

Bio-Pesticides used for Insect-Pests Management

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INTRODUCTION

The term "bio-pesticides," short for "biological pesticides," refers to a variety of pest management strategies, such as chemical, parasitic, and predatory interactions. The phrase has long been linked to biological pest control, and therefore, to the tampering with living things. Public impressions can affect regulatory positions; they are obtained from organisms including plants, bacteria and other microbes, fungi, nematodes, *etc.* They frequently play a key role in integrated pest management (IPM) programmes and have attracted a lot of interest in the real world as alternatives to synthetic chemical plant protection solutions.

Types of Bio-pesticides-

A microbial pesticide- Bacteria, entomopathogenic fungi, or viruses are the main components of microbial insecticides (and sometimes includes the metabolites that bacteria or fungi produce). Even though they are multicellular, entomopathogenic nematodes are frequently classified as microbial insecticides.



Source- indiamart.com



Source- tradeindia.com

Plant derived pesticides- Pyrethrum, rotenone, neem oil, and other essential oils are all naturally occurring compounds that control (or monitor in the case of pheromones) pests and microbiological diseases. These four groups are used commercially.

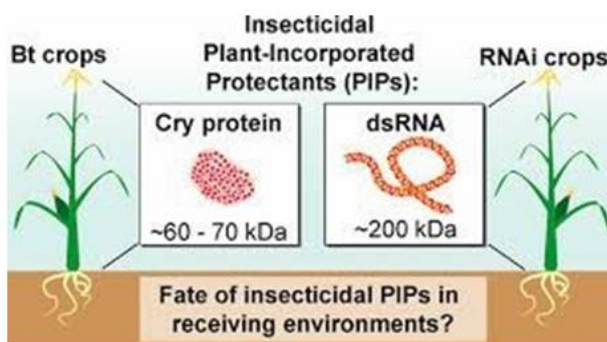


Source- gardeningknowhow.com



Source- timeofagriculture.com

Plant-incorporated protectants- The genetic make-up infused with material from different species (i.e. GM crops). Their use is contentious, particularly in several European nations.



Source – pubs.acs.org



Source- nipc.orst.edu

A well-known example of an insecticide is *Bacillus thuringiensis*, a bacterium that may infect Lepidoptera, Coleoptera, and Diptera with illness. Through the application of genetic engineering, the *B. thuringiensis* toxin (Bt toxin) has been directly integrated into plants. Bt toxin use is a particularly contentious topic. Its producers assert that it is less harmful to the environment than synthetic pesticides and has little impact on other organisms.

Application:-

Bio-pesticides are biological or biologically derived compounds that are typically applied similarly to chemical pesticides in order to control pests while minimizing harm to the environment. Effective control with any pest management tools, but

notably microbiological agents, requires the right formulation and application.

Advantage:-

- In order to combat crop diseases, bio-pesticides have already become established on a number of different crops.
- For instance, bio-pesticides are already crucial in the management of downy mildew infections.
- Their advantages include a 0-Day Pre-Harvest Interval (see: maximum residue limit), the capacity to be used under conditions of moderate to severe disease pressure, and the ability to be mixed with other registered fungicides or used in a rotational programme.
- The incorporation of bio fungicides into grape production has significant

advantages in terms of extending the useful life of other fungicides, especially those in the reduced-risk category, as some market studies estimate that up to 20% of global fungicide sales are directed at downy mildew diseases.

- Seed treatments and soil supplements are two key growth areas for bio-pesticides. Controlling soil-borne fungal infections that cause seed rots, damping-off, root rot, and seedling blights requires the use of fungicidal and bio-fungicidal seed treatments. Both fungal pathogens on the seed's surface and those that are inside to the seed can be controlled with their help.
- Numerous bio-fungicidal substances also exhibit the ability to promote host defiance mechanisms in plants and other physiological processes, which can increase treated crops' resistance to a range of biotic and abiotic challenges.

Disadvantage:-

- High specificity may necessitate precise pest/pathogen identification

and the usage of several products, but it can also be advantageous because the bio-pesticide is less likely to harm species besides the target.

- Oftentimes, actions move slowly thus making them unsuitable if a pest outbreak is an immediate threat to a crop.
- Due to the affects of numerous biotic and abiotic conditions, efficiency is frequently vary because some bio-pesticides are living organisms that suppress pests and pathogens by proliferating inside or close to the target pests or pathogens.
- Living things change throughout time and become more resistant to physical, chemical, biological, and other types of control. The target population can develop a tolerance for whatever forces are applied if it is not eliminated or rendered incapable of reproducing, which could lead to an evolutionary arms race.