*International Research Journal of Environmental Sciences*_____ ISSN 2319–1414
Vol. **6(3),** 66-67, March **(2017)** *Int. Res. J. Environmental Sci.*

Short Review Paper

Eco-friendly way: biological control by using insect natural enemies (prevention of cancer caused by pesticides)

Pradeep Kumar Yadav[1*], Reetu Yadav[2] and Anshul Agarwal[3]
[1]Department of Forensic Medicine and Toxicology King George Medical University, Lucknow, India
[2]Microbiology Lab Department of Botany R.B.S. College, Agra, India
[3]Department of Chemistry, Faculty of Engg. and Tech., Agra College, Agra, India
ritu.biotech.agra@gmail.com

Available online at: www.isca.in, www.isca.me
Received 7th July 2016, revised 4th February 2017, accepted 20th March 2017

Abstract

Pesticides are harmful to human health. In farming, most of the pesticides (99%) accumulate in the environment. People with great exposures to pesticides, such as farmers, are at high risk of cancers. According to the news of print media (The Hindu), published during August 2011, cancer among farmers was due to disproportionate use of pesticides in Punjab. In this review, we offer an eco- friendly way to control pests that are found in farms to manage pest by using their natural enemies against them. Some beneficial insects which are harmless to people but they are born to consume farmer target pest insect.

Keywords: Pesticides, Cancer, Eco-friendly.

Introduction

Pesticides are compounds used to eradicate or control unwanted or harmful insects, plants, fungi, animals or microorganisms to protect food, crops, and other plants. Few pesticides have been categorized as cancer causing (a substance or agent producing or initiating cancer). Chlordane (a highly chlorinated viscous volatile liquid insecticide $C_{10}H_6Cl_8$) and DDT are possible human carcinogens. Chemical pest control appears to be a straightforward and attractive means of solving pest and disease problems. Under certain circumstances, it may help to reduce economic losses of farmers in the short-term but we have to realize that pest problems are complex and diverse, and therefore ecologically sound pest management could be more complicated, particularly for resource-poor farmers in developing countries. The Pesticide is proving too expensive and their excessive use has proved counterproductive and even dangerous to farmers. People experiencing high exposures to artificial chemicals (pesticides) have been reported with carcinoma of blood and lymphatic system; as well as melanoma (usually malignant tumor containing dark pigment) and other skin cancers[1]. Biological control is considered to be a Eco-protective method to keep pests such as aphids and mites under control.

It is a cheap and efficient method of agriculture management control in agriculture method. Pollution free and thus environmentally eco safe method. The biological control process reduced environmentally dangerous chemicals; hence, it promotes natural balance. Traditional bio-control is economical and yields long-lasting effects. Bio-control requires initial more expenditure to stabilize (importation, accumulation and rearing). After optimization of system the farmer requires fewer expenses. Bio-control is long term economical, ecological and efficient way of farming.

Increased cases of cancer by using pesticides

One of the causes of death in the world[2] is cancer. Now it is spreading in the developing countries affecting approximately 5.5 million people. Prevalence of cancer in India is around 2.5 million, with above 8,00,000 new cases and 5,50,000 deaths happening each year due to this disease. More than 70% of the cases visit to the hospital for medical services in the last stages of the disease, which has lead to a high death rate[3]. According to the news published in print media, during August 2011, cancer among farmers was caused by disproportionate use of pesticides[4].

Biological control of pest by insect

Bio- control is the management of pests diseases by means of predator organisms. It depends on predation, of a plant eating animals, but characteristically also an alert farmer management. There are three main types of biological pest control methods viz., importation, accumulation and rearing. Soil serves as a natural habitat and reservoir for many varieties of insect pathogen, including viruses, bacteria, protozoa, fungi and nematodes.

Implication of Biological Control of Pest by Insect

Introduction of bio-control organisms to a field is cost effective when the grower is making the change from conventional to an organic production system. Besides classical biological control,

there is a rich and self-motivated array of natural opponents that aid to keep pests under control in most agro-ecosystems in Asia have been reported[6-8]. The goal of traditional bio- control is to find beneficial natural enemies, bring them into the area of the target pest, and permanently establish them so that they will provide unending pest control with little or no additional human intervention[9].

Table-1: Some common harmful insect and their biological control insects.

Common harmful insect	Biological control agents
Spider mites	Phytoseiulus persimilis
White flies	Eretmocerus spp
Aphids	Aphidius colemani
Colorado potato beetle	Blue-green ground beetle Lebia grandis
Cutworms	Bacillus thuringiensis
Mexican Bean Beetle	Pediobius foveolatus
Tomato Hornworm	Braconid wasp

Farmer's Education

Farmers are introduced to ecology through an understanding of bio- control. It has been debated that in conventional Bio-control, there is no need of farmer' greed. Educating farmers are in the impact of agrochemicals on beneficial organisms. Farmers cannot be expected to know that the pests that attack their crops are themselves susceptible, in many cases, to predators and infection by diseases; the interaction is at microscope level and beyond simple field observation. Farmer's Education can be possible by TV, Cable, Newspaper, internet, Educational Books etc.

Conclusion

The Efficient bio-control by natural enemies is a biological strategy. However conventional methods use the chemical pesticide system which are easy to handle but costly and Environment-enemy approach. Biological control is one of best eco- friendly (it is not polluting as in chemical pesticides) technique of optimization because it is approximately harmless, non-pathogenic or non-toxic to humans. Biological control has the benefit of being autonomous and usually does not harm non-target bio-object found in the surroundings. But biological control requires smart farmers which are less in our country. By educating the farmers about the relation between cancer and pesticide, we can find a solution of establishing biological control of pest by an insect.

References

1. Nanda Kumar A. (1990). National Cancer Registry Programme. Indian Council of Medical Research, Consolidated report of the population based cancer registries, New Delhi, India, 1984-1993.

2. Stewart B.W. and Kleihues P. (2003). World Cancer Report. Cancers of female reproductive tract, World Health Organization, International Agency for Research in Cancer, Lyon, France: IARC Press.

3. Dinshaw K.A., Rao D.N. and Ganesh B. (1999). Tata Memorial Hospital Cancer Registry Annual Report. *Mumbai, India*, 1-35.

4. The Hindu, New Delhi April 23, 2012.

5. Smith S.M. (1996). Biological control with Trichogramma: advances, successes and potential of their use. *Annual Review of Entomology,* 41(1), 375-406.

6. Kenmore P.E., Carino F.G., Perez C.A., Dyck V.A., and Gutierrez A.P. (1984). Population regulation of the rice brown planthopper (Nilaparvatalugens Stal) within ricefields in the Philippines. *Journal of Plant Protection in the Tropics,* 1(1), 19-37.

7. Ooi P.A.C. (1986). Insecticides Disrupt Natural Control of Nilaparvatalugensin Sekinchan, Malaysia. Biological Control in the Tropics (M. Y. Hussein, and A. G. Ibrahim, Eds.), University Pertanian Malaysia, Serdang, 109-120.

8. Wood B.J. (1973). Integrated Control: Critical Assessment of Case Histories in Developing economies. *Insects: Studies in Population Management,* Ecological Society of Australia Canberra, 196-220.

9. Robert J. (2006). Wright, Extension Entomology, biological control of insect and Mite Pests. University of Nebraska – Lincoln Extension, Institute of Agriculture and Natural Resources.