

***Bacillus popilliae* Spores (054502) Fact Sheet**

Summary

Spores of *Bacillus popilliae* infect larvae (grubs) of Japanese beetles, eventually killing the larvae and preventing their development into adult beetles. As a pesticide active ingredient, the spores of this bacterium are approved for use on lawns and ornamental plants around residential areas. The spores also infect larvae of some closely related beetles, but do not infect other non-target organisms, such as other insects, birds, mammals, earthworms, and plants. No harm is expected to humans or the environment from use of pesticide products containing spores of *B. popilliae*.

I. Description of the Active Ingredient

Bacillus popilliae spores were initially isolated from infected Japanese beetle larvae in the late 1930s. The name undoubtedly reflects the beetle it came from, *Popillia japonica*, the scientific name for the Japanese beetle. This bacterium protects itself from harsh conditions by becoming a spore, which resists heat, cold, drying, and other environmental insults.

When the spores are ingested by Japanese beetle larvae (grubs) as they feed in the ground, the spores become active bacteria and multiply in the grubs, which continue to live. However, the large numbers of bacteria prevent larval maturation. When the larvae's bacterial population reaches a high enough density, bacterial spores are released to the soil to await ingestion by future beetle larvae. The infected beetle larvae die when the spores are released. [Note: Only the *B. popilliae* spores are found in the environment; the bacteria themselves are present only in the beetle larvae.] Once the bacteria and spores become established in a geographic area, they greatly decrease the numbers of grubs and adult Japanese beetles, thereby reducing plant damage.

II. Use Sites, Target Pests, and Application Methods

- **Use Sites:** Lawns and ornamental flowers in residential areas

- **Target Pest:** Japanese beetle.

- **Application Methods:** The one current pesticide product containing *B. popilliae* spores is sold as a powder, to be spread on soil between spring and fall (that is, when the ground is not frozen).

III. Assessing Risks to Human Health

Whether a substance poses a risk to humans or other organisms depends on two factors: how toxic the substance is, and how much of it an organism is exposed to. Therefore, the EPA considers toxicity data and exposure data in deciding whether to approve a pesticide for use.

Various tests indicate that spores of *B. popilliae* are not harmful to humans. The spores appear to develop into active bacteria only at temperatures lower than human body temperature, and only in a few species of beetle. As a precaution, the label advises users to avoid inhaling the spores or letting them touch open wounds.

IV. Assessing Risks to the Environment

Risks to the environment are not expected. The spores are found naturally in soil. They infect larvae only from Japanese beetles and from a few closely related beetles. The spores do not infect other insects, mammals, birds, earthworms, or plants. Also, the spores have been used since the 1940s against Japanese beetle larvae with no adverse environmental effects reported. Because the effect of *B. popilliae* spores on aquatic organisms is not known, the label tells users not to contaminate lakes, streams, or other bodies of water.

V. Regulatory Information

In 1948, spores of *B. popilliae* became the first microbial agent registered as a pesticide active ingredient. In 1995, the active ingredient was reassessed to ensure it met current registration requirements. As of October 2004, there was one end-use product.

VI. Registrant Information

Theodore E. Reuter
D/B/A St. Gabriel Laboratories
14044 Litchfield Drive
Orange, VA 22960

VII. Additional Contact Information

Ombudsman, Biopesticides and Pollution Prevention Division (7511P)
Office of Pesticide Programs
Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Washington, D.C. 20460

