

Lesson Number 2

Title: Introduction to Pesticide Management

Purposes / Objectives

To decide when to use pesticides -- and when not to use them.

Materials

Required

Paper

Colored Pencils or Markers

Sheets of Paper (8 ½" x 11" or larger) with writing (and pictures) describing pesticide use decision-making (see Methods section.)

Optional

Pesticide Containers (empty and rinsed, clean)

Methods

Ahead of time, prepare a set of papers. Each paper should list one question a farmer should ask before deciding to use a pesticide.

If possible, draw a picture to show the task* on the paper.

Use the remarks in parenthesis () to guide the discussions or add information about each step.

The steps are:

- Check your plants often. Watch for signs of insect damage or symptoms of disease.

* Draw a picture of a farmer in a green bean field, looking at his or her crop plants.

(Scouting or monitoring is very important. It enables farmers to spot problems before they become serious.)

- If you see a problem, find out what is causing it.

* Draw a picture of a plant with brown spots or brown, dead leaf margins.

(Did an insect or disease cause the damage? Or, is it caused by something else?)

Other causes of plant injury might be too much water, not enough water, unusually warm temperature, not enough fertilizer, or the wrong kind of

fertilizer. Look closely for signs of pest insects or disease. Ask IER or OHVN scientists or technicians for help in identifying pests.)

- If a pest is causing the problem, identify this pest!

* Draw pictures of several of the common insect pests found on the crop.

(An insect might cause brown spots on leaves. However, brown spots might also be due to a plant disease. The treatments for insect problems are very different than the remedies for diseases. If you see insects, identify them and be sure they are pests before using an insecticide. Not all insects injure crops. Some may be pollinators. Others may be eating pest insects. Still others may be in the field for other reasons, ex. seeking moisture.)

- Is the pest problem serious? Should I act now, or watch and wait?

* Draw a grower thinking or talking to a FFS technician.

(Pest management is expensive. It takes time. Materials cost money. Growers must decide if the problem is serious enough -- or will become serious enough -- to justify spending time and money to control it.)

- Is using a pesticide the best way to control this pest? If so, do I have the right pesticide for the job?

* Draw a pesticide container.

(No one pesticide can control all pests. Before you use a pesticide, be sure it will control the pest that is damaging your crop.)

- Will a pesticide be effective at this stage of the pest's life cycle?

* Draw a beetle larva and adult.

(Be sure the pesticide will kill the pest at this stage of its life. Timing may be very important for success. For example, Neem does not kill insects right away. However, it stops them from feeding. Neem also prevents them from becoming adults. So, it should be applied when insect pests are immature and actively feeding. Treating adult beetles with Neem may not be much help.)

- Can I apply the pesticide correctly and safely?

* Draw a grower using a sprayer or a sprinkling can to apply a pesticide solution to green beans. Be sure to draw the person wearing a long sleeved shirt and long pants.

(Unless an insect eats Neem, the insect will not stop eating and die. So, when Neem is applied to a crop, the solution should cover all above-ground parts of the plants. If the lower leaves are not coated with Neem solution, some insects may continue to live and feed there. Before using a pesticide, be sure you have the right kind of application equipment. Be sure you can mix it, pour it into the application device (ex. sprayer), and apply it with care. Be sure you wear clothing to protect your skin.)

- What can be done to prevent outbreaks of this pest in the future?

* Draw sticky traps in the field (flags w/ Vaseline.)

(Is this a pest that comes every year? If so, ask if there are things other than spraying that you can do early in the season to control them or reduce their numbers?)

Ask growers to assume they see plant damage or injury. Working as a group, ask them to look at the papers and put the steps described in logical order -- first to last.

In the process, encourage them to discuss the reason(s) for their decision(s.)

Results / Data

Here is the 'correct' order of events:

1. Check your plants often. Watch for signs of damage or disease symptoms.
2. If you see a problem, find out what is causing it.
3. If a pest is causing the problem, identify it!
4. Is the pest problem serious? Should I act now, or watch and wait?
5. Is using a pesticide the best way to control this pest?
(If so, do I have the right pesticide for the job?)
6. Will the pesticide be effective at this stage of the pest's life cycle?
7. Can I apply the pesticide correctly and safely?
8. What can be done to prevent outbreaks of this pest in the future?

It would also be logical to put #8 first...and then list # 1-7.

If the growers have a different order, discuss the reasons for their decisions.

To help explain the logical order, compare the farmer's thinking to that of a doctor. Use the examples of human diseases and medicines. To treat a patient properly, the doctor must know what hurt the person, or what is making the person sick. If a doctor misdiagnoses a person's illness and gives him or her the wrong medicine, the sick person may not get well. Use examples of illnesses and medicines used in Mali.

Discussion

Summarize and review the growers' responses. Be sure all the points they want to make and any questions they ask are recorded.

The points of the lesson are:

- It is not necessary to spray pesticides on crops just because you see plant injury. A pest may not cause the problem.
- Usually, is it not good practice to use pesticides on some pre-determined schedule. It is better to watch for problems, and use a pesticide only when a

pest is causing a serious problem. If you must use a pesticide, it is important to choose the right pesticide for the job, and apply it correctly and carefully.

Conclusion(s)

FFS Leader:

In this lesson, we talked about how a farmer can decide if something needs to be done to protect a crop from pests. Pesticides are one way -- but not the only way -- to protect crops.

In the next several lessons, we will talk about how to reduce the dangers involved in using pesticides, and how to use them properly.

Notes

Here is some information about Neem and Decis, and how they work to control insect pests.

Neem (azadirachtin):

The main insecticidal ingredient found in the Neem tree is a naturally-occurring substance called azadirachtin.

An insect must eat Neem to be affected by it. Spraying an insect with Neem will not kill it. However, if an insect eats a leaf with dried Neem solution on it, the insect will not develop normally. Most stop eating. Death is slow.

Chemicals from Neem trees are similar to natural insect hormones called "ecdysones." Ecdysones control the process of insect metamorphosis. Specifically, these hormones control molting. Insects must molt to grow. Insect development requires the careful coordination of many hormones and other physiological changes. Neem seems to be an "ecdysone blocker." It blocks the insect's production and release of these vital hormones. If insects cannot molt, they cannot become mature. They will not change from larvae to pupae. Thus, they will not reach the adult stage, and they will not reproduce.

Insects that eat Neem-treated plants may not die for several days. However, upon ingestion of minute quantities, insects become quiescent and stop feeding.

Decis (deltamethrin):

Deltamethrin is a synthetic pyrethroid insecticide.

Deltamethrin may poison insects that come in contact with a Decis spray. It can also poison insects that eat plant parts treated with a Decis solution.

Decis affects the insect nervous system. It causes paralysis. It is fast-acting, and disables feeding insects. When a poisoning exposure lasts more than a few hours, insects die because of irreversible damage to the nervous system.

Source for Notes:

EXTOXNET: Extension Toxicology Network, a cooperative effort of University of California-Davis, Oregon State University, Michigan State University, Cornell University, and the University of Idaho (USA.)

*** Dessinez un agriculteur dans un champ d'haricots verts, regardant ses plantes.**

*** Dessinez une plante avec des points marron ou des feuilles mortes marrons.**

*** Faites plusieurs dessins des insectes que l'on trouve communément sur les plantes.**

*** Dessinez un agriculteur qui pense ou qui parle à un technicien FFS.**

*** Dessinez un récipient de pesticide.**

*** Dessinez un scarabée adulte et une larve.**

*** Dessinez un agriculteur qui utilise un pulvérisateur pour appliquer un pesticide sur des haricots verts. Soyez sûr de dessiner la personne avec un habit en manches longues et pantalon.**

*** Dessinez des pièges à vaséline dans un champ (morceau de plastique imprégné de vaséline.)**