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Symptoms related to pesticide exposure among migrant
farmworkers in the Skagit Valley

University of Washington

SYMPTOMS RELATED TO PESTICIDE EXPOSURE
AMONG MIGRANT FARMWORKERS
IN THE SKAGIT VALLEY

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ABSTRACT

A group of 47 migrant farmworkers in the Skagit Valley of Northwestern Washington was interviewed regarding symptoms which they associated with pesticide exposure. Farmworkers interviewed were self-identified as having a "pesticide allergy", i.e. had recurrent symptoms while working in the field.

The three most frequently reported symptoms were: 1) rash or dermatitis, 2) headache and, 3) eye irritation. Among Skagit Valley crops, dermatitis was more frequently associated with cucumbers and strawberries while eye irritation was more frequently associated with raspberries.

Fifty-six percent of farmworkers interviewed had never received instruction on pesticide health or safety. Ninety-six percent had never received protective clothing or equipment from an employer. None of the farmworkers knew which pesticides were used in the fields where they worked.

Among those who sought medical care for their symptoms, 19% were diagnosed with a possibly pesticide-related illness. Twenty-one percent were not questioned regarding exposure to pesticides in the medical history.

The difficulties with studying this population and showing a correlation between pesticide exposure and illness are discussed.

I. INTRODUCTION

Washington employs the fourth largest number of farmworkers in the U.S. yet only two previous studies on Washington farmworkers and pesticides exist.^{1,2} Nationally, most studies looking at migrant farmworkers and pesticides have focused on either 1) acute poisonings or 2) delayed sequelae such as cancer and neuropsychological changes. Very few studies have focused on recurrent symptoms related to chronic low-level exposure.

The goal of this project is to document complaints that migrant farmworkers associate with pesticide exposure. No attempt has been made to quantify exposure or to prove a direct correlation between exposure and complaints. Rather, the aim of this study is to look at the nature of the complaints and the association between a particular complaint and a particular crop. Data regarding demographics, maternal reproductive history and health and safety issues will also be presented.

The signs and symptoms of acute poisoning by cholinesterase-inhibiting insecticides, i.e. organophosphates and carbamates, have been well documented. These include miosis, blurred vision, lacrimation, bronchoconstriction, vomiting, diarrhea, sweating, salivation, bradycardia and other symptoms related to accumulation of acetylcholine at cholinergic receptors.^{3,4,5}

Mild to moderate cases of poisoning, however, may present simply as vomiting and diarrhea and often go unreported. A review of 4 episodes of pesticide poisoning involving a total of 175 workers revealed that only the most severely poisoned received appropriate diagnosis and treatment. The remaining 111 workers did not receive appropriate medical diagnosis or treatment.⁶

Pesticide-related illness often is unreported for several reasons. Mild symptoms of cholinesterase depression such as nausea and diarrhea may be easily misdiagnosed as gastroenteritis or the flu by both farmworkers and physicians. Most farmworkers are temporary employees without health insurance or a legal contract. In addition many states exclude farmworkers from Worker's Compensation and Unemployment benefits.⁷ Thus, fear of high medical costs, losing work-time or losing one's job may prevent farmworkers from seeking medical treatment.

There are three major routes of occupational exposure to pesticides: 1) skin absorption, 2) inhalation and 3) ingestion. One author suggests that as much as 98-99% of field worker exposure to pesticides is dermal.⁸ This includes exposure to pesticide residues on crop foliage as well as the crop itself, prolonged contact with contaminated workclothes and contact with contaminated water (i.e. standing in irrigation water mixed with pesticides). Farmworkers who work as pesticide mixers, loaders and applicators often have increased dermal exposure.

Skin absorption of pesticides during routine agricultural harvesting has been documented by depressed cholinesterase levels.⁹ The 40% of workers in this study wearing gloves showed less cholinesterase depression. It has also been shown that pesticide residues can persist on the skin for as long as two months after the last known exposure.¹⁰

Acute poisonings resulting from dermal exposure have been documented. Poisonings have occurred even after the specified "reentry interval" for the pesticide used had elapsed.¹¹ Reentry intervals are guidelines set by the EPA determining when it is safe to reenter a field after a pesticide application.

A second major route of exposure is via inhalation. It is not uncommon for farmworkers to be accidentally sprayed on by aerial applicators of pesticides. Forty-eight percent of farmworkers surveyed in Florida reported having been sprayed with chemicals at least once while working,⁶ while 43% in Washington reported having been sprayed or drifted upon.¹

Drift exposure occurs when pesticides that are sprayed on one field are carried by the wind to adjacent fields where workers live and work. It is estimated that only 10% to 15% of sprayed pesticides actually reach the target pest, with the remaining 85% to 90% dispersed off-target to air, soil, and water through drift, runoff, volatilization, etc.¹²

Ingestion represents the third major route of pesticide exposure. This includes: eating the fruits or vegetables that are being harvested without washing them; eating in the fields using pesticide-contaminated hands; drinking water out of contaminated, hollowed-out cucumbers, bell peppers, etc.; smoking without washing hands to remove pesticide residues; and drinking or cooking with contaminated water (e.g. water from irrigation ditches). Young children are at increased risk as they often play in dirt and irrigation water in the field when child care services are not provided in the labor camps.

Fetuses and newborns can be exposed to pesticides transplacentally and via breast milk. Several studies have documented the presence of chlorinated pesticides in breast milk.^{13,14} Infants may be exposed prior to birth via transplacental circulation. Certain pesticides have been detected in adipose tissue, liver, adrenals, lungs, heart, brain, kidneys and spleen of stillborns and infants who died in the neonatal period, as well as in the cord blood of normal neonates.¹⁵

Detection of pesticides in the blood or urine is difficult and expensive. Gas chromatography can detect certain pesticides but is expensive and not helpful in low level exposures.¹⁶ Cholinesterase activity can be used to detect exposure to organophosphates and carbamates, but does not detect other classes of pesticides.

Interpretation is difficult because there is a wide range of variation in enzyme activity between normal individuals. Unless pre-exposure or baseline cholinesterase levels are known, many patients will still fall within the normal range after an acute poisoning episode.¹⁷ Although some patients show depressed cholinesterase levels with low-level exposure, studies have not shown a correlation between symptoms and cholinesterase level.¹⁸

Studying chronic effects of pesticides is difficult because farmworkers are exposed to a vast number of different pesticides. The term "pesticides" refers to insecticides, herbicides, rodenticides, and fungicides, and includes thousands of different chemicals.

Only the active ingredient in a pesticide must be registered with the EPA; approximately 1200 active ingredients are currently registered. Active ingredients are combined with "inert" ingredients into approximately 35,000 different commercial products.¹¹ Inert ingredients, which may be as toxic or even more toxic than the active ingredient, are neither required to be tested for health effects nor listed by name on the pesticide label.¹⁹

Nevertheless, there are a significant number of studies looking at the incidence of cancer, birth defects, neurobehavioral deficits, and infertility among populations with long-term pesticide exposure. A cumulative review of studies on farmers, farmworkers, pesticide applicators, structural pest control operators and pesticide manufacturing workers suggest a possible increased risk for the following types of cancer: lymphoma,

leukemia, multiple myeloma, testicular cancer, liver, pancreatic and stomach cancer, lung cancer, skin cancer and brain tumors.^{20,21,22,23,24,25}

Several studies examining chronic effects of acute intoxication with pesticides have found persistent neurobehavioral changes in some of the subjects. These changes include anxiety, impaired concentration, headaches, visual disturbances, and impaired intellectual functioning compared to controls.^{26,2}

The following is a descriptive study looking at symptoms which farmworkers themselves associate with pesticide exposure.

II. STUDY POPULATION and DEMOGRAPHIC RESULTS

In the summer months migrant farmworkers come to the Skagit Valley of Northwestern Washington to harvest raspberries, strawberries, cucumbers and potatoes. A few families live in the Skagit Valley year-round and cultivate and harvest tulips during the rest of the year. Most families spend the rest of the year in Eastern Washington harvesting apples, peaches, asparagus, onions and grapes. Many also do fieldwork in Texas and California. It is not uncommon for migrants to live and work in as many as 4 or 5 states in the course of one year.

Table 1 shows that Texas was most commonly considered home-base among farmworkers interviewed. Reasons given for coming to the Skagit Valley to work included: "it's hard to find work in the fields in Texas during the summer because a lot of Mexicans cross the border to work"; "children are allowed to work here while in California they are not"; and "it's cheaper [to live in the labor camps] because I don't have to pay rent or utilities."

Table 1 also shows that the majority of farmworkers interviewed (91%) were born in Mexico. Yet 79% now live permanently in the United States. Despite the fact that the average farmworker had been in this country for 9 years, only 13% had been able to achieve citizenship status. Four farmworkers interviewed were illegal aliens, most of the remainder were U.S. residents.

The average weekly salary per worker was \$131.39. Workers are paid depending on how much they pick. Frequently the earnings of all members of one family are combined and one cumulative check is given to the head of the family at the end of the harvest. This system enables some growers to avoid paying minimum wage.

Children as young as eight years often work in the field to augment the family income. During the school year many farmworker children both work and go to school. An estimated 50% of farmworker children do not graduate from high school.

Migrant farmworkers in the Skagit Valley generally live in labor camps. These consist of rows of shacks constructed with plywood and cement floors. The one-room shacks often house as many as ten people and include beds, a sink and a stove top. There is a one communal bathroom per labor camp; in one camp I visited the toilets consisted of a hole in the ground. The camps are owned by a grower. Farmworkers live there free of charge until that grower's fields are harvested and then they move on to another labor camp.

Sanitation facilities in the fields are usually inadequate. None of the farmworkers interviewed knew of hand-washing facilities in the field where they worked. Drinking water may or may not be available. A few fields do not have portable toilets.

Table 1: Demographic Data

		n=47
SEX		
	Male	17
	Female	30
AGE		
	Average age, Male	34 years
	Average age, Female	36 years
	Range of ages	13 to 61 years
BIRTHPLACE		
	Mexico	43
	Texas	2
	Arkansas	1
	Arizona	1
ETHNICITY		
	Hispanic	46
	White	1
RESIDENCY STATUS		
	Resident Alien/Green Card	34
	U.S. Citizen	6
	Undocumented	4
	Status Unknown	3
	Applying for amnesty	2
HOME BASE		
	Texas	15
	Mexico	9
	California	7
	Yakima	5
	Mt. Vernon	3
	none (always migrating)	3
	Sunnyside or Granger	3
	Arizona	1
	unknown	1
INCOME		
	Average weekly salary	\$131.39
NUMBER OF YEARS WORKED AS FARMWORKER		
	Average	9 years

Table 2
Crops Worked On

Crop	Percent Working in Given Crop in One Year
Raspberries	68
Cucumbers	66
Strawberries	55
Asparagus	49
Apples	30
Onions	15
Broccoli	13
Cherries	13
Grapes	13
Potatoes	13
Flowers	6

AVERAGE # OF CROPS WORKED ON PER PERSON = 4.4 crops/year

III. MATERIALS and METHODS

During July and August of 1989, 47 migrant farmworkers were interviewed at 13 different labor camps in the Skagit Valley. All interviews were conducted by the author; nearly all the interviews were conducted in Spanish. A questionnaire was used which contained both open and closed-ended questions. Information regarding pesticide use and exposure not covered by the questionnaire was encouraged. After the interview both written and verbal information on pesticide health and safety as well as on local health services was provided. Copies of the questionnaire in both English and Spanish can be found in the appendix.

The study population does not represent a random sample of farmworkers. I found that upon asking random farmworkers questions regarding health and pesticide exposure, I was quickly directed to certain people in the camp. Since farmworkers live and work together, someone who experiences symptoms while working in the fields is known by most inhabitants of a camp. This type of person is commonly described as having a "pesticide allergy." As it is the goal of this study to describe the type of symptoms experienced while working in the fields, only these "pesticide-allergic" farmworkers were interviewed.

IV. RESULTS

1. Symptoms Associated with a "Pesticide Allergy"

As shown in Table 3 the most commonly reported symptoms in order of frequency were: (1) rash, (2) headache, (3) watery eyes, (4) dizziness, (5) muscle aches, (6) itchy eyes, (7) difficulty breathing, (8) loss of appetite, (9) excessive sneezing, (10) eye pain, (11) chest pain, (12) runny nose, and (13) stomach ache. The last four complaints were reported at an equal frequency.

Sixty-two percent of farmworkers interviewed complained of some type of rash. The most common type of rash described translates roughly as erythematous maculopapular eruptions distributed "all over the body." The second most common type of rash was "blisters" or bullous eruptions on the hands and/or feet (Table 3).

Rashes most commonly occurred at the site of exposure. For example, rashes on the hands and forearms were usually associated with not wearing gloves. Rashes on the feet and legs usually were associated with standing in irrigation ditches filled with water.

Eye irritation comprised the second most frequently reported complaint. Forty-three percent of respondents complained of some type of eye problem while working in the fields.

Table 3
Reported Symptoms of Pesticide "Allergy"

(Page 1 of 2)

<u>Symptoms</u>	<u>No. Reporting this Symptom</u>
	(n=47)
RASHES, TOTAL	29 (62%)
Rash all over body	10
Rash on face & neck only	5
Rash on hands and arms only	5
Rash on feet or hands & feet only	5
Rash on chest or back only	2
Note: above were accompanied by itching	
Rash without itching	2
Rash with a burning sensation	5
Erythematous Maculopapular Eruptions	12
White papular eruptions	4
Hyperpigmentation	1
Red patches circled by white papules	1
Blisters accompanied by itching on hands and/or feet	9
Desquamation	2
Anesthesia or dysesthesia	2
NERVOUS SYSTEM	
Headaches	21 (45%)
Dizziness	13
Excessive sweating or night sweats	7
Hands tremble	2
EYE SYMPTOMS, TOTAL	20 (43%)
Watery eyes	14
Itchy eyes	12
Burning or injected eyes	9
Blurred vision	9

Table 3
Reported Symptoms of Pesticide "Allergy"
(Page 2 of 2)

RESPIRATORY SYMPTOMS

Difficulty breathing	11
Excessive sneezing	10
Chest pain	9

NOSE SYMPTOMS

Rhinitis	9
Nosebleeds	4
Itchy nose	3

GASTROINTESTINAL SYMPTOMS

Lack of appetite	11
Stomach aches	9
Nausea, vomiting	6
Diarrhea	2

GENERAL

Muscle aches	12
Anxiety	6
Difficulty Swallowing/Sore Throat	5
Fever	3

2. Association Between Symptoms and Crops

As shown in Table 4, the most common association among Skagit Valley crops was a rash while working with cucumbers (39%). The second most common association was the development of a rash while working in strawberries (31%).

The third most frequently reported association among Skagit Valley crops was eye irritation while picking raspberries (22%). As shown in Table 4, eye problems were more common with crops picked at or above eye level (raspberries, grapes, and apples). Respondents frequently described a "powder" falling from the foliage or fruit into their eyes while picking.

Three other Washington state crops (grapes, apples and asparagus) not grown in the Skagit Valley were frequently associated with headaches and rash (Table 4).

3. Pesticide Health and Safety

Although not specifically asked by the questionnaire, 16 farmworkers revealed having been sprayed or drifted upon while working in the field. Although all 16 incidents resulted in acute illness, only two respondents filed for Worker's Compensation (Table 5).

None of the respondents knew which pesticides were used on the crops in which they worked. Thirty-seven percent had never been advised of when it was safe to reenter a field after a pesticide application. Fifty-six percent had never received instruction on pesticide health and safety (Table 5).

Table 4
Symptoms Reported with a High Frequency
for a Particular Crop

Crop	Symptoms	Percentage with given Symptom when working in given crop
SKAGIT VALLEY CROPS		
Cucumber (n=31)	Rash	39
Strawberry (n=26)	Rash	31
	Headaches	19
Raspberry (n=32)	Eye Irritation	22
OTHER WASHINGTON STATE CROPS		
Grapes (n=6)	Headache	83
	Rash	66
	Eye Irritation	50
	Loss of Appetite	50
Apples (n=14)	Rash	43
	Headaches	43
	Difficulty breathing	36
	Eye irritation	36
Asparagus (n=23)	Headaches	39
	Rash	22
	Nausea, vomiting, diarrhea	17 (4 cases)*

*Note: 3 of these cases were acute episodes of vomiting, diarrhea etc. after being sprayed or drifted upon. Each case was a separate episode.

Table 5
Pesticide Health and Safety

SITUATION	Number of Workers
Exposure to Pesticides by Chemical Spray/Drift <i>Note: information was volunteered by interviewee</i>	16
Filed an L & I Claims Form for Worker's Compensation	2 (4.3%)
Advised of When a Field was Sprayed and/or When it was Safe to Reenter a Field	24 (63%)
<i>Note: of these 24 workers:</i>	
<i>9 had been advised of pesticide use while working with asparagus or apples but had never been advised of pesticide use while working in the Skagit Valley.</i>	
<i>4 had been advised of pesticide use one time only.</i>	
<i>3 had been advised of pesticide use while working in flowers only.</i>	
<i>2 had been advised of pesticide use for the first time this year.</i>	
Never Advised of When a Field was Sprayed and/or When it was Safe to Reenter a Field	14 (37%)
Never Received Instruction on Pesticide Health & Safety	23 (56%)
Received Instruction on Pesticide Health and Safety	18 (44%)
Agency providing this information:	
Spanish-speaking radio station or advertisement on bus	5
Evergreen Legal Services	4
Corporate Farm Owners (e.g. DelMonte, asparagus)	4
Texas Department of Labor or Department of Agriculture	3
United Farmworkers Union	3
Migrant Farmworkers Clinic	3

Table 6 shows that 96% of respondents had never received protective clothing or equipment from an employer. Sixty-seven percent used protective equipment that they bought themselves, mostly gloves.

4. Pregnancy Outcome Among Female Farmworkers

Table 7 shows that 1 in 4 farmworker women interviewed had had at least 1 miscarriage. One woman reported having had a stillbirth and no children with birth defects were reported.

5. Use of Health Care Services

As shown in Table 8, 53% of farmworkers interviewed did not seek medical care for their "pesticide allergy" symptoms. Of those that did seek medical care, 19% were diagnosed as having an illness possibly related to pesticides. In 21% of the cases, questions concerning occupational exposure to pesticides were not included in the medical history.

V. DISCUSSION

The results of this study are very similar to the findings of a previous study by Mines and Kearney in Tulare County, California.²⁷ Mines and Kearney surveyed 428 workers about symptoms that they believed to have been caused by agricultural chemicals. "Rash or Itch" was the most frequently reported symptom (46%). This was followed by headaches (44%) and eye irritation (27%). Thus the top three health

Table 6

Use of Personal Protective Equipment

DESCRIPTION	NUMBER
	(n=45)
Never received protective clothing or equipment from employer	43 (96%)
<i>Note: the 2 interviewees who had received protective clothing in the form of gloves worked for a nursery and a flower grower respectively.</i>	
# Reporting having used protective clothing that they bought themselves	30
Gloves	27 (60%)
Bandana covering nose and mouth	3 (6.7%)
# Reporting having never used protective clothing or equipment	15

Table 7

Reproductive Health of Female Farmworkers

SYMPTOM	NUMBER
	(n=39)
Spontaneous Abortion	10 (26%)
Two or more Spontaneous Abortions	4 (10%)
<i>Note: 1 woman: 7 miscarriages</i>	
<i>1 woman: 6 miscarriages</i>	
<i>1 woman: 4 miscarriages</i>	
Stillbirth	1 (2.6%)

Table 8

Use of Health Care Services by
Farmworkers with a Pesticide "Allergy"

DESCRIPTION	NUMBER
	(n=43)
Did not seek medical care for symptoms	23 (53%)
Did seek medical care for symptoms	20 (47%)
Outcome of medical visit:	
Diagnosed illness as possibly related to pesticides	8 (19%)
Diagnosed illness as allergy not related to pesticides	5 (12%)
Diagnosed as neither allergy nor pesticide-related illness	6 (14%)
Medical history did not include information regarding pesticide exposure	9 (21%)

problems thought to be caused by pesticides were identical in the Mines and Kearney study compared to this study.

Mines and Kearney also found an association between crops picked at or above eye level (grapes and citrus) with eye irritation (38% and 24% respectively). A lower percentage (18%) sought medical care for their symptoms compared to 47% in this study.

Two other studies looking at general health complaints among farmworkers found headache to be the most frequently reported symptom. The study by Mentzer of 460 farmworkers in Washington found the three most commonly reported symptoms to be: headache (44%), itching (32%), and soreness or inflammation of nose or throat (26%).¹ A similar study in Wisconsin of 378 farmworkers listed headache (33%), eye trouble (32%), and backache (27%) as the most common symptoms.²⁸ This suggests that although headache may be the most prevalent complaint, rashes and eye problems are more frequently thought to be associated with pesticide exposure by farmworkers themselves.

It is clear that rash or dermatitis represents a major source of morbidity among farmworkers. In 1984, skin disorders comprised over two-thirds of occupational illnesses reported among agricultural workers.²⁹ Yet the role that pesticides play in the development of dermatitis is difficult to determine. Farmworkers are occupationally exposed to many physical, chemical and infectious agents that can cause or exacerbate dermatitis. Examples include ultraviolet radiation, plants, soil, fertilizers, and zoonoses in addition to pesticides.³⁰

Determining the type of dermatitis is also difficult. Contact dermatitis is the most frequently diagnosed category of occupational skin disease in farmworkers, and

both irritant and allergic contact dermatitis occur.³¹ It is not usually possible to distinguish irritant from allergic contact dermatitis by physical examination. Skin patch testing may help to identify allergic sensitization, and to assess the specific etiologies (e.g. allergic sensitization to specific pesticides). A large number of pesticides in common use have been shown to cause sensitization as well as direct irritant dermatitis.³²

Following dermatitis and headache, eye irritation was the third most commonly reported symptom. Farmworkers face several occupational hazards which could potentially cause eye irritation. These include: infection, sun, dust, soil, pesticides, and other contaminants present on crop foliage. Although it is impossible to determine the percentage of eye irritation caused by pesticides, it has been shown that pesticides can cause conjunctivitis, corneal ulceration, uveitis, lenticular and corneal opacities and destruction of the conjunctiva.^{33,34}

The high rate of spontaneous abortions (26%) found in this study is supported by similar findings in other studies. A study on maternal occupation and fetal death in the state of Washington found a fetal death rate (stillbirths and spontaneous abortions) of 26% among farmworker women compared to 18% among controls.³⁵ A study in India on grape workers found a spontaneous abortion rate of 44% compared to 8% among controls.³⁶ Rates cited in these studies refer to the number of spontaneous abortions per 100 pregnancies. In contrast, the rate of 26% among Skagit Valley farmworkers refers to the number of spontaneous abortions per 100 women.

The Mentzer study reported similar results on pesticide health and safety.¹ The Mentzer study found 85% of farmworkers had never been supplied with protective equipment, 76% had never received information or instruction on how to work safely

around pesticides and 89% did not know the name of any pesticide they had worked with or near. These findings indicate poor enforcement of the Washington state law on provision of protective equipment for workers (W.A.C. 296-306-060) and the Hazard Communication or "Worker Right to Know" law (W.A.C. 296-62-05403).

The finding in this study that 47% of farmworkers sought medical care for their symptoms is significantly different from similar studies reporting 10-15% sought medical care.^{1,4} One possible explanation for this difference is the accessibility of low-cost care available at the Seamar Migrant Health Center in Mount Vernon. A previous study on utilization of health care services in the Skagit Valley showed 75% of farmworkers were familiar with the Seamar clinic, and of the migrants who knew of the clinic, 89% had used it.³⁷

Despite the fact that farmworkers in this study sought care for symptoms they believed to be pesticide related, only 19% were diagnosed as having a possibly pesticide-related illness. Possible explanations for this include: 1) the non-specific nature of the complaints, 2) lack of physician awareness of pesticide-related illness, 3) language and cultural barriers, and 4) the difficulty of proving a diagnosis.

Potential sources of bias in this study include: 1) small sample size, 2) gender imbalance (64% female respondents), 3) subjective nature of the variables and 4) translation of responses from Spanish to English by the author.

VI. CONCLUSION

It is impossible to prove a causal relationship between pesticide exposure and the symptoms reported in this study. One can conclude however that the most frequently reported symptoms, rash, headache and eye irritation, are possibly, perhaps probably, pesticide related.

One goal of this study is to increase awareness among health providers so that their differential diagnosis of these common health problems will include pesticides when appropriate. I believe this is an important step in improving the health and safety of farmworkers. By recognizing possible pesticide-related illness, health providers may be better able to advise farmworker patients on using protective equipment, washing contaminated workclothes, avoiding contaminated water and other measures to decrease exposure to pesticide residues. They may also be better advocates for farmworkers injured by pesticides in filing for Worker's Compensation and receiving proper medical treatment.

Finally, it is recommended that further research of a quantitative nature be carried out concerning symptoms related to pesticide exposure in migrant farmworkers.

VII. RECOMMENDATIONS

1. Develop screening protocols to identify pesticide-related health problems in a medical history.
2. Train health care providers on how to comply with the new pesticide law, HB 2222, which requires they report all suspected cases of pesticide-related illness.
3. Train rural health providers to educate farmers and farmworkers about pesticide health and safety.
4. Improve compliance with and enforcement of Department of Agriculture regulations prohibiting spraying and drifting of pesticides onto workers.
5. Require employers to provide protective equipment such as gloves and protective eyewear to farmworkers.
6. Improve compliance with and enforcement of Department of Labor and Industries field sanitation regulations which require hand-washing facilities in the workplace.
7. Mandate Washington to follow the example of California and Texas in establishing its own reentry intervals for the estimated 99% of pesticides on the market with no established reentry interval.
8. Require posting of "Do Not Enter" signs around fields during the reentry period.
9. Initiate further research on the effect of pesticides on farmer and farmworker health in Washington.

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APPENDIX A

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Name: _____ Age: _____

Where were you born?

Where is your home base?

Are you an American Citizen?

If not, are you a resident (or do you have a green card)?

How many years have you worked as a migrant farmworker?

With which crops do you usually work?

How many months of the year do you work in the fields?

How much, on average, do you earn per week in the fields?

What do you do the other months of the year?

How are you affected by the chemicals that they use of the field where you work?

Have you ever had any of the following symptoms:

rash

with burning? with itching?

what color was it?

blisters

muscle aches

stomach aches

nausea or vomiting

diarrhea

anxiety

burning or itching eyes

watery eyes

runny nose

excessive sneezing

headaches

dizziness

chest pain

difficulty breathing

excess sweating or night

sweats

blurry vision

loss of appetite

burning sensation

other symptoms?

Did you seek medical help when you had these symptoms?

Where? Did you explain to the doctor that you had had contact with chemicals?

What type of treatment did you receive?

APPENDIX A

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If you chose not to seek medical help, why not?

For women (or spouse):

Have you ever had a miscarriage or stillbirth? How many?

Have you ever had a child born with birth defects?

Have you ever filed a Labor and Industry Claims Form?

Have you ever received information about what pesticides you're being exposed to and/or pesticide safety?

If so, where? From whom?

Does your employer inform you when he has applied pesticides and when it's safe to reenter the field?

Do you use gloves or protective clothing in the field?

Would you like to learn more about pesticide health and safety?

If so, where would be the best place for a presentation on this topic?

APPENDIX B

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Nombre _____ Edad _____

¿Donde nació? _____

¿Donde tiene su casa? _____

¿Es ud. ciudadano americano? _____

¿Si no, tiene tarjeta verde? _____

¿Cuántos años ha trabajado como trabajador migrante? _____

¿En que cosecha trabaja? _____

¿Cuánto gana promedio por semana? _____

¿Cuántos meses del año trabaja en el campo? _____

¿En que trabaja los otros meses del año? _____

Como le afectan las químicas que se usan en el campo donde trabaja?

Ronchas _____
con picazón _____
con quemadura _____
de que color _____

Bejijitas _____

Nervios _____

calambre de los músculos _____

dolor del estomago _____

vomito _____

diarrea _____

Dolor de cabeza _____

moreos _____

picazón de los ojos o de la nariz _____

le corre la nariz _____ le lloran los ojos _____

estornudos _____

dolor del pecho _____

dificultad en respirar _____

APPENDIX B

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sudor demasiado o sordores en la noche _____

vista nublada _____

falta de apetito _____

quemadura _____

Otras sintomas _____

¿Ha buscado servicios medico? _____

¿Donde? _____

¿Si no, porque no? _____

¿Explicó al doctor que tenía contacto con las químicas? _____

¿Que tipo de tratamiento recibió? _____

Para las mujeres (o la esposa):

¿Ha perdido um embarazo? _____ ¿Cuantos? _____

Ha tenido un niño que ha nacido muerto o que ha nacido con deformidades? _____

¿Ha tenido caso con el departamento de la labor y industrias (por ejemplo, despues do algun accidente en el trabajo)? _____

¿Ha recibido instrucción sobre las pesticidas y su seguridad o protección? _____

¿En donde? _____ ¿De quién? _____

¿Usa guantes o ropa protectiva en el campo? _____

¿Le advisa el ranchero cuando applica pesticidas o cuando se puede entrar en el campo despues de un "spray" de pesticidas? _____

¿Le gustaría apprender màs sobre las pesticidas y la seguridad? _____

¿Si sí, donde seria el mejor lugar para una charla así? _____