

Rhamnolipid biosurfactant (110029) Fact Sheet

Chemical Name of Active Ingredient: Decanoic acid, 3-[[6-deoxy-2-O-(6-deoxy-alpha-L-mannopyranosyl)-alpha-L-mannopyranosyl]oxy]-, 1-(carboxymethyl)octyl ester, mixture with 1-(carboxymethyl)octyl 3-[(6-deoxy-alpha-L-mannopyranosyl)oxy]decanoate

Common Name: Rhamnolipid biosurfactant

Summary

Rhamnolipid biosurfactant is a liquid contact biofungicide used in agricultural, horticultural and turf settings to prevent and control plant pathogens such as downy mildews, Pythium and Phytophthora. Studies have shown that rhamnolipid biosurfactant is not generally toxic, but is corrosive to eyes. When applied according to label directions by appropriately protected handlers, no adverse effects on humans or the environment are expected from the use of this biofungicide.

I. Description of the Active Ingredient

Rhamnolipid biosurfactant is a mixture of two structurally related rhamnolipid molecules. The active ingredient is prepared commercially by controlled aerobic fermentation of a strain of the soil-borne bacterium *Pseudomonas aeruginosa*. Strict quality controls assure that no bacteria are present in the manufactured product. The rhamnolipid molecules are simple glycolipids comprised of a fatty acid tail with either one or two rhamnose rings at the carboxyl end of the fatty acid. Rhamnose is a sugar which the Food and Drug Administration has approved as a food additive. Fatty acids, a major source of energy in the body, are ubiquitous in animals and plants. Exposure to rhamnolipids and other biosurfactants is widespread. Rhamnolipid biosurfactant works by disrupting cell membranes; the targeted fungal pest zoospores are especially vulnerable because they lack the protective cell wall present in the fungal pest's other life stages.

II. Use Sites, Target Pests, and Application Methods

- **Use sites:** Agricultural, horticultural and turf sites. No homeowner uses.
- **Target pests:** Pathogenic fungi.
- **Application methods:** Application may be made by conventional spray, fog or drench equipment, or by chemigation or hydroponics, to treat plant foliage, fruits, roots, seeds and/or soil or growth media.

III. Assessing Risks to Human Health

Based on reviews of toxicology (studies using laboratory animals) and other information related to rhamnolipid biosurfactant, EPA found that this active ingredient shows no

adverse effects, except for eye irritation. Therefore, special precautions were put on the label to prevent damage to handlers' eyes. For example: "DANGER. Corrosive. Causes irreversible eye damage. Do not get in eyes...Wear goggles or face shield." If used according to label instructions, no risk to human health, including that of children and other sensitive populations, is expected from the fungicidal use of rhamnolipid biosurfactant.

IV. Assessing Risks to the Environment

Rhamnolipid biosurfactant was found to be slightly toxic to aquatic invertebrates and honeybees. However, risk to non-target organisms and the environment is expected to be minimal due to its mode of action, its ready biodegradability, and the low concentration of active ingredient in the diluted product as applied.

V. Regulatory Information

Rhamnolipid biosurfactant was initially registered (licensed for sale) on March 23, 2004. As of that date, EPA had registered one pesticide product, ZONIX™ Biofungicide, that uses this active ingredient.

VI. Registrant Information

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VII. Additional Contact Information

[Ombudsman, Biopesticides and Pollution Prevention Division](#) (7511P)

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