

Pasteuria usgae (006545) Fact Sheet

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Summary

Pasteuria species are gram-positive, mycelial, endospore-forming bacteria that are endoparasitic to nematodes and water fleas. The microbial active ingredient, *Pasteuria usgae*, is host-specific to the sting nematode (*Belonolaimus longicaudatus*), which can be damaging to a wide variety of crops such as turf and strawberry. Presently, there are three Environmental Protection Agency (EPA or the Agency)-registered pesticide products containing *Pasteuria usgae* as an active ingredient: one manufacturing-use product (*Pasteuria usgae* – BL1, EPA Reg. No. 85004-1) and two end-use products (Econem™, EPA Reg. No. 85004-2; *Pasteuria usgae* – Liquid Formulation, EPA Reg. No. 85004-3). These pesticide products are presumed to be in the public interest as they could serve as partial replacements for conventional nematicides of continuing concern to the Agency (e.g., methyl bromide (ozone-depleting substance) and 1,3-dichloropropene (probable human carcinogen)). Use of *Pasteuria usgae*, as a nematicide and in accordance with label directions, is not expected to cause any unreasonable adverse effects on human health or the environment.

I. Description of the Active Ingredient

Pasteuria usgae is an obligate endoparasitic bacterium of the sting nematode (*Belonolaimus longicaudatus*), which can be damaging to a variety of crops such as turf and strawberry. The active agent of *Pasteuria usgae* is an endospore that attaches to and infects the host nematode during all life stages (except eggs). Increased moisture, neutral pH, temperatures above 10°C, and sandy soil seem to provide the best environments for spore attachment to the host. After attachment of the endospore, a germ tube penetrates the nematode cuticle and mycelial microcolonies are formed in the pseudocoelom, leading to eventual death of the host. The endospores are formed inside the host, released into the soil when the infected nematode decomposes, and considered nonmotile and stable in the soil environment for several years.

II. Use Sites, Target Pests, and Application Methods

- **Use Sites:** Turf and strawberry

- **Target Pests:** Sting nematode (*Belonolaimus longicaudatus*)

- **Application Methods:**

Econem™ (EPA Reg. No. 85004-2): Applied via standard ground equipment (e.g., drop spreader) at a rate of 2–10 pounds of product per 1,000 square feet of turf.

Pasteuria usgae – Liquid Formulation (EPA Reg. No. 85004-3): Applied via standard ground spray equipment or through chemigation at a rate of 0.1–5 gallons of product per 100 square feet of turf or strawberry bed.

III. Assessing Risks to Human Health

Given the results of required toxicity/pathogenicity testing and the absence of occurrences of hypersensitivity incidents during testing and production of *Pasteuria usgae*, no human health risks are expected when pesticides products containing *Pasteuria usgae* are used according to their respective label directions. Despite the low toxicological profile of *Pasteuria usgae*, baseline personal protective equipment (PPE) is required for handlers that may be exposed to the active ingredient, due to their occupation, for prolonged periods. Handlers working with *Pasteuria usgae* in manufacturing facilities or in occupational and agricultural settings must wear a long-sleeved shirt, long pants, socks, shoes, waterproof gloves, and a dust/mist filtering respirator meeting National Institute for Occupational Safety and Health (NIOSH) standards of at least N-95, R-95, or P-95. Additional PPE may be required based on a product-specific basis.

IV. Assessing Risks to the Environment

Adverse effects to terrestrial animals and plants or freshwater and marine/estuarine fish, invertebrates, and plants are not expected because of exposure to labeled applications of *Pasteuria usgae*. Furthermore, “No Effect” (NE) determinations have been made for direct and indirect effects to listed species and their habitat as a result of the uses of *Pasteuria usgae*. As is typical for manufacturing-use products, the *Pasteuria usgae* – BL1 label instructs manufacturers not to discharge the product into waters of the United States, unless in accordance with the requirements of a National Pollutant Discharge Elimination System (NPDES) permit and only after contacting the permitting authority in writing prior to discharge. Manufacturers are also instructed not to discharge *Pasteuria usgae* – BL1 into sewer systems without providing the local sewage treatment plant authority with notification. For the Econem™ and *Pasteuria usgae* – Liquid Formulation end-use products, the label directs

end users not to make applications to water or contaminate water when cleaning application equipment or disposing of application equipment washwaters or rinsate.

V. Regulatory Information

The first pesticide product, containing *Pasteuria usgae* as an active ingredient, was registered for formulating purposes on June 2, 2009 (*Pasteuria usgae* – BL1, EPA Reg. No. 85004-1). In addition to this manufacturing-use product, there are currently two end-use products (Econem™, EPA Reg. No. 85004-2; *Pasteuria usgae* – Liquid Formulation, EPA Reg. No. 85004-3) registered for applications to turf and strawberry. Moreover, as the Agency has concluded that there is a reasonable certainty that no harm will result to the United States population, including infants and children, from aggregate exposure to residues of *Pasteuria usgae*, a permanent tolerance exemption for this active ingredient was established under 40 CFR § 180.1290.

VI. Producer Information

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Pasteuria Bioscience, Incorporated's Authorized Agent:

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VII. Additional Contact Information

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