



Frederick County Office

# OPERATING A PROFITABLE SMALL FARM

## FACT SHEET 8

### *Pest Management*

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#### **I. Developing an Integrated Pest Management Approach**

Farmers have been fighting to protect their crops/livestock from pests since before recorded time. Cultivated crops are considered fair game to many of Mother Nature's creatures. In fact some of our agricultural practices will even make our crops even more attractive to pests. Crops will be assaulted by weeds, insects, microorganisms, wildlife, and even adverse weather. Livestock can have the added danger of predation from wild predators and dogs.

Most farm operations can tolerate minor losses to some of their crops and some mortality in livestock, however no farm has a profit margin that can tolerate heavy losses. This is especially the case on small farms where limited production makes the total operation more sensitive to even moderate losses. It is therefore critical to the small farm's financial survival that a sound pest management plan be developed and followed each season. This plan is necessary whether, or not an operator is controlling pests organically or using chemical pesticides. The plan should include the use of a wide range of natural and applied controls that give consideration to the costs, benefits, and liabilities of each control strategy.

#### **II. Natural Controls**

There are an enormous amount of naturally occurring factors in the environment which help to control pest problems. Without these natural controls, we would be waist deep in pests. These forces act independently of humans. It is up to the farm operator to recognize and utilize these natural controls whenever possible in the pest management plan.

Weather is a significant influence in pest management. It can contribute to pest problems, or it can alleviate pest problems. While prolonged hot, dry weather promotes the development of mites, timely rains will cause the populations of mites and alfalfa weevils to crash. A hard rain will wash cereal leaf beetle larvae off small grain leaves. Monitoring pest populations and being familiar with pest vulnerabilities and the weather report can help to limit the need for some pesticide applications.

Food, water, and shelter are necessities to most living things. This includes pests. By learning the life cycle of your pests, you may be able to use one, or more natural factors to control a pest. For example, certain weeds/plants are preferred as alternative foods for pests, grasses are often preferred by many insects as egg-laying sites, birds and deer love trees for shelter, and geese are attracted to water sources. In this situation, the host species of plants around the field can be removed and grass can be controlled in the field. However the elimination of the trees and water source will not be easy, or practical. Since the habitat cannot be changed, control measures need to be tried. If these fail, it may then be necessary for you to consider producing a commodity that is less attractive to that pest.

Natural enemies are certainly the more well known of the natural controls. This group includes a wide range of large and small creatures that feed upon, or parasitize pests. The challenge with natural enemies is finding ways to entice and keep them in our fields and how to avoid killing them when we treat our fields with a pesticide. If a farm operator can become familiar with the natural enemies of a pest, strategies could be developed to increase and maintain the population of a natural enemy.

The soil contains a host of natural enemies to pests. It is essential that the soil organic matter content be adequately maintained, since much of the soil's ability to support these beneficial organisms is dependent on organic matter. The value of good soil management should not be underestimated as part of a comprehensive pest management plan.

Along with good soil management, good plant fertility and management are essential to the overall management of pests. Many plants have developed natural defenses against pests during their evolutionary process. Healthy plants that are not stressed, are able to resist pests above and beyond those pests for which they were developed to resist.

### **III. Applied Controls**

Despite your best efforts to encourage natural controls, it is not usually going to be enough to prevent unacceptable economic losses from pests. Other control measures will have to be implemented by you to overcome the deficiency in natural controls. When people take a proactive role in controlling pests, we call this applied control.

#### **Resistant varieties**

Using resistant varieties is one of the easiest and most effective ways to control a pest. A pest resistant plant, by itself, provides its own defense against that pest and does not require any additional help from the producer. It is therefore very economical and environmentally friendly. It seems today, that almost every crop has some varieties available that are resistant to some of the pests of that crop. Using resistant varieties of crops should be part of a pest management plan.

## **Biological Control**

The use of biological controls involves introducing natural enemies of pests, such as parasites, predators, and pathogens into the field, or crop area to be protected. Biological control will not eradicate a pest and control is usually erratic. However, for some pests, biological control has been effective. For example, released viruses have helped to reduce the population of gypsy moths and released parasitic wasps have significantly reduced the population of cereal leaf beetles.

Biological controls also includes using natural attractants, such pheromones. These materials can be used to lure males away from females during breeding periods. This can lower the overall pest population.

## **Cultural Control**

The use of cultural controls by the producer, together with the use of resistant varieties of crops, can form the basis of an effective, low-cost, environmentally sound pest management plan. Cultural controls alter the environment, the condition of the plant, the behavior of the pest, or suppresses an infestation. These practices disrupt the normal relationship between the pest and the crop (plant), thereby making the pest less likely to survive, grow, or reproduce. Cultural controls include some long accepted agricultural practices as, cultivation, crop rotation, varying time of planting or harvesting, adjusting plant population or row widths, pruning, thinning, mowing, and fertilization.

## **Mechanical (Physical) Control**

The use of mechanical controls involves the use of devices, machines, and other methods to control pests and alter the environment. Mechanical controls can affect the availability of light, or heat, or can physically repel a pest. Some examples of mechanical controls include traps, screens, netting, fences, row covers, mulches and two blocks of wood. For many wildlife and predator problems, mechanical controls will provide the primary part of the pest management plan.

## **Sanitation**

Including sanitation as part of the pest management plan can be essential to the plan's success. Sanitation helps to control pests by removing the pests themselves or their sources of food or shelter. The removal of crop residues will remove a source of disease inoculum and can reduce the severity of that disease to the following crop. Also, some insect pests like to winter in crop residues. Good manure management can reduce parasite and fly problems. Other examples of sanitation practices include using disease-free seed or transplants and cleaning equipment or tools between fields.

## **Chemical Control**

When most people think about pest control, they tend to think about chemical control (pesticides). Pesticides are chemicals used to kill pests, control their activity, or prevent them from causing damage. There are several different types of pesticides, formulations, and chemistries. Some pesticides are made from natural substances and can be used in organic operations. While pesticides provide the fastest way to control a pest, they should be considered the last line of defense in your pest management plan. Only when all the other avenues of control in your plan fail, should a pesticide be used. Always select the least toxic pesticide to you and the environment, and you should always read the label. The best advice is to consult the Extension office on the best pesticide selection.