

Pesticides and Environmental Safety

Biopesticides are biochemical pesticides that are naturally occurring substances that control pests by nontoxic mechanisms. Biopesticides are living organisms (natural enemies) or their products (phytochemicals, microbial products) or byproducts (semiochemicals) which can be used for the management of pests that are injurious to plants. They pose less threat to the environment and to human health. The most commonly used biopesticides are living organisms, which are pathogenic for the pest of interest. These include biofungicides (*Trichoderma*), bioherbicides (*Phytophthora*) and bioinsecticides (*Bacillus thuringiensis*). There are few plant products also which can now be used as a major biopesticide source. Plant-incorporated protectants include substances that are produced naturally on genetic modification of plants. Such examples are incorporation of Bt gene, protease inhibitor, lectins, chitinase etc. into the plant genome so that the transgenic plant synthesizes its own substance that destroys the targeted pest. The potential benefits to agriculture and public health programmes through the use of biopesticides are considerable. The interest in biopesticides is based on the advantages associated with such products which are:



- Inherently less harmful and less environmental load,
- Designed to affect only one specific pest or, in some cases, a few target organisms,
- Often effective in very small quantities and often decompose quickly, thereby resulting in lower exposures and largely avoiding the pollution problems and
- When used as a component of Integrated Pest Management (IPM) programs, biopesticides can contribute greatly.