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BENEFITS OF INTEGRATED PEST MANAGEMENT PRACTICES

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Integrated Pest Management (IPM) is a recent concept that is an environmental friendly and sensitive approach to pest management. IPM practices are based upon the relationship between information on the life cycles of pests and their interaction with the environment. The practice involves techniques for plant diseases and pest-control. Many pest-control methods are used in an ecologically harmonious manner in order to keep the infestation within manageable limits. IPM practices are gaining important and popularity during current situation as it addresses the serious ecological problems caused due to excessive use of chemical pesticides and the hazardous effects caused by them. IPM practices minimizes the use of these harmful chemicals and combines the these chemicals with biological methods of pest control, for example use of pest-resistant crop varieties, development of crop culture methods, use of mechanical methods like placement of traps baited with the pest's pheromones etc. There are many organisms that are economically significant, example locusts has been found infected with bunt and ergot diseases. Most species that became pests was because of the various environmental changes sometimes due to human activities.

There are many biological and physical reasons behind the high infestation of the insects on the plant population. One of the major reasons is the availability of uniform food source which leads plant-eating species increase to large populations. Crops growing under the concept of monoculture easily get attacked by the insects. Sometimes the introduction of new crops over large areas results in the transfer of harmful insects from the native place to the new area rich and abundant in food. Many cultural practices like fertilization, irrigation, and the use of modern harvesting equipment enhance the ability of pest species to increase rapidly. Due to advances in transport system across the world there is an ease, with which people and goods can be transported around the world. This sometimes results in transfer of pests from one place to another, in case the quarantine methods are not take into consideration appropriately.

Microorganisms like fungi, bacteria, and viruses can also be considered as pests, they are the carrier agents of many disease in the plant kingdom. Pest is anything that cause damage to the plants. Animal pests are mostly invertebrates, some example of animal pests are protozoa, flatworms, nematodes, snails, slugs, insects, and mites. Few vertebrates, plant pests include rabbits, elk, deer, and rodents. Insects are major pests because they play an essential role in the transmission of disease.

Pest management received major attention around eighteenth century. Many chemical and biological management programs were developed to regulate tormentor infestation. Mechanical ways like sticky barriers, heat killing, and flooding were conjointly developed to minimize tormentor attack. Mechanical ways of tormentor management were terribly restricted and since of their restricted utility and short-run effectiveness, they need been outdated mostly by chemical and biological ways.

The first use chemical was with the utilization of plant life compounds. The primary compound used was ground tobacco, in France to kill aphids in year 1763. Alternative natural merchandise

like alkaloid, rotenone, petroleum, kerosene, creosote, and turpentine were utilized in the nineteenth century. Inorganic compounds like Paris inexperienced, lime sulfur, Bordeaux mixture, compound, and insect powder were conjointly introduced within the 1800s.

The artificial organic compounds throughout war II, which result in the dramatic modification in tormentor management. It absolutely was the invention of the insecticidal properties of DDT (dichloro-diphenyl-trichloroethane) and of BHC (benzene hexachloride) that created the idea of pest-free crops potential. Analysis within the Thirties on plant hormones diode to the event of the selective weed killer a pair of, 4-D (2, 4-dichlorophenoxyacetic acid), and this became commercially offered concerning a similar time as DDT. Look of those new artificial organic compounds, a full new series of pesticides insecticides, fungicides, herbicides, and plant growth regulators was introduced. Within the year 1900, associate attempt tries were created to regulate the poisonous plant woody plant in Hawaii by introducing an insect. This was the 1st arrange to management weeds biologically. The utilization of microorganisms to destroy insect pests began within the late 1800s and early decennary.

The intensive use of powerful chemical agents shortly resulted during a range of great ecological issues. Consequently, current tormentor management apply minimizes the utilization of pesticides associated combines them with biological ways in an approach known as integrated management. Alternative necessary tools of recent tormentor management or importation and quarantine laws, that are designed to stop the introduction of exotic pests.

Some of the benefits of an Integrated approach

- Promotes healthy plants, with minimal use of chemical compounds.
- Promotes sustainable bio-based pest management alternatives that are cost effective and environmental friendly.
- Reduces environmental risk associated with pest management by encouraging the adoption of more ecologically benign control tactics
- Reduces the potential for air and ground water contamination
- Reduces the need and importance of pesticides by combination of pest management methods.
- Reduces issues related to pesticide residue.
- It reduces the dependence of crops on chemical pesticides.
- The practice alleviates the public interest on pest control.
- IPM is a very cost-effective practice of pest management.

Role of IPM practices

With increasing Indian population, India will face a major challenge of feeding the rapidly growing human population during this century. It is very important for the Agricultural growth rate and productivity to improve enormously to sustain the green revolution. Pests of crops if not handled properly can lead to huge economic crop losses. Unwise use of chemical insecticides can also result in control failure, polluting the environment, disturbing the ecological balance. Therefore In order to minimize the harmful effects of chemical pesticides, integrated pest management involving is required to reduce the losses caused by pests.

Success Story

Name of the Farmers: Md. Siddique
Address: Village – Naulakha, Block – Kahra, District – Saharsa, State – Bihar, Pin – 85220

Md. Siddique started vegetable farming in the Naulakha village of Kahra block with small land holding. His vegetables field gave good income but did not generate a handsome amount. There was a major damage to his crops because of the insect infestation. He was very upset to use the chemical pesticides, because of their cost and health side effect. In 2014, he then came in contact with Krishi Vigyan Kendra, Agwanpur, Saharsa where the Scientists of the Krishi Vigyan Kendra help him to learn scientific cultivation of vegetables as well as best possible Integrated Pest and disease Management practices to control the insect pest and diseases of vegetable crops with minimization of cost of pesticide application that led to less health hazardous effects. He started using Trichoderma harzianum formulations in vegetable crops to get rid of the problem such as damping off, wilt and fruit rot disease of many vegetables such as Tomato, Brinjal, chilli, Potato, Cauliflower, Cabbage, cucurbitaceous vegetables etc. He tried to treat the seeds with Trichoderma as well as apply Trichoderma through soil application. Trichoderma formulations were used in seed treatment @ 5 gram per kilogram of the seed, in seedling dip in solutions of 10 gram Trichoderma formulation per litre of water and through soil application mixed and incubated in vermicompost @ 1kilogram per 10 quintal of vermicompost for 7 days in moist conditions. When the soil is in water logged condition chances of attack of soil and root pathogen may increase which can be successfully managed by using the Trichoderma formulations through various delivery methods such as soil and root drenching of the vegetable crops. Major inference that can be drawn from his success story is that the use of Trichoderma Solutions right from seed treatment, seedling dip to soil treatment with vermicompost, foliar spray of neem oil, plant extract and planting of trap crops around the farm area may effectively reduce insects pest attack on the vegetable crops.

Conclusion

IPM practices can be of major importance if used judiciously. There should be judicious use of combination of the practices that includes chemical as well as biological methods. There has been many recent research with respect to the topic as this integrated method of pest control has shown a greater role in protection of the crops, from insect pest damage. For sustainable development IPM practices can be of major importance as it protects the crop from the use of injurious pesticides that may cause many harmful diseases, and many hazardous phenomenon like biomagnification. Therefore the use of IPM practices can be of great benefit in terms of environment protection and also with respect to profit orientation.