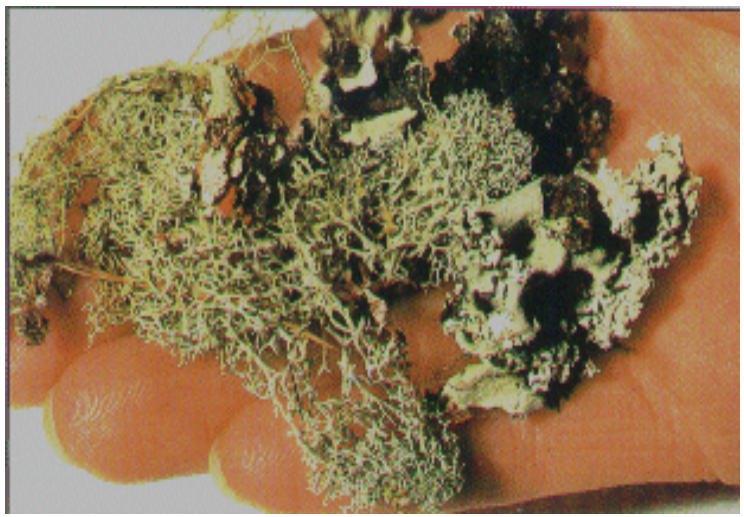
SERENADE®

UAP CANADA

AGRAQUEST®

AgraQuest's Sourcing and Isolation of Microorganisms



About 70% of the medicines we benefit from today are derived from these sources

Less than 10% of the agricultural pesticides are derived from these sources

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SERENADE is a highly effective broad spectrum fungicide and bactericide bundling several modes of action for a wide spectrum of control with little potential for resistance

- Based on the proprietary active ingredient, *Bacillus subtilis* QST713
- Each or jug contains chemical compounds produced by QST713 during fermentation, as well as spores
  - QST713 is unique in its production of both antifungal and antibacterial compounds

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SERENADE®

- Effective on Fungus and Bacteria
- Multi Modes of Action
- Multi Site
- OMRI Approved (Soft, not Weak)
- Tank Mix Synergy
- 0 Day PHI

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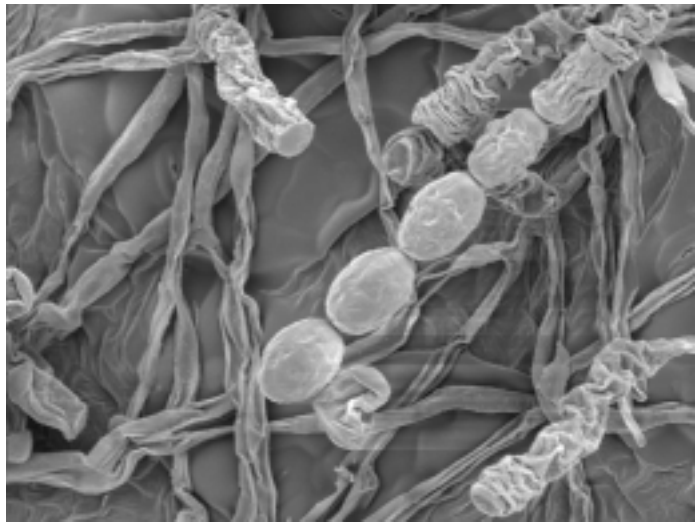
Anti-fungal Activity

SERENADE Lipopeptides Kill Fungal Cells



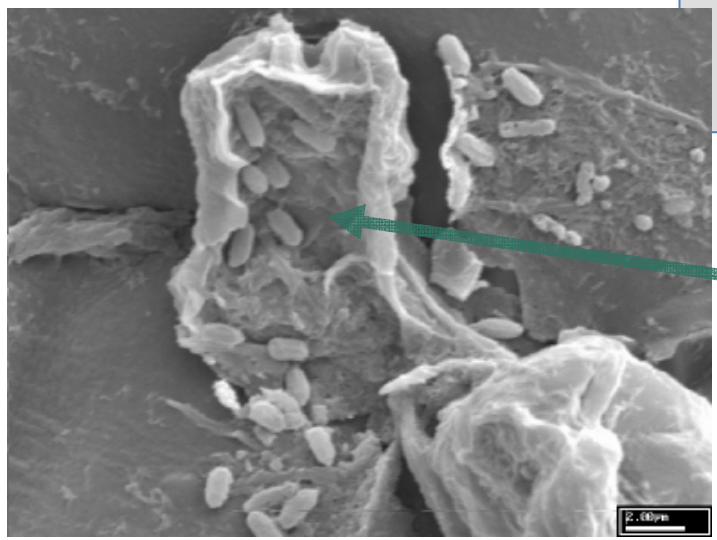
Mildew on Untreated Leaf Surface

Lipopeptides punch holes in fungal cell membranes

- Cell contents leak out
- Fungal cell is destroyed

Lipopeptides are active upon application

- They are already in the jug/bag
- They do not require time or weather to activate.



Serenade Destroys Germinating Fungal Spore

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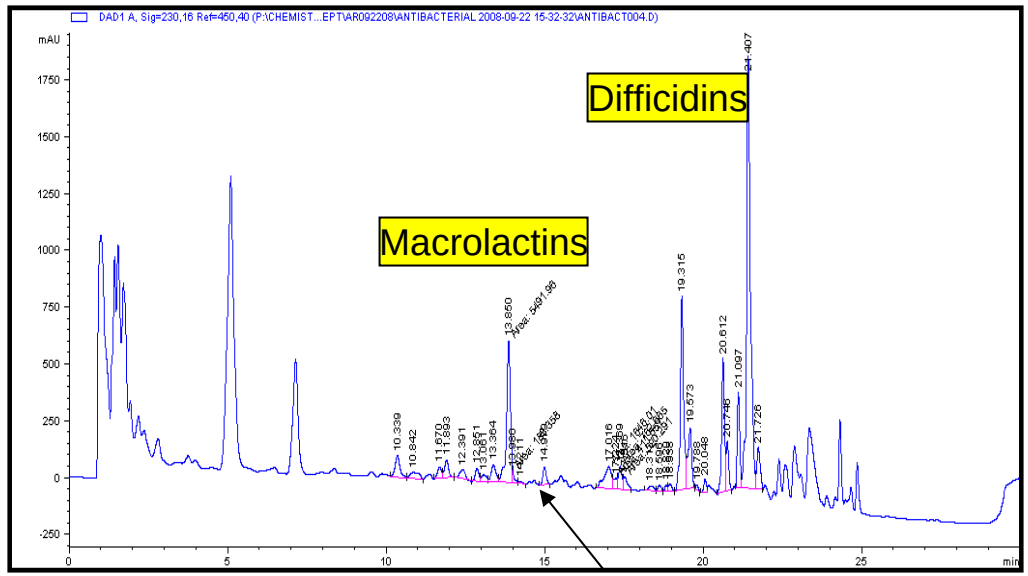
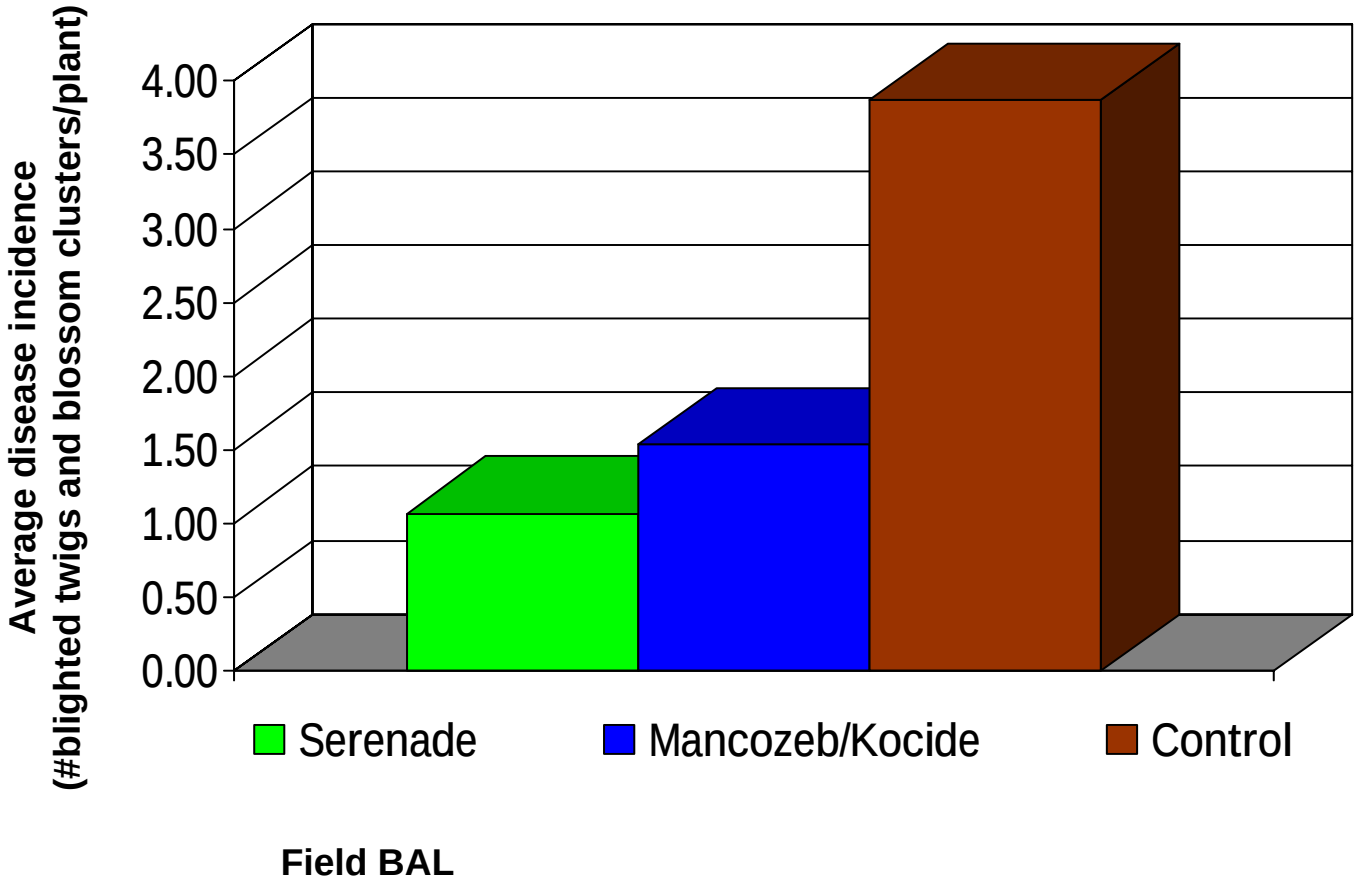
Anti-bacterial Activity

- QST713 produces at least 3 classes of anti-bacterial compounds
  - The classes have different modes of anti-bacterial action
  - Compounds are not used in human or animal health
  - Block bacterial cell protein production and cell wall formation
- Efficacy against broad range of bacterial pathogens
  - *Clavibacter, Pseudomonas, Xanthomonas, Erwinia*
- Lipopeptides are not involved in anti-bacterial control



SERENADE VS Bacterial Blight of Blueberry
BC BLUEBERRY COUNCIL - 2006



(60951)

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Plant Activating

- **Serenade triggers internal defenses of the plant**
  - Activated when Serenade contacts the plant
  - The effect is systemic – responses are triggered throughout the plant even when a small area is treated

- **Serenade induces resistance to disease**
  - Proven with bioassay and RNA analysis
  - Activated pathway is distinct from salicylic acid (SAR, systemic acquired resistance) and jasmonic acid (ISR, induced systemic resistance) pathways

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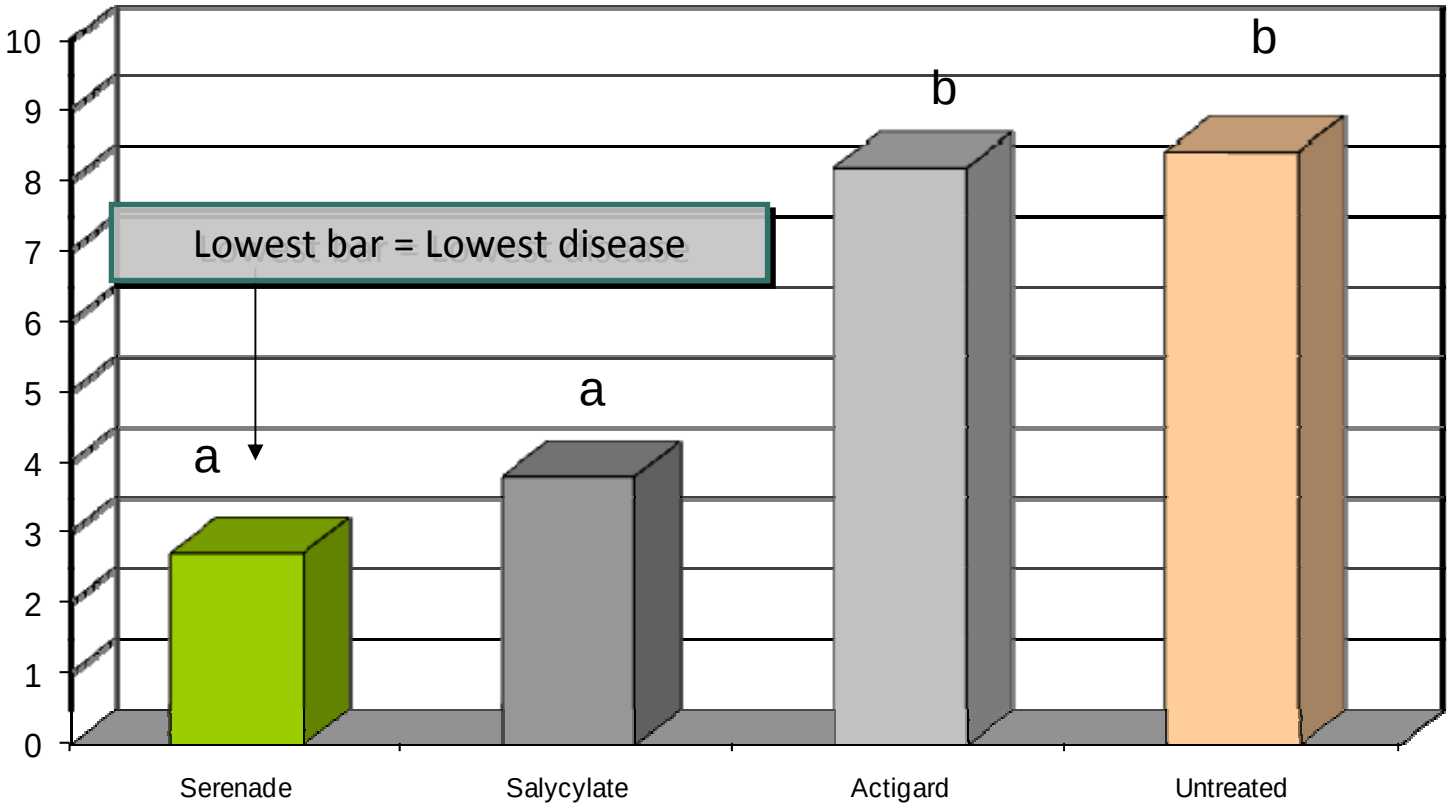
Plant Health

Induced Resistance

SERENADE Inducing Resistance in “Wild Type” Tobacco against Anthracnose *Colletotrichum gloeosporiodes*

(Two trials combined) J. Kloepper, Auburn University- 2001



- One application on lower 2 true leaves only (Serenade) or applied at base of the medium (Actigard and SA).
- All leaves inoculated 7 days after treatment. Means fb same letter NSD 0.05 LSD.
- Actigard = acibenzolar-S-methyl

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Growth Promoting

Serenade encourages improved growth when applied at planting

Serenade ASO applied to tomatoes in furrow at seeding

Locations of Canola Trials - 2008

- Ag-quest Minto, MB
- Ag-quest Elm Creek, MB
- Ag-quest Saskatoon, SK
- ICMS Portage la Prairie, MB
- ICMS Saskatoon, SK
- ICMS Fort Saskatchewan, AB

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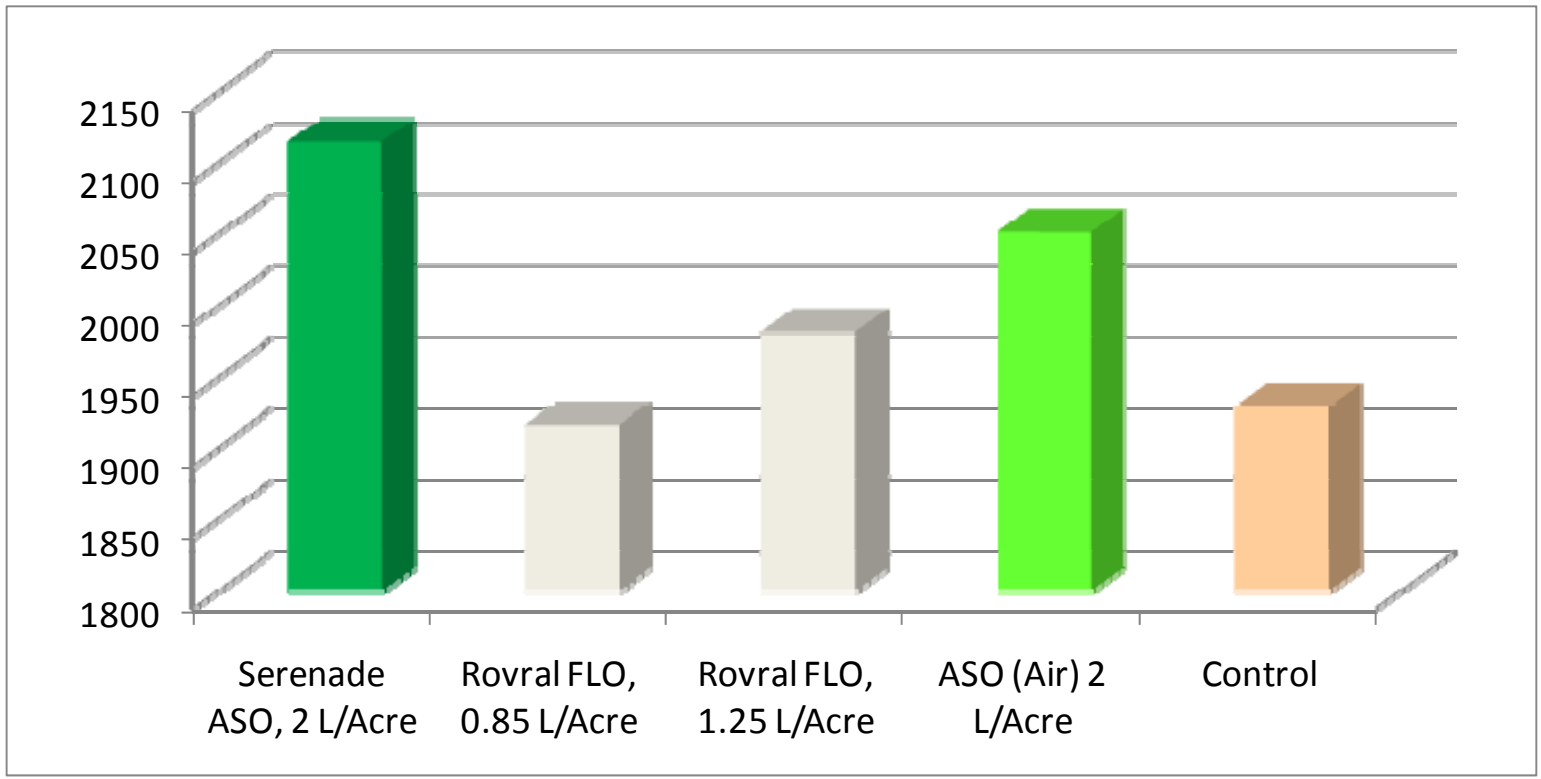
SERENADE vs. Sclerotinia Stem Rot on Canola
Average of 4 Trials. Canada – 2008
Yield



(80157, 80158, 80159, 80160),

ASO (Air) was a simulated air application at 5 GPA.
All other applications were at 10 GPA.

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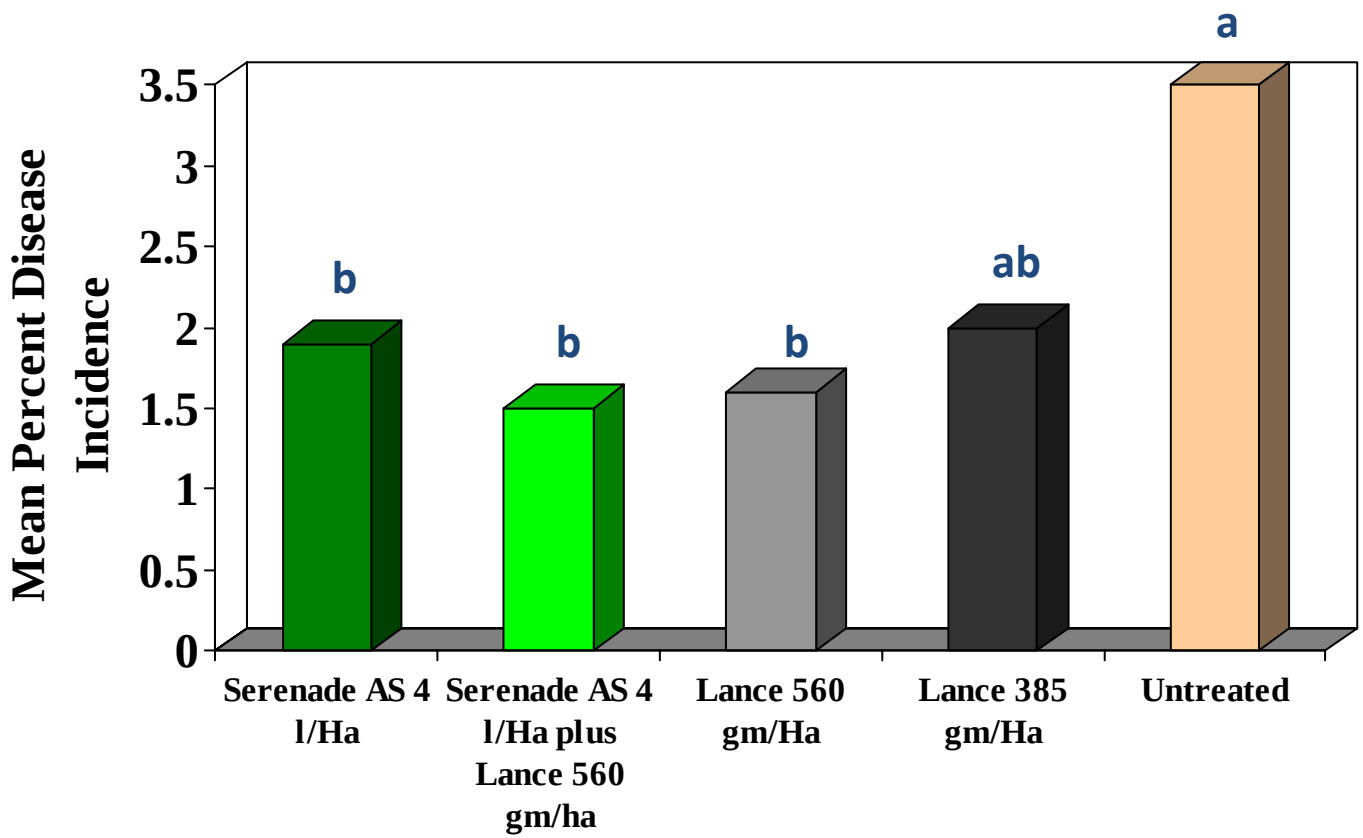
SERENADE ASO

SERENADE alone or in programs controls *Sclerotinia* in dry beans equivalent to conventional standards



Total of 1 Serenade application. Low infection. Means FB same letter NSD 0.05 Tukeys.
(F. Charbonneaux, Quebec, CAN- 2007) #70585

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Why Use Serenade?

- Comparable Efficacy
- Added Bactericide Effect
- Resistance Management
- Crop Safety
- Favorable user and environmental profile

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