



Users' guide for Serenade[®] Prime in carrots

The biological link between soil and plant root systems

Serenade Prime is the beneficial bacteria *Bacillus subtilis* (also known as *Bacillus amyloliquefaciens*) 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 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 during the early growth stages of the crop.

Serenade Prime has consistently resulted in significant benefits to plant establishment and early growth.

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 the highly effective QST713 strain of *Bacillus subtilis* to ameliorate the soil resources in the vicinity of the plant roots and set the plants up for early establishment and growth.

Serenade Prime is an extremely dominant colonising strain and consistently assists in providing measurable differences in nutrient uptake. The benefits generally show as better crop establishment and early growth continuing through to improved quality and uniformity at harvest.



SERENADE[®]
prime

SERENADE PRIME AT A GLANCE

Active organism	<i>Bacillus subtilis</i> (<i>Bacillus amyloliquefaciens</i>) strain QST713
Formulation	A suspension concentrate formulation of dormant viable <i>B. subtilis</i> strain QST713 spores plus associated biochemicals
Application target	Apply to the soil targeting the root zone
Application method	In-furrow bands sprays, broadcast sprays over beds, irrigation injections
Application placement	Serenade Prime needs to be within about 13 cm of actively growing roots for germination to occur
Irrigation	For several days after application, care should be taken not to wash the bacterial spores out of the root zone
Timing	First application at or about planting
Interval	Retreat when crop reaches 4-6 leaf stage if feasible
Rate	Apply 5-7 L/ha
Speed of effect	Complete within 2-3 days
UV Stability	Generally very stable
Compability	Compatible with most pesticides and fertiliser products
Withholding period	Not required when used as directed

CRITICAL FACTORS TO GET RESULTS

Timing	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 carrots, the first in-field application at planting is the most important. Repeat at 4-6 leaf stage if application is feasible
Placement	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.