use PPE correctly and that PPE is inspected on a daily basis. In part, the cleaning requirements for PPE for handlers states:

(a) The handler employer shall assure that all personal protective equipment is cleaned according to the manufacturer’s instructions or pesticide product labeling instructions before each day of reuse. In the absence of any such instructions, it shall be washed thoroughly in detergent and hot water.

(b) If any personal protective equipment cannot be cleaned properly, the handler employer shall dispose of the personal protective equipment in accordance with any applicable federal, state, and local regulations. Coveralls or other absorbent materials that have been drenched or heavily contaminated with an undiluted pesticide that has the signal word danger or warning on the label shall not be reused.

(c) The handler employer shall assure that contaminated personal protective equipment is kept separately and washed separately from any other clothing or laundry....

(h) The handler employer shall inform any person who cleans or launders personal protective equipment:

(i) That such equipment may be contaminated with pesticides.

(ii) Of the potentially harmful effects of exposure to pesticides.

(iii) Of the correct way(s) to clean personal protective equipment and to protect themselves when handling such equipment.

(j) The handler employer shall not allow or direct any handler to wear home or to take home personal protective equipment contaminated with pesticides.

(WAC 296-307-13045 (6))
The same conflict exists: employers are not required to launder the PPE and handlers are not supposed to take home PPE contaminated with pesticides. In most cases, farm employees or their spouses will wash their own PPE, in their homes or in a laundromat. Studies have shown that taking contaminated PPE home increases the risk of pesticide exposure for children and other family members (Coronado et al. 2004, Flower et al. 2004) One study of pesticide applicators, primarily farmers, determined that 94 percent of clothing worn for pesticide work is washed in the same machine as other clothing (Gladen et al. 1998). Other studies have shown that removal of pesticide residues varies by type of pesticide, fabric, and wash water temperature; residues may remain in a washing machine for numerous cycles and be redeposited on other fabrics, providing a possible exposure route for family members even if they do wash pesticide contaminated clothing separately from other clothing (Easter and DeJonge 1985, Laughlin and Gold 1989, Laughlin, Newburn, and Gold 1991).

Direct comparisons between occupational health and safety rules for agriculture and those for other industries in Washington reveal a number of striking differences. Although this chapter has not examined whether most workers in Washington are receiving adequate protection from toxic exposures, it is clear from these comparisons that agricultural workers receive fewer protections against toxic exposures than other workers do. Protections are weaker in all areas covered in this chapter – right to know, training, engineering controls, and personal protective equipment. A brief discussion of the findings will summarize the major differences between agriculture and other industries identified in this chapter.
CHAPTER 5
DISCUSSION AND CONCLUSION

This chapter reviews and discusses the most important points related to agricultural health and safety drawn from the previous chapter. Inherent in the discussion are some conclusions about whether farm workers conduct their work in a safe and healthful environment as guaranteed by the Washington legislature. The final conclusion addresses the question of whether or not farm workers receive equal protection, based on this analysis, and draws attention to some of the limitations of this thesis. As part of the conclusion, I make some recommendations for improving the Worker Protection Standard (WPS) and providing greater protection for farm workers against toxic exposures.

DISCUSSION
Right to Know and Training

Farm workers in Washington should have the right to know about specific chemicals to which they may be exposed, just as other workers in the state do. Although it would be impossible to cover every pesticide registered in the state, it is possible for farm and orchard owners to cover the several pesticides used on their establishment in a given season. The thiram standard demonstrates that the state can, if willing, indeed require the sharing of chemical-specific information. As part of sharing chemical-specific information on pesticides, employers should cover either the label or the Material Safety Data Sheet (MSDS) for each pesticide, just as most industries that work with specific air contaminants are required to do. Furthermore, the Pesticides (Worker Protection
Standard) (WPS) should address barriers to accessing MSDSs that are more relevant to agriculture, such as illiteracy and intimidation. At a minimum, MSDSs should be posted in a central location that is easily accessible to farm workers and not dependent on requesting access to the information.

Alternately, Washington should explore the possibility and effectiveness of requiring agricultural employers to provide crop sheets to every worker. Typically, crop sheets cover general pesticide health and safety information and should include the pesticides commonly used for each crop. The Washington State Department of Agriculture has published some crop sheets as training aids, but the agricultural safety standards do not require their use.

The sharing of chemical-specific information also should include specific information on the health effects and symptoms of exposure. Because many farm workers may be exposed to more than one pesticide at a time, and because pesticide illness can be very difficult to identify, workers should at least have as much information as possible on potential pesticide exposures in case they need to seek medical treatment.

Posting requirements for pesticide applications should be modified to include the name of the specific pesticide applied, the date applied, and the restricted-entry interval. Information on specific pesticides used should be posted at all points of worker access to the agricultural establishment, just as other industries must post warning signs at the entrance to any regulated area. Posting chemical-specific signs would mirror requirements for posting for specific hazardous substances used in other industries.

And as with other industry training programs, farm workers should receive pesticide safety training annually. Pesticide registrations are updated bi-annually, and
several new products could come on the market before the current five-year training cycle is over. Furthermore, the sheer number of workers potentially exposed to hazardous chemicals each year should motivate the Washington Department of Labor and Industries (L&I) to re-examine the five year training interval. If one industry that uses hazardous substances requires training annually, it makes sense that agricultural employers, who may use several hazardous substances simultaneously, should provide training annually. Although employers who use general hazardous substances do not necessarily have to provide annual training, workers are more likely to be protected from such hazards because employers must measure and observe permissable exposure limits (PELs).

Ideally, pesticide handlers would be required to be trained and licensed by the state, just as certified pesticide applicators are. Pesticide handlers need a solid understanding of the pesticides they use in order to protect human health, crops and the environment. Handlers are applying restricted-use pesticides, which have that designation particularly because they are hazardous and not determined safe for general use. Barring instituting licensing requirements, L&I should ensure that pesticide handlers receive training only from qualified trainers – and not certified applicators – and require them to display their knowledge of pesticide labels and the safe use of pesticides, through an exam or by some other means. Only qualified trainers should be allowed to conduct pesticide safety training for pesticide handlers. Pesticide handlers – and certified pesticide applicators – should be a minimum of 18 years of age. Those under the age of 18 are not allowed to work in any other industry in the state that is hazardous or uses hazardous substances.
Related to training, unlicensed pesticide handlers are allowed to apply restricted-use pesticides to agricultural crops without having a certified crop advisor present. Although the WPS requires pesticide handlers to have direct supervision, "direct" does not require the physical presence of the crop advisor. In contrast, uncertified pesticide operators may apply pesticides for non-agricultural purposes under the direct supervision of a certified pesticide applicator; however, in this case “direct” supervision means the applicator must be in visual and voice contact. At the very least, handlers should also be in visual and voice contact with a supervising crop advisor. Handlers do not have the extensive training required of licensed crop advisors and pesticide applicators, and applying toxic pesticides without that knowledge or without immediate supervision presents inherent dangers.

Agricultural employers should also be required to document the training of all farm workers, including handlers. Although other industries in the state do not require employers to document training, they have other protections in place to ensure that workers are trained about hazardous substances in the workplace. The specific rules for lead, benzene, and MDA, for example, do not require documentation of training, but they do require employers to inform employees about exposures based on measurement of permissible exposure limits and to share a copy of the relevant standard, which addresses training requirements, with their employees. (Although the cholinesterase monitoring rule of the Safety Standards for Agriculture was not addressed in the Findings chapter, because it involves medical monitoring the rule provides similar de facto documentation of training for handlers who apply organophosphate and N-methyl carbamate pesticides, which are cholinesterase inhibitors) (WAC 296-307-148).) For industries that must
adhere to the Safety and Health Core Rules (Core Rules), documentation of training is at least recommended. Furthermore, each employer is responsible for training new employees, whereas in agriculture employers may rely on Worker Protection Standard worker training cards issued by any other employer.

The final topic addressing a worker’s right to know about hazardous chemicals in the workplace has to do with toxic inert ingredients. Because the restrictions on listing inert ingredients on pesticide labels come from the federal level, it is difficult to make any recommendations on controlling exposure to these substances. However, several inerts are regulated as dermal or respiratory hazards in Washington, and agency rules make it clear that workers have the right to know about the use of these hazards in their workplaces, labeling conventions and obstacles to obtaining information on inert ingredients notwithstanding.

**Engineering and Personal Protective Equipment**

The Core Rules, rules for specific air contaminants, and the Safety Standards for Agriculture all require employers to look at feasible engineering controls as a way to control and reduce exposures to chemical hazards. A basic principle of industrial hygiene requires employers to do this before resorting to personal protective equipment as a means to control exposures. Engineering controls have been required for decades under several rules for specific air contaminants. Engineering controls such as closed cabs and closed mixing and loading have been a feasible technology for decades and have been proven to reduce pesticide exposures among farm workers in California, where their use is required. However, these technologies are not in wide use in Washington. In order to
provide workers with a safer work environment, L&I should make the use of closed systems mandatory for toxicity Category I pesticides.

In situations where engineering controls are not adequate or feasible, PPE must be used. However, numerous studies that have documented farm workers' overexposure to pesticides or identified the failure of PPE to protect workers from all routes of pesticide exposure make it clear that the PPE provisions of the WPS are not adequate to protect workers or their families from exposure to toxic pesticides.

The comparisons of PPE requirements in the Findings chapter illustrate three major problems with PPE requirements for agriculture. The first is that the WPS does not require employers to provide PPE for farm workers, who typically enter fields or orchards only after restricted-entry intervals are no longer in effect. Yet, the studies cited in previous chapters show that dermal exposure can be very hazardous, particularly for orchard thinners, despite observance of restricted-entry intervals. Dermal exposure is not measured in agriculture, even though agricultural employers are required to adhere to the Air Contaminants rules, which note dermal exposures for tens of toxic chemicals, including some pesticides.

Again, in part these problems arise due to a failure of federal labeling requirements, but that does not excuse a lack of worker protection at the state level. The Environmental Protection Agency has recognized, though not acted upon, the problems of dermal exposure associated with organophosphate (OP) pesticide use, as well as numerous other hazards of OP pesticide use. As one example, consider the EPA's recent revised risk assessment for azinphos-methyl, a highly toxic OP pesticide (US EPA 2001). As part of pesticide risk assessments, the EPA determines margin of exposures (MOE).
Without explaining the complexities of assessment, the agency’s target MOE is 100. Although the restricted-entry interval for hand thinning apple trees after azinphos-methyl application is 14 days, the target MOE of 100 is not reached until 102 days after application.

Clearly, workers who are exposed to this and other highly toxic pesticides that are easily absorbed are not working in a safe and healthful environment; at a minimum, the WPS should require agricultural employers to provide PPE to all farm workers who may be exposed to any pesticide that has skin absorption listed as an exposure route on the pesticide label. In addition, Washington should re-assess pesticide registrations for any such products. To truly protect worker health, these toxicity Category 1 pesticides should not be registered in Washington State.

A second problem with the PPE requirements for agriculture is that they do not necessarily require early entry workers to use PPE. It is problematic enough that the WPS allows workers to enter fields when restricted-entry intervals are in effect, with appropriate PPE, but this is more directly a problem of exposure. However, the WPS also allows workers to enter a treated area when a restricted-entry interval is in effect as long as “The worker will have no contact with anything that has been treated with the pesticide to which the restricted-entry interval applies, including, but not limited to, soil, water, air, or surfaces of plants” and the inhalation exposure level listed in the labeling has been reached (WAC 296-307-12020). As noted previously, exposure levels are not measured, and as far as I can tell it is impossible to enter a treated field without coming into contact with the air. No other industries have PPE exceptions for entering controlled areas, and no exceptions should apply to agriculture either.
Finally, the requirements for PPE removal and laundering are not strict enough. Under no circumstances should workers be allowed to leave the agricultural establishment with contaminated clothing and PPE, including gloves. The language of the WPS should be explicit on this point. Other industries that use toxic chemicals have much stricter provisions for removing, storing, and laundering PPE. Agricultural establishments should provide changing rooms and showers for all workers, and employers should be required to launder PPE. If this is not feasible, the burden of protection should not be placed on farm workers – or the farmers - but other controls, such as banning the most toxic pesticides, should be considered.

CONCLUSION

So are farm workers receiving equal protection under Washington law? Working conditions, race, language, income levels, and a documented lack of access to health care all indicate that the primarily Hispanic farm worker population in Washington State may indeed qualify as a “class,” a status that is necessary to bring an equal protection lawsuit. The comparisons of agency rules for training, right to know, engineering controls, and PPE highlighted in this paper indicate that farm workers are not ensured the same level of protection against toxic exposures as workers in other industries, and thus are not receiving equal protection under the law. Additionally, despite the protections afforded by the Safety Standards for Agriculture, the studies cited here indicate that pesticide exposure among farm workers is wide-spread – too wide-spread to presume that farm workers work in a safe and healthful environment.
The equal protection argument could be strengthened in at least two ways. First, a true toxicological comparison of the hazards of a specific, highly-regulated air contaminant with a highly toxic class of pesticides could emphasize why greater protection from pesticide exposures is necessary and how exposure varies based on particular administrative or technological controls. Second, many of the provisions of the WPS are poorly enforced or implemented, or simply are not enforceable; I believe an in-depth look at enforcement procedures and statistics would strengthen the argument that farm workers are not receiving equal protection under the law.

Pesticide use and regulation is fairly entrenched in the regulatory structure, both at the national and state levels. The cost-benefit analyses that are so vital to federal pesticide registration no doubt fail to take into account adequately the true socio-economic, environmental, and health costs to workers and the state. To truly ensure equal protection under the law, the state and agricultural industry should be looking at ways to reduce the use of hazardous pesticides. Again, it is a basic principle of industrial hygiene to attempt first to eliminate hazards.

Due to poor monitoring of pesticide-related illnesses and the inability of data, which ties pesticide exposure to numerous cancers and reproductive problems, to convince regulatory agencies that the hazards of many pesticides clearly outweigh their benefits - how much is a human life worth? - alternative strategies are worth exploring. Because the agricultural standards direct employers to look at feasible alternatives, the standards should include references to biological pest control, inter-cropping, and other non-toxic controls to reduce exposures, just as the Core Rules make recommendations on how employers can reduce or eliminate exposures. As foreign competition in the
agriculture sector continues to increase, the state should provide more support and research for the thriving organic agriculture sector and should consider the economic opportunities of sustainable organic marketing when conducting cost-benefit analyses at the state level.

Overall, to better protect farm workers from pesticide exposures, the traditional understanding of health and safety has to be expanded to encompass environmental health and safety. Although Washington is more progressive than many states in this arena, many of its occupational laws still focus on protecting workers from visible hazards, despite the growing documentation of the health effects of less visible toxic hazards. Clearly much more can and has to be done to protect farm workers as well as our environment. As is happening in other areas of environmental health, when federal policy fails to provide adequate protections, individual states must take the lead.
## Appendix A

### List of Acronyms

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>ANSI</td>
<td>American National Standards Institute</td>
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<tr>
<td>ATSDR</td>
<td>Agency for Toxic Substances and Disease Registry</td>
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<tr>
<td>BLS</td>
<td>U.S. Bureau of Labor Statistics</td>
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<tr>
<td>CCR</td>
<td>California Code of Regulations</td>
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<tr>
<td>CFR</td>
<td>U.S. Code of Federal Regulations</td>
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<tr>
<td>CLS</td>
<td>Columbia Legal Services</td>
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<td>DOH</td>
<td>Washington State Department of Health</td>
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<tr>
<td>DOL</td>
<td>U.S. Department of Labor</td>
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<tr>
<td>EPA</td>
<td>U.S. Environmental Protection Agency</td>
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<tr>
<td>FIFRA</td>
<td>Federal Insecticide, Fungicide and Rodenticide Act</td>
</tr>
<tr>
<td>FOIA</td>
<td>Freedom of Information Act</td>
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<tr>
<td>GAO</td>
<td>U.S. General Accounting Office (Or, as of July 7, 2004: Government Accountability Office)</td>
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<tr>
<td>L&amp;I</td>
<td>Washington State Department of Labor and Industries</td>
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<tr>
<td>MDA</td>
<td>Methyleneedianiline</td>
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<td>MOE</td>
<td>Margin of exposure</td>
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<tr>
<td>MOU</td>
<td>Memorandum of Understanding</td>
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<td>MSDS</td>
<td>Material Safety Data Sheet</td>
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<tr>
<td>NIOSH</td>
<td>National Institute for Occupational Safety and Health</td>
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<tr>
<td>OSHAct</td>
<td>Occupational Safety and Health Act</td>
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<td>Occupational Safety and Health Administration</td>
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<td>NAWS</td>
<td>National Agricultural Workers Survey</td>
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<td>NRDC</td>
<td>Natural Resources Defense Council</td>
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<td>PAN</td>
<td>Pesticide Action Network</td>
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<td>PEL</td>
<td>Permissible exposure limit</td>
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<td>PPE</td>
<td>Personal protective equipment</td>
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<td>RCW</td>
<td>Revised Code of Washington</td>
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<tr>
<td>STEL</td>
<td>Short term exposure limit</td>
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<td>USDA</td>
<td>United States Department of Agriculture</td>
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<td>WAC</td>
<td>Washington Administrative Code</td>
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<td>WISH Act</td>
<td>Washington Industrial Safety and Health Act</td>
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<td>Washington Industrial Safety and Health Program</td>
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<td>WSESD</td>
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I. Background
The Department of Labor and Industries (L&I) maintains jurisdiction over the health and safety of agriculture workers who may be exposed to pesticides as part of their job duties. Such workers are employees subject to the protection of the Washington Industrial Safety and Health Act (WISHA).

Although the federal Occupational Safety and Health Administration (OSHA) does not directly regulate pesticides, L&I’s activities in this area are part of the State Plan and subject to OSHA oversight. The Washington State Department of Agriculture (WSDA) is the Washington designee of the federal Environmental Protection Agency (EPA) and is subject to EPA oversight. Because WSDA normally relies on L&I to enforce pesticide regulations where workers are at risk, L&I readily shares information about WISHA pesticide enforcement with WSDA and EPA. However, L&I is not formally subject to EPA oversight.

Because L&I, WSDA and the Department of Health (DOH) all have pesticide responsibilities, the Legislature directed in 1996 that the three agencies work together to define their roles, minimize duplication and eliminate any conflicting requirements. That effort resulted in WSDA and L&I adopting updated and identical versions of the “worker protection standard,” based on the standard adopted and enforced by the federal EPA. The three agencies also developed and signed a Memorandum of Understanding, and provided joint training to pesticide enforcement staff.

II. Scope and Application:
This WISHA Regional Directive (WRD) provides guidance to WISHA enforcement and consultation staff regarding the enforcement of the worker protection standard in agriculture (Part I of Chapter 296-307), particularly as it relates to allegations of actual pesticide exposure. It replaces and rescinds WIM #96-11-M, and it will remain in effect indefinitely.
III. **WISHA Enforcement Protocols**

1. *In general, how should WISHA enforcement staff conduct investigations into complaints regarding pesticide exposure?*

   As a general principle, WISHA handles complaints (or referrals) regarding pesticide exposure the same way it handles other complaints of worker health and safety violations. However, it is important to coordinate regional activities with DOH and WSDA in order to avoid duplicative enforcement activities and requests for information. WISHA enforcement staff must determine whether a violation of WISHA requirements can be substantiated through witnesses or documentation and, if so, issue citations as appropriate to the circumstances.

2. *How quickly should an inspection be conducted in response to a complaint or referral alleging pesticide exposure in violation of WISHA requirements?*

   Although the WISHA Compliance Manual allows up to 30 days to respond to a serious complaint, and even longer for non-serious complaints, those maximum time limits do not reflect normal WISHA practice. In addition, for some alleged conditions, WISHA expects a more rapid response.

   A. When complaints or referrals allege serious violations resulting from ongoing pesticide application, WISHA enforcement staff are expected to make every reasonable effort to respond before the activity has been discontinued. This is especially important if the allegations suggest that the employer may be trying to avoid detection (for example, allegations of false records or allegations that spraying is scheduled for nighttime or early morning hours specifically to avoid discovery (there are other, appropriate reasons to spray at night)).

   B. In addition, WISHA staff are expected to respond to the following allegations within 48 hours if the allegation is received within seven calendar days of the event:

   - Illness from direct pesticide spray or drift;
   - Reentry into a field before reentry intervals are expired;
   - Direct spills or splashes of pesticides onto an employee.

   C. Finally, WISHA staff are expected to respond as quickly as practical to serious allegations of specific exposure occurring within the previous 30 calendar days if it appears likely that residue sampling will be relevant.

3. *How should employee interviews be handled?*

   As always, employee interviews are expected whenever such interviews are needed to ensure a thorough inspection (for example, when employee complaints and employer records are inconsistent with one another). In addition, such interviews are expected whenever no employee representative is available to participate in the inspection.
Interviews may be conducted away from the workplace and may be conducted by telephone. In addition, the following issues should be given particular consideration in pesticide exposure cases.

A. Even if an employee representative participates on the walk-around, allegations about past activity (as opposed to current conditions) cannot be evaluated without employee interviews, including any witnesses to the alleged events. A small, basically random sampling of employees may not be enough to evaluate a specific allegation; the inspector is expected to determine who may have been present at the time of the alleged incidents and to select employees to interview accordingly.

B. If the complainant alleges specific exposure, WISHA staff are expected to interview the complainant, if known. Exceptional caution must be exercised to avoid giving away the identity of a complainant who has requested confidentiality.

C. If the complainant or others likely to have relevant information cannot be located or refuse to participate in an interview, this information should be documented in the inspection file.

4. When should foliage, clothing, or other bulk samples be taken, and how should they be handled?

WISHA staff are expected to take samples when they are—or may be—necessary to determine whether a WISHA violation has occurred. When appropriate samples have already been collected by DOH or WSDA, WISHA staff are expected to rely on those sampling results to complete the inspection.

A. WISHA staff are expected to consider samples in the case of allegations regarding direct spraying or drift onto employees, premature reentry into fields or orchards, spills and splashed onto employees, contact with residues on equipment, or contact with contaminated PPE. When exposure is alleged and the employer will not readily confirm the use of a particular pesticide or type of pesticide, it is especially important to take samples.

B. Samples must be collected according to WSDA protocols and sent to the WSDA Pesticide Laboratory in Yakima, documenting the appropriate chain of custody (WISHA staff also can rely on samples collected by WSDA or DOH staff investigating the same incident).

C. WISHA staff should collect samples of clothing or PPE directly from the worksite or employee. In such cases, a history of its use and laundering must be obtained. If others (for example, an employee representative or a family member) were involved in obtaining the sample, it can be used only if they will be available to help establish the chain of custody.
5. *When should medical records be obtained?*

Medical records, if available by the employee’s consent or through records obtained from workers compensation or DOH, should be used whenever they are relevant to proving the presence of a chemical or the severity of a violation. However, it is not necessary that adverse health effects be documented in order to prove many violations, nor is it necessarily the case that all health effects caused by pesticides are the result of a WISHA violation. If allegations of cause and effect are not relevant to the WISHA inspection, such medical records are unnecessary.

6. *What unique documentation requirements arise in pesticide inspections?*

As a general rule, WISHA staff must provide documentation sufficient to support the violations that are cited, as well as sufficient explanation as to why other allegations were not cited (such documentation also helps to communicate with the complainant regarding the results of the inspection).

In the case of pesticide exposure complaints, labels should be obtained whenever possible as should spray records. Spray records can be used to verify employee allegations as well as employer statements. However, they should never be relied upon as the only documentation that an exposure did not occur. If spray records are inconsistent with other evidence indicating that exposure did occur, such as employee statements, pesticide samples or medical records, the value of the spray records should be evaluated in light of these discrepancies.

Approved: 

Michael A. Silverstein  
Assistant Director for WISHA Services

For further information about this or other WISHA Regional Directives, you may contact WISHA Policy & Technical Services at P.O. Box 44648 or by telephone at (360)902-5503. You also may review policy information on the WISHA Website (http://www.wa.gov/lni/wisha).
REFERENCES


Code of Federal Regulations. Title 40, Part 156 et seq.


_____. Regulatory Fairness Act. Title 19, Chapter 85.

_____. Washington Industrial Safety and Health Act. Title 49, Chapter 17.


_____ 1970. Occupational Safety and Health Act. Title 29, Chapter 15, § 651 et seq.

_____ 1962. Public Health Services Act. Title 42, Chapter 6A.


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____. 2004. Respiratory Hazards. Title 296, Chapter 841.

____. 2004. Respirators. Title 296, Chapter 842.

____. 2004. Safety and Health Core Rules. Title 296, Chapter 800.


