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DEVELOPING YOUR OWN IPM PROGRAM

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IPM stands for integrated pest management. It is a process for determining if, when, where, and what type of control measures should be used to control a pest. As the term integrated infers, it stands for the use of a combination of control tactics such as cultural, mechanical, biological and chemical controls to develop an overall pest management plan.

Homeowners should not feel intimidated about developing their own IPM program. Most of the techniques are common gardening practices. An IPM plan brings together all the gardening and pest control strategies necessary for good plant protection. Such a plan provides a systematic way of maintaining plant health while reducing pest, plant injury or loss of yield. Risks to the environment and non-target organisms, including ourselves, are lessened too. Effective IPM does this by maintaining natural predators and other low toxicity controls, thus reducing chemical overuse which can lead to pest resistance.

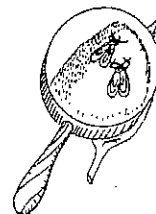
Home gardens, unlike agriculture crops, contain many different kinds of plants. They are home to many different organisms including small animals, spiders, insects, mites and microscopic organisms such as fungi, bacteria and nematodes—most of which cause little or no damage to the plants in the garden. Many of them are essential to the well-being of the garden and the environment.

INSPECTION AND MONITORING

Effective IPM requires that you look at your plants. When examining a plant, look for the presence of beneficial insects as well as the pests. Also look for the presence of disease, animal

damage and signs of stress-stunted growth, poor color and excessive wilt. Weakened plants are more susceptible to pests. This is an ongoing process that should be done on a weekly basis.

Monitoring aids such as magnifiers, drop cloths, sticky traps, pheromone traps and even a flashlight are useful. Carefully search the plants or at least examples of each type of plant growing in the garden. Many plants have specific pest problems. For example, the corn ear worm is found only on sweet corn. The silk of the corn would be the part of the plant to check first and most frequently.



Sticky traps and pheromone traps lure insects into them and the insect sticks to the tacky substance in the trap. These are very useful for monitoring seasonal occurrences of insects. By keeping records of your monitoring, you will know in future years when to start inspecting for a particular pest.

It is essential to keep accurate records of your observations. Note when a pest occurs, on what plants and under what climatic conditions. Also document the various IPM methods used to manage the pests. Remember IPM strategies vary in the home garden and success is dependent upon the pest, the plant and its vigor, soil and climatic conditions, timing, etc. Your records should include the temperature and weather conditions for each day you monitored the garden. This will help you identify weather related problems.

DETERMINING THRESHOLDS

The threshold is that point when the ornamental or food value of the plant will be threatened or the plant will die if a pesticide is not used. For fruit and vegetables the threshold is when the yield will be significantly reduced if pest control is not implemented.

APPLYING CONTROL STRATEGIES

Inspection and monitoring are only two of the strategies of IPM. Developing strategies for control and protection before a threshold is reached is also important. Included in this group are cultural practices and mechanical, biological and chemical controls. Cultural practices are methods used to reduce the possibility of a pest problem developing in the first place. The others are the steps you would take to stop the pest before going to the next step. The point at which a control is selected and used is based upon your monitoring records.

CONTROL STRATEGIES

1. Cultural practices. Cultural practices include knowing the life histories and habits of the pests you're likely to encounter and the selection of resistant plants.

A. Resistant plants are not as susceptible to pests and natural controls are usually sufficient to keep pests under control. An example of a plant with pest resistance is the tomato. Most have been bred to have resistance to verticillium wilt and other pest problems.

B. Rotating crops to a new location in the garden reduces the build-up of plant pests, particularly diseases in the soil. If potatoes are grown in the same spot year after year, the chance of losing the crop to disease increases dramatically. The problem that most of us have with crop rotation is room. You cannot simply move the crop over a couple of rows each year; it has to be moved to the other side of the yard. One solution would be to grow potatoes one year, lettuce or broccoli the next, squash the third year and potatoes again the fourth year, in the same space.

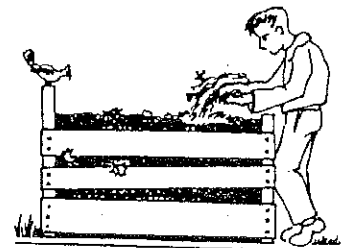
C. Sanitation keeps the garden clean and free of weeds, pest-ridden plants, plant litter and debris. Do not let plant residue lie around in the garden, even over winter. It harbors diseases and insects and should be removed from the garden.

D. Cultivation is critical because many of the weeds in the garden harbor diseases and insects that attack plants. Cultivation can also expose soil insects to the elements and their natural predators.

E. Intercropping and companion cropping reduce pests. Intercropping is planting two different crops, one maturing early and one late, in the same spot at the same time. This might slow the spread of pests. Companion planting is the use of plants that are supposed to repel pests from the crop they are planted next to. In reality, when tested under controlled conditions, companion planting does not appear to consistently repel insects. However, intercropping and companion planting may harbor predators and improve biological control for neighboring plants.

F. Mulches conserve water and aid in weed control. Make sure the mulch is free of disease, harmful insects and weed seed. Excessively thick mulches in the vegetable garden can increase pest damage by providing a location for pests to hide. Organic matter tilled deeply into the soil in the fall improves the soil-plant relationship and soil nutrition for healthier plant growth.

G. It is important to reduce stress to plants. This is done by providing adequate water and fertilizer. Plants that are allowed to wilt before being irrigated are weaker and more susceptible to pest problems. Though generally not as critical, the same holds true for undernourished plants—those not receiving adequate nutrients through fertilization.



2. Mechanical methods. Mechanical methods are very important to IPM. Methods include hoeing

out weeds, hand removal of insect pests or using a stiff spray of water to wash the pest off the plant.



Hoeing is a good method of controlling weeds. Weeds compete for water and nutrients with desirable plants and also harbor insects and disease. Pruning out diseased, damaged and

dead parts of a plant is also a mechanical method. Barriers can also be effective. Sticky tape or bands of sticky materials painted around the base of trees, are very effective at trapping insects as they crawl onto plants. Floating row covers of thin porous plastic film can be laid over the top of the crop to exclude insect pests from the garden. There are various traps available as well, such as pheromone traps, gopher, vole and mole traps.

3. Biological controls. Biological controls are an important part of IPM in the home garden. There are many beneficial insects and mites in your garden. They can be supplemented by purchasing more or even different predators. These include lady beetles, lacewings, syrphid flies, wasps and praying mantis. Insect-eating birds are also useful. Disease-causing organisms such as bacteria, fungi and parasitic nematodes are effective controls for many garden pests as well.



Bacillus thuringiensis, Bt., is one of the most popular microbial-based insecticides used at the present time.

4. Chemical methods. These are generally used as a last resort, but they are often the only practical method of reducing insect populations that have reached threshold levels. Chemicals include attractants, growth regulators, sterilants, repellents, insecticides, fungicides and antibiotics.

When chemicals are used in an IPM program, great care needs to be taken. Use the proper chemical at the proper time to control the pest and not damage the plant or crop. This reduces the

risks to yourself, family and the environment.

Always follow the label instructions and measure accurately when mixing. It is also important to remember that most chemicals do not stop the pest dead in its tracks. It may take hours or even days to control the pest. Be sure to identify the pest and use a chemical that lists that pest on its label. Never exceed the recommended rate—it is dangerous and against the law.

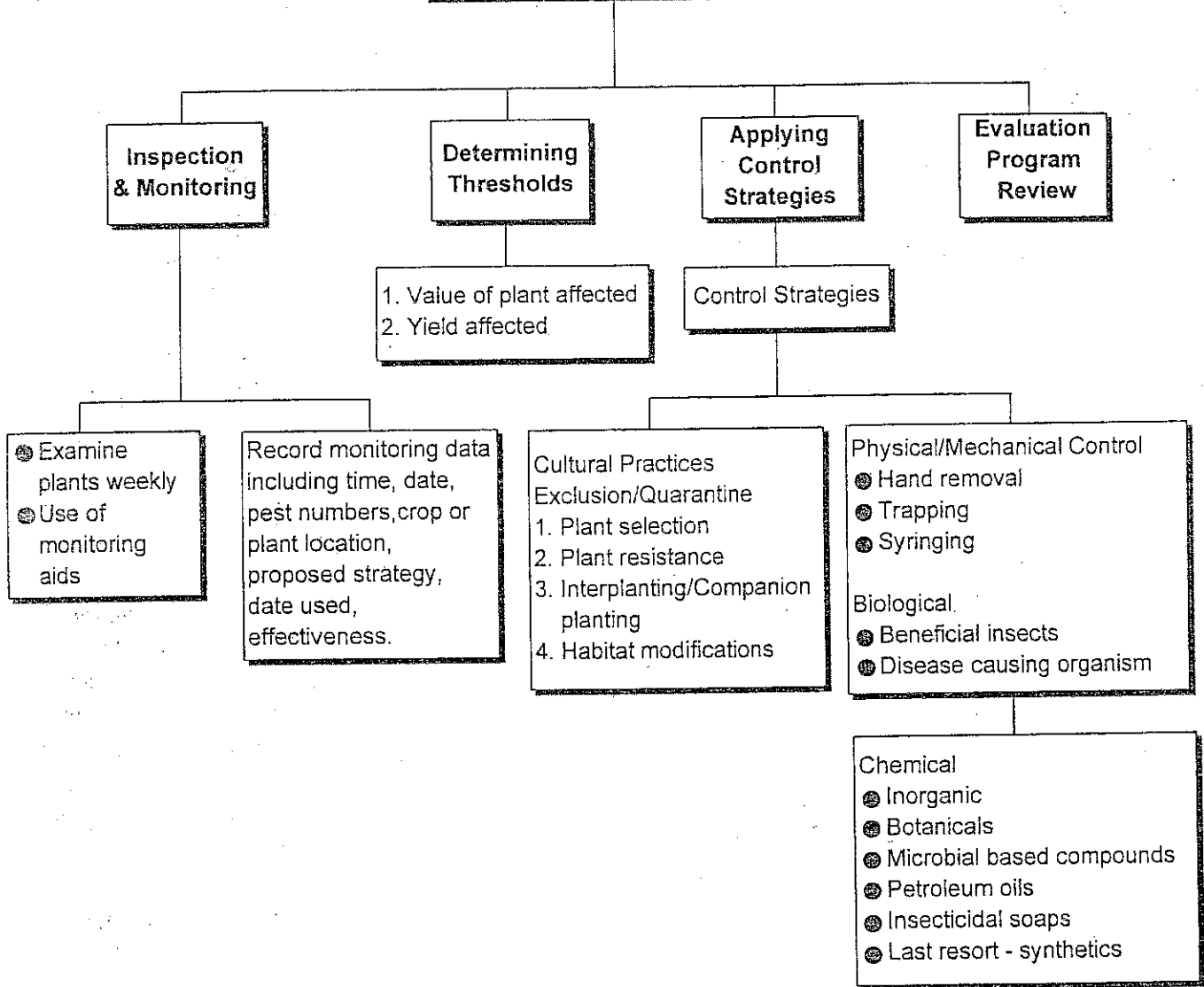
The classification of chemicals is based on how they originated. The origins of chemicals include inorganic compounds, plant-derived botanicals, microbial-based



products, insecticidal soaps, petroleum oils and synthetic materials. Inorganics include lime sulfur (disease control) and boric acid (roach control). Examples of plant-derived botanicals are pyrethrum (from the flowers of *Chrysanthemum cinerarifolium*) and Neem, an extract from the Neem tree in India. Examples of microbial-based pesticides include streptomycin, a bactericide for fire blight, and *Bacillus thuringiensis*, Bt., bacteria used as an insecticide. Insecticidal soaps are soaps with insecticidal action. Petroleum oils are highly refined oils used to control certain insects. Synthetic organic compounds are organic chemicals that have been synthesized using an organic molecule. These include chlorinated hydrocarbons, synthetic pyrethroids (chemically similar to pyrethrin from the chrysanthemum), organophosphates and carbamates.

Integrated Pest Management is very effective in the home garden and landscape. It will take some time and effort to develop your own program, but in the long term it will mean healthier plants, safer pest control for you and your animals and a better environment.

Integrated Pest Management For The Home Garden



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