



PESTICIDES: RISKS VS HAZARDS

PRESENTATION AGENDA

1. Program background
2. Hazard vs Risk
3. Pesticide-related illness
4. WSDA, LNI, DOH
5. Case scenarios
5. Discussion

PESTICIDE ILLNESS SURVEILLANCE

AUTHORITY CHAPTER 70.104 RCW

NOTIFIABLE CONDITION
WAC 246-101-101

ILLNESS REPORTING RELATIONSHIPS
WITH:

WASHINGTON STATE POISON CENTER

WASHINGTON STATE DEPARTMENT OF
LABOR & INDUSTRIES

WASHINGTON STATE DEPARTMENT OF
AGRICULTURE

MEMORANDUM OF UNDERSTANDING

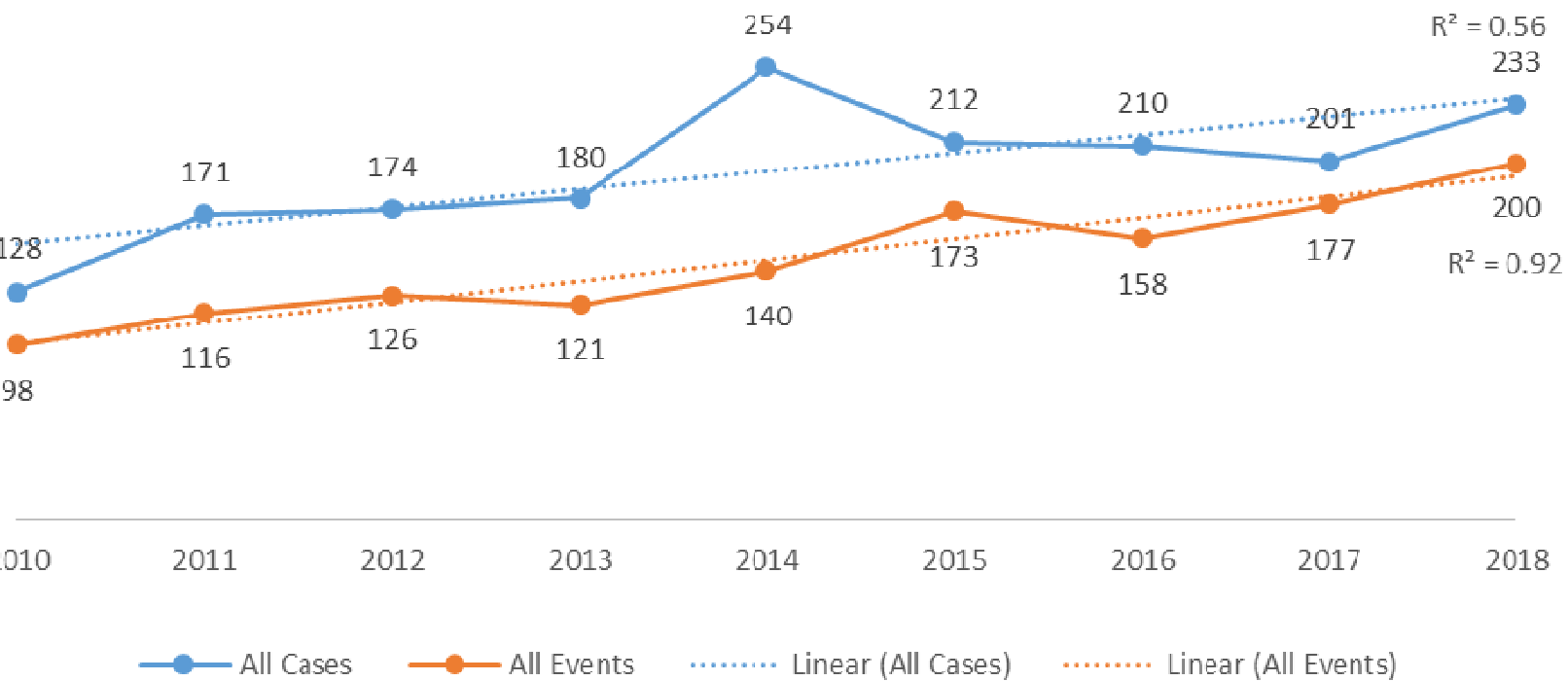


PUBLIC HEALTH SURVEILLANCE

- CONFIRM IF SYMPTOMS ARE RELATED TO A PESTICIDE EXPOSURE
- ROOT CAUSE OF EXPOSURE

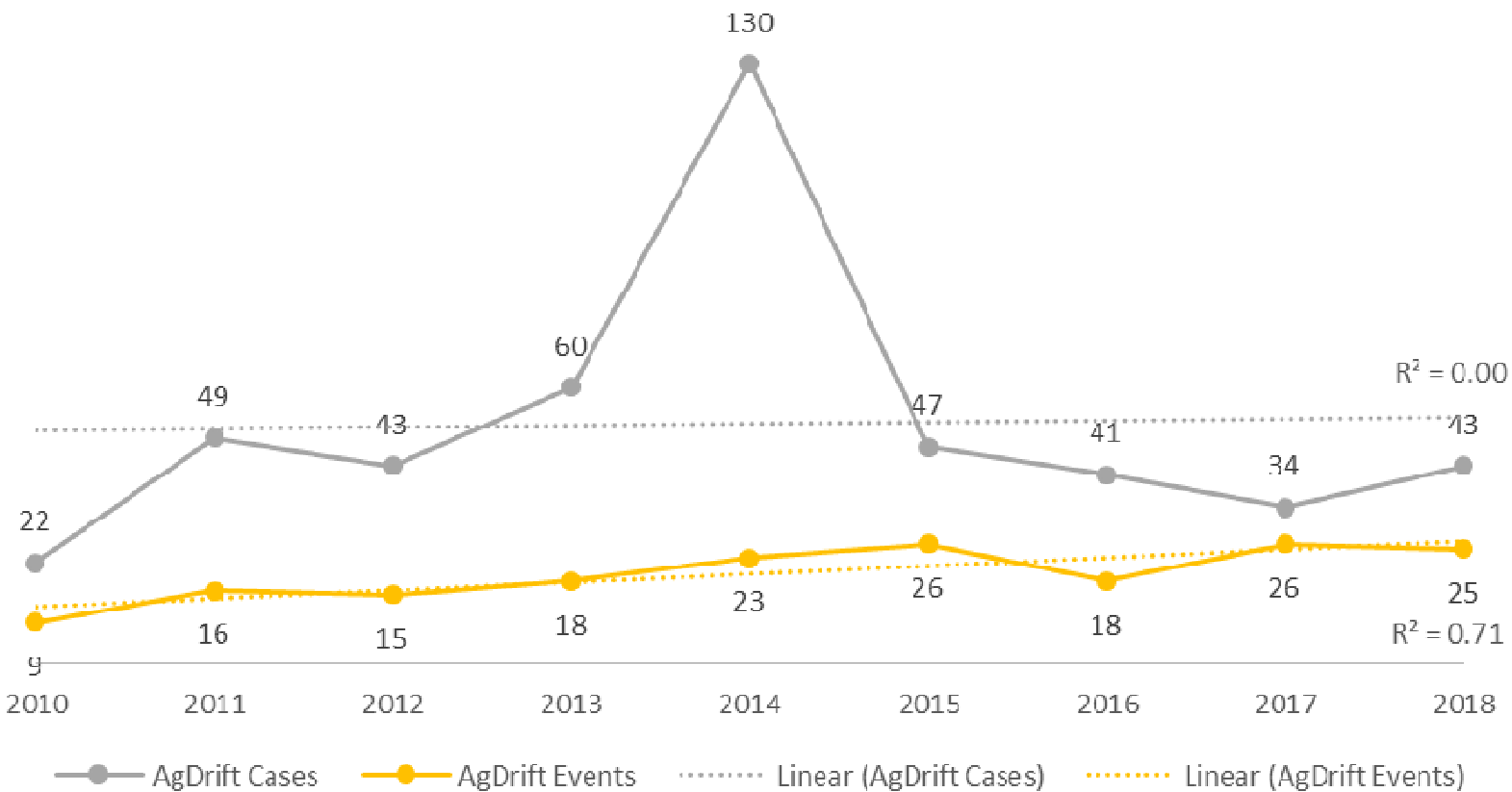
ALL PESTICIDE EVENTS AND ILLNESS CASES

Illness Cases and Events (2010-2018)



AGRICULTURAL DRIFT EVENTS AND ILLNESS CASES

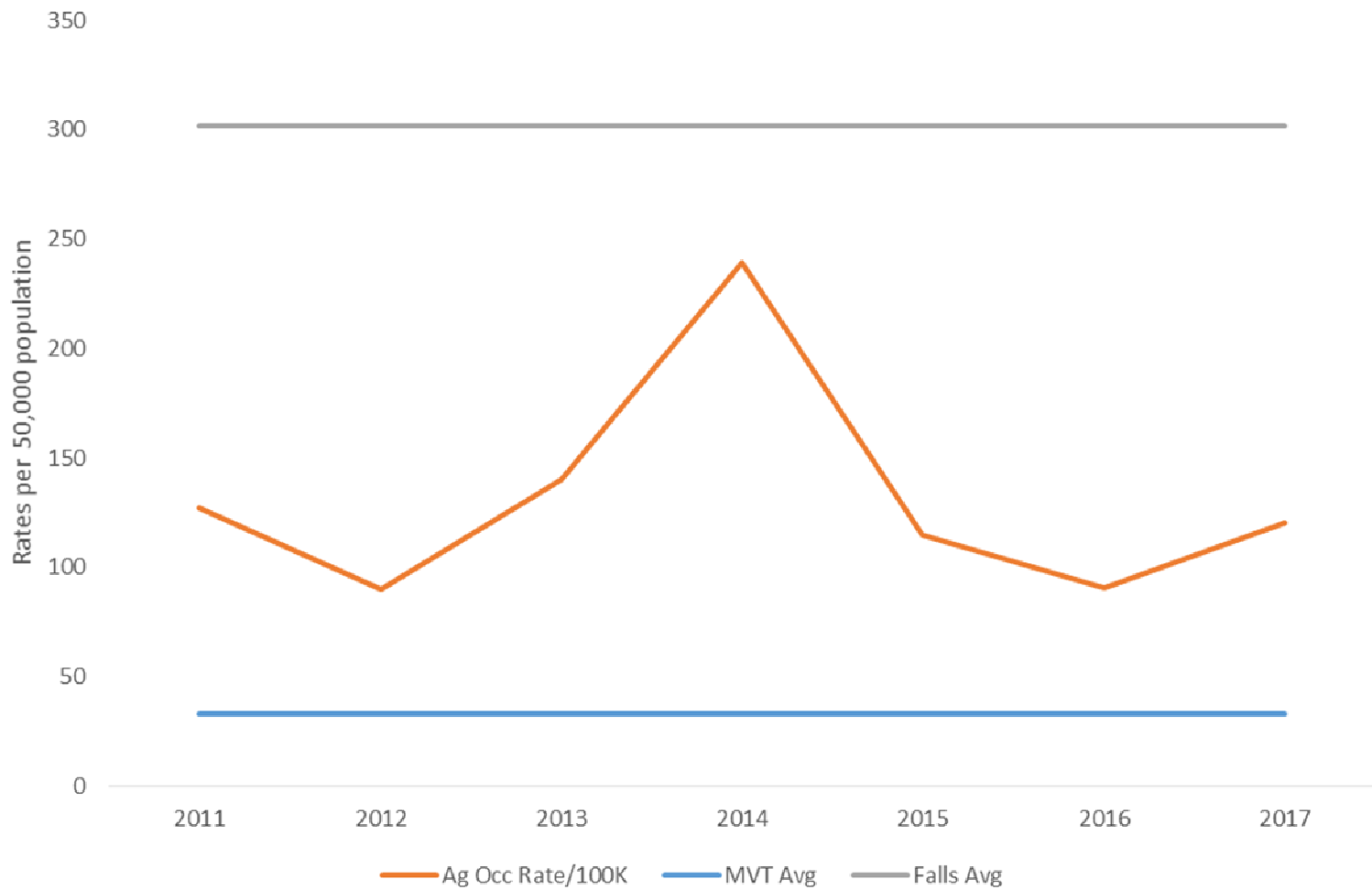
Agricultural Drift Cases and Events (2010-2018)



DEPARTMENT OF LABOR STATISTICS FARMWORKER POPULATION

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
	33024	38914	44521	46056	48736	79629	85543	68602	75500	70843	38782	35715	55,489
	34397	40266	47462	46877	48790	69385	87499	69658	80540	79676	46205	37758	57,376
	38293	41513	44057	47708	50052	79966	107403	74704	86994	79331	42946	33169	60,511
	37038	41656	46002	47920	48095	76181	96224	71706	83317	79273	46997	35578	59,166
	37216	41960	44063	46840	47482	63684	97923	79502	82717	79138	55812	39851	59,682
	38699	43194	47813	51550	55582	80604	108163	83807	86742	80296	53672	41174	64,275
	39667	44834	48935	54577	57045	86323	94332	78843	83490	77512	47768	39974	62,775
	41968	43686	50813	58332	60997	90144	98286	82670	88463	79718	56761	44724	66,380
	45493	49664	55616	61859	64872	97094	96381	87889	87815	72861	52159	45543	68,104
	45082	50817	55780	65501	69657	95842	92978	91208	88370	75618	57941	46879	69,639
	38635	48507	56784	61846	64059	83516	103319	85717	86888	78343	60420	50563	68,216

COMPARISON OF ILLNESS RATES



HAZARD VS RISK

HAZARD = DANGER

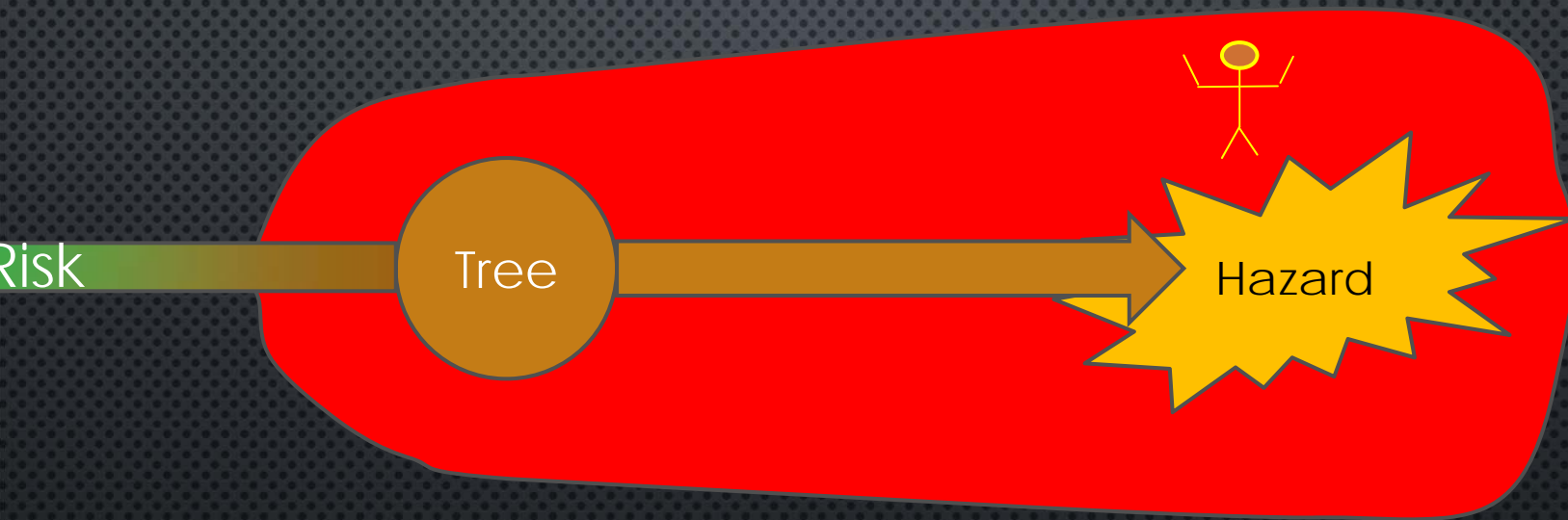
RISK = ARE YOU OR SOMEONE ELSE IN DANGER?

HAZARD VS RISK



Photo credit: © Chris Crisman

HAZARD VS RISK



LOG SKIDDER AND FALLING WEDGE



PESTICIDE CASE STUDIES

APPLE ORCHARD APPLICATOR

APPLE ORCHARD APPLICATOR

- A 26-year-old male sprayed an apple orchard for approx. 3 hours.
- He wore the full-face respirator provided by his employer.
- He could smell the products.
- He removed his mask after feeling shortness of breath. He breathed in and felt the mist fall on him from what he'd just sprayed.
- He breathed the spray mist and finished the job. As he finished, he felt dizzy & fainted.



APPLE ORCHARD APPLICATOR

- TANK MIX:

CARBARYL 4L INSECTICIDE

REGULAD

FIRELINE 17 WP FUNGICIDE

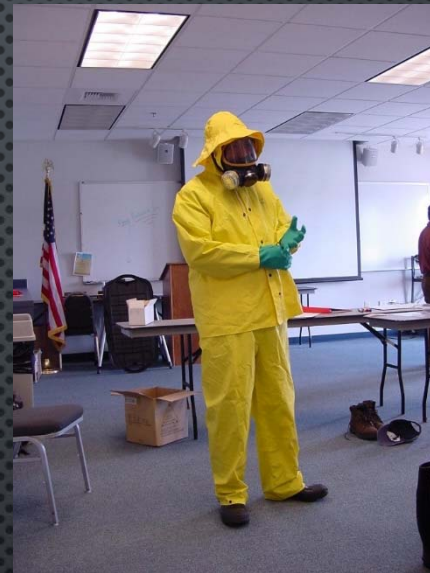
PRO NATURAL CALCIUM PLUS



PEAR ORCHARD FARM-TO-FARM DRIFT

LNI inspection results:

- No WPS handler training
- No respirator training
- No fit test
- No medical approval
- No chemical hazard communication training
- EPA #s not on pesticide inventory
- No monthly safety meetings
- Deficient outdoor heat exposure program
- No heat-related illness training



ORCHARD FARM-TO-FARM DRIFT

PEAR ORCHARD DRIFT



PEAR ORCHARD FARM-TO-FARM DRIFT

APPLICATION TO A PEAR ORCHARD TO PREVENT SAP-SUCKING INSECT (PSYLA) ON THE ORCHARD

PSYLA CAN ACCUMULATE ON LEAVES AND FRUIT REDUCING PHOTOSYNTHESIS AND REDUCING FRUIT SIZE

REDUCES THE COMMERCIAL VALUE OF FRUIT.

PESTICIDES ARE APPLIED IN THE SPRING TO REDUCE THE PSYLA INFESTATION.

PEAR ORCHARD FARM-TO-FARM DRIFT

- 20 WORKERS: 19 WOMEN ONE MAN

- AGE FROM 25 TO 63

- SCATTERED THROUGH CHERRY ORCHARD

- STARTED TO BECOME SICK IN MINUTES

- EMERGENCY MEDICAL DECONTAMINATED 6 WORKERS AND TRANSPORTED THEM TO THE EMERGENCY ROOM.

- REMAINDER HAD LOW SEVERITY ILLNESS.

- LEAVES AND CLOTHING SAMPLES COLLECTED BY WSDA TESTED POSITIVE

PEAR ORCHARD FARM-TO-FARM DRIFT

HEADACHE WITH TINGLING, BURNING, AND OTHER SKIN SYMPTOMS

NAUSEA, DIFFICULTY BREATHING, LUNG AND THROAT IRRITATION

8 WORKERS 2 WEEKS AFTER THE INCIDENT REPORTED PERSISTENT SX.

THE APPLICATORS WHO WERE WEARING PPE (RESPIRATORS AND CHEMICAL RESISTANT HEADGEAR REPOSTED NO SX.

PEAR ORCHARD FARM-TO-FARM DRIFT: PRODUCTS

THE MIXTURE CONTAINED NUVALURON, PYRIDABEN, TRIFLUMIZOLE, MINERAL OIL.

IT ALSO CONTAINED BORON AND PHOSPHORIC ACID AS FERTILIZERS.

PYRIDABEN AND NOVALURON ARE TOXICITY II PESTICIDES

PYRIDABEN INHIBITS MITOCHONDRIAL TRANSPORT I ELECTRON TRANSPORT. APPROVED IN 1994 AND PRODUCT LABEL INDICATES IT IS FATAL IF INHALED AND APPLICATOR HAVE TO USE RESPIRATORS.

PEAR ORCHARD DRIFT: WHAT HAPPENED?

APPLICATORS WERE REQUESTED TO SHUT-DOWN THE AIR-BLASTER BY THE CREW LEADER. THE APPLICATORS REFUSE TO SHUT-DOWN THE AIR-BLASTERS AND CONTINUE SPRAYING.

- FARMWORKERS WERE NOT PREVIOUSLY NOTIFIED ABOUT THE APPLICATION.

- DRIFT IS THE MAJOR ROOT CAUSE OF PESTICIDE-RELATED ILLNESS OF FARM WORKERS.

- UNKNOWN TOXICITY OF RECENTLY INTRODUCED PESTICIDES.

- GAPS IN NOTIFICATION REQUIREMENTS

APPLE ORCHARD FARM-TO-FARM DRIFT

APPLE ORCHARD FARM TO FARM DRIFT



APPLE ORCHARD FARM TO FARM DRIFT

- NINE FARM WORKERS; SIX FEMALE AND THREE MALES EXPOSED TO DRIFT BY NEIGHBORING ORCHARD.
- PRUNING FOR FIRE BLIGHT AND APPLYING A FUNGICIDE WITH TRIGGER-PUMP SPRAY BOTTLE.
- AIR-BLAST APPLICATION OF INSECTICIDE BY NEIGHBOR WITH A FUNGICIDE CONTAINING CITRIC AND PHOSPHORIC ACID; A SPREADER CONTAINING ETHYLENE GLYCOL AND PROPYLENE GLYCOL AND A FERTILIZER CONTAINING CALCIUM CHLORIDE.
- EIGHT WORKER FELT THE SPRAY ON THEIR SKIN. NINE REPORTED EYE AND DERMAL IRRITATION.

APPLE ORCHARD FARM TO FARM DRIFT

- EIGHT WORKERS EXPERIENCE NEUROLOGICAL SYMPTOMS.
- SEVEN SOUGHT MEDICAL CARE WITHIN 3 HOURS OF BEING EXPOSED.
- THE TWO ORCHARDS ARE SEPARATED BY A CANAL AND ARE BORDERED EACH SIDE BY A FIELD ROAD.

APPLE ORCHARD FARM TO FARM DRIFT



APPLE ORCHARD FARM TO FARM DRIFT

- CONFIRMED: ALL 9 INDIVIDUALS' ILLNESSES WERE ASSOCIATED TO THE PESTICIDE EXPOSURE

- FIVE MODERATE AND FOUR LOW SEVERITY CASES.

- WIND DIRECTION FROM THE SOUTH, SOUTH WEST ACCORDING TO NEAREST WEATHER STATIONS IN THE AREA SUPPORTING DRIFT EVENT SCENARIO.

- NOTICE OF CORRECTION ISSUED BY WSDA FOR THE APPLICATORS AND A NOTICE OF INTENT FOR THE EMPLOYER FOR ALLOWING WORKERS TO USE A FUNGICIDE WITHOUT PROPER TRAINING.

APPLE ORCHARD FARM TO FARM DRIFT



2014 APPLE ORCHARD FARM-TO-FARM DRIFT

2014 APPLE ORCHARD FARM-TO-FARM DRIFT

- TRIGGER-PUMP SPRAY BOTTLE ISSUED TO FARM WORKERS TO SPRAY THE FUNGICIDE ONTO PRUNED TREE STUMPS INFECTED WITH FIRE BLIGHT.
- PRODUCT NOT USED IN ACCORDANCE TO THE LABEL REQUIREMENTS.
- READ THE LABEL BEFORE USING PRODUCTS TO TREAT THE TREE AND PRUNING EQUIPMENT TO PREVENT BLIGHT.

2014 APPLE ORCHARD FARM-TO-FARM DRIFT



2014 APPLE ORCHARD FARM-TO-FARM DRIFT



2014 APPLE ORCHARD FARM-TO-FARM DRIFT

- SIX MALE FARM WORKERS AGES 25 TO 37 WERE ON A LUNCH BREAK WHEN THEY GOT EXPOSED BY DRIFT.

- NEUROLOGICAL: 3 HEADACHE; 1 DIZZINESS

GASTROINTESTINAL: 2 NAUSEA; 3 PAIN

OCULAR: 2 EYE IRRITATION

RESPIRATORY: 1 THROAT IRRITATION

SEVERITY: MILD

2 INSUFFICIENT INFORMATION CASES

3 POSSIBLE CASES

1 ASYMPTOMATIC

2014 APPLE ORCHARD FARM-TO-FARM DRIFT



ORCAL, INC.

REX LIME SULFUR SOLUTION

Fungicide-Insecticide-Miticicide for Fruits, Nuts, Ornamentals, Roses

OR-CAL, INC. • 29454 MEADOWVIEW RD. • JUNCTION CITY, OR. 97448

EPA REGISTRATION NO. 71096-6

EPA ESTABLISHMENT NO. 52251-OR-005

KEEP OUT OF REACH OF CHILDREN
DANGER PELIGRO

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle. (If you do not understand the label, find someone to explain it to you in detail.)

SEE ADDITIONAL PRECAUTIONARY STATEMENTS INSIDE BOOKLET.

ACTIVE INGREDIENT:

Calcium Polysulfide 28%

INERT INGREDIENTS 72%

TOTAL 100%

ALL APPLICABLE DIRECTIONS, RESTRICTIONS AND PRECAUTIONS ON THE LABEL ARE TO BE FOLLOWED. SEE DIRECTIONS FOR USE IN BOOKLET.

Approved under Washington State Department of
Agriculture Organic Food Program

Rev. 1/26/11

NET CONTENTS

FIRST AID

If Swallowed:	<ul style="list-style-type: none"> • Call poison control center or doctor immediately for treatment advice. • Have person sip a glass of water if able to swallow. • Do not induce vomiting unless told to do so by the poison control center or doctor. • Do not give anything by mouth to an unconscious person.
If in eyes:	<ul style="list-style-type: none"> • Hold eye open and rinse slowly and gently with water for 15-20 minutes. • Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. • Call a poison control center or doctor for treatment advice.
If inhaled:	<ul style="list-style-type: none"> • Move person to fresh air. • If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth, if possible. • Call a poison control center or doctor for further treatment advice.
If on skin Or clothing:	<ul style="list-style-type: none"> • Take off contaminated clothing. • Rinse skin immediately with plenty of water for 15-20 minutes. • Call a poison control center or doctor for treatment advice.

HOT LINE NUMBER

Have the product container or label with you when calling a poison control center or doctor, or going for treatment. You may also contact the National Pesticide Telecommunications Center at: 1-800-858-7378 for emergency medical treatment information.

Note to Physician

2014 APPLE ORCHARD FARM-TO-FARM DRIFT

- LIME SULFUR HYDROLYZES INTO SULFIDE IN THE PRESENCE OF WATER.

- IT CAN SUBLIMATE TO HYDROGEN SULFIDE HIGH TEMPERATURES.

- CAPABLE OF PRODUCING NAUSEA, VOMITING, HEADACHE AND DIARRHEA.

- IT'S A TOXICITY CLASS I PESTICIDE; CORROSIVE

- PRODUCES DERMAL, OCULAR AND RESPIRATORY IRRITATION.

APPLE ORCHARD EMPLOYER-EMPLOYEE DRIFT

APPLE ORCHARD EMPLOYER-EMPLOYEE DRIFT



APPLE ORCHARD EMPLOYER-EMPLOYEE DRIFT

- FIVE FEMALE FARM WORKERS DEVELOPED GASTROINTESTINAL, NEUROLOGICAL AND UPPER RESPIRATORY IRRITATION AFTER SMELLING LIME SULFUR SOLUTION WHILE WORKING IN TWO DIFFERENT LOCATIONS INSIDE THE ORCHARD.
- THEY STARTED TO WORK EARLY MORNING AT 7:00 AM AND COULD SMELL SULFUR IN THE AIR. THEY WERE MOVED TO ANOTHER SECTION OF THE ORCHARD THIS TIME EVEN CLOSER TO A BLOCK BEING APPLIED WITH REX LIME SULFUR SOLUTION. WORKERS REPOSTED SEEING THE APPLICATOR AT 20 FEET AWAY FROM THEM.
- A NARROW ROAD DIVIDED THE WORKERS FROM THE APPLICATORS AND EVEN THEIR FOREMEN ADMITTED TO THE LACK OF COMMON SENSE IN LEAVING THE WORKERS SO CLOSE TO THE APPLICATION AREA.



- EARLY MORNING WORKERS LOCATED RIGHT SIDE OF THE ROAD
- APPLICATORS TO THE LEFT SIDE OF THE ROAD. SOME WORKERS COULD NOT SEE THE APPLICATORS BUT SMELLED THE SULFUR.
- THEY WERE THEN TRANSFERRED TO ANOTHER SECTION OF THE ORCHARD.



- APPROXIMATELY 4 HOURS LATER WERE MOVED HERE WHERE THE AIR-BLAST SPRAYERS WERE AT 20, 50 AND 100 FEET AWAY FROM THE WORKERS. WORKERS LOCATED ON THE LEFT SIDE.

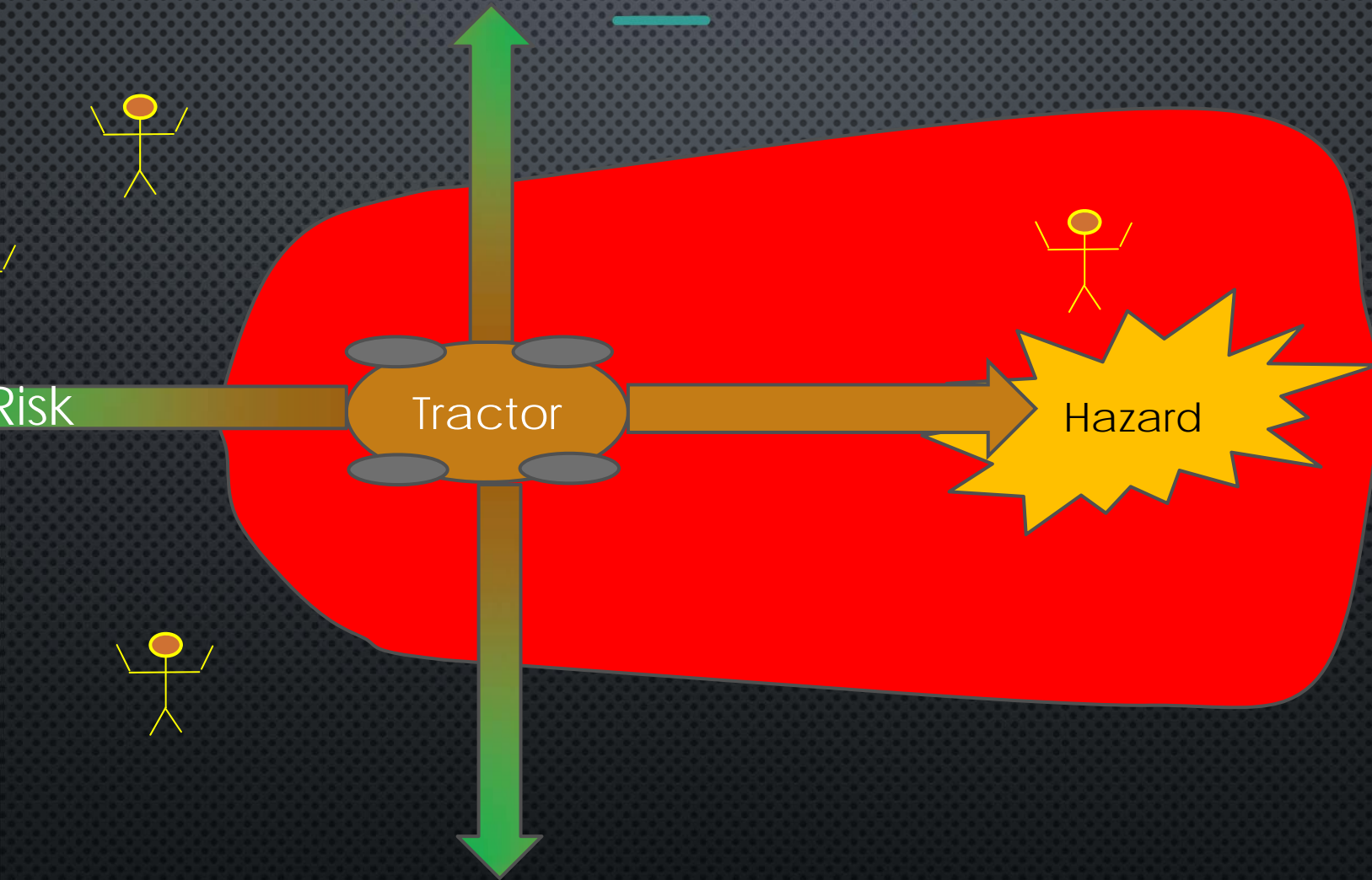
2018 FUMIGATION DRIFT

- APPLICATOR SHANK INJECTING METAM-SODIUM
 - SIGNAL WORD "POISON"
 - POTENTIALLY FATAL, DO NOT ALLOW CONTACT
- WORKERS WERE NEARBY AT A POTATO TRANSLOAD AREA
 - BEGAN NOTICING IRRITATION ABOUT 1 – 2:00PM
 - BY 3-4:00 REPORTED DIFFICULTY BREATHING
 - COMPLAINTS TO SUPERVISOR BETWEEN 5 AND 5:30
 - SYMPTOMS GET WORSE AS APPLICATION GETS CLOSER
 - RELOCATED TO ABOUT $\frac{3}{4}$ MILE NORTH OF TRANSLOAD AREA
- 911 CALLED AND EMS DISPATCHED
 - EMS STAFF BEGAN TRIAGE, AND BEGAN EXPERIENCING IRRITATION
 - WORKERS AND EMS RELOCATE TO 1 1/2 MILES AWAY

2018 FUMIGATION DRIFT

- WHAT HAPPENED?
 - APPARENTLY THERE WAS OFF GASSING
 - APPLICATION TO THE AREA NEAR THE TRANSLOAD SITE WOULD HAVE BROKEN THE ROW ENDS OF PREVIOUSLY TREATED SOIL.
 - WEATHER INVERSION
 - TWO ADDITIONAL FUMIGATIONS IN THE AREA
- RESULTED IN 10 CONFIRMED ILLNESS CASES
 - SOME PEOPLE MISSED UP TO A WEEK OF WORK

HAZARD VS RISK



DISCUSSION

Department of Health Pesticide Program Contacts

Manager, [Wayne Clifford](#), 360-236-3181

Epidemiologist and Investigator, [Joanne Bonnar Prado](#),
360-236-3172

Investigator, [Tito Rodriguez](#), 360-236-3173 (Se habla español)

Investigator, [Jennifer Sievert](#), 360-236-3338 (Se habla español)

Investigator, [Paul Marchant](#), 360-236-3355

Office Phone: 1-877-485-7316 (toll-free) or 360-236-3385

Pesticide Program Fax: 360-236-3276

WA Poison Center- 24 hours/day, 7 days/week: 1-800-222-1222

WA State Department of Agriculture- Drift hotline: 1-844-

