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Department of Zoology

Best Practices- 2018-2019

Pest control management and practices



Brief Note on Pest control management and practices

Pest control is the regulation or management of a species defined as a pest, a member of the animal kingdom whose impacts adversely on human activities. The human response depends on the importance of the damage done, and will range from tolerance, through deterrence and management, to attempts to completely eradicate the pest. Pest control measures may be performed as part of an integrated pest management strategy

Pesticides are used to control pest populations, and are generally named for the type of organism they control. Pesticides are important tools for homeowners, growers, land managers, public health officials and beekeepers to control insect pests, disease vectors (such as mosquitos), disease-causing organisms (bacteria, fungi), weeds, and invasive species that threaten the balance of our natural ecosystems.

In agriculture, pests are kept at bay by cultural, chemical and biological means. Ploughing and cultivation of the soil before sowing reduces the pest burden and there is a modern trend to limit the use of pesticides as far as possible. This can be achieved by monitoring the crop, only applying insecticides when necessary, and by growing varieties and crops which are resistant to pests. Where possible, biological means are used, encouraging the natural enemies of the pests and introducing suitable predators or parasites.

IPM is an ecosystem-based strategy that focuses on long-term prevention of pests or their damage through a combination of techniques such as biological control, habitat manipulation, modification of cultural practices, and use of resistant varieties. Pesticides are used only after monitoring indicates they are needed according to established guidelines, and treatments are made with the goal of removing only the target organism. Pest control materials are selected and applied in a manner that minimizes risks to human health, beneficial and nontarget organisms, and the environment.

Aims and Objectives

- Focuses on pest prevention.
- Uses pesticides only as need
- Determine the best preventive measures.
- Reduce the unnecessary use of pesticides
- Increase farmer income
- Increase sustainability of agricultural practices
- to improve production and marketing methods
- Maximize crop production with minimum input costs.
- Minimize environmental pollution in soil, water and air due to pesticides.
- Minimize occupational health hazards due to chemical pesticides.
- Conserve ecosystem and maintain ecological equilibrium.
- Judicious use of chemical pesticides for reducing pesticide residues

Activities

- Surveillance & Monitoring of insect-pest & diseases.
- Augmentation and Conservation of Natural enemies.
- Production and release of bio-control agents.
- Farmers' Field orientation programme

Survey and Surveillance

- To keep a close watch over a desired period of time in an identified cropped area on build up of pests (insects, vertebrates, diseases, nematodes & weeds etc.) and their natural enemy population so that a prior care can be adopted to control the target pests.
- The basic objective of pest surveillance is to detect the early sign of existing and emerging pest and their natural enemies
- Survey, monitoring, field scouting are the major activities of the pest surveillance.
- Rapid Roving Pest Surveys are conducted by the teams of student on a predetermined survey routes.

ORGANIC FARMING

Organic farming relies on methods which combine scientific knowledge of ecology and modern technology with traditional farming practices based on naturally occurring biological processes. It is a farming system that sustains the health of soils, ecosystems and people. The principal methods of organic farming include crop rotation, green manure and compost, mechanical cultivation and biological pest control.

Farmers are faced with myriad of production challenges where the most common problems are pests, which include insects, diseases, and weeds. They integrate cultural, biological, mechanical, physical and chemical practices to manage pests.



Cultural practices – Means making the environment unsuitable or unfavorable, unacceptable to pests by interfering with their oviposition preferences, host plant discrimination or location by both adults and immatures. Those can be achieved with practices such as crop isolation, mixed cropping, and crop rotation. The timing of sowing and planting can be used to allow young plants to establish to a tolerant stage before an attack occurs and to reduce the susceptible period of attack. Management of trap and nursery crops and surrounding environment is also included to divert insect attack away from the crop.



Mechanical and physical control – include tillage, mowing, cutting, mulching and organic soil coverage and barriers. Tillage turning the soil between crops to incorporate crop residues and soil amendments. It also destroys weeds and disrupts pest life cycle.



Biological control – biological control in organic plant protection is a method of controlling insect pests and diseases using other organisms which rely on predation, parasitism and herbivore, or some other natural mechanisms with active farmer's management interaction. Natural enemies of insect pests, known as biological control agents, are predators, parasitoids and pathogens. For weeds biological control, agents are seed predators, herbivores and plant pathogens, while for plant diseases biological agents are antagonists. In organic farming, biological agents can be imported to locations where they don't naturally occur, or farmers can make a supplemental release of natural enemies, boosting the naturally occurring population.



Chemical control - organic standards are designed to allow the use of naturally occurring substances such as pyrethrin and rotenone. Farmers avoid the use of broad-spectrum synthetic pesticides, which severely disrupt natural control and promote the occurrence of secondary pests such as spider mites, brown planthoppers and Rhizoctonia. There are also few synthetic substances allowed in organic farming, such as fixed coppers (copper hydroxide, copper oxide, copper oxychloride, copper sulfate), hydrated lime, hydrogen peroxide, lime sulfur, and potassium bicarbonate.



To design and implement best practices of pest management in organic farming, it is also necessary to have accurate knowledge of crop and pest biology, ecology, phenology and of pest-crop interactions, while following strictly regulated rules of organic farming. In many countries around the world, it's regulated by an inspection, certification and labeling scheme. Although organic farming has many regulations and restrictions, farmers still need to track their activities on fields. To facilitate their record keeping and to have all in one place, Agrivi farm management software helps farmers track organic materials, work hours and finances spent on their farm. It also helps farmers fight with complex organic farming regulations and reports. With over 20 different reports of all farm activities, from planting, protecting, maintaining to harvesting, Agrivi enables farmers to track spent amounts of organic pesticides and fertilizers per fields and crops, their finances and farm productivity and to print it out. Everything that farmer enters into the system; it's automatically filled in reports.

Prevent Crop Loss with Proper Harvest Management

When the time comes to harvest, it's important to choose a suitable method to maximize the yield and minimize losses. Many farmers have difficulties at harvesting and handling their crops. They have to know the exact time for harvest, because harve