

BIOCHEM show case

Develop a natural fungicide with good efficacy

Problem

Commercial agriculture needs effective fungicides to deal with plant pathogens. Many of these materials are highly toxic, representing a risk to the operator and to the environment. There must be a gap between application and harvesting to minimise crop contamination, and most products cannot be used in the growing organic market.

Technical solution

AgraQuest Inc developed a bio-fungicide, Serenade, based on naturally occurring strain of *Bacillus subtilis*. The microbe produces three groups of lipopeptides; iturins, agrastatins/plipastatins and surfactins. These act synergistically to disrupt fungal infestation and growth.

Serenade stops germination, disrupts the germ tubes and mycelial growth, and it inhibits attachment of the plant pathogen to the leaf.

Because of the multiple modes of action, it is hard for resistance to develop.

Serenade has low environmental toxicity outside of the target organisms, and can be applied right up to harvesting.

Benefits

- **Natural product**
- **Suitable for organic farming**
- **Broad spectrum (tested on 30 crops)**
- **Not toxic to non-target organisms**

- **No build up in the environment, safe for groundwater**
- **Safe for workers**
- **No gap needed between application and harvest**

This product was a winner of the Presidential Green Chemistry Challenge in 2003.

Additional information

AgraQuest website

<http://www.agraquest.com/agrochemical/products/fungicides-serenade-max.php>

EPA 2003 Small Business Award

<http://www.epa.gov/greenchemistry/pubs/pgcc/winners/sba03.html>