

This presentation is part of an educational modular program designed to provide new and beginning farmers and ranchers with relevant information to initiate, improve and run their agricultural operations

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United States Department of Agriculture
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Integrated Pest Management Principles



IPM

- o Integrated pest management (IPM) is an environmentally sensitive approach to dealing with animal, insect and plant pests
- o It relies on studying the life cycles of pests and their interaction with the environment, and using this information to control them with the least possible risk to people, property and the environment



What is a pest?



Pests are organisms whose population are high enough to cause economic, aesthetic, social or medical losses

- o The term “pest” is very subjective, because it depends on the specific conditions of the place

It includes:

- o **Vertebrates**

- Birds, deer, rodents

- o **Arthropods**

- Mites, insects, spiders

- o **Plant diseases**

- Fungi, bacteria, viruses

- o **Plant parasitic nematodes**

- o **Weeds**



Insects can damage or destroy crops, but they can also cause significant damage to livestock and poultry operations

Several insects are vectors of important animal and human diseases such as Salmonella, E. coli and others

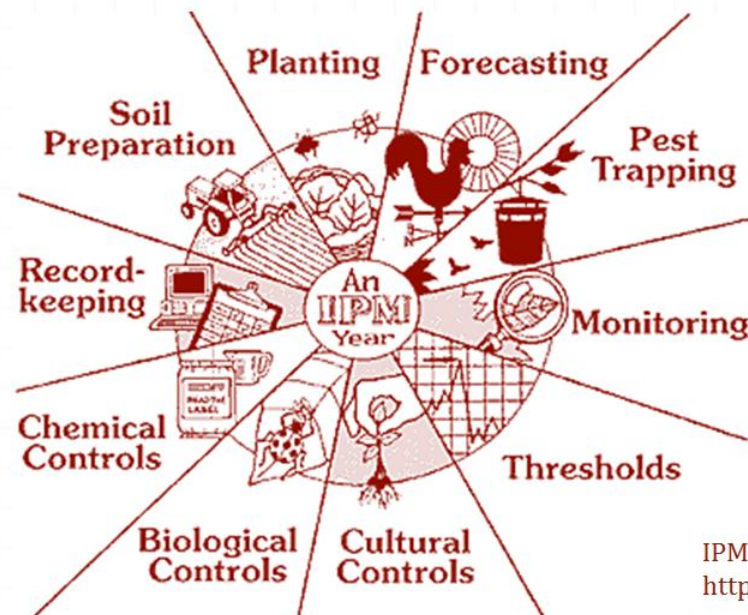
In other cases, they directly harm the animals. For example, the “fly strike” in sheep and “pink eye” in cattle transmitted by flies

In a case of fly strike, the flies find a patch of damp wool and lay their eggs on it, which then hatch into maggots. These then eat their way into the flesh of the sheep. Over the next week, the sheep then gets septicemia which often leads to death



Integrated Pest Management (IPM)

- o Integrated pest management strategies can be applied to all types of agriculture and other situations including residential and commercial structures
- o The integration of multiple control and prevention strategies, along with knowledge and experience makes it ideal for low impact, natural and organic farming



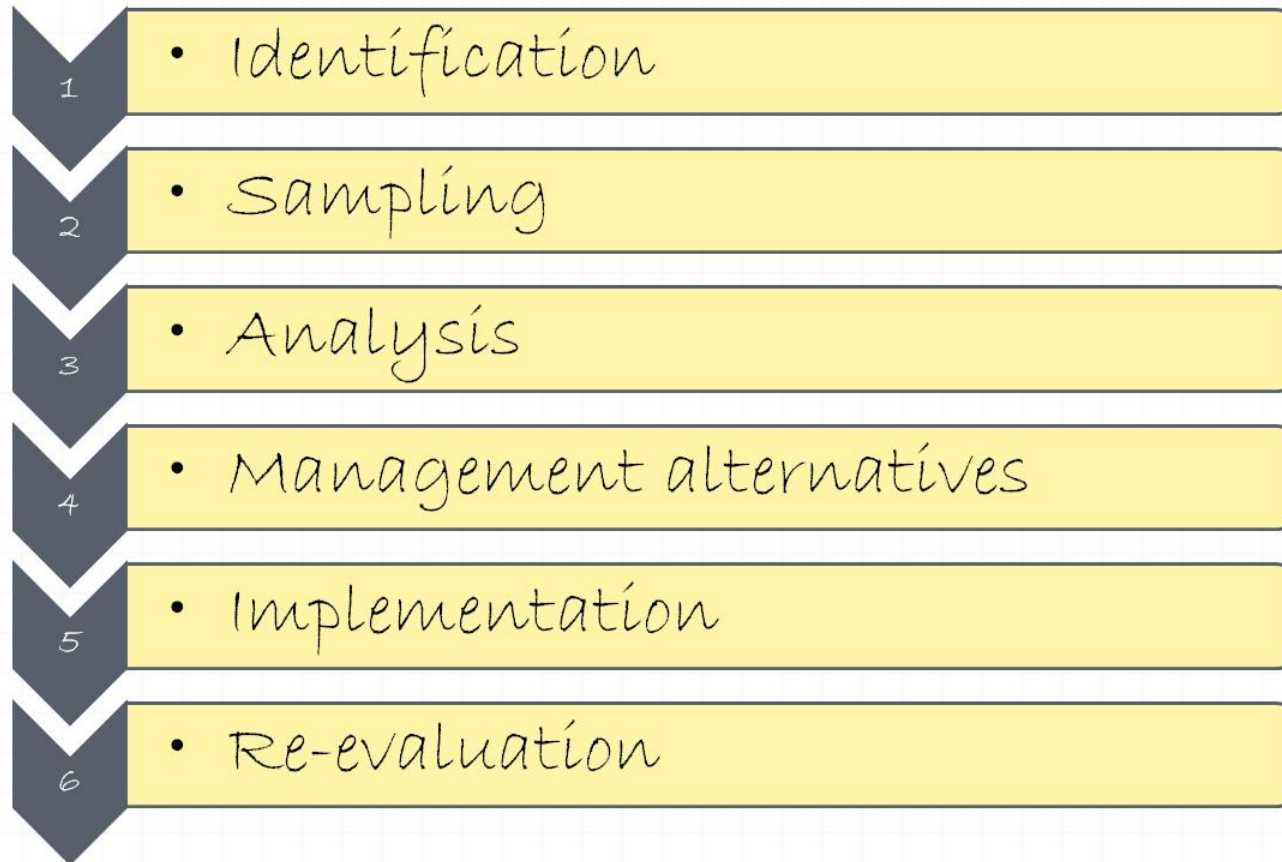
IPM

- One of the main goals of the use of integrated pest management strategies is to reduce the risks and costs of the use of natural and synthetic pesticides
 - All pesticides can have harmful effects on humans, animals and the environment
 - It doesn't matter if it is natural or synthetic in origin
 - Inappropriate use of pesticides can lead to resistance pest strains

Non selective pesticide strategies can also hurt beneficial insect or plant populations, including pollinators



There are 6 main steps in a IPM program



1. Identification

- Proper identification of the problem is the most important step in controlling a problem
 - Is it a pest problem?
 - Nutritional deficiency?
 - Environmental stress?

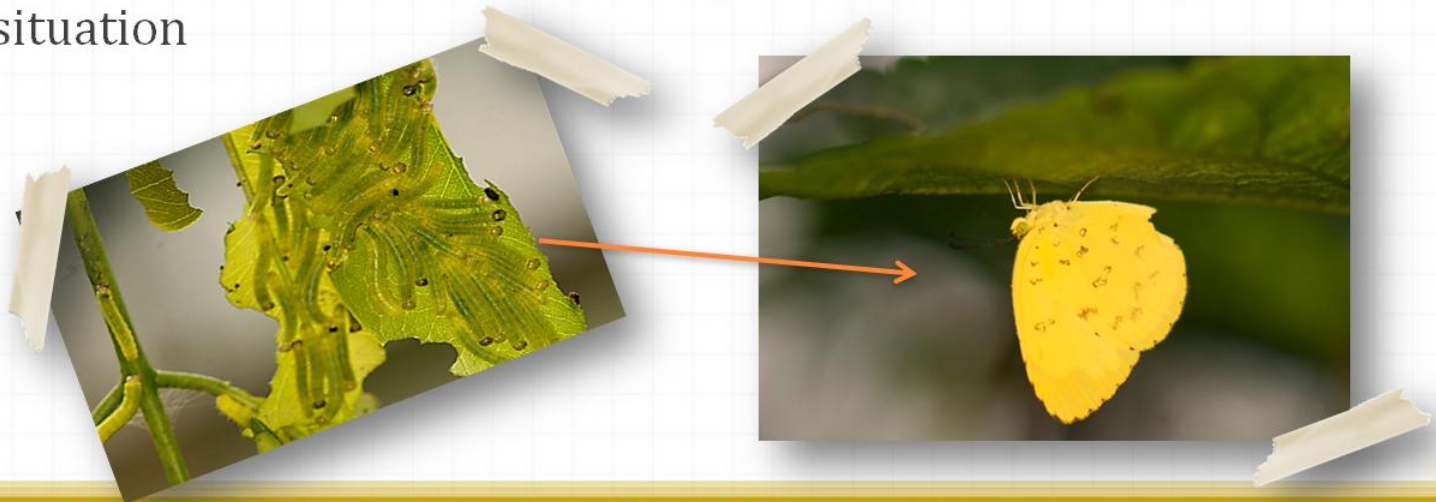


- Many insects and critters can be found in fields, however only a relatively small group of them actually cause any harm
- If you are not sure, take pictures or samples and take them to the nearest extension office or to other farmers in the area for help



2. Sampling

- Once the pest has been identified, the next question is how big of a problem is it.
 - Is it only one area or is it the whole field? Only a few animals or the whole herd?
 - Is the problem a growing threat?
- For many pests, information on their life cycle and some special scientific models can help to assess potential damage
 - For example, large cutworms will soon pupate and solve the problem naturally
 - Visit your extension office or farmers in your area to discuss your specific situation



2. Sampling

Monitor and identify pests

- Not all insects, weeds and other organisms need control
- Many are innocuous and others are beneficial
- It is important to identify the potential pests and distinguish them from beneficial insects and plants
 - Record keeping is essential for a good monitoring program
- Once you identify the pest, you must research its biology, habitat and best strategies to control it



- Traps for monitoring insect populations on the farm
- They contain chemical lures to attract insects
- They should be checked and emptied frequently

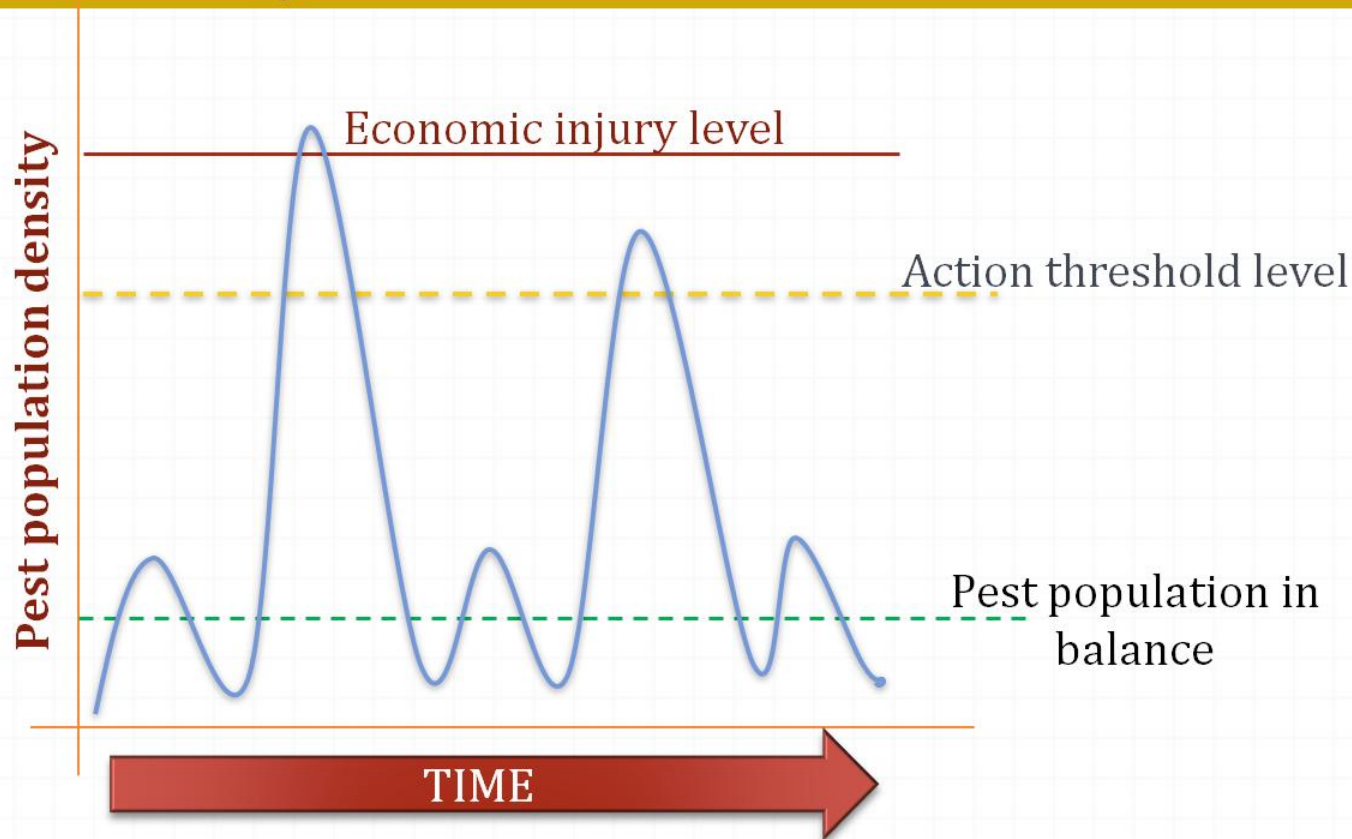


3. Analysis

- Study the pest species, the damage and then decide at which point the pest population or environmental situations will determine that action will be taken
 - Decisions must be based on the health of the crop and animals, the environment, and its financial cost
 - These decisions or “action thresholds” are always pest and site specific
 - Always consider if the control action is more costly than the actual potential damage
- The goal is **CONTROL** not **ERADICATION**
 - Total eradication is often impossible and most likely expensive and not environmentally sound



3. Analysis



If you have a good monitoring system in place, you will be able to detect changes in the pest populations and initiate control measures before they cause significant damage to your operation

4. Management alternatives

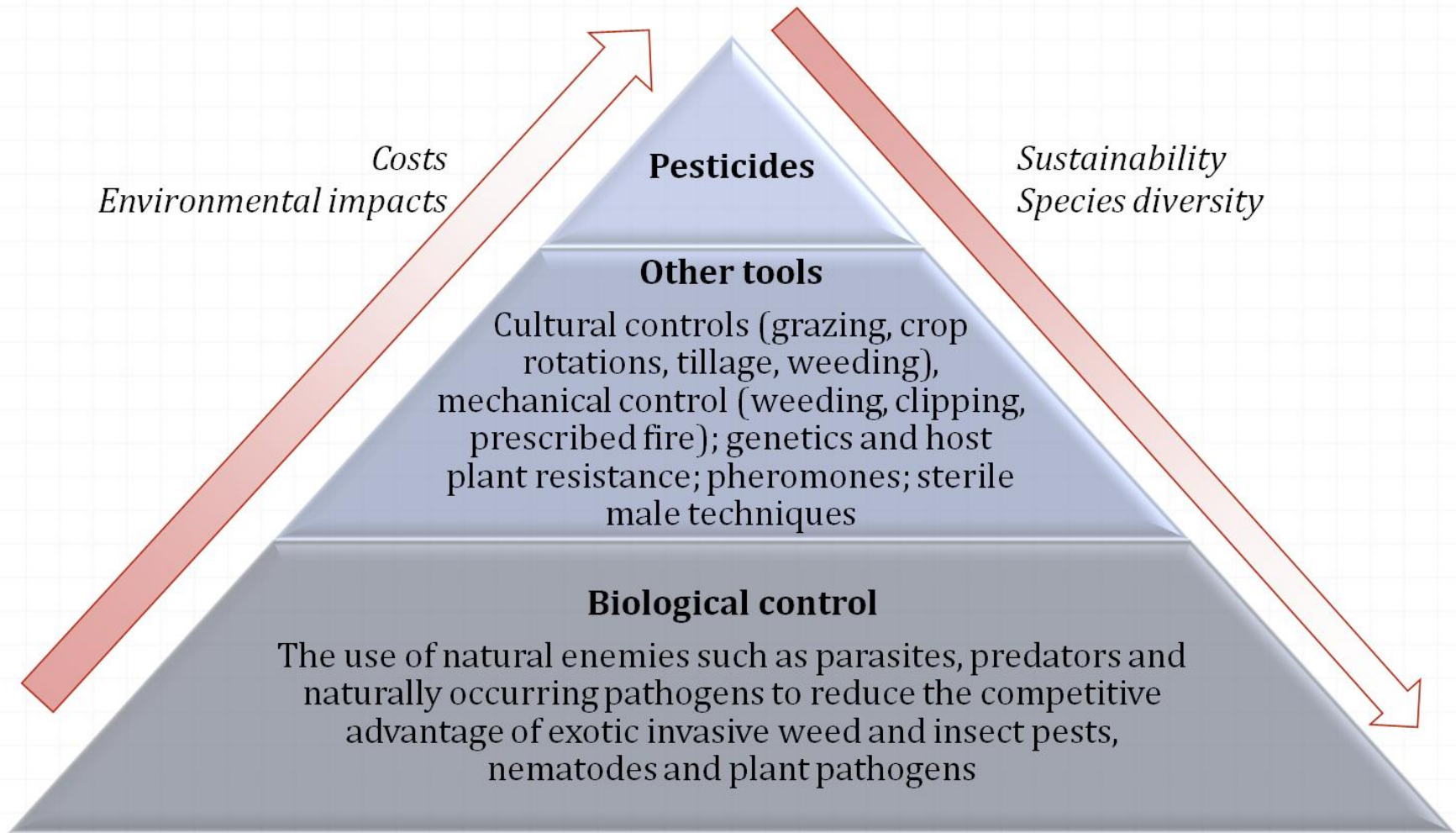
- When it is determined that an action should be taken is it essential to evaluate the costs, benefits and possible risks of employing any management strategy
- Always consider first those strategies that are safer for the crops, animals, people and environment
 - Mechanical strategies (traps, barriers, weeding)
 - Biological strategies (introduction of pest predators, pheromones or infertile insects)
 - Chemical (oils, natural or synthetic pesticides)



Trap for beetles



4. Management alternatives



4. Management alternatives

Green lacewings, ladybugs, praying mantis and spined soldier bugs are effective biological methods of control of harmful bugs



4. Management alternatives

Pesticides

- o Even though one of the objectives of the IPM is to reduce the use of pesticides, it is important to recognize that when used properly they can be the only alternative to avoid or solve severe economical or health damage
- When selecting a pesticide it is important to consider:
 - Specificity
 - Always choose specific pesticides first and with targeted spraying. Only if these pesticides fail then a general pesticide should be used
 - Potential for groundwater contamination
 - Acute mammalian toxicity
 - Efficacy
 - Disruption of natural enemies
 - Resistance management

In organic and transitional agricultural operations, it is very important to make sure that all substances used in the farm are approved by the National Organic Program (NOP)

<http://www.ams.usda.gov/AMSv1.0/nop>

4. Management alternatives

Pesticides

- o If you choose to use a pesticide, always read the label carefully. Mix and apply as directed, *do not overdose or treat too often*
- o Remember that improper practices can lead to illegal residues in food products and leave residues in the environment
 - o Plus, it is illegal to use a pesticide in any manner inconsistent with the label

Always read the
label first!

PRODUCT NAME	
1.	DIRECTIONS FOR USE It is a violation of federal law to use this product in a manner inconsistent with its labeling. _____ _____ _____
2.	PRECAUTIONARY STATEMENTS HAZARD TO HUMANS (AND DOMESTIC ANIMALS) DANGER _____ _____ _____
3.	ENVIRONMENTAL HAZARDS _____ _____ _____
4.	PHYSICAL OR CHEMICAL HAZARDS _____ _____ _____
5.	STORAGE AND DISPOSAL STORAGE _____ _____ DISPOSAL _____ _____ _____
6.	KEEP OUT OF THE REACH OF CHILDREN DANGER
7.	FIRST AID (STATEMENT OF PRACTICAL TREATMENT) IF SWALLOWED _____ IF INHALED _____ IF IN EYES _____ IF ON SKIN _____
8.	ACTIVE INGREDIENTS: _____ % OTHER (INERT) INGREDIENTS: _____ % TOTAL: _____ %
9.	THIS PRODUCT CONTAINS XX LBS. OF XXXX PER GALLON
10.	WARRANTY STATEMENT _____ _____ _____
11.	MANUFACTURER'S ADDRESS _____ _____ _____
12.	NET WT. / NET CONTENTS STATEMENT _____
13.	EPA Registration No. / EPA Reg. No: _____
14.	EPA Establishment No. / EPA Est. No: _____

5. Implementation

- Once the control strategy has been selected, it should be implemented with precision and thoroughness.
- The control method should be employed in a timely manner
 - Most pesticides are most effective at a specific time in the life of the insect, plant or other pests
 - Verify the doses and times of application for all your treatments



5. Implementation

- Always check the weather forecast before applying any treatment
 - Rain, wind or temperature changes can affect the efficacy of any chemical or biological treatment
 - Proper application will maximize the effectiveness and minimize the need for additional sprays



6. Re-evaluation

- Review the operation and evaluate its success
 - Take note periodically after the treatment to assess its efficacy (a few days later, a few weeks later)
 - Take note of the cost of the treatment to include it for future cost estimations
- Take a close look at pest activity and presence before and after the treatment



Nets, traps and sticky cards are good ways to monitor the efficacy of any control treatment



Prevention

- o The main strategy should always be prevention
- o This includes activities such as maintaining healthy crops and livestock, crop and grazing rotations, inter-planting species, selecting pest-resistant varieties, avoid overcrowding, resting periods
- o Encourage beneficial and natural predator control systems in your farm



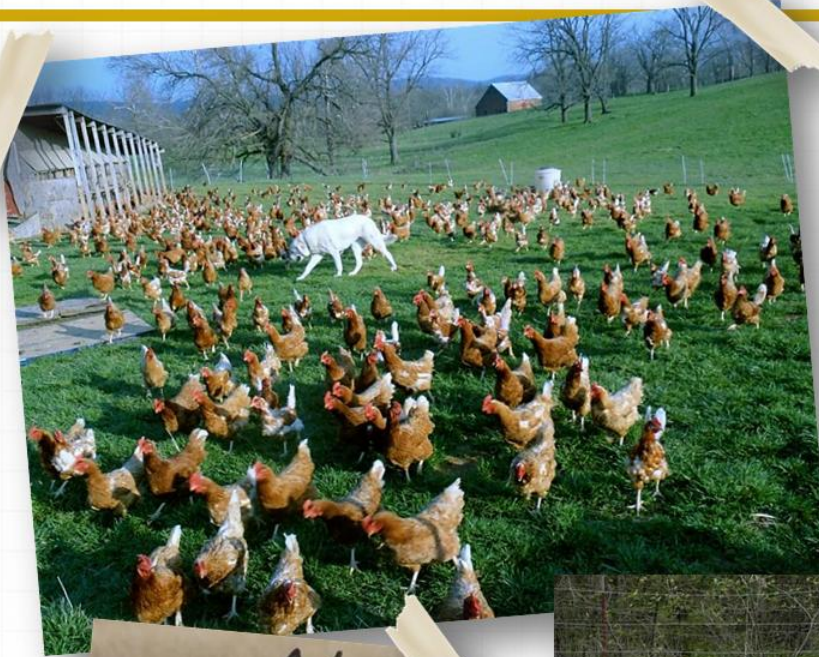
Bats can eat about 600 insects in one hour!



Owls and cats are still among the best strategies for rodent control



Prevention



To protect your animals from predators, one of the best investments that you can make is to get a guard dog, donkey or llama to watch your animals at all times



Prevention

- Keep all areas as dry and clean as possible
- Avoid feed waste or leaky waterers
- Waste management is the first line of defense in developing an effective pest control
- Control of wet spots is essential to control insect populations (many will breed in water)



- Keep a strict control of who and what comes into your farm
- Quarantine all new plants and animals
- Thoroughly clean all farm tools and implements that are used in different parts of the farm
- Work with your neighbors in pest control

VISITORS

Please respect our nursery

BIOSECURITY

People can carry pests & disease

NO VISITORS PAST THIS POINT

IPM Labeling and certification

- o Interest among consumers for environmentally sound production methods has pushed for a growing market for IPM labels
 - o Make sure that you have a written plan for your IPM strategies
 - o Records of all strategies are required before being able to use an IPM grown.
 - o There are some established IPM protocols for some crops, always try to obtain as much information as possible before you use any claim in your label
 - o There are established protocols that have be used for beets, cabbage for sauerkraut, carrots, peas, snap beans and sweet corn
- o **Check for specific programs and IPM label regulations in your area**



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