

# BT BIOINSECTICIDES:

Potent, Targeted, Natural Caterpillar Control.  
Worms have options, so do you.

**Agree**

BIOLOGICAL INSECTICIDE

**Crymax**

BIOINSECTICIDE

**Deliver**

BIOLOGICAL INSECTICIDE

**Javelin**

BIOLOGICAL INSECTICIDE



## PRODUCT HIGHLIGHTS

Excellent control of caterpillar larvae on a variety of crops.

Does not threaten predatory insects or mites.

No cross resistance with other insecticides.

Ideal for Integrated Pest Management (IPM) programs in organic and conventional production.



Always carefully read and follow label instructions. Crymax is not approved for organic production.



1.800.250.5024

[www.CertisBio.com](http://www.CertisBio.com)

## THE BROADEST PORTFOLIO OF BT BIOINSECTICIDES ON THE MARKET

Our portfolio of Bts features over a dozen products worldwide, each proven to control a wide spectrum of worms across varying crops. Their unique and highly specific modes of action make them a valuable tool for resistance management, as there is no cross resistance reported between Bt and any chemical insecticides. Bts are also highly specific towards caterpillar larvae, with no adverse impact on predatory mites or insects - including bees or other pollinators. This makes them an ideal solution for incorporation into Integrated Pest Management (IPM) programs.

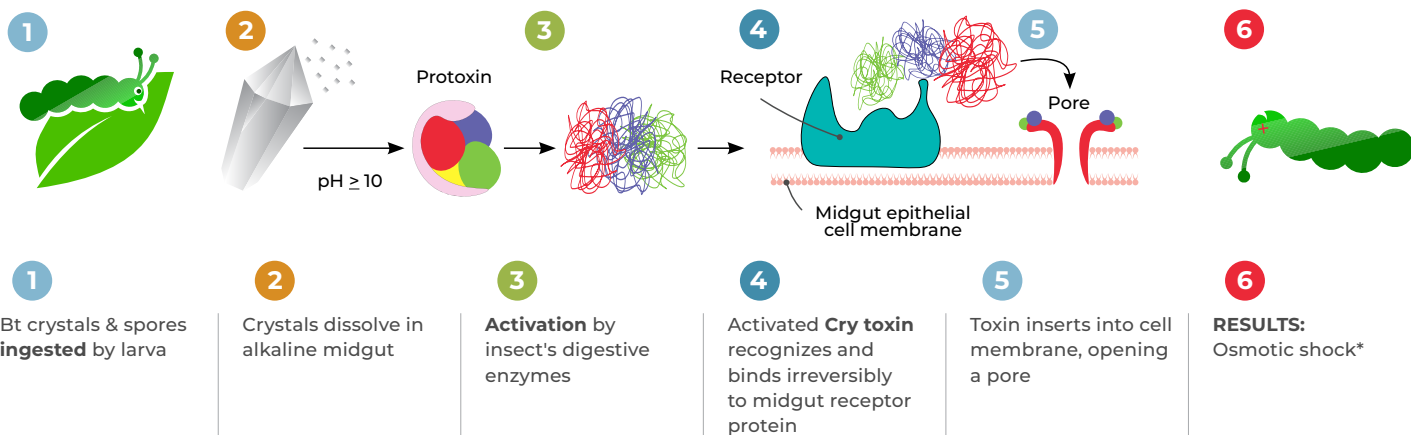
PRODUCT	DESCRIPTION	SUBSPECIES	REI	PHI	NOP COMPLIANT	OMRI LISTED*	SUGGESTED RATE
<b>Agree</b> BIOLOGICAL INSECTICIDE	The Bt hybrid known for its versatility and reliability against both resistant and non-resistant diamondback moths, armyworms, loopers, and grape defoliators.	Bt aizawai strain GC-91 (Bta/Btk "hybrid")	4	0	X	X	0.5-2lbs/acre
<b>Crymax</b> BIOINSECTICIDE	A high-potency Bt protecting vegetable crops from destructive lepidopterous larvae like armyworms and others.	Bt kurstaki strain EG7841 (GMO)	4	0			0.5-2lbs/acre
<b>Deliver</b> BIOLOGICAL INSECTICIDE	The highest potency Bt on the market for control of leafrollers, peach twig borer, navel orange worm, and other lepidopterous pests on tree fruit, nut, and grape crops.	Bt kurstaki strain SA-12	4	0	X	X	0.25-2lbs/acre
<b>Javelin</b> BIOLOGICAL INSECTICIDE	Known as the "utility knife" of Bt products, Javelin is the Bt of choice for crops threatened by loopers, diamondback moths, armyworms, bollworms, budworms, and more.	Bt kurstaki strain SA-11	4	0	X	X	0.12-1.5lbs/acre

## HOW IT WORKS

Sporulating Bt cells produce insecticidal proteins called Cry toxins, which form crystals that are present with the spores in formulated Bt products. When a worm pest ingests Bt-treated plant material, the crystals dissolve in its midgut, releasing the Cry toxins in an activated form that bind to and destroy the cells lining the gut. The larva stops feeding (often in less than an hour) and dies with several days.

There are many subspecies and strains of Bt, from which more than 700 unique Cry toxins have been identified to date. Most commercial Bt spray products targeting caterpillar pests (lepidopteran larvae) contain Bt subspecies kurstaki (Btk) or aizawai (Bta) and their associated Cry1 and Cry2 toxins.

## THE MODE OF ACTION OF BT: CRY TOXINS



\*Gut contents leak into bloodstream, gut paralysis & cessation of feeding (~30 m), infection by germinating spores, and death within 1-3 days (depending on insect species, larval age, dose, and temperature)

## CONSIDERATIONS FOR USING BT BIOINSECTICIDES:

Bt performance can be affected by environmental conditions such as exposure to sunlight and high pH. Water used to mix sprays should be at neutral pH (6 to 8). Bt products are moderately rainfast if sprays are allowed to dry for at least 4 hours. The half-life of Bt spray deposits is 1 – 4 days in direct sun and 7 – 30 days in the shade. Residual activity can be extended by spraying late in the day (larvae continue to feed and ingest Bt at night) or tank mixing with a commercial sunscreen adjuvant. Rapid plant growth is often more important in determining the need for reapplication.