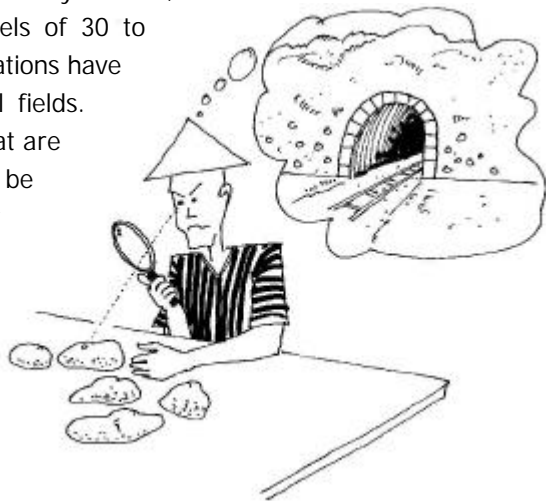


19 Sweetpotato weevil

Background

Farmers in many sweetpotato growing areas in the world perceive the sweetpotato weevil as their greatest enemy. The weevil larvae cause serious quality damages to the storage roots, making them unmarketable, and the pest is one of the most difficult to control. Considerable loss of marketable yield occurs particularly during the dry season, and can reach average levels of 30 to 50%, and even 100% infestations have been observed in individual fields.

Even sweetpotato roots that are partly infested cannot be marketed, or only at a very low price, since the tunneling of the weevil larvae causes the roots to produce a poisonous chemical that makes it unsuitable for human and animal consumption.



Sweetpotato weevil control is difficult since as soon as the larvae have entered the roots, we cannot do anything to stop it from causing damage. The best method is prevention of adult weevils to emerge and lay eggs on the sweetpotato plants. To understand how we can prevent weevil occurrence by disrupting its life cycle, we have to know first how and where it lives.

Objectives

After completing this activity, the participants:

- Have gained understanding about the biology and behavior of the sweetpotato weevil.
- Know what effects are caused by weevil damage.
- Are able to determine and implement the most effective control measures.

Materials

- Some knives or sickles.
- Glass containers covered with screen, as many as the number of small groups.
- Sex pheromone traps (consisting of a pheromone lure, a cover and a container with soapy water), as many as the number of small groups.
- A bucket.
- Some torches for evening observation.
- Maize seeds or any other quantifier for matrix ranking.

Activity steps

A Weevils in the field

- A.1 The participants are divided into small groups.
- A.2 Each group is given a sex pheromone trap to be set up in the field at an observation spot. The participants observe the foliage around the trap for about ten minutes, after which they move to another spot. Each group observes three spots, one of which is at a location where the soil is cracked and roots are exposed, and the two others of which are on soil without cracks and/or roots are not exposed.
- A.3 At each spot the participants should observe and count the number of:
 - Weevils on the leaves.
 - Weevils on the soil surface or in the upper soil layer.
 - The storage roots infected by weevils.
 - Male weevils captured in the sex pheromone trap within half an hour.

- A.4 The results of all observation spots of all groups are combined and recorded on a sheet of newsprint paper. The groups take turns in presenting their results.

B *Sweetpotato life cycle, behavior and control*

- B.1 Each small group collects a root from the field that is infected by weevils. The roots are cut carefully by the group members, and the different stages of weevils that are living within the roots are exposed on the analysis boards. Using these specimens, involve the participants in a discussion about the life cycle of the sweetpotato weevil. Draw the life cycle of the sweetpotato weevil on a sheet of paper, showing the various stages (egg, larva, pupa and adult weevil), the duration of each stage, the place where each stage lives, and the effects caused by each stage on root yield and quality.
- B.2 Explain how can we distinguish between male and female weevils, and how do the males and females behave in the day time and at night.
- B.3 Put pieces of sweetpotato roots with weevil larvae and pupae in glass containers and let the participants (one representative per group) take them home for further observation. When the weevils become adults, they should provide whole storage roots as food and place for egg-laying. Ask the participants who take the containers home to observe the development of the weevils and infestation of the roots every day, and report the results of their observations during the next meeting.
- B.4 Ask the participants to mention all methods they usually apply to control weevils. Draw the format of a table (as example below) and write the four or five most common methods as heading for the columns. In the first column, write the criteria for evaluating the methods, such as effective, easy to implement, or cheap, or any other criteria the participants mention.

	<i>Method A</i>	<i>Method B</i>	<i>Method C</i>	<i>Method D</i>
Effective				
Easy				
Cheap				

.....				
TOTAL				

B.5 Conduct a matrix ranking by letting the participants individually divide as many maize seeds as methods mentioned per criteria among the methods. Most seeds are given to the method considered most effective (or easiest, or cheapest, etc.). When all criteria are done, count the total score per method and draw conclusions.

B.6 Discussion:

- What are the strengths and weaknesses of each method?
- Are there any other methods to control weevils that they have heard of but have hardly ever practiced? (Bring up important measures if they have not been mentioned such as sanitation and inundation.)
- Why is field sanitation particularly important in weevil management?
- What is the most effective method of field sanitation (inundation, burying of roots, etc.)? What is the most practical method?
- What natural enemies of the sweetpotato weevil can we normally find in the field?

B.7 In case the participants are unfamiliar with the practice of inundation of roots to kill weevils in the infested storage roots, suggest to conduct an experiment. Put seven weevil infested storage roots in a bucket of water. Let one participant take the bucket home and observe one sweetpotato root every day. The root should be carefully cut into small pieces to count how many weevil larvae, pupae and adults in the roots are dead and how many are alive after inundation of 1, 2, 3, 4, 5, 6 and 7 days. The results are presented during the next meeting.

C *Weevil activity at night*

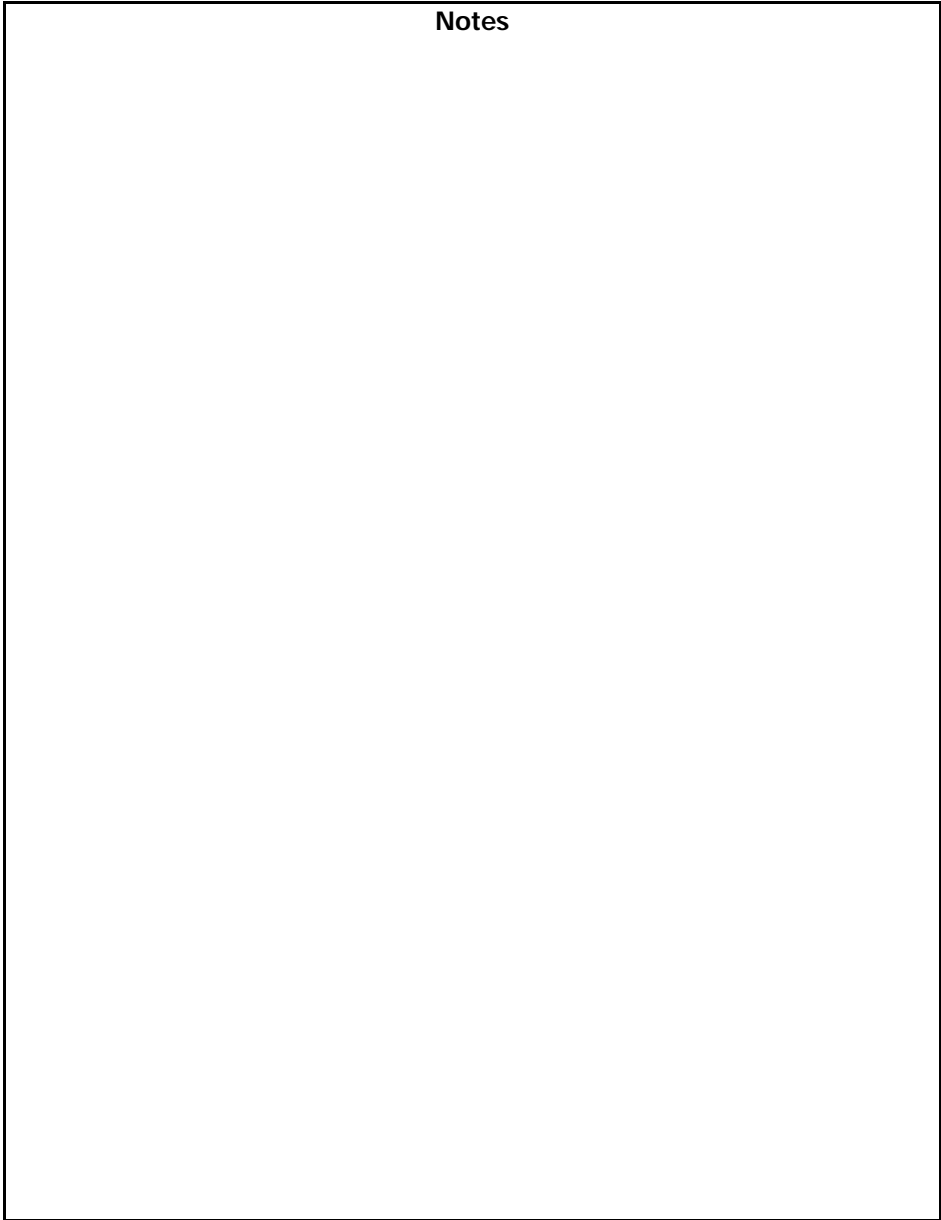
C.1 For those who are interested, evening observation of sweetpotato weevils could be organized (between 6.00 to 8.00 p.m.). Torch and sex pheromone traps should be used to attract and observe the activity of weevils by night. The participants could do the following tasks:

- Count the number of weevils that are captured in the traps within half an hour. Is it different from the number captured during day time?
- Catch some weevils on the foliage and determine their sex. What is the sex ratio?

For more information see:

- Sweetpotato weevil (Part III, Section 5.2.1).

Notes

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