Users’ guide for Serenade® Prime in Cucurbits

The biological link between soil and plant root systems.

Serenade® Prime is the beneficial bacteria Bacillus subtilis (also known as Bacillus amyloliquifaciens) strain QST713 delivered as viable dormant spores. This type of beneficial bacteria lives on plant root surfaces and in the soil around the plant root system in a zone called the rhizosphere. QST713 is an extremely vigorous strain of this bacteria which colonises very rapidly and tends to dominate on young plant root surfaces. When the bacterial colonies on the roots are active they function as a dynamic biological link between the soil and the plant roots.

This means that resources required for growth such as nutrients and water become more available, particularly early in the crop. Serenade Prime has consistently resulted in significant benefits to plant establishment and early growth. In cucurbits, improved overall yields, more uniform sizing, and brix and taste differences are often evident at harvest.

Serenade Prime is designed to be applied early as a colonising agent to kick-start the soil/root/microbe inter-relationships in the rhizosphere to a highly activated state early in the crop.

NUTRIENT UPTAKE CAPABILITIES

Colonising the soil-root interface with QST713 beneficial bacteria provides a dynamic biological link which enables better access to nutrients from the surrounding soil. Applying Serenade Prime from the start of the crop allows Bacillus subtilis to prime the young plants for efficient utilisation of key nutrients early in crop establishment.

The live microbial colonies around fine roots and root hairs are fundamental to the complex uptake reactions between the roots and the nutrients in the soil. Serenade Prime is a dominant coloniser strain and consistently gives improved nutrient uptake. The benefits show as better establishment and early growth often continuing through to fruit quality and uniformity differences at the end of the crop cycle.
### Critical Factors to Get Results

<table>
<thead>
<tr>
<th>Critical Factor</th>
<th>Details</th>
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<tbody>
<tr>
<td><strong>Timing</strong></td>
<td>Serenade Prime benefits plants when new root tissue is colonised very early after formation. Consequently it is best used to prime plants for EARLY GROWTH. In cucurbits the initial in-field application at planting/transplanting is the most important. Repeat after about 3-4 weeks.</td>
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<tr>
<td><strong>Placement</strong></td>
<td>Do not apply outside root zone. If microbes do not sense the biochemical root exudates which are the signal for root colonisation, then they will not be attracted to root structures and successful colonisation will not occur.</td>
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<tr>
<td><strong>Active organism</strong></td>
<td>Bacillus subtilis (Bacillus amyloliquefaciens) strain QST713</td>
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<td><strong>Formulation</strong></td>
<td>A suspension concentrate formulation of dormant viable B. subtilis strain QST713 spores plus associated biochemcals</td>
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<td><strong>Application target</strong></td>
<td>Apply to the soil targeting the root zone</td>
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<tr>
<td><strong>Application method</strong></td>
<td>Plant hole drench, in-furrow bands sprays, irrigation injections, band sprays</td>
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<tr>
<td><strong>Application placement</strong></td>
<td>Serenade Prime needs to be within about 13 cm of actively growing root for germination to occur</td>
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<td><strong>Irrigation</strong></td>
<td>Care should be taken not to wash the bacterial spores out of the root zone for one to two days after application</td>
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<tr>
<td><strong>Timing</strong></td>
<td>First application at or about planting/transplanting. Repeat once or twice depending on crop duration</td>
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<tr>
<td><strong>Interval</strong></td>
<td>Retreat at about 3-4 week intervals</td>
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<tr>
<td><strong>Rate</strong></td>
<td>Apply 5-7 L/ha</td>
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<td><strong>Speed of effect</strong></td>
<td>Complete within 2-3 days</td>
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<td><strong>UV stability</strong></td>
<td>Generally very stable</td>
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<tr>
<td><strong>Compatibility</strong></td>
<td>Compatible with most pesticides and fertiliser products</td>
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<tr>
<td><strong>Withholding period</strong></td>
<td>Not required when used as directed</td>
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