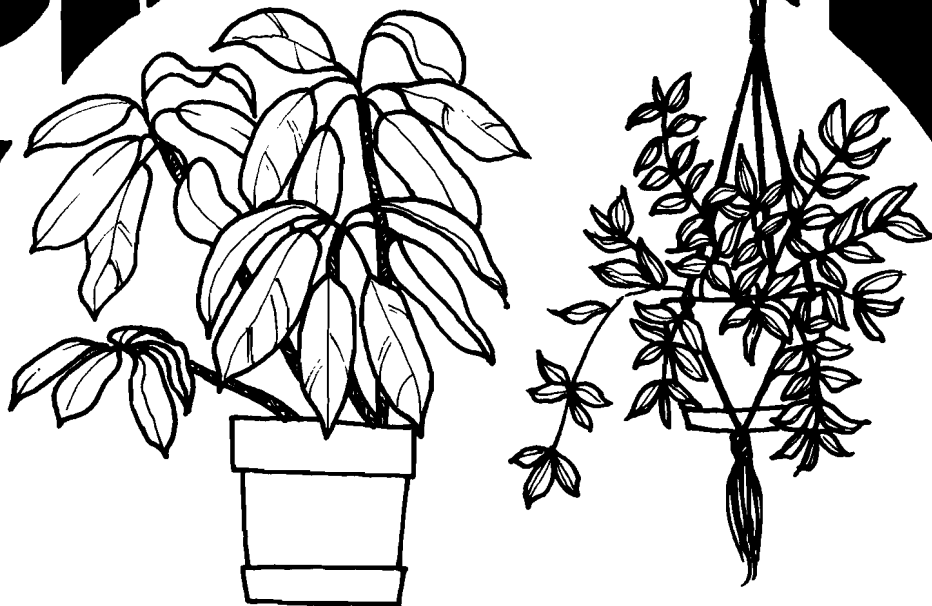


PLANTS

PROTECTED



FROM

PESTS



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Plants Protected From Pests

C. A. Boyles and P. G. Koehler

To Help You

As you use this book, watch for words written in *italics*. Look in the glossary in the back for the meaning of these words.

Statement of Purpose

In the 1960's and 1970's, people began to worry about the harmful effects of *pesticides* and other poisons. Pesticides are needed to manage many pests of man, his crops and animals. To help protect soil, water and air (the *environment*), man no longer uses some pesticides.

Integrated Pest Management (IPM) is an effective, but less harmful way of managing pests of all kinds. An IPM user looks at the whole picture — the *pest*, the *host*, and the environment. Then following IPM methods, the user chooses one or several ways to manage the pest.

Most pesticides are made from the same materials as gas and oil. Gas and oil are also used to apply pesticides. Through IPM, wiser use of pesticides helps to save energy.

The purpose of this book is for you to learn the basic ideas of IPM and how plants resist pests. You should be able to manage pests safely, with less energy and lower costs.

For more information check these publications, available from your County Extension Agent.

**Pest Management — Where to Start —
Circular 548**

All About Pests — Circular 543

**Using Natural Enemies to Manage Pests —
Circular 545**

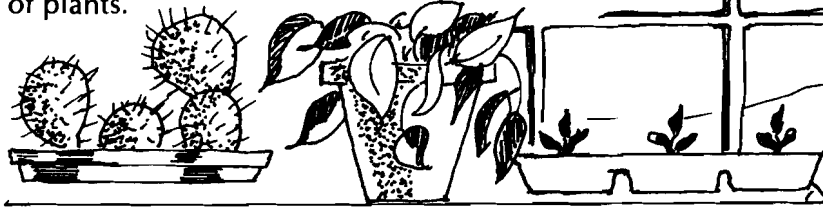
**Cultural Practices to Manage Pests —
Circular 547**

Spraying Away Pests — Circular 544

The ABC s of IPM — Circular 549

Who Lives in the Bushes?

Think about **plants**. They are all around. Almost everywhere you look, you can see many kinds of plants.



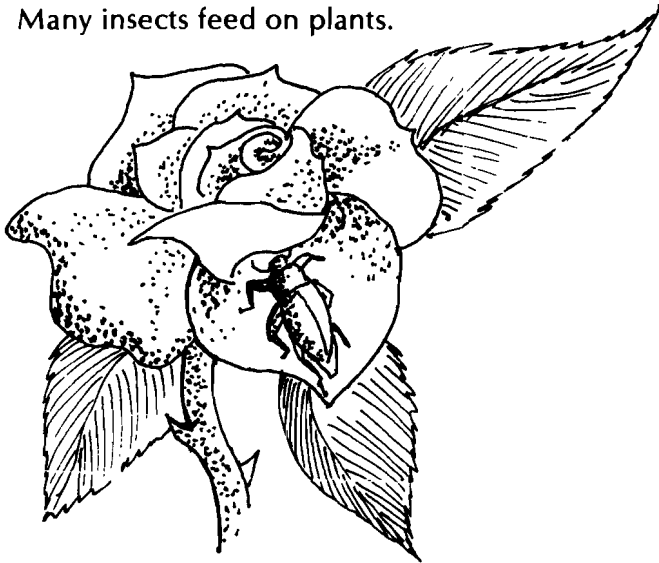
Look closely at a plant. Look on the undersides of leaves. Look where branches and stems join in a "Y."

Many different *organisms* live around plants. Insects, lizards, birds, and other animals live around plants.

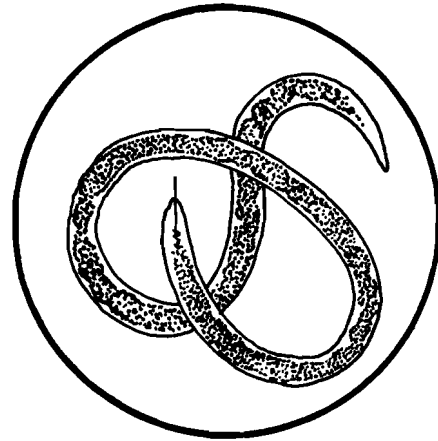
Some of the organisms that live around plants do more than just walk around on the plants. They may also feed on the plants.



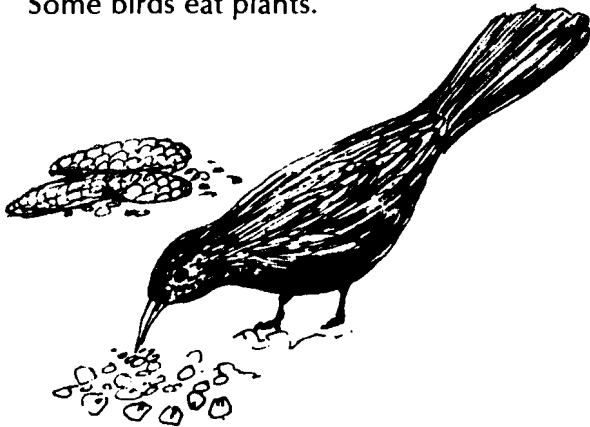
Many insects feed on plants.



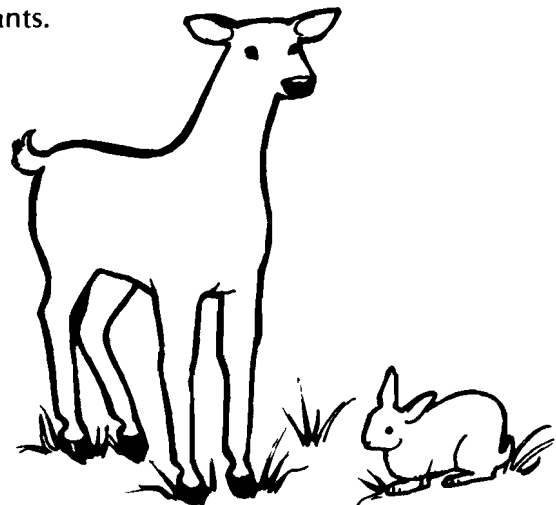
Tiny worms called *nematodes* feed on the roots of plants. This often causes the plants to wilt, turn brown, and die.



Some birds eat plants.

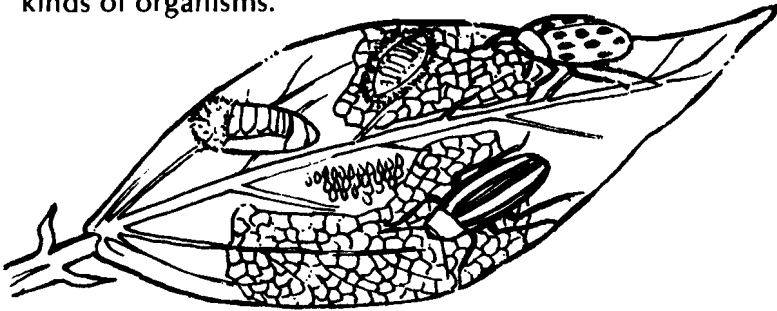


Animals such as rabbits and deer feed on plants.



Organisms called *pathogens* live in plants and cause plant diseases.

Every plant has something that eats it. Some plants are eaten by just a few kinds of organisms. Some plants are eaten by many kinds of organisms.



Man manages some kinds of plants for food and other uses. These plants are called crop plants. Examples of crop plants are oranges, corn, lettuce, and pine trees.

Many organisms may eat or live on man's crop plants. Organisms that harm man's crop plants are called pests.

Some kinds of pests harm only one kind of crop plant. Other kinds of pests harm many kinds of crop plants.

Because we depend on crop plants for many things, we must find ways to manage these pests.

Why Pests Attack Plants

Pests have several reasons for attacking plants. They may be looking for shelter or they may be looking for a place to lay eggs. Mostly, though, they are looking for food.

Basically, each pest *prefers* a certain kind of plant. Pests won't eat plants they don't like.

Plants That Are Protected

Often, plants are not damaged when they are exposed to pests. They may be *resistant* to the pest.

For example, some plants may be bad for the pest that eats them. The plant may not have everything in it that the pest needs to grow and be healthy or the plant may be harmful to the pest.

Some plants grow in ways that help protect them from pests. For example, some onions have many tightly bunched leaves at the base. This helps keep some pests away. Some corn has very tight husks. This protects the ear of corn inside from attack by some insects and pathogens.

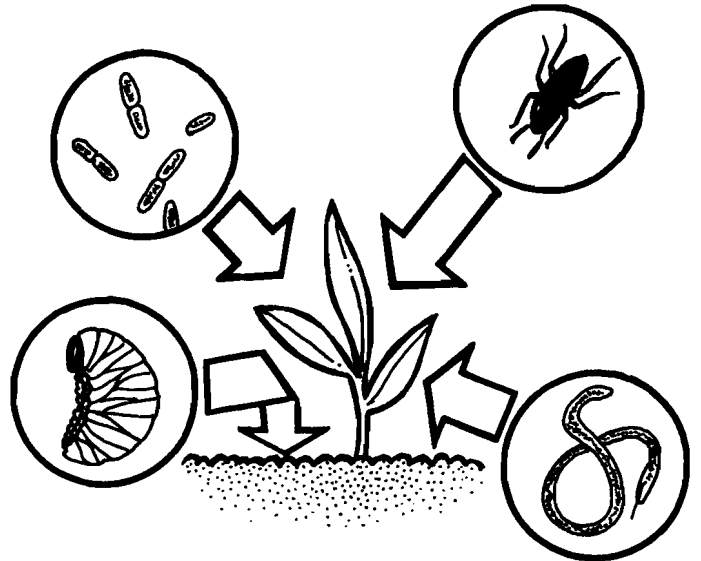
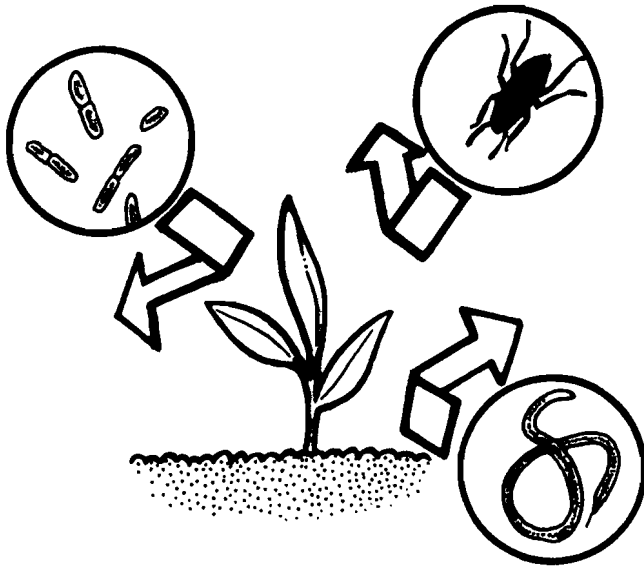


Some plants have special *traits* that may help keep pests away. For example, they may be very hairy, waxy, or thick-skinned. The color of some plants also can be important. Some pests are attracted to certain colors more than other colors.

Often, plants can produce a crop even if they have been attacked by a pest. This is called *tolerance*. The age and size of the plant can affect tolerance. Also, the health of the plant affects tolerance. Older, well established plants often can stand more damage than younger plants (if the plants are healthy). Some plants can even regrow if they are damaged.

Helping Man's Crops

If all pests liked all plants, no plants would be left. But, most pests prefer to eat certain kinds of plants. A pest won't eat a plant it doesn't like. Resistance of plants to pests is mostly due to a special trait of the plant. Some plants have developed resistance to some pests. The amount of resistance can vary. Some plants are very resistant to some pests, others are only slightly resistant.



Man has learned how to help plants develop resistance to pests. Plant *breeders* have worked on many crop plants. Many plants showing resistance to certain insects, pathogens, and nematodes have been developed. These have been very helpful in today's agriculture.

<p>STEP 1. IDENTIFICATION</p>	<p>STEP 2. PREVENTION</p>
<p>STEP 3. MONITORING</p>	<p>STEP 4. PREDICTION</p>
<p>STEP 5. DECISION</p> <p>continue monitoring ? apply control</p>	<p>STEP 6. EVALUATION</p>

How Resistance Is Used in IPM

In **Pest Management — Where to Start**, you learned about the six steps of IPM:

1. Identification
2. Prevention
3. Monitoring
4. Prediction
5. Decision
6. Evaluation

Resistant varieties of plants are a very valuable IPM tool. Resistance can be used to prevent many pests from becoming a problem (step 2).

Problems with Resistant Varieties

Resistance will not solve all pest problems.

1. Some kinds of pests still damage varieties that are resistant to other pests.
2. Pests may, over a period of time, become tolerant of the resistant variety.
3. How well resistance works depends on several things.

The environment is important. Things like light, temperature, humidity, and rainfall affect how well general resistance works. Other conditions such as soil moisture and fertility can also affect resistance.

The abundance of other hosts is also important. Many hosts in one area often mean more pest problems.

The activity of the pest is important. What are the pests doing?

- Are they mating?
- Are they laying eggs?
- Are they in a growing stage?
- Are they resting over winter?

Summing Up

Man grows many crop plants. They can be attacked and damaged by many pests. But some of these plants are not damaged when they are exposed to pests. They are resistant to the pests. Plant resistance to pests is a valuable IPM tool. It can be used to prevent many pests from becoming a problem.

Glossary

1. Breeder — One who produces and/or develops new offspring with good qualities.
2. Environment — Surroundings, including anything that affects man, other animals or plants.
3. Host — Any plant or animal that shelters or gives a home to a parasite or other natural enemy.
4. Nematode — A tiny worm-like organism that lives in the soil and damages the roots of plants. Nematodes may live in the soil, in water, in animals, or in plants.
5. Organisms — Living things; includes all animals and plants.
6. Pathogen — A very tiny organism that causes a disease. The three types of pathogens are fungi, bacteria, and viruses.
7. Pest — An organism that hurts something or is bad for something that belongs to man. A pest may be an insect, a plant, an animal, a disease, or any other kind of organism.
8. Pesticides — Poisons that are used to kill organisms that man regards as pests. Insecticides kill insects. Herbicides kill plants. Fungicides kill fungi.
9. Prefer — To choose over another; to value more.
10. Resistant, Resistance — Withstanding attack; offering opposition to pests. Able to withstand infection or contamination. Resistance is the ability of a pest population to stay alive after it has been treated with a pesticide.
11. Tolerance — Capable of growing and producing even when subjected to a pest.
12. Traits — Different features or qualities.

This publication was promulgated at a cost of \$450.00, or 15 cents per copy, to inform Florida residents about IPM (Integrated Pest Management). 2-3.1M-84

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