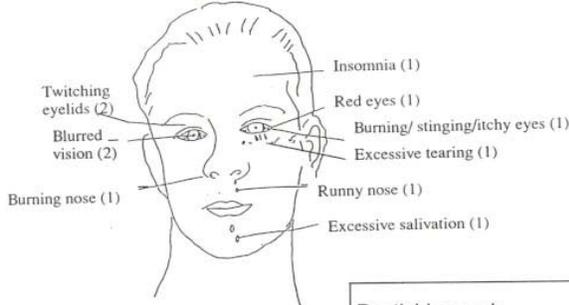
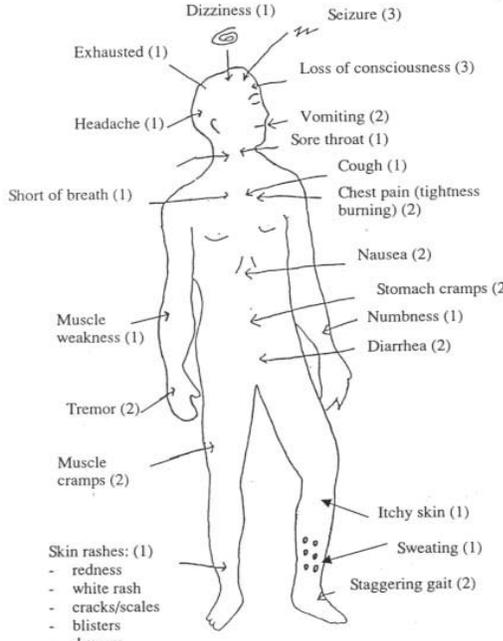


A FARMER SELF- SURVEILLANCE SYSTEM OF PESTICIDE POISONING

Name: Address: Date/Month:	Male/Female (pregnant?) Spray session #: Crops sprayed:
Fill out form after each spray session. Mark signs and symptoms if any experienced during or up to 24 hours after spraying	
	
	
Pesticide used:	
# tanks used =	
Hours sprayed =	
Other signs/symptoms:	
Number of: (1): Mild (2): Moderate (3): Severe	
Spray Session Illness Category: (0): No signs/symptoms (1): Mild (only (1)'s marked) (2): Moderate (at least one (2) marked) (3): Severe (at least one (3) marked)	

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 Community Integrated Pest Management in Asia
 (revised) June 2002

Rationale

Reliable data on the incidence of pesticide poisoning is rare in most countries. At best, it is an underestimate because the source of the surveillance data from which these figures are derived is health facilities. These figures represent only a small fraction of pesticide poisoning for a number of reasons. First, only a small number of poisonings present to the health care system. These usually are severe cases of ingestion from suicide attempts. The bulk of cases- which are mild to moderate poisonings from occupational accidents-will not necessarily report to the health care system due to costs, inaccessibility of services, or fear of reporting and loss of employment. Finally, those few farmers that do present themselves for treatment are often misdiagnosed because pesticide poisoning mimics other health problems. Therefore, the magnitude of occupational pesticide poisoning is so underestimated that it cannot effectively inform policy.

Surveillance systems also do not provide feedback to their client communities. Commonly the data is seen as the domain of the health care system and upper level policy makers. Rather than being analyzed and used at a local level, the data migrates up to central government institutions. As a result, communities from which the data are derived are not aware of the magnitude of pesticide poisoning nor are they given the opportunity to take preventive action or develop community solutions.

Most countries recognize that the magnitude of pesticide poisoning is not well known. As a result, a number of initiatives to address this problem are underway at national and international levels. For example the United States is redesigning its national surveillance system and the World Health Organization International Programme on Chemical Safety has piloted a system in 7 developing countries. Case definitions are being better defined by W.H.O. whereas in the US system, other sources of data are being considered.

Overview of the Self-Reporting System

To fill the information gaps, the Food and Agriculture Organization of the United Nations Integrated Pest Management Programme for Asia (FAO/IPM) has adapted both systems and developed a simple means for farmers to self-report signs and symptoms of pesticide poisoning after each spray session. Trained community members (farmer field graduates) collect the forms weekly. They then summarize, graph, and present back to the participating community the data for discussion on a monthly basis. A local physician attends each of these meetings and adds any pesticide poisoning cases seen in the local clinic from the proceeding the month. This method has been tested over a period of one year within a community of 50 farmers in North Vietnam.¹ The data yields:

- The average number of spray sessions per person per month (this will reflect the impact self-reporting has on spray frequency)
- The number of minor, moderate and serious signs and symptoms per spray session
- Percentage of spray sessions associated to none, mild, moderate or serious poisoning
- Types of pesticides used per month
- Number of cases seen in the local health facility

¹ Murphy HH, Hoan NP, Matteson P, Morales Abubakar ALC. Farmer's self-surveillance of pesticide poisoning: a 12-month pilot in Northern Vietnam. *Int J Occup Environ Health*. 2002;8:202-213.

Objectives

- ◆ Increase farmer awareness of the burden of illness created by indiscriminant pesticide use.
- ◆ Encourage farmer to decrease spray frequency, the use of extreme, high, and moderately hazardous chemical products (WHO class Ia, Ib, and II) for pest control and to seek non-chemical alternatives.
- ◆ Provide data on the incidence of mild and moderate pesticide poisoning not necessarily seen within or reported by the local health care system.

Methods

Gather a Management Team

A management team is required to conduct the self-surveillance project. Their duties are:

- Select the self-reporting farmers
- Train the self-reporting farmers
- Gather the self-reporting forms weekly
- Analyze the data monthly
- Conduct the monthly feedback meetings with the participant self-reporting farmers

The management team should be community members who live close to the self-reporting farmers. Each team member should be responsible for 5-10 self-reporting farmers.

They can be:

- IPM farmer field school graduates
- Community non-formal education teachers
- NGO community staff members
- A school classroom of students (minimum age 12-13 that know how to calculate percentages (%))
- A women's organization
- Community health volunteers

Sample Selection

- The sample should be at least 30-50 pesticide-using farmers per site from 'sentinel' or characteristic areas of the country that use high amounts of pesticides.
- They must agree to self-report for a full season or year.
- Enumerate (assign numbers) to each household within the selected surveillance community
- Randomly select 30-50 households.
- Visit the household and ask the farmer to participate. If the person refuses choose another numbered household (keep a list of refusal reasons).
- Invite all the selected self-reporting farmers with their spouse and one school aged child (who will be helpers) for a training meeting
- After completion of the self-reporting season or year, each participating farmer must be offered an alternative to chemical pest control such as an IPM farmer field school or an organic farming program.

Self-Reporting

Each farmer is asked fill out a form after each time he or she sprays. The information that is to be recorded includes:

- o Name
- o Gender (if female specify if pregnant)
- o Address
- o Date
- o Spray event number (for the month)
- o Crops sprayed
- o List of pesticides used
- o Number of tanks used
- o Hours sprayed.

Any sign or symptom experienced during or up to 24 hours after spraying must be circled on the body map that shows 31 potential signs and symptoms associated with pesticide poisoning. (Any other effects not on the body map can be written in.) These signs and symptoms are classified as minor (1), moderate (2), or severe (3) as defined below:

- (1) Minor: vague, ill defined, or results of the irritant effects of pesticides.
- (2) Moderate: clearly defined potential neurological effect (cholinesterase inhibition)*
- (3) Serious: serious neurological effects (loss of consciousness, seizure)

*Although excessive sweating, salivation or tearing can be a product of acetylcholinesterase inhibition with over-stimulation of these glands, these symptoms are also commonly confused with environmental conditions or the irritant effects of pesticides (heat, thirst and irritation to the eyes). Therefore they were re-classified as minor.

At the end of the each week, the trained community member management teams collect the forms from their households and summarize the results. A community meeting is held with these reporting farmers and the local doctor each month to discuss and graph the data.

Training

The same training methods should be used to train both farmers and the community management teams. The only exception is regarding pesticides. Because WHO hazard levels and chemical families must classify the pesticides by the community management teams, more details should be given to them. Later during the feedback meetings, this information can be given to the participating farmers. The training steps are outlined as follows:

1. Introduce purpose of surveillance and describe the process
2. Body mapping
 - Break the participants into small groups
 - One person in each group should lie down on two taped together newsprints.
 - Outline his/her body to make the body map.
 - Cut up 31 pieces of paper.
 - The group should brainstorm the signs and symptoms (S&S) of poisoning they have either experienced or seen in another farmer.
 - They should write down each S&S on the pieces of paper and attach them to the body map. *[this first picture gives the instructor an idea of how much pesticide poisoning is occurring in the community²]*
 - Distribute the form (see page 10) to let each group correct their body map
 - Take each S&S card they thought was pesticide poisoning and discuss why it is not included on the form [these may be unknown effects or work related problems like back or joint pain]
3. Difference between a sign and symptom (Annex 3)
 - Label 2 newsprints and label one SIGNS and the other SYMPTOMS
 - Ask the class if they know the difference
 - Define SIGN: an health effect you can SEE (like vomiting, tremors, staggering gait)
 - Define SYMPTOM: a health effect you cannot see but the person FEELS (like nausea, headache, dizziness)
4. Sign and Symptom game
 - Organize the class into a circle.
 - One by one each participant chooses one S&S card out of a hat
 - Each participant should either act out the S&S or describe it **without using the actual word** for the group to guess.
 - Write the word on either the sign or symptom newsprint paper (actor and class to decide)
 - Instructor demonstrates how to examine for the following signs: tremor, staggering gait, eye twitching, blurred vision and red eyes. (See Annex 4 for details)
 - Next to the word, the class must list all the other illness or conditions that are **not** from pesticides that also can result in the sign or symptom. For example, staggering gait and being drunk. See Annex # 5 for more examples. *[This exercise insures everyone understand the definition and that other conditions can cause the same S&S]*

² For instance in Cambodia where very hazardous chemicals are used, farmers list all known S&S including those that are most serious. But in Sri Lanka where all class Ia and Ib are banned, farmers list only a few minor S&S like dry throat and headache.

5. Pesticide product recognition (Community Management Team only)

- Take one pesticide and reading the bottle demonstrate which name is the Trade name and which is the common name
- Distribute the pesticides brought in to the meeting outside at numbered stations
- Distribute each participant or group of participants to one station each.
- Ask the participant or group to write down the Trade and common name of the product.
- After 1-2 minutes blow a whistle as a signal for the participant or group to move to the next station.
- Continue until they have visited and recorded the information at each station
- On a newsprint make a table with Trade name and common name columns
- In groups assign 3-5 pesticides per group (e.g. station 1-5, 6-10)
- Ask each group to make a table with column labels as follows:

Station #	Trade Name	Common Name	Type	WHO Hazard Level	Chemical Family
-----------	------------	-------------	------	------------------	-----------------

- Each group should fill in the Trade name and common name
- From a resource pesticide list ask each group to find the common name then fill in the WHO hazard level and chemical family
- Teacher explains WHO human health hazard classifications (Annex 1)
- As a group have the class categorize the pesticide list by WHO health hazard levels (e.g. make a poster for each category; Ia, Ib, II, III, IV with the trade and common name)
- Teacher explains chemical families (see Annex)
- As a group have the class categorize the pesticide list by chemical family (e.g. make a poster for each family; OP-organophosphate, C-carbmate, OC-organochlorine, PY-pyrethroid)
- Teacher explains the chemical families and their health effects, referring back to the body map (see Annex 2)
- For advance groups the teacher can explain how organophosphates and carbamates disrupt the nervous system (Annex 7)

6. Explain how the forms should be filled in:

- Fill in after EACH spray session (especially if NO symptoms in which case one should fill out everything but the picture)
- Mark any S&S that appears only during or up to 24 hours after spraying (with the exception of skin rashes)
- Start on a day on which the person has had at least a three day rest from spraying
- Sweating should only be marked once the person is out of the hot sun and had a chance to cool down
- Use one form per sprayer (if more than one person sprays per household)
- If the sprayer is a woman specify if pregnant or not (explain that this is important to interpret nausea or vomiting) Any woman who knows she is pregnant should be EXCLUDED from the self surveillance and warned that this could be dangerous to the health of her baby.
- Explain each box to be filled in: name, address etc...
- List each pesticide by Trade name (not just herbicide, insecticide or fungicide)
- The family may add totals on each form (# mild, moderate, severe S&S)

- The family may make monthly totals on an additional spray event form:
 - Number of headaches, dizziness etc
 - List of pesticides used over the month
 - List of other S&S experienced
 - Total minor, moderate, severe symptoms
 - Number of spray sessions that the person had:
 - i. NO signs or symptoms
 - ii. ONLY minor (1) signs or symptoms
 - iii. moderate signs or symptoms (at least a 2)
 - iv. severe signs or symptoms (at least one 3)
7. Practice using the form and summarizing the data.
- Distribute the self-surveillance forms to each participant
 - Each participant should fill out the form as if they were a farmer reporting on a spray session (managers training) or on their last spray session.
 - Calculate the total mild, moderate, and serious S&S marked
 - Fill in the spray session illness category: no illness, mild, moderate or serious
 - To analyze the results, question by question tally the results by polling the class putting the results on large newsprint. Calculate and summarize the following:

Information

Male/Female

Crops sprayed

Signs and Symptoms

Pesticides

Tanks used

Hours sprayed

Number mild S&S

Number moderate S&S

Number serious S&S

Data analysis calculations

Numbers and percentage

List types with numbers and percentage

On an enlarged body map, write by each S&S the number of spray sessions (forms) that reported each sign or symptoms /number of total spray sessions (forms). For example headache-6/10 forms.

List each pesticide by Trade or common name. Then beside the names, add the WHO hazard level and chemical family. Calculate # and % of products used that were an Ia, Ib, II, III, and IV and an Op, C, OC, Py.

List all the numbers of tanks used during each spray session. Calculate the range (minimum-maximum # of tanks used) and average number of tanks used per spray session.

List all the numbers of hours it took to complete each spray session. Calculate the range (minimum-maximum # of hours used) and average number of hours spend in spraying.

List the number of mild S&S from each spray session (form). Calculate the range (minimum-maximum # of mild S&S) and average

List the number of moderate S&S from each spray session (form). Calculate the range (minimum-maximum # of mild S&S) and average

List the number of serious S&S from each spray session (form). Calculate the range (minimum-maximum # of mild S&S) and average

Spray Session Illness
Categories

Poll the class to determine how many spray sessions (forms) had:

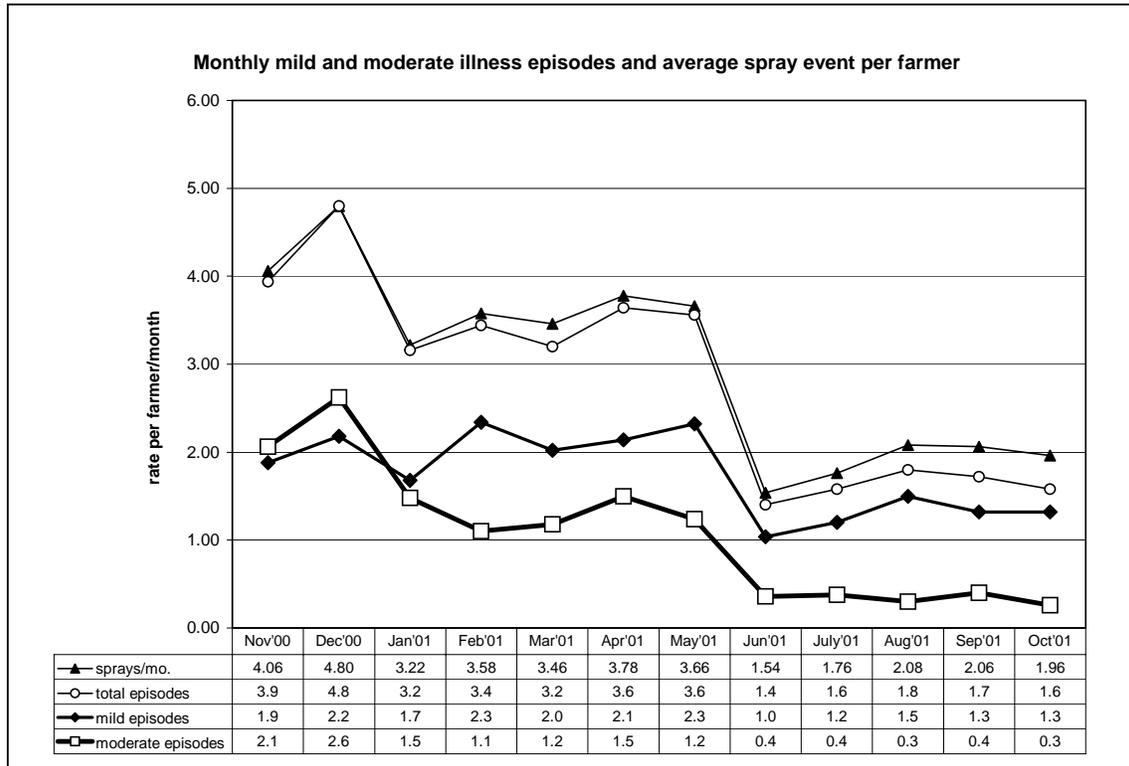
- no signs or symptoms marked
- Mild only mild (1)'s S&S's marked
- Moderate (at least one moderate (2) S&S marked
- Serious (at least one serious (3) S&S marked

Calculate the numbers and % of spray sessions

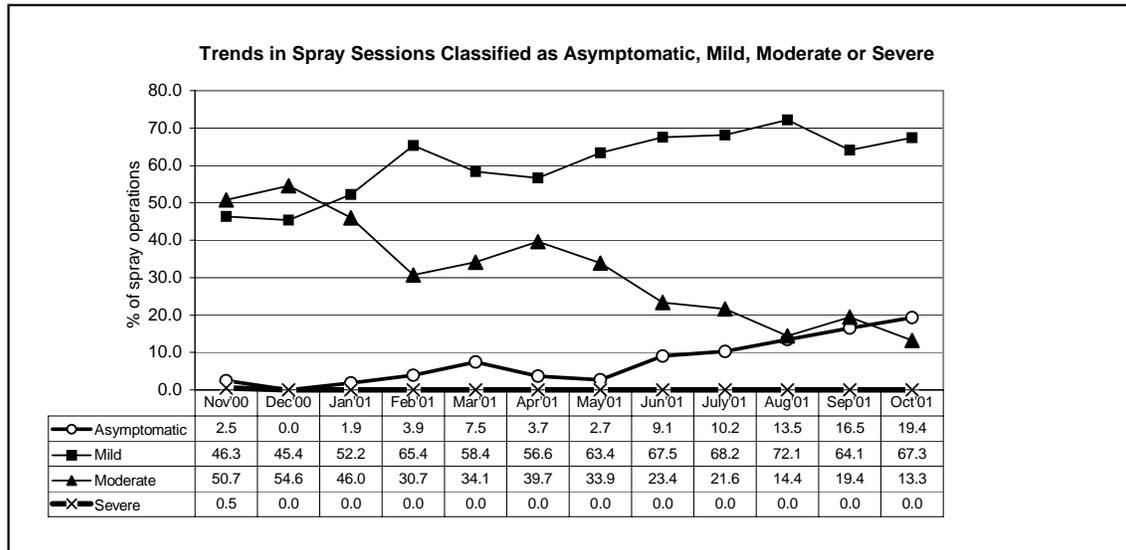
Data analysis:

1. IPM farmer trainers should pick up the forms weekly from each household.
2. The IPM farmer trainers should tabulate the data monthly (or optionally with the participants)
3. Calculate and graph for the month (adding each successive month):
 - Spray sessions per person (total forms-spray sessions/spraying persons)
 - # Minor S&S per spray session (total minors/spray sessions)
 - # Moderate S&S per spray session (total moderates/spray sessions)
 - # Serious S&S per spray session (total serious/spray sessions)
4. Calculate and graph for the month (adding each successive month):
 - % Spray sessions that resulted in NO poisoning (sessions with no S&S/sessions)
 - % Spray sessions that resulted in minor poisoning (sessions with only 1's/sessions)
 - % Spray sessions that resulted in moderate poisoning (sessions with at least one 2's but no 3's/sessions)
 - % Spray sessions that resulted in severe poisoning (sessions with at least one 3/sessions)
5. Optional (new picture each month):
 - Make a body map on newsprint showing the sign and symptoms percentages (total times a S&S was marked/total spray sessions)

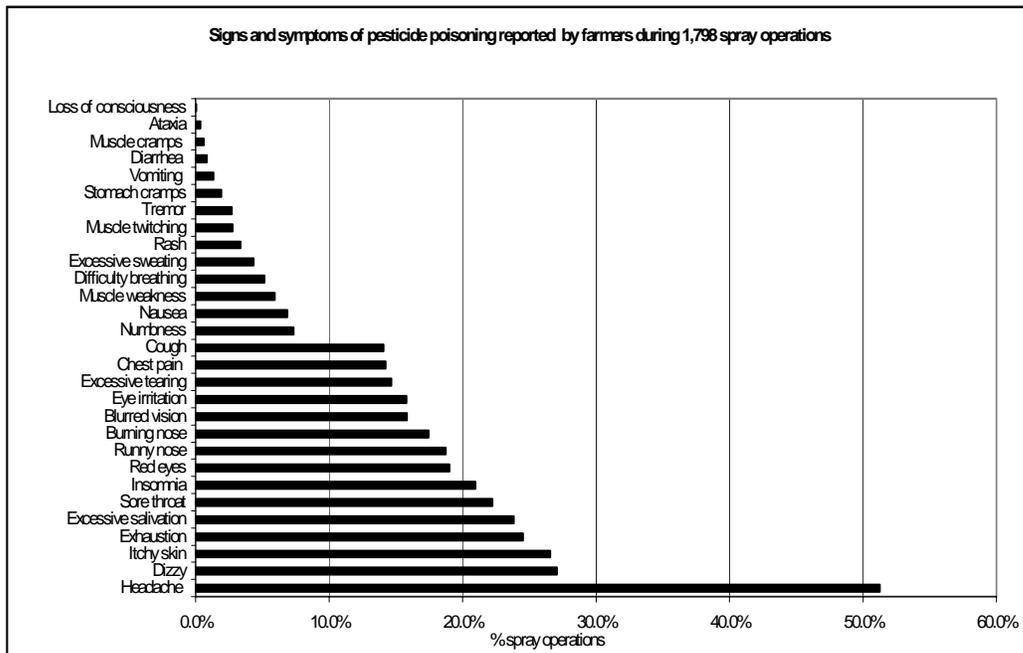
Graph Examples:



Murphy HH, Hoan NP, Matteson P, Morales Abubakar ALC. Farmer's self-surveillance of pesticide poisoning: a 12-month pilot in Northern Vietnam. *Int J Occup Environ Health*. 2002;8:202-213.



Murphy HH, Hoan NP, Matteson P, Morales Abubakar ALC. Farmer's self-surveillance of pesticide poisoning: a 12-month pilot in Northern Vietnam. *Int J Occup Environ Health*. 2002;8:202-213.



Murphy HH, Hoan NP, Matteson P, Morales Abubakar ALC. Farmer's self-surveillance of pesticide poisoning: a 12-month pilot in Northern Vietnam. *Int J Occup Environ Health*. 2002;8:202-213.

* These percentages would be shown on the body map picture and kept in the community

Use of the Self-Surveillance Information

The first priority of data dissemination is the community. The information must first be shared with the members at large. At the end of the surveillance period, a meeting should be held for the community to discuss their problems with pesticides so that they can make some decisions about future use.

The information should also be shared and added to the databases of the following:

- Ministry of Agriculture
- Ministry of Health

Other groups should also be informed such as:

- Ministry of Education (if school classrooms are part of the management teams)
- Farmer networks
- Women's associations
- School groups
- Teachers groups
- NGOs

Finally, every attempt should be made to publish the methods and results *locally*. This could be in national journals, newsletters or the press. In this way, more people can be made aware of farmer's health as a means to reduce the hazards of pesticide use.

TECHNICAL INFORMATION**1. WHO Hazard Classification**

LD₅₀: Human toxicity level. It is based on experiments with animals and is the number of mg of toxicant (chemical) per kg of body weight required to kill 50% of a large population of test animals.(optional information)

WHO Hazard Classifications: World Health Organizations classifies most pesticides by common name in terms of their potential human health effects. These classifications are usually based on the acute oral LD₅₀ levels.

- * Ia = extremely hazardous
- * Ib = highly hazardous
- * II = moderately hazardous
- * III = slightly hazardous
- * IV = IV or “U” = unlikely if used safely

This table* below can be used optionally:

Class	LD ₅₀ for the rat (mg/kg body weight)	
	Oral	
	Solids	Liquids
Ia = extremely hazardous	5 or less	20 or less
Ib = highly hazardous	5-50	20-200
II = moderately hazardous	50-500	200-2000
III = slightly hazardous	500-2000	2000-3000
IV = unlikely if used safely	over 2000	over 3000

* Adapted from International Programme of Chemical Safety. The WHO Recommended Classification of Pesticides by Hazard and Guidelines to Classification 1996-1997. WHO/PCS/96.3.

Carbamates: behave the *same* way as the organophosphates in that they suppress AChE, and cause over-stimulation of the nerves. The effect comes on *sooner* after exposure (as fast as 15 minutes) and *does not last as long* (3 hours). Symptoms are the same with the exception of these symptoms below which are *rare*:

- Convulsions
- Loss of consciousness
- Coma

Organochlorines: affect the central nervous system. They are absorbed by fat so they can stay in the body a long time. As the fats cells in breast tissue can store organochlorines, it can be measured in breast milk. The effects can occur within one hour after absorption and acute effects can last up to 48 hours. Some organochlorines (endosulfan) are rapidly and easily absorbed through the skin. The nerves stimulating glands are *not* affected so you will not see:

- * excessive salivation
- * excessive sweating
- * excessive eye tearing

(or over-stimulation of small muscles like)

- * twitching eyelids

But you will see symptoms that are from disruption of central nervous:

- * Muscle Weakness
- * Dizziness
- * Headache
- * Numbness
- * Nausea
- * Loss of consciousness
- * Convulsions
- * Vomiting
- * Hand tremors
- * Staggering gait
- * Anxiety/restlessness
- * Confusion

Annex 2: Chemical Families of Pesticides

Pyrethroids: are irritants to the eyes, skin and respiratory tract. The symptoms last from 1-2 hours. The symptoms from spraying can be:

Normal use:	<ul style="list-style-type: none"> * Numbness (hypersensitivity of skin) * Shortness of breath (wheezing) * Dry throat * Sore Throat * Burning nose * Skin itching
If ingested:	<ul style="list-style-type: none"> * Loss of consciousness/coma * Convulsions
High doses:	<ul style="list-style-type: none"> * Vomiting * Diarrhea * Excessive saliva * Twitching eyelids * Staggering gait * Irritability

Thiocarbamates: are similar to the pyrethroids in that they also are irritants to the eyes, skin and respiratory tract. The symptoms can appear immediately when spraying and can be:

Respiratory tract:	<ul style="list-style-type: none"> * Dry throat * Sore Throat * Burning nose * Cough
Eyes:	<ul style="list-style-type: none"> * Eye irritation (burning, itching) * Red eyes
Skin:	<ul style="list-style-type: none"> * Skin itching * White spots on skin * Scaling skin rash * Red rash

Annex 2: Chemical Families of Pesticides

Paraquat: is very toxic to the skin and mucous membranes (inside of mouth, nose, eyes). Particles are too large to get deep into the lungs*, but once paraquat is in the blood it collects in the lungs. If ingested (drink) it is very lethal

Skin:	<ul style="list-style-type: none"> * dryness, cracks * erythema (redness) * blistering * ulcerations
Nails:	<ul style="list-style-type: none"> * discoloration * splitting nails * loss of nails
Respiratory tract:	<ul style="list-style-type: none"> * cough * nosebleeds * sore throat
Eyes:	<ul style="list-style-type: none"> * conjunctivitis (irritation) * ulceration, scarring, blindness
Ingestion:	<ul style="list-style-type: none"> * lung fibrosis (stiff lungs) * multi-system organ failure, specifically <ul style="list-style-type: none"> ⇒ respiratory failure ⇒ kidney failure

* Manufacturer claims

3. Definitions of signs and symptoms.

The difference between a sign and a symptom:

- * Sign: something you can observe or see that *requires an examination*
- * Symptom: something a person feels but you cannot see. So one must ask questions to elicit the story about the symptoms.

For **signs** there are special exams. On the table below, each sign is bolded and next to it are listed ways to look for the sign. In training it is a good idea to either bring in pictures, a video showing the condition, or find a person in the community with the condition. This will be useful in identifying red eyes, the skin conditions, tremors and staggering gait.

For **symptoms** stories are important. One cannot simply ask..."have you felt x, y, or z"...It is important to use probing to get the information with descriptions about how the symptoms feel. So in questioning, use words to probe..."After spraying have you ever felt short of breath which *feels like* you cannot get enough air?"

On the table below an example of 'feels like' is given for each symptom. But the class must develop their *own feels-like list*, which is more appropriate to their own experience and language.

4. Signs: How to examine for signs.

SIGNS	HOW TO OBSERVE
* Tremors	Hands and fingers shake when holding a piece of paper
* Twitching eyelids	Ask the farmer to close his eyes and pretend he is sleeping. Look for twitching of the eyelids side to side
* Excessive sweating	Look at the forehead and upper lip to see beads of sweat
* Redness of the eyes	Both whites of the eye look red
* Runny nose	Look to see if the farmer rubs his nose a lot. This is different than a cold. The discharge should be clear while with a cold it is yellow or green.
* Cough	Listen to hear if he is coughing a lot (this could be from smoking so ask if this is worse after spraying)
* Wheezing	The person makes a whistling sound when they breathe
* Staggering gait	Ask farmer to walk in a straight line heel to toe with his arms out to the side. If he cannot walk straight this is staggering. Looks like he is drunk
* Diarrhea	too many stools with water
* Skin redness	Ask if he has noticed any rashes and look at hands, arms, feet and legs
* White patches on skin	Ask if any rashes and look at hands, arms, feet and legs
* Skin scaling	Ask if any rashes and look at hands, arms, feet and legs (like fish scales)
* Loss of consciousness/coma	Farmer faints, drops to ground and you cannot wake him up
* Convulsions	Seizure, all the muscles contract, like babies sometime do when they have a high fever. The eyes roll back and the teeth are clenched, the whole body becomes stiff
* Vomiting	everything from the stomach comes out

Some conditions may appear before and after spraying because they could be **chronic** conditions from using pesticides for a long time. The following conditions may be chronic:

- Staggering gait
- Twitching eyelids
- Tremors
- Skin lesions: redness, white patches, scaling etc.

5. Symptoms: How to interview for symptoms.

SYMPTOMS	<u>FEELS LIKE</u>
* Dry throat	Feels like when you wake up in the morning if you have slept with your mouth open
* Fatigue/tired	Feels like after climbing a mountain all day long
* Insomnia (disturbed sleep)	Bad dreams, cannot sleep through the night
* Chest pain/burning feeling	Like it feels when breathing in chilies or smoke
* Numbness	Feels like after you sit on your foot too long...like ants or pins and needles in the skin
* Burning/stinging eyes	Feels like smoke or soap in the eye
* Itching eyes	Feels like when you have pollen in your eyes
* Blurred vision	This is like looking at a movie or picture that is out of focus
* Shortness of breath	Look to see if the farmer is breathing in fast or does he feel he cannot get enough air
* Dizzy	Feels like after you spin around many times
* Nausea	the feeling just before you vomit or how you feel if driving on a curvy road or on a boat in rough seas
* Excessive salivation	Notice if the farmers spits a lot and ask him if he feels there is a lot of spit, like after one eats a lemon
* Sore throat	It hurts to swallow.
* Burning nose	Feels like when you are in the kitchen when someone is frying chilies
* Muscle cramps	Like after playing football all day and the leg muscles seize up, become stiff and hurt
* Headache	A sharp or squeezing pain in the head
* Stomach cramps/pain	Pain like you feel just before having diarrhea
* Skin itching	Like many mosquito bites

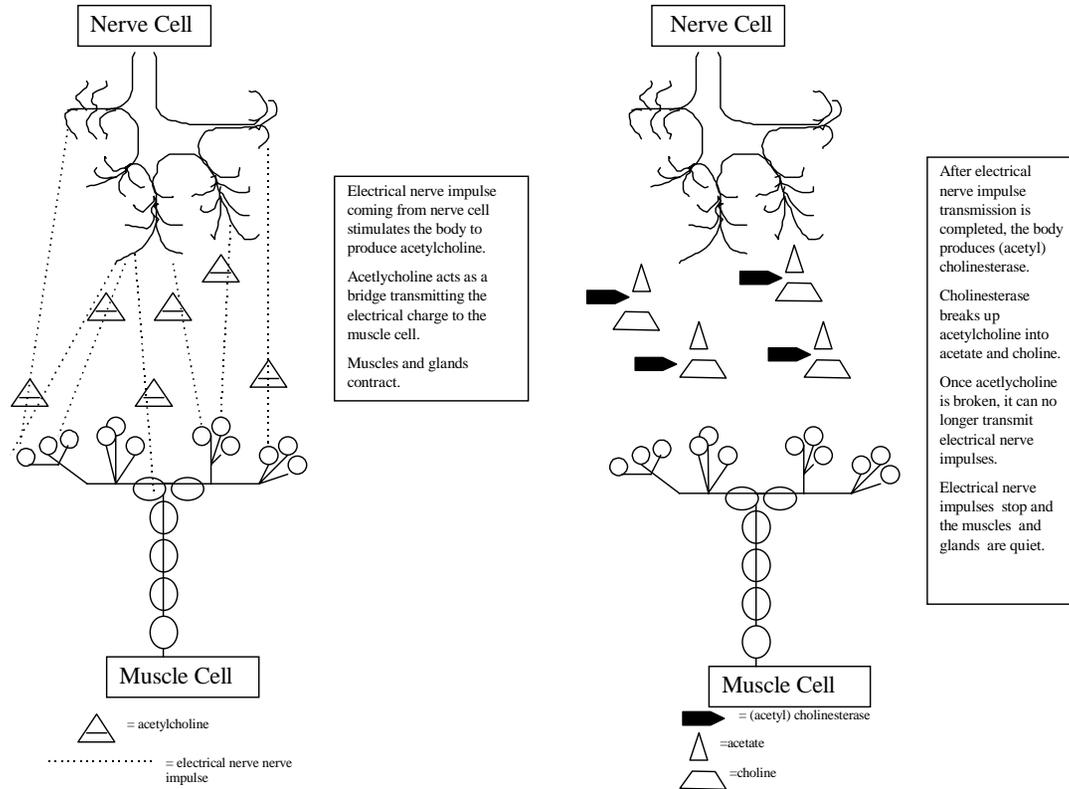
One can also ask if the farmer has ever experienced the sign or symptoms. Because a farmer may not want to admit to getting sick from pesticides the wife can be asked for a more accurate story.

6. Other conditions that mimic pesticide poisoning.

There are other illness or conditions have the same sign or symptoms of pesticide poisoning. Because of this it is useful to interview and examine the farmer before and after spraying to know if these things are related to the pesticide or another condition or illness. If the signs or symptoms appear only **after** spraying they are more likely from the pesticide. Here are some examples of other conditions that can cause the same signs or symptoms that the farmer may have **before** spraying: (Signs are in bold)

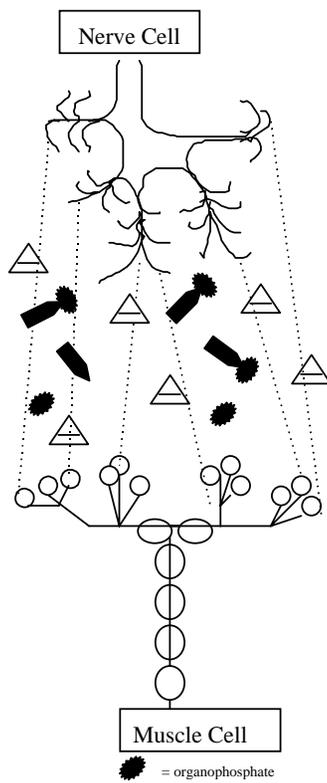
SIGNS OR SYMPTOMS	OTHER CONDITIONS OR ILLNESSES
* Fatigue	not enough sleep
* Insomnia	stress, too many thoughts, worried
* Staggering gait	drinking too much whiskey
* Loss of consciousness/coma	
* Convulsions	
* Dizzy	flu, anemia, heart condition
* Headache	flu, dengue fever, too much whiskey
* Excessive sweating	fever, wearing too many clothes on a hot day
* Blurred vision	chronic eye conditions (glaucoma, cataracts)
* Burning/stinging eyes	allergy
* Itching of the eyes	allergy
* Redness of the eyes	eye infection
* Twitching eyelids	
* Excessive salivation	
* Runny nose	flu, common cold (discharge yellow or green)
* Burning nose	
* Dry throat	thirsty, dehydration
* Sore throat	flu, common cold, throat infection
* Chest pain/burning feeling	heart condition (occurs with exercise)
* Shortness of breath	too much smoking, heart condition
* Wheezing	too much smoking, allergies
* Cough	too much smoking, flu, common cold
* Nausea	food poisoning, flu, too much whiskey
* Stomach cramps/pain	food poisoning, flu
* Diarrhea	food poisoning, flu
* Vomiting	food poisoning, flu
* Skin redness	other skin disease (psoriasis)
* White patches on skin	other skin disease (psoriasis)
* Skin scaling	other skin disease (psoriasis)
* Numbness	
* Itching of skin	scabies
* Muscle cramps	
* Muscle weakness	flu
* Tremors	too much whiskey

8. Normal Electrical Nerve Impulse Transmission



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**9. Organophosphate-Carbamate Disruption of Electrical Nerve Impulse
Therapeutic Effect of Atropine**

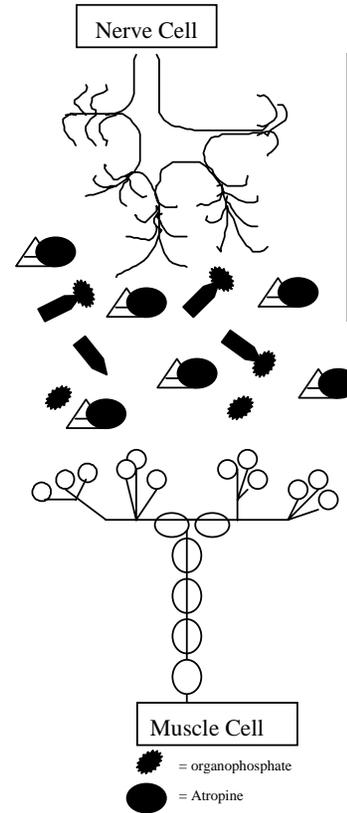


If an **organophosphate** or **carbamate** is present, they bind with cholinesterase.

Cholinesterase cannot penetrate acetylcholine to break it up.

The body continues to produce acetylcholine unimpeded.

This results in a build up of acetylcholine with continuous electrical nerve impulse transmission and over stimulation of muscle and glands.



Atropine relieves the over stimulation of the muscles and glands by reducing the amounts of acetylcholine.

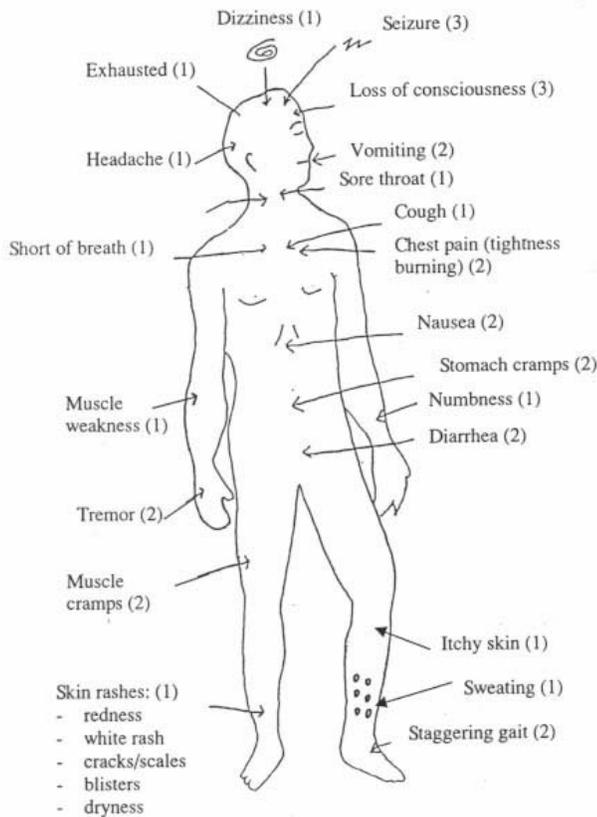
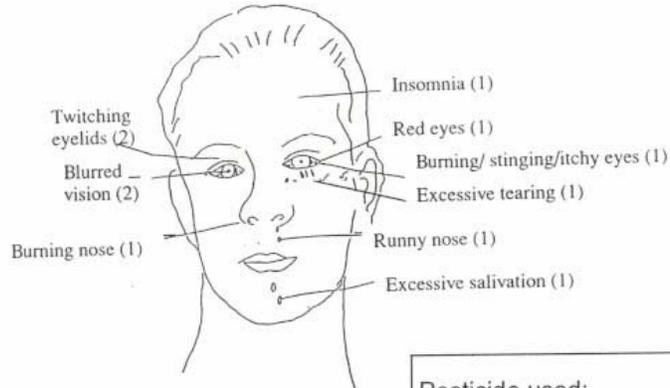
The effect only lasts 15 minutes. Therefore the dose must be repeated until the organophosphate or carbamate binding effect has worn off.

Self Surveillance Form

Name:
Address:
Date/Month:

Male/Female (pregnant?)
Spray session #:
Crops sprayed:

Fill out form after each spray session. Mark signs and symptoms if any experienced during or up to 24 hours after spraying



Pesticide used:

tanks used =

Hours sprayed =

Other signs/symptoms:

Number of:

- (1): Mild
- (2): Moderate
- (3): Severe

Spray Session Illness Category:

- (0): No signs/symptoms
- (1): Mild (only (1)'s marked)
- (2): Moderate (at least one (2) marked)
- (3): Severe (at least one (3) marked)