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## Biopesticides...The Latest Technology

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*(Much of this article will either sound like “Ripley’s Believe it or Not”, or science fiction, depending on your point of view - but I assure you every thing here is true - Dave).*

Biopesticides aren’t new - **Bt** or **Bacillus thuringiensis**, a.k.a. Dipel or Thuricide or many other brand names, has been around for decades - a workhorse against caterpillars but very safe, relatively speaking, for other organisms. Yet in the past several years there has been a revolution going on - in an unannounced, underground sort of way. Big companies have been buying small companies - or creating partnerships - attempting to jockey for position in the anticipated “biopesticides” market.

What, on green earth, is a biopesticide? I’m glad you asked. EPA defines it as “certain types of pesticides derived from such natural materials as animals, plants, microorganisms and certain minerals. The examples quoted on the EPA’s Biopesticide home page are canola oil and baking soda which have pesticidal (!!) applications. Some of these products (the word chemicals doesn’t seem to apply) are derived from other organisms - such as the product from Dow AgroSciences called **Conserve SC** which is derived from fermented bacteria.

The easiest way to classify these products is by the type of organism that is either in the product or that the product is derived from. The **microbial** products, for example are either derived from microorganisms or, in fact, contain living or dormant microorganisms. By the same token **botanical** products are derived from plants. An excellent example is **Nemastop**, a new product for nematodes that is derived from plant extracts and fatty acids in a water soluble liquid - said to disrupt the “root location mechanism” of parasitic plant nematodes and inhibit root penetration. Products that are naturally occurring substances or derived from them are simply called **biochemical** products. These products include pheromones that interfere with mating or molting, the process that insects use to shed their shell when they outgrow it. The products that fascinate me are the microbials. These are specific strains of fungus, bacteria, nematodes, or virus, or combinations of the above. **Bacillus subtilis**, for example is a beneficial soil microorganism that out-competes other invading pathogens. It is used to prevent and cure crown and root diseases and some products claim a 2 year shelf life. 2 varieties of **Bacillus subtilis** are among the 187 biopesticide active ingredients recognized by EPA. Other interesting products currently on the market include:

**Beauveria bassiana** - a beneficial soil fungus that secretes enzymes to dissolve an insects cuticle so that the fungus may invade the body of the insect

**Candida oleophila**: - a fungus (yeast) that out-competes disease organisms. Currently used to protect organically grown fruit

**Trichoderma harzianum** (and other species) a fungus said to control some soil pathogens and possibly some turfgrass diseases

**Vector** - a product consisting of bacteria-carrying nematodes that seek out and destroy fleas.

The pace of biopesticide research is increasing. From the beginning of 1999 through early June 1999, 38 biopesticides had been registered with EPA. Many of these are agriculture related and registered for use as such. But remember that virtually all of the chemicals used by the turf and ornamental industry came from agriculture. Most of the information in this article came from biopesticide websites such as EPA's Biopesticide home page at: <http://www.epa.gov/pesticides/biopesticides/> and a huge biopesticide index at: <http://www.wisc.edu/entomology/mbcn/bcindex.html> also check out the various vendor's websites.

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