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## Microbial pesticides a better choice than chemical pesticides

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**Abstract**

Agriculture plays a crucial role in the life of an economy. Agriculture not only provides food and raw material but also employment opportunities to a very large proportion of population. But one of the major issues facing by them is pest. The worldwide consumption of pesticide is about two million tons per year, out of these India shares 3.75%. Indiscriminate uses of these agrochemicals have caused adverse effects on soil health, animal health, water quality and developed problems like insect resistance, genetic variation in plants, toxic residues in food and feed. An ecofriendly alternative to chemical pesticides is biopesticides. Biochemicals derived from micro-organisms and other natural sources, and processes involving the genetic incorporation of DNA into agricultural commodities that confer protection against pest damage. Biopesticides fall into three major classes. Microbial pesticides are composed of naturally occurring Bacteria, fungi and viruses that controls pests by nontoxic mechanism and eco-friendly manner. Biological pest control mechanism followed to protect plants from pests and diseases without resorting to the use of chemicals. Creating awareness among the farmers as well as farm workers about hazards of chemical pesticides and encourage them to use Microbial pesticides.

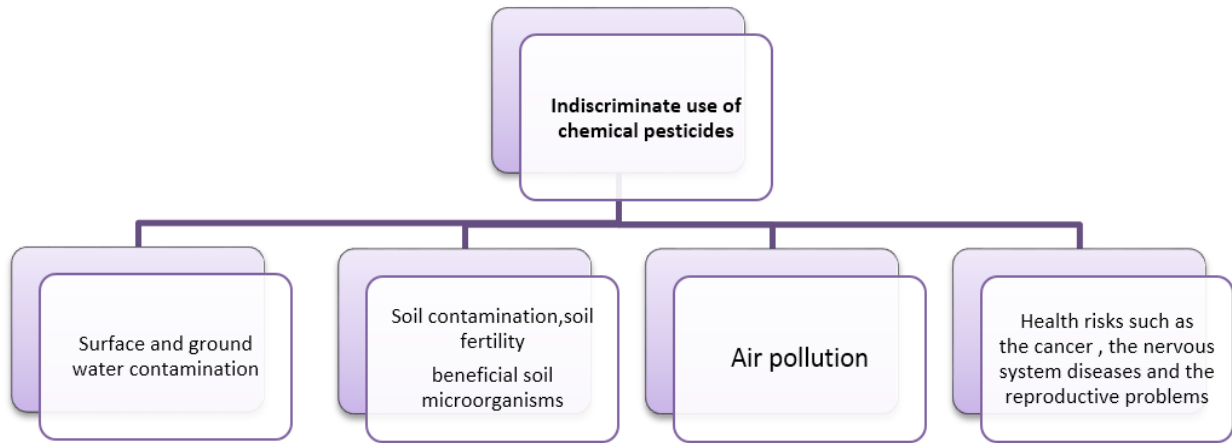
**Keywords:** Microbial pesticides, choice, an ecofriendly, chemical pesticides,

**Introduction**

Agriculture plays a crucial role in the life of an economy. Agriculture not only provides food and raw material but also employment opportunities to a very large proportion of population. But one of the major issues facing by them is pest (insects, weeds, bacteria, fungi and viruses) which adversely affect these agricultural crops and reduce its productivity. Which affect the life of farmers as well as the whole population. Many measures have been taken to protect these crops. The most common method of pest control is by using synthetic pesticides like dichloro-diphenyl-trichloroethane (DDT), Organophosphates and carbamate pesticides etc. Pesticides are chemical compounds that are used to kill pests. The worldwide consumption of pesticide is about two million tons per year, out of these India shares 3.75%. These chemical pesticides could increase agricultural productivity, but indiscriminate uses of these agrochemicals have caused adverse effects on soil health, animal health, water quality and developed problems like insect resistance, genetic variation in plants, toxic residues in food and feed. Moreover dependence on chemical pesticides in agriculture caused adverse effects on environment and human health. So encouraging the use of Microbial pesticides instead of chemicals can save our earth and life's.

**What really happens after the indiscriminate use of chemical pesticides?**

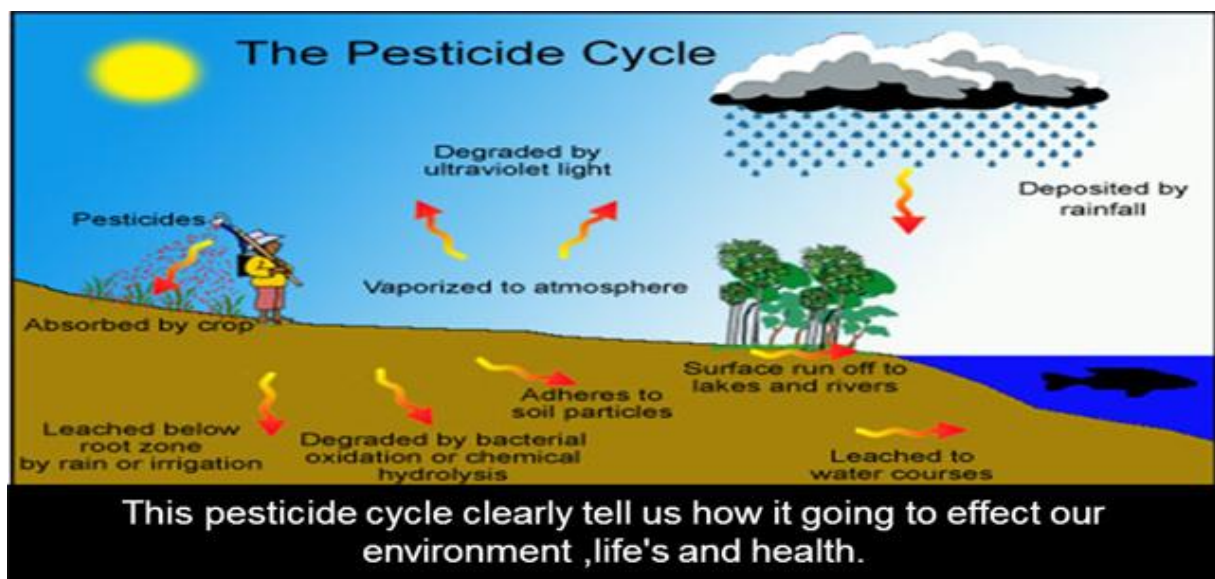
- Many pesticides are not easily degradable they persist in soil, leach to ground water and contaminates environment.
- When pesticides applied they do not always stay in location where they are applied, they often move through air, water and soil and come contact with other beneficial organisms and cause harm to wildlife
- Many synthetic pesticides are not able to be broken down once they enter into the body of an organism and that substances build up in the body then leads to Bioaccumulation.
- Chemical pesticides leads to Bio magnifications, increases its concentration with each level of food chain.



Spraying of chemical pesticides



drainage of pesticides into stream



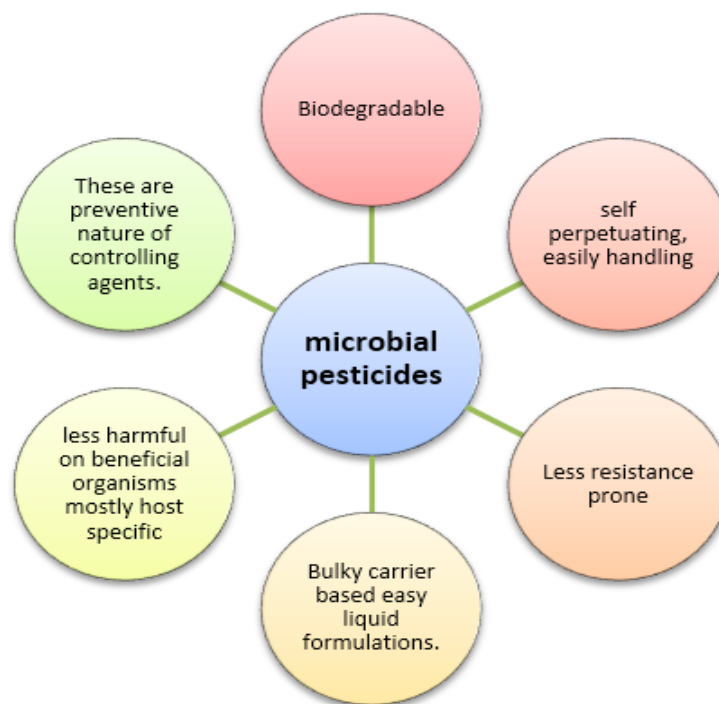
Due to the indiscriminate use of chemical pesticides it will directly or indirectly effect the environment, animal health and human health. This is a great concern. Therefore an alternative for this chemical pesticide is microbial pesticide a choice to save the earth and human life.

**An alternative for chemical pesticides: Microbial pesticides**

Microbial pesticides are composed of naturally occurring Bacteria, fungi and viruses that controls pests by nontoxic mechanism and eco-friendly manner. Biological pest control mechanism fallowed to protect plants from pests and diseases without resorting to the use of chemicals. These Microbial pesticides fallows nature’s own biological pest control mechanism. When using microbial pesticides, they usually only target a specific pest, unlike broad-spectrum pesticides

That kill not only pests but also beneficial insects that are needed in the environment. Hence microbial pesticides pose less threat to the environment and human health. However, there are several types of microbial bio-pesticides available that can be used to eliminate several different types of pests. One of the most widely used microbial pesticides is *Bacillus thuringiensis*, popularly known as Bt. The bacterium produces crystalline proteins and specifically kills one or a few related insect species. Binding of the BT crystalline protein to insect gut receptor determines the target insect species. Some of the Bio- pesticides registered in India includes: 1. *Bacillus thuringiensis var. israelensis* 2. *Bacillus thuringiensis var. kurstaki* 3. *Bacillus thuringiensis var. galleriae* 4. *Bacillus sphaericus* 5. *Trichoderma viride* 6. *Trichoderma harzianum* 7. *Pseudomonas fluorescens* 8. NPV of *Helicoverpa armigera* 9. NPV of *Spodoptera litura* 10. *Beauveria bassiana*.

## Importance of microbial pesticides



### Some success stories about successful utilization of biopesticides and bio-control agents in Indian agriculture include

- Control of diamondback moths by *Bacillus thuringiensis*.
- Control of mango hoppers and mealy bugs and coffee pod borer by *Beauveria*.
- Control of *Helicoverpa* on cotton, pigeon-pea, and tomato by *Bacillus thuringiensis*.
- Control of *Helicoverpa* on gram by N.P.V.
- Control of sugarcane borers by *Trichogramma*.
- Control of rots and wilts in various crops by *Trichoderma* based products.

### Key points to remember

- The most common method of pest control has been following is using synthetic pesticides these agrochemicals have caused adverse effects on environment.
- Microbial pesticides are composed of naturally occurring Bacteria, fungi and viruses that targets a specific problem.
- Creating awareness among the farmers as well as farm workers about hazards of chemical pesticides and encourage them to use Microbial pesticides.

Indiscriminate use of pesticides causes adverse effects in environment as well as human health. Most chemical pesticides are susceptible to ineffectiveness due to resistance buildup in insects. Thus the only viable solution for the future is microbial pesticides.

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