



BIOPESTICIDES

What is BIOPESTICIDE?

- Bio pesticides are biochemical pesticides that are naturally occurring substances that control pests by nontoxic mechanisms.
- Biopesticides are certain types of pesticides derived from such natural materials as animals, plants, bacteria, and certain minerals.
- All the living organism which are cultivated in the laboratory on large scale and are used and exploited experimentally for the control of harmful organism.

THREE MAJOR CLASSES OF PESTICIDES

1. *Microbial pesticides*

- Consist of a microorganism (e.g., a bacterium, fungus, virus, or protozoan) as the active ingredient. Microbial pesticides can control many different kinds of pests, although each separate active ingredient is relatively specific for its target pest[s]. For example, there are fungi that control certain weeds, and other fungi that kill specific insects.

2. *Plant Pesticides*

- Are pesticidal substances that plants produce from genetic material that has been added to the plant. For example, scientists can take the gene for the Bt pesticidal protein and introduce the gene into the plant's own genetic material. Then the plant, instead of the Bt bacterium, manufactures the substance that destroys the pest. Both the protein and its genetic material are regulated by EPA; the plant itself is not regulated.

3. *Biochemical pesticides*

- Are naturally occurring substances that control pests by non-toxic mechanisms. Conventional pesticides, by contrast, are generally synthetic materials that directly kill or inactivate the pest. Biochemical pesticides include substances, such as insect sex pheromones, that interfere with mating, as well as various scented plant extracts that attract insect pests to traps. Because it is sometimes difficult to determine whether a substance meets the criteria for classification as a biochemical pesticide, EPA has established a special committee to make such decisions.

THE ADVANTAGES OF USING BIOPESTICIDES

- Biopesticides are usually inherently less toxic than conventional pesticides.
- Biopesticides generally affect only the target pest and closely related organisms, in contrast to broad spectrum, conventional pesticides that may affect organisms as different as birds, insects, and mammals.
- Biopesticides often are effective in very small quantities and often decompose quickly, thereby resulting in lower exposures and largely avoiding the pollution problems caused by conventional pesticides.
- When used as a component of Integrated Pest Management (IPM) programs, biopesticides can greatly decrease the use of conventional pesticides, while crop yields remain high.
- To use biopesticides effectively, however, users need to know a great deal about managing pests.
- Cheap, renewable can be handled safely.
- Difficult for insects to develop resistance to these pesticides.

THE DISADVANTAGES OF USING BIOPESTICIDES

- Slow effect
- Lack persistence and wide spectrum activity
- Rapidly degraded by UV lights so residual action is slow.
- Seasonal availability of plants products indicates the needs for storage.
- They are not available easily
- Poor water solubility and generally not systemic in nature
- All products applied followed by growers have not been scientifically verified.

APPLICATION OF BIOPESTICIDES

- Biopesticides are typically microbial biological pest control agents that are applied in a manner similar to chemical pesticides. In order to implement these environmentally friendly pest control agents effectively, it can be important to pay attention to the way they are formulated and applied.

EXAMPLE OF BIOPESTICIDES

- ***Bacillus thuringiensis*** (or **Bt**) is a Gram-positive, soil-dwelling bacterium, commonly used as a biological pesticide. *B. thuringiensis* also occurs naturally in the gut of caterpillars of various types of moths and butterflies, as well on leaf surfaces, aquatic environments, animal feces, insect rich environments, flour mills and grain storage facilities.

BACILLUS THURINGIENSIS

