What Is IPM?

IPM is a sustainable approach to managing pests by combining cultural, biological, chemical, and physical tools in a way that minimizes economic, health, and environmental risks. IPM relies heavily on current knowledge of pests and their interaction with the crop system to select the best combination of pest management tools.

Therefore, IPM is not a single product that can be purchased, like a drum of pesticide, and it does not rely on one “silver bullet” method to solve all our pest problems. We have learned through experience that pests adapt very quickly to single control tactics through natural selection, and that multiple methods used simultaneously, or an “integrated” approach, is the most effective for long-term, sustainable management programs.

IPM is not organic production. Nor does it attempt to rely solely on biological control to achieve the desired outcomes. It does often try to assist the action of natural enemies by limiting the impact of pesticide applications on their populations.

IPM is a management approach that encourages natural control of pests where possible. It seeks to restore some balance between the crop and the natural environment. In the IPM concept, use of pesticides involves a trade-off between pest control and the risks of adverse effects on non-target organisms, such as natural enemies, pollinators, wildlife, and plants, and contamination of soil and water.

Using IPM In Crop Production

The foundation of IPM is regular monitoring of the crop or habitat to identify pests and their potential for damage. This provides knowledge of the current pest and crop situation that is critical in selecting the best possible combination of management methods. Most farmers already use IPM in some form or another but may be unaware of it because IPM can include many different methods.

IPM methods include threshold assessment and biological, chemical, cultural, and physical or mechanical controls.

Threshold assessment is based on the concept that most plants can tolerate at least some pest damage before economic loss of yield occurs. Much research has been done to determine this level of damage, often called the economic injury level, for a variety of crop and pest situations. In an IPM program where the economic injury level or threshold is known, chemical controls are applied only when the pest capacity for damage is nearing the threshold. When an economic injury level has not been established, common sense is used, and controls are applied when it appears that pest numbers are increasing to damaging levels.

Biological controls include natural enemies, such as insect predators, parasitic wasps, or nematodes. In IPM programs, native natural enemy populations are conserved, and non-native agents may be introduced. Many disease organisms that attack pests are exploited as biological control agents and are commercially developed for application to crops. Genetically transformed crops with pest resistance may also be considered in the biological control category.

Chemical controls are used to keep populations below economically damaging levels when pests cannot be controlled by other means. Pesticides with the least negative impacts on non-target organisms and the environment are most useful in IPM programs. Fortunately, new generation pesticides with novel modes of action and low environmental impacts are being developed and registered for use.

Cultural control methods are really crop production practices that make the crop environment less suitable for pest development. Crop rotation and fallowing, manipulating of planting and harvest dates, manipulation of plant and row spacing, and destruction of old crop debris are just a few examples of cultural methods used to manage pest populations. Cultural controls are selected based on knowledge of pest biology and development.

Physical or mechanical controls based on knowledge of pest behavior can help farmers develop physical barriers or traps to keep pests away. The best way to eliminate invasion of household pests, for example, is to seal cracks to the outside and other sites of entry around the home. Placing plastic-lined trenches along potato fields to trap migrating Colorado potato beetles in the spring and fall is one example of a physical control. Using mulches to smother weeds and providing row covers to protect plants from insects are other examples.

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Benefits Of Using IPM

The adoption of IPM provides many benefits.

- It increases profits and makes producers more competitive.
- It provides consumers with a safe, high-quality supply of food and other agricultural products.
- It helps sustain natural resources, and reduces environmental and human health risks associated with pesticide use on farms, ranches, and range lands.
- In urban settings, IPM can manage household and landscape pests with low pesticide-use strategies.

IPM adoption opens and enhances new export markets.

It also supports new business opportunities in the pest management industry and in the development and marketing of new IPM products.

The U.S. Department of Agriculture has fully supported and encouraged the use of IPM by farmers in order to ensure the future profitability, sustainability, and competitiveness of U.S. agriculture. In 1993, the USDA issued a goal of implementing IPM practices on 75% of U.S. cropland by the year 2000. The Federal government views IPM as an investment in the future of American agriculture as well as a contribution to a cleaner environment.

Hand picking of insect pests—perhaps the most simple pest control method—is another physical control often practiced by home gardeners.

Weather monitoring system for timing fungicide applications.

Habitat enhancement with clover to attract beneficial insects to cabbage plantings.

Pheromone trap used to monitor insect pest populations.

Predatory stink bug feeding on potato beetle larva.

For more information, call your county Extension office. Look in your telephone directory under your county’s name to find the number.