

14 Pesticides: Medicine or poison?

Background

When we are ill, we often take a medicine to soon get healthy again. Similarly, farmers often say that they have applied a “medicine” to the crop when attacked by a pest or disease. But do these “medicines” really make the crop healthier? Lately, many farmers complain that ever since they used “medicines” on their crops, pests have increased and become more difficult to control. Consequently, the farmers either look for another “medicine” that they hope is stronger, or they mix several “medicines” together in a cocktail. But to their despair, “cure” often does not occur. What happens for sure is that natural enemies are killed and the environment is polluted due to the chemicals they used and call “medicine”. It would actually be more appropriate to call these poisonous chemicals, or pesticides, “poison” rather than medicine. In addition to killing natural enemies, many cases are reported every year of farmers



being poisoned by pesticides while spraying, or having acquired chronic diseases as a result of repeated exposure to pesticides. Unfortunately, many farmers do not realize the negative side effects of these poisonous chemicals.

Objectives

After completing this activity the participants will have gained:

- Knowledge about the characteristics of pesticides.
- Understanding about the effects of pesticides on natural enemies and pests.
- Awareness about the negative side effects of pesticides on the environment and human health.

Materials

- Half a teaspoon of *monocrotophos* (or any other contact insecticide).
- One and half teaspoons of *carbofuran* (or any other systemic insecticide).
- Four glass jars.
- Two used tin cans.
- Two young sweetpotato plants with roots.
- Two large transparent plastic bags.
- Wristwatch.
- Newsprint paper.
- Felt-tip markers.
- Four photocopies of the "Pesticide experiment" form (Appendix II-G).

Activity steps

During this meeting the participants prove through an experiment that insecticides do not only kill pests but also natural enemies.

A Preparation

- A.1 Prepare two glass jars filled with water for the pesticide solutions.
- A.2 One bottle is given half a teaspoon of monocrotophos and shaken briefly. The other bottle is given half a teaspoon of carbofuran granules and stirred thoroughly until the granules have dissolved.
- A.3 Close the bottles well.

B Treatment

- B.1 The participants are divided into four small groups.
- B.2 Each group collects three species of pests and three species of natural enemies that are still alive. One individual per species is enough.
- B.3 Each group applies a different treatment to the six specimens collected. Explain the different treatments and divide the tasks among the groups.
- B.4 Group 1: Monocrotophos: contact, direct action
 - Fill a glass bottle with a layer of 0.5 cm of the monocrotophos solution. Close the bottle, shake and turn it until all walls of the bottle are wet. Remove excessive pesticide solution from the bottom of the jar by pouring it back into the stock container. Put the pest and natural enemy specimens in the bottle. Shake the bottle so that specimens touch the wetted walls of the jar.
 - Observe what happens. Take notes of the condition of the specimens in the bottle at 2, 4, 6, 8, 10, 15 and 20 minutes after treatment.
 - Write the observation results in the form "Pesticide experiment".
- B.5 Group 2: Carbofuran: contact, direct action
 - Fill a glass bottle with a layer of 0.5 cm of the carbofuran solution. Close the bottle, shake and turn it until all walls of the bottle are wet. Remove excessive pesticide solution from the bottom of the jar by pouring it back into the stock container. Put the pest and natural enemy specimens in the bottle. Shake the bottle so that specimens touch the wetted walls of the jar.
 - Observe what happens. Take notes of the condition of the specimens in the bottle at 2, 4, 6, 8, 10, 15 and 20 minutes after treatment.
 - Write the observation results in the form "Pesticide experiment".
- B.6 Group 3: Monocrotophos: systemic, indirect action
 - Fill an old tin half with soil. Plant a young sweetpotato plant with roots in the can. Pour some monocrotophos solution on the soil surface around the stem base. Cover the can and plant with a transparent plastic bag with some small holes for ventilation. Put

the pest and natural enemy specimens on the leaves of the plant, and close the plastic bag again.

- Observe what happens. Take notes of the condition of the specimens in the bottle at 5, 10, 15 and 20 minutes, and 0.5, 1 and 2 days after treatment (one of the participants should take the jar home and observe).
 - Write the observation results in the form "Pesticide experiment".
- B.7 Group 4: Carbofuran: systemic, indirect action
- Fill an old tin half with soil. Plant a young sweetpotato plant with roots in the can. Broadcast a teaspoon of carbofuran granules on the soil surface around the stem base. Cover the can and plant with a transparent plastic bag with some small holes for ventilation. Put the pest and natural enemy specimens on the leaves of the plant, and close the plastic bag again.
 - Observe what happens. Take notes of the condition of the specimens in the bottle at 5, 10, 15 and 20 minutes, and 0.5, 1 and 2 days after treatment (one of the participants should take the can home and observe).
 - Write the observation results in the form "Pesticide experiment".

C *Presentation and discussion*

C.1 During the next FFS meeting, the groups take turns presenting their observation results.

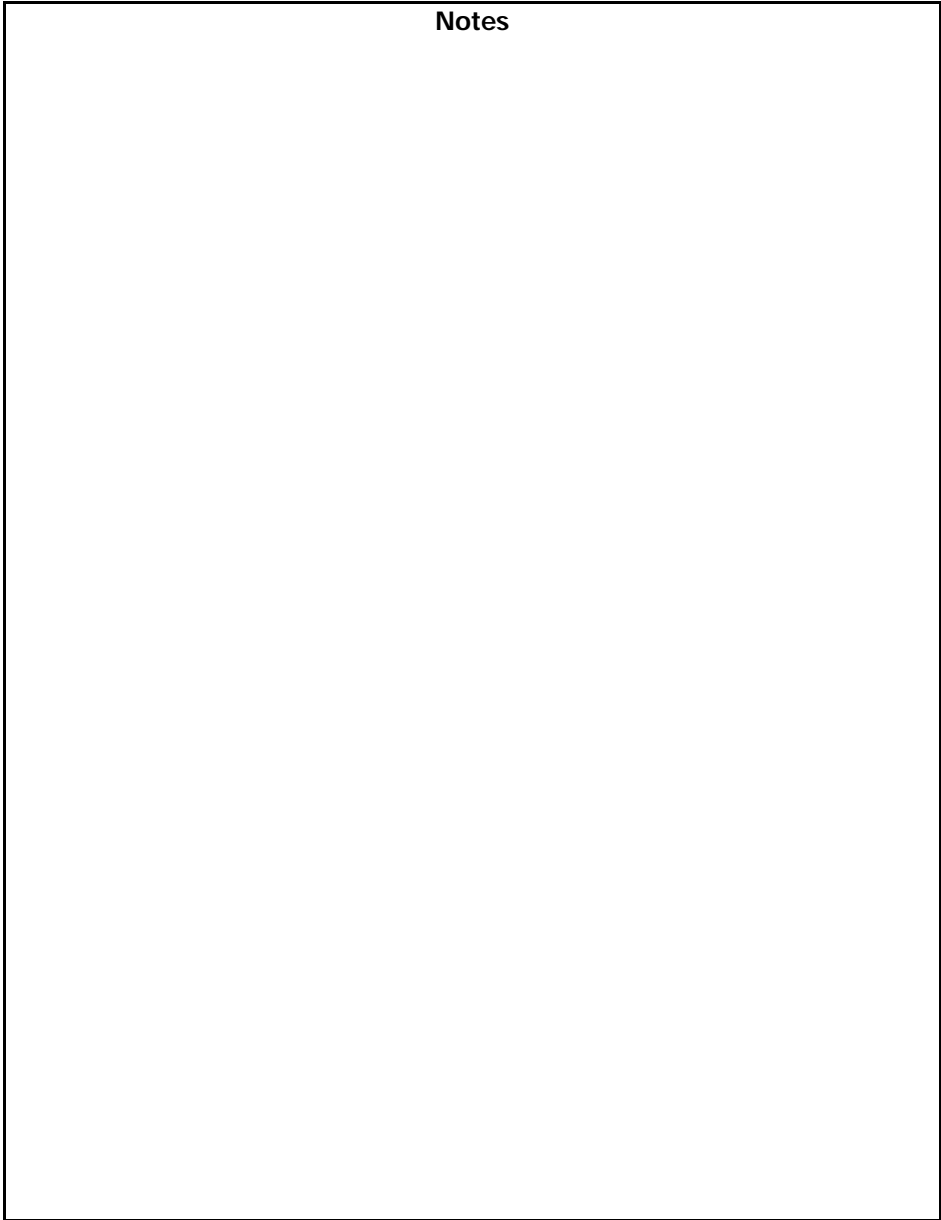
C.2 Discussion:

- What is the difference between the reaction of the pest and natural enemy specimens to the pesticide?
- What is the difference between the reaction of the insect to monocrotophos and carbofuran?
- What is the difference between the reaction of the insect to direct and indirect action of the pesticide?
- Which pesticide and what application method kills the natural enemies? What would be the consequence if this happens in the field?
- Among the participants, who has ever experienced symptoms of pesticide poisoning after pesticide application? What symptoms did you suffer from? How did you recover?
- What should we do to avoid poisoning when applying pesticides?

For more information see:

- Natural enemies and pesticides (Part III, Section 4.4).

Notes

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