

# BT NOW<sup>®</sup> Insecticide

Water-Based, Liquid Bioinsecticide

## Lepidoptera specific bioinsecticide

### Key Features & Benefits

- ✓ Priced and Certified for Conventional and Organic Crops
- ✓ Four-hour REI; zero-day PHI
- ✓ No residue; MRL exempt
- ✓ Not harmful to beneficial/pollinators
- ✓ Easy to use water-based liquid formulation
- ✓ Stabilized w/ UV inhibitors for better persistence
- ✓ Formulated with natural organic ingredient to improve adherence to plant
- ✓ Formulated with phago-stimulants to increase insect uptake of BT NOW
- ✓ Tank-mix compatible w/ many commonly used pesticides, fertilizers, and adjuvants



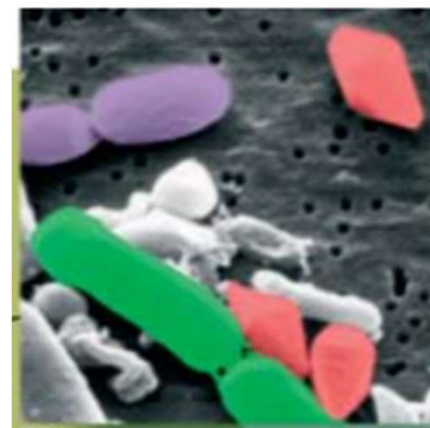
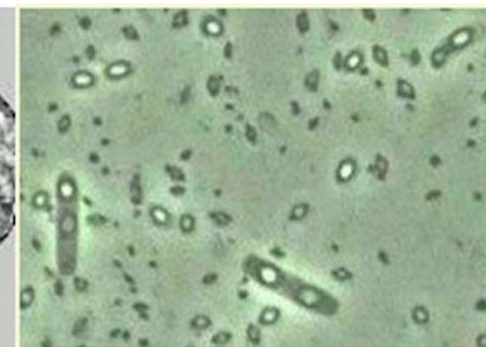
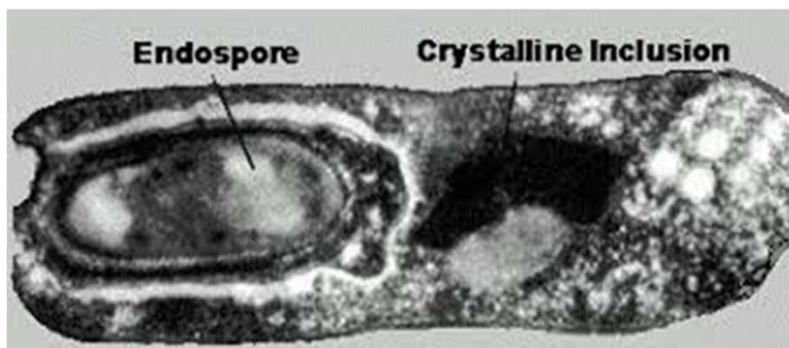
Valued for its target insect specificity and its environmental and beneficial insect safety profile.

ACTIVE INGREDIENT:	
<i>Bacillus thuringiensis</i> ssp. <i>kurstaki</i> strain EVB-113-19 fermentation solids, spores, and insecticidal toxins.....	14.49%
OTHER INGREDIENTS:.....	85.51%
TOTAL:.....	100.00%



## What is Btk?

- Microbial or biological insecticide.
- Contains crystal-shaped proteins ('cry toxins') and living spores
- Crystal protein is inactive until consumed by a caterpillar = 'protoxin'



Scanning electron microscope image of Bt showing whole bacteria (green), endospores (violet), and crystal protein toxins (red). [Colors added for emphasis.]

**BT NOW contains  
FIVE cry toxins**



## Cry toxin comparison

<i>subspecies</i>	<i>kurstaki</i>	<i>kurstaki</i>	<i>kurstaki</i>	<i>aizawai</i>	<i>aizawai</i>
<i>strain</i>	<b>EVB-113-19</b>	ABTS-351	SA-11	GC-91	ABTS-1857
<i>product/ cry toxin</i>	<b>Bt NOW</b>	Dipel	Javelin	Agree	XenTari
<b>1Aa</b>	+	+	+	+/-*	+
<b>1Ab</b>	+	+	+	-	+
<b>1Ac</b>	+	+	+	+(primary toxin)	-
<b>1C</b>	-	-	-	+	+
<b>1D</b>	-	-	-	+	+
<b>2A</b>	+	+	+	-	-
<b>2B</b>	+	-	-	-	-

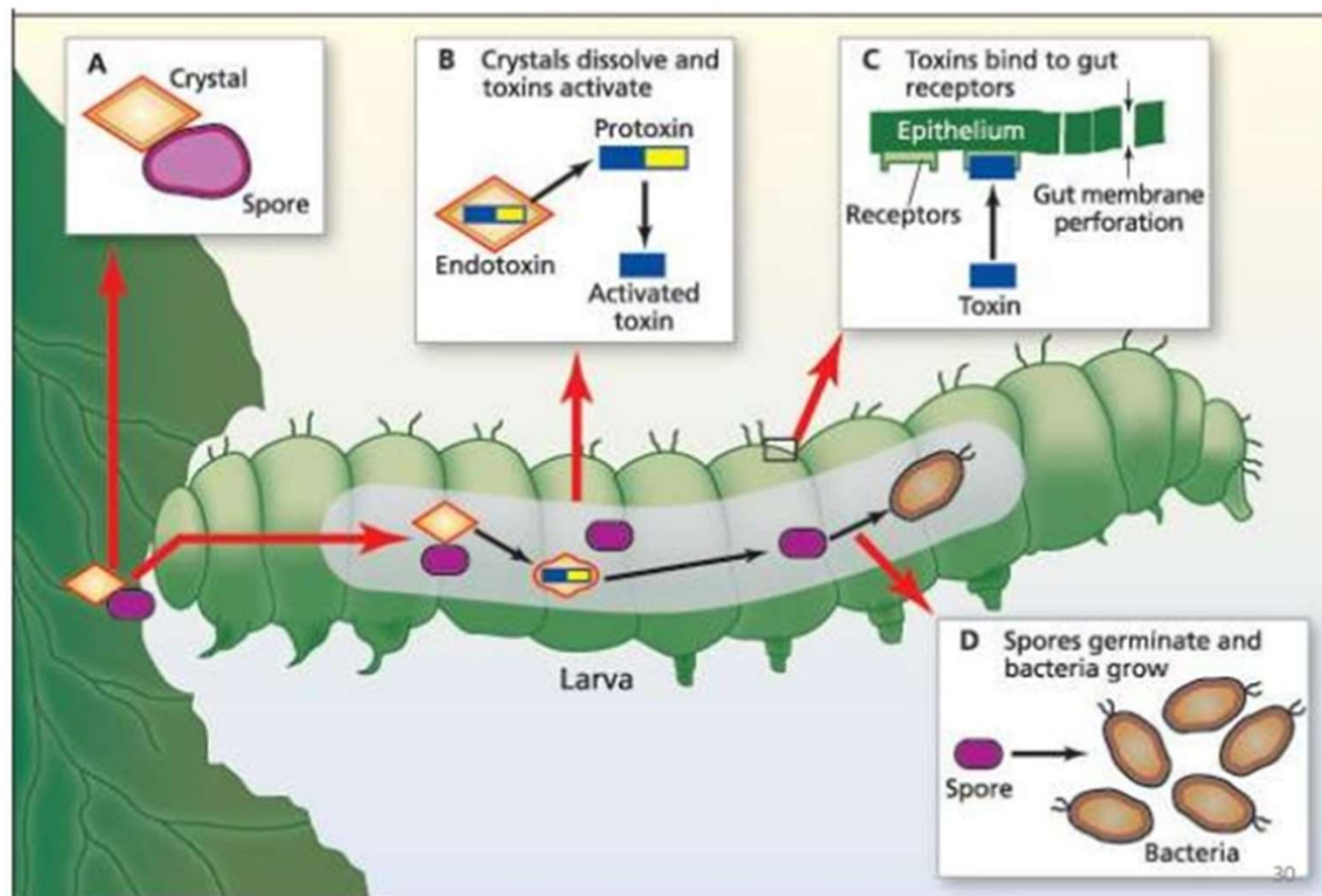
### Superior formulation

- Easy to use water-based liquid formulation
- Stabilized w/ UV inhibitors for better persistence
- Natural, organic ingredient to improve leaf adherence
- Feeding stimulants to increase insect uptake

## Efficacy of individual cry toxins

	1Aa	1Ab	1Ac	1C	1D	2A	2B
Armyworm species ( <i>Spodoptera</i> spp.)	+	+	-	++	+	+	-
Diamondback moth ( <i>Plutella</i> spp.)	++	++	++	++	++	-	-
Cotton bollworm ( <i>Helicoverpa zea</i> )	-	+	++	-	-	+	-
Cabbage Looper ( <i>Trichoplusia ni</i> )	+	+	++	+	+	++	-

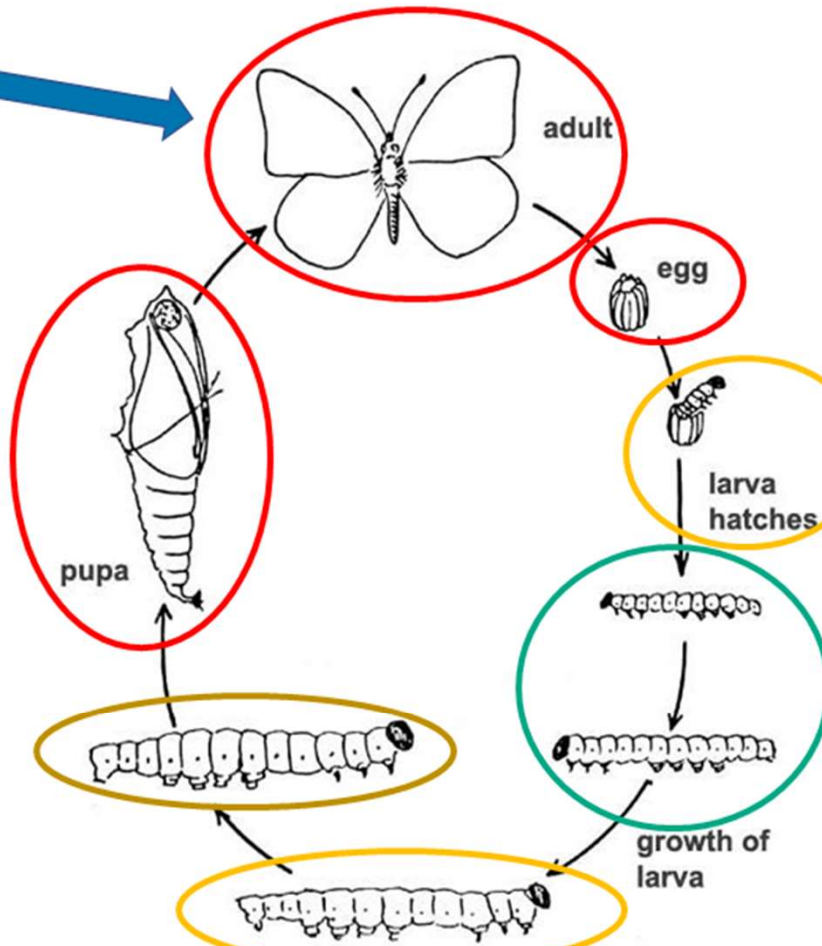
# How does BT NOW work?



- BT NOW is sprayed on foliage. Ensuring good coverage.
- Caterpillar consumes BT NOW.
- Crystal protein dissolves in alkaline gut. Cry toxin is activated.
- Toxins bind to gut. Insect stops feeding within minutes to hours.
- Gut membrane breaks down. Caterpillar dies 2-5 days later.



Scouting



Picture credit: <https://www.caburchill.com/images03/040107027.jpg>



BT NOW  
spray timing



# Best use practices with BT NOW

**Timing** of spray application to target early larval instars

**Rate** adjustment under heavy pressure.

- Use higher recommended rates

**Interval** between sprays determined by

- Plant growth rate
- Insect development rate or overlapping instars
- Generally 3-10 days

**Coverage** needs to be uniform for best results

- Use spreader/sticker for hard-to-wet foliage
- Water volumes sufficient to cover surfaces of crop

**Tank mix** compatible

- pH between 4.5 to 8
- Do not tank mix with copper

## Integrated ag approach

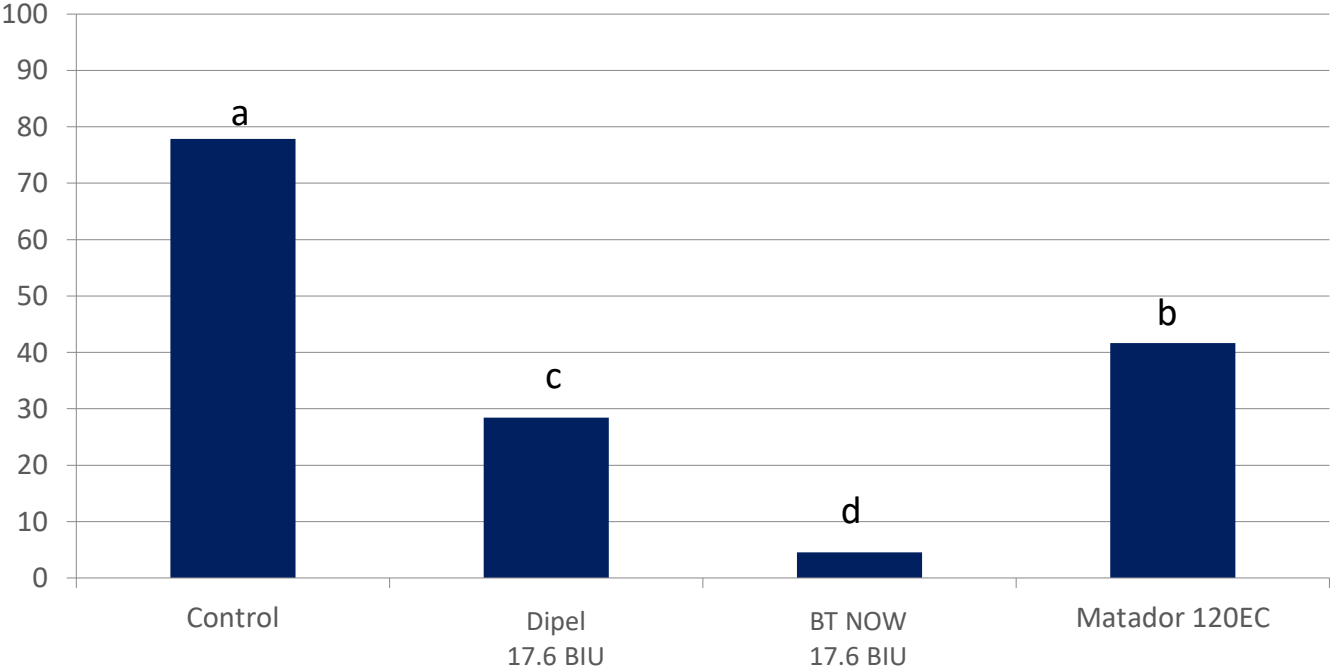
- Can combine with synthetic pesticides to take advantage of the many benefits of BT NOW...
  - Resistance management
  - Residue management
  - Pest spectrum/gaps
  - Beneficial insect preservation
  - Worker/environmental concerns
  - Can be applied during flowering
  - Registered for hundreds of crops and most lepidoptera

# BT NOW<sup>®</sup> Insecticide



**Larvae of:  
Imported cabbageworm  
Diamondback moth  
Cabbage looper**

% plants with Larvae in head - Cabbage

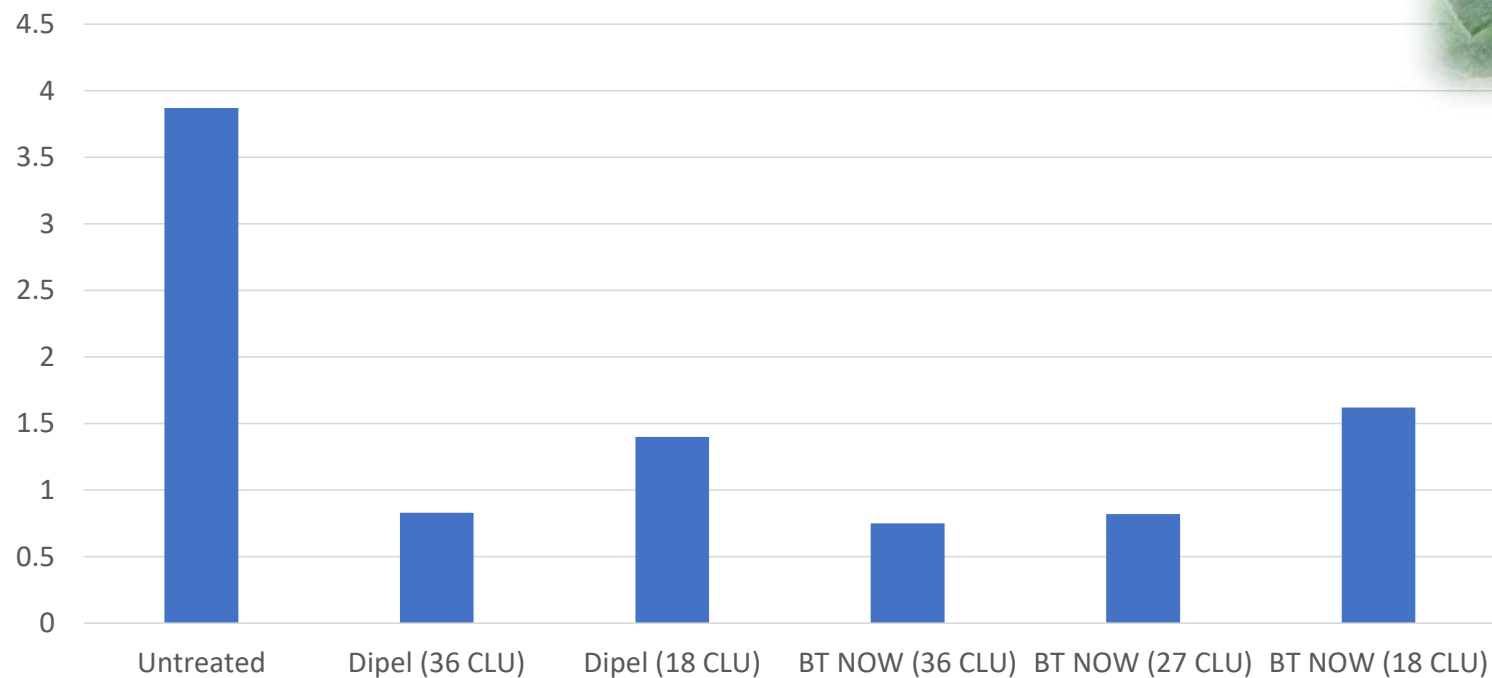


Trial conducted by AAFC St-Jean. 1999, Québec, Cabbage, DBM, CL, ICW  
Within-column means sharing a same letter are not significantly different according to Tukey test with  $\alpha=0.05$



# BT NOW<sup>®</sup> Insecticide on cabbage

**% Defoliation Lepidoptera Larvae**  
Primary Imported Cabbage Worm (*Pieris rapae* L)

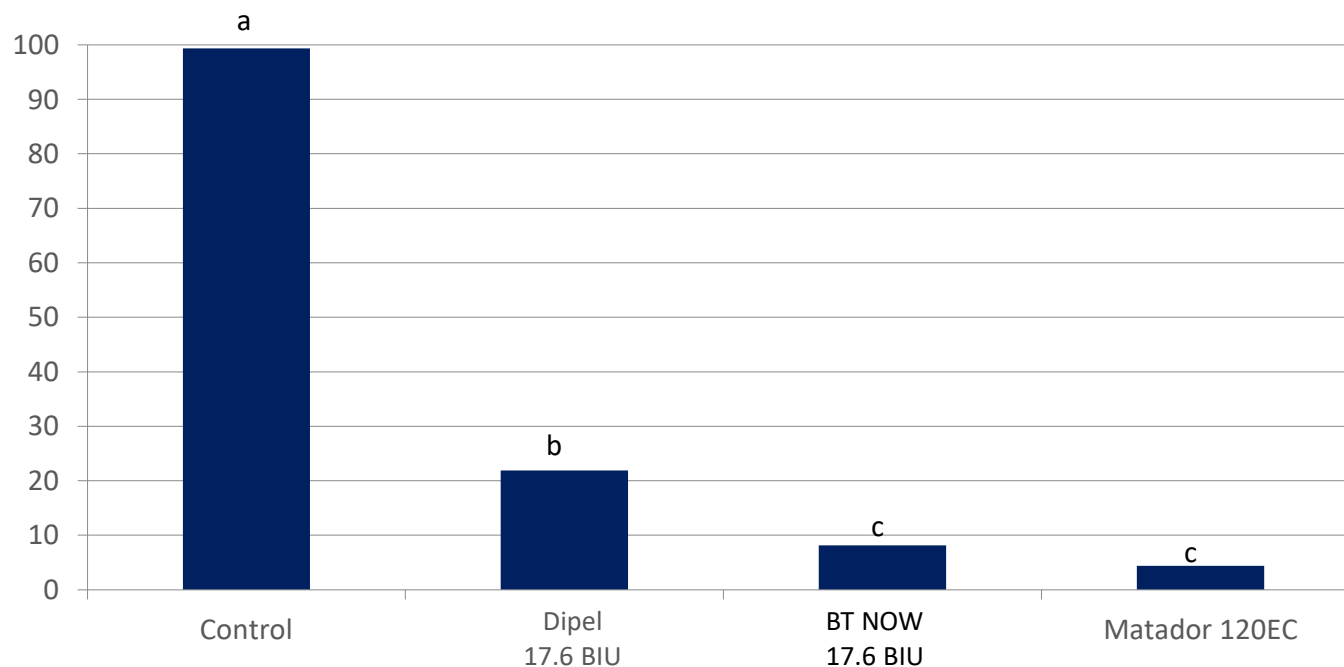


“Megaton” Cabbage Trial - Phelps, NY 2016 – Chris Becker BAAR Scientific, LLC

# BT NOW<sup>®</sup> Insecticide on broccoli



### % plants with Larvae in head (Broccoli)



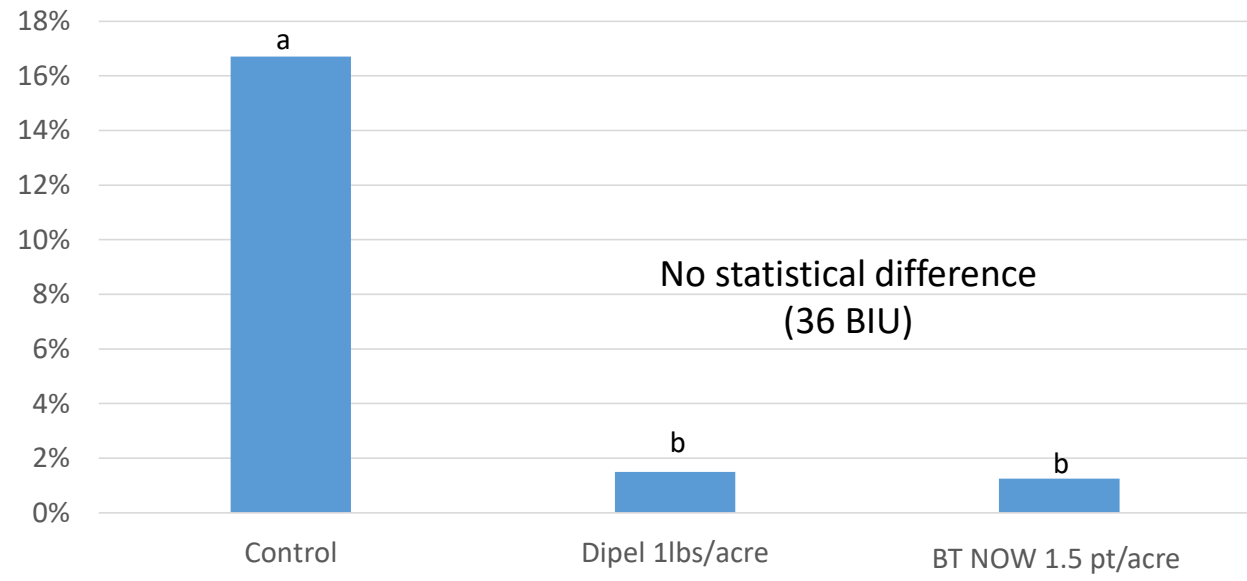
**Larvae of:**  
**Imported cabbageworm**  
**Diamondback moth**  
**Cabbage looper**

Trial conducted by AAFC Qc. 1999, Québec, Broccoli, DBM  
Within-column means sharing a same letter are not significantly different according to Tukey test with  $\alpha=0.05$

# BT NOW<sup>®</sup> Insecticide on apples



### % OBLR Infested terminals



Trial conducted by Agr.Assistance. 2017, NY State, Comparative treatments: July 2th, July 9th and July 17  
Within-column means sharing a same letter are not significantly different according to Tukey test with  $\alpha=0.05$

### Oblique banded leafroller



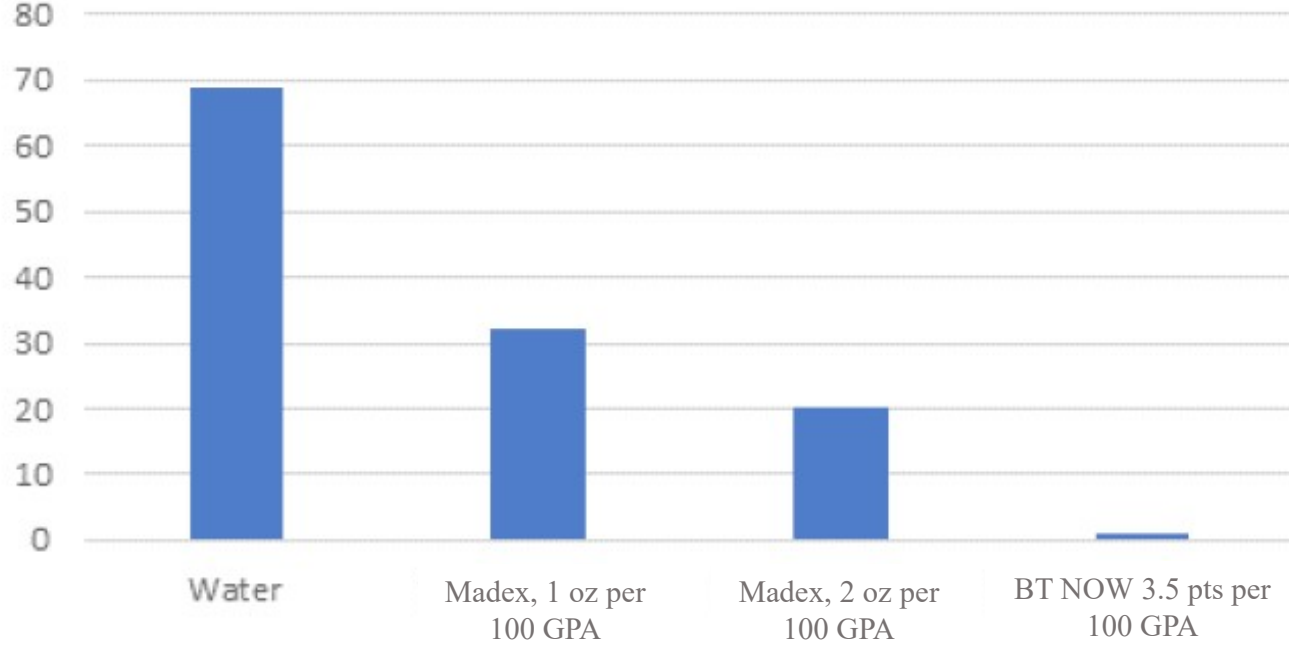
5482353

Todd M. Obigian and Marc T. Epstein, CSU, Regester.org

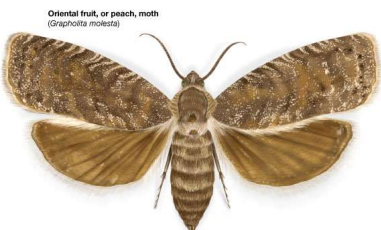
# BT NOW<sup>®</sup> Insecticide on apples



Number of Live Larvae – Oriental Fruit Moth



**Oriental fruit moth**



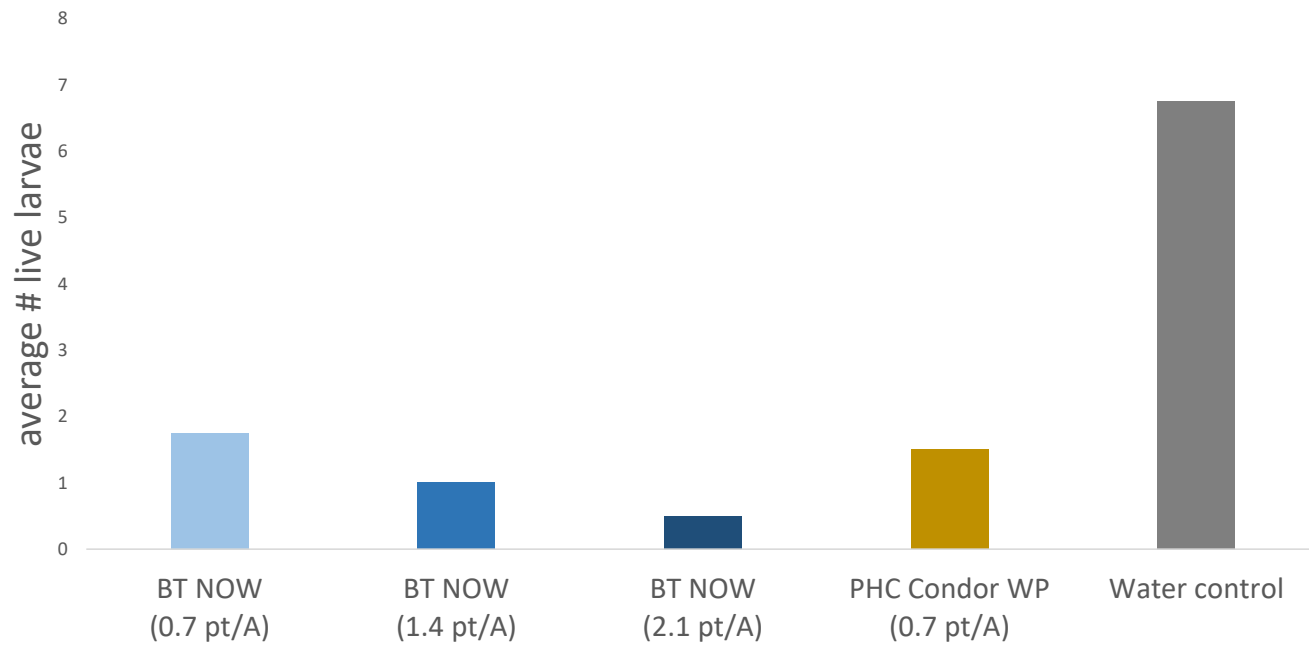
Bioassay conducted by the USDA, ARS, in 2018. N = 80 neonate larvae

© 2012 Encyclopaedia Britannica, Inc.

# BT NOW<sup>®</sup> Insecticide on tomato



Beet armyworm (*Spodoptera exigua*)  
on tomato



Study conducted in Copandaro de Galeana, Michoacan, Summer 2020 on tomato for *Spodoptera exigua* (beet armyworm) and *Heliothis virescens* (tobacco budworm). Treatments applied 4 times at 100 GPA.

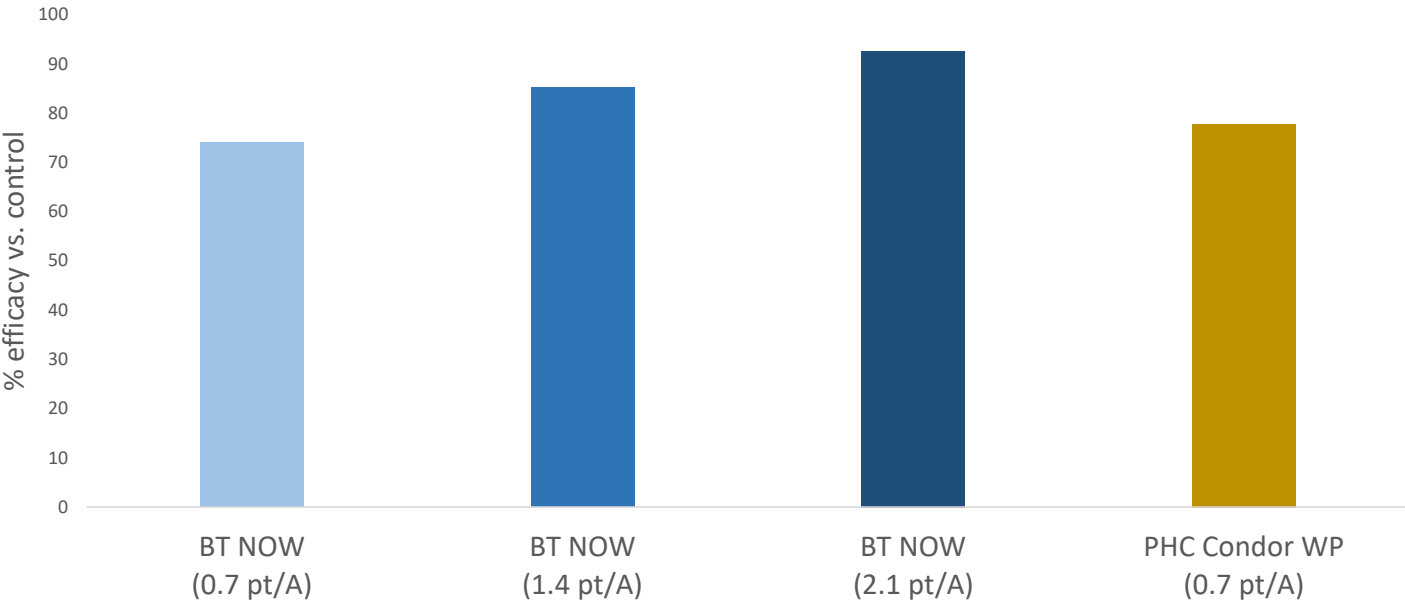
**Beet  
armyworm**



# BT NOW<sup>®</sup> Insecticide on tomato



% efficacy vs.  
beet armyworm on tomato



**Beet  
armyworm**

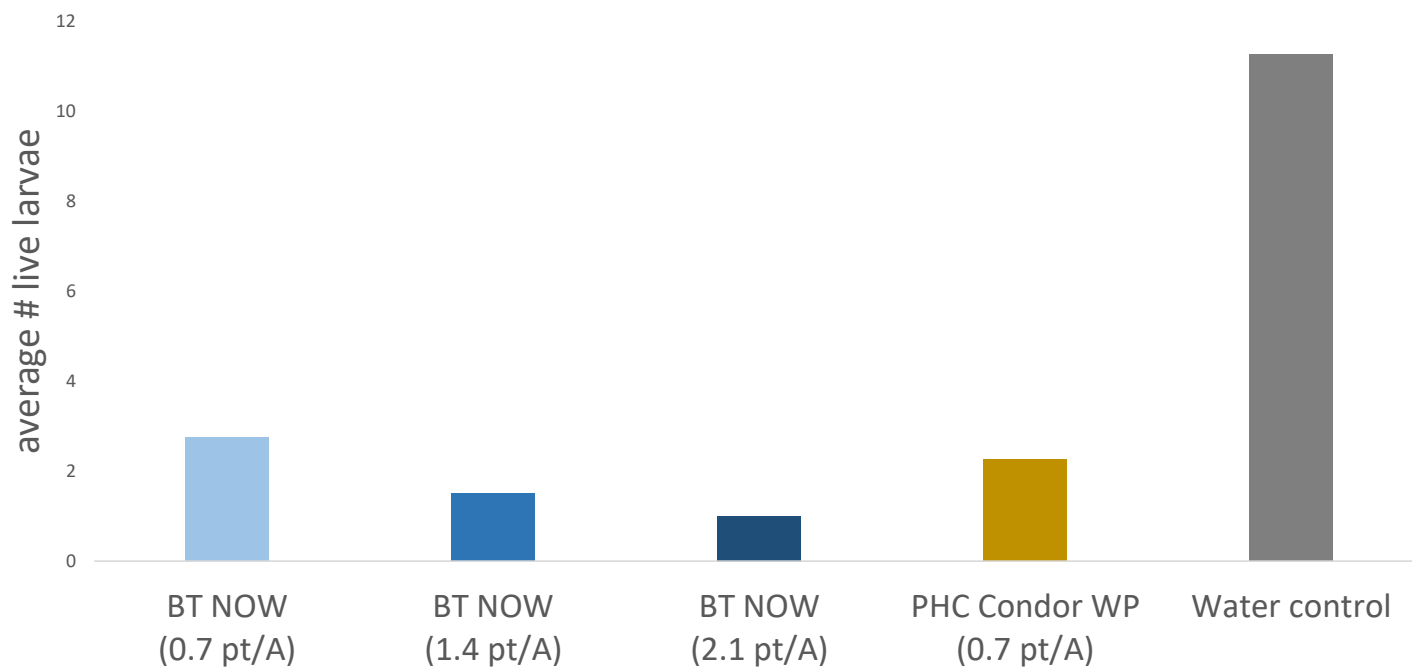
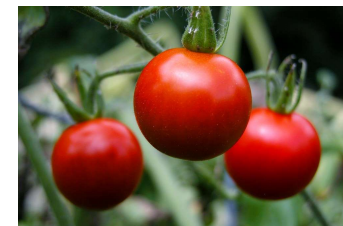


Study conducted in Copandaro de Galeana, Michoacan, Summer 2020 on tomato for *Spodoptera exigua* (beet armyworm) and *Heliothis virescens* (tobacco budworm). Treatments applied 4 times at 100 GPA.

# BT NOW<sup>®</sup> Insecticide on tomato



Tobacco budworm (*Heliothis virescens*)  
on tomato

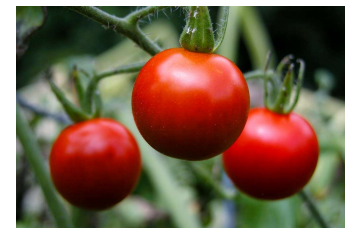


**Tobacco budworm**

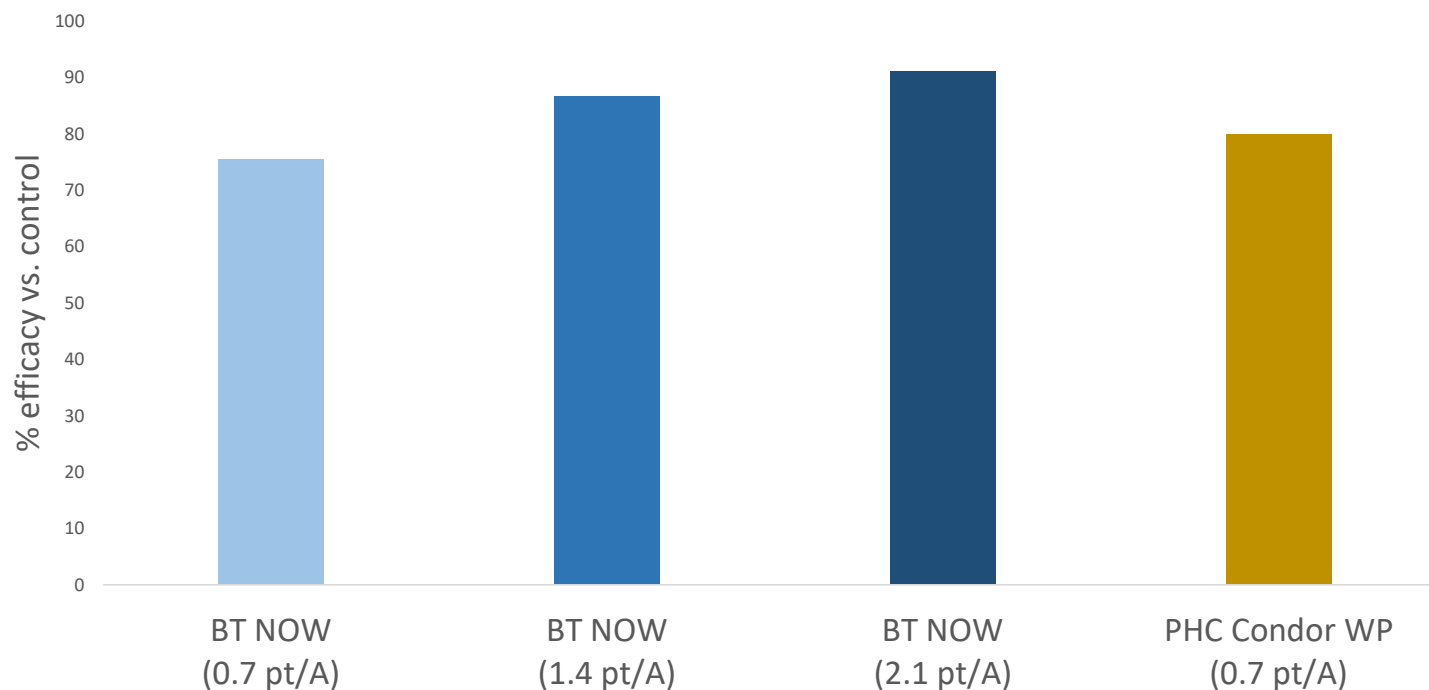


Study conducted in Copandaro de Galeana, Michoacan, Summer 2020 on tomato for *Spodoptera exigua* (beet armyworm) and *Heliothis virescens* (tobacco budworm). Treatments applied 4 times at 100 GPA.

# BT NOW<sup>®</sup> Insecticide on tomato



% efficacy vs.  
tobacco budworm on tomato



Study conducted in Copandaro de Galeana, Michoacan, Summer 2020 on tomato for *Spodoptera exigua* (beet armyworm) and *Heliothis virescens* (tobacco budworm). Treatments applied 4 times at 7-day intervals at 100 GPA.

**Tobacco budworm**

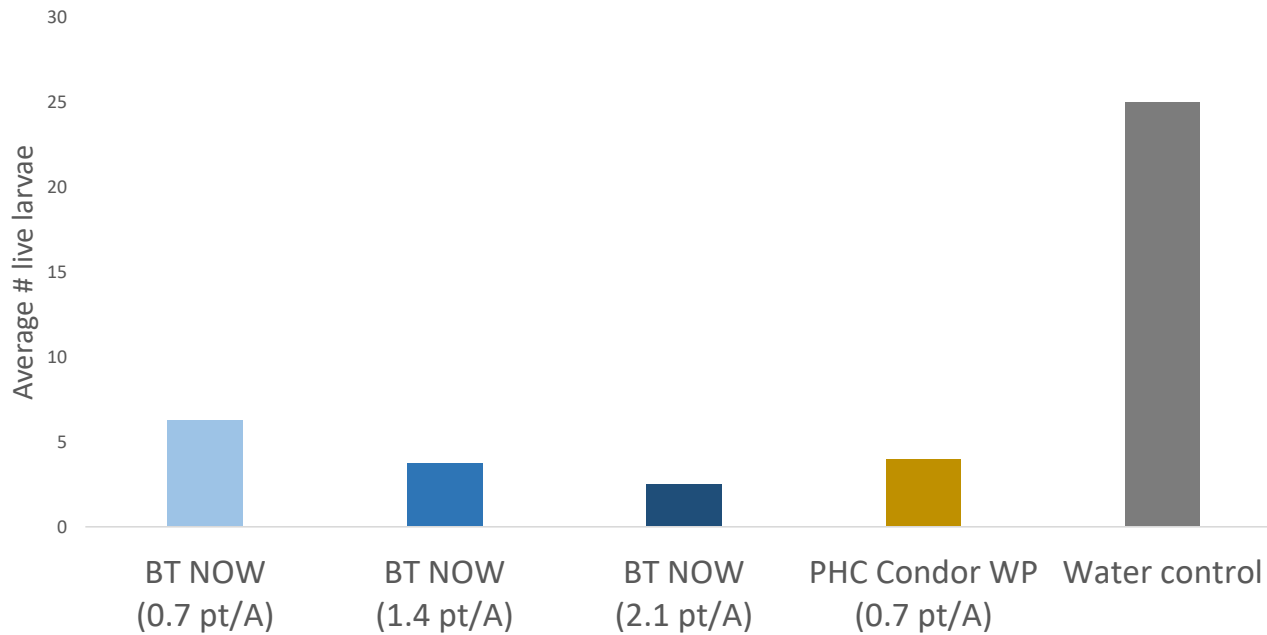




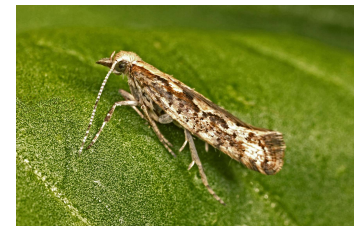
# BT NOW<sup>®</sup> Insecticide on broccoli



Diamondback moth (*Plutella xylostella*)  
on broccoli



**Diamondback moth**

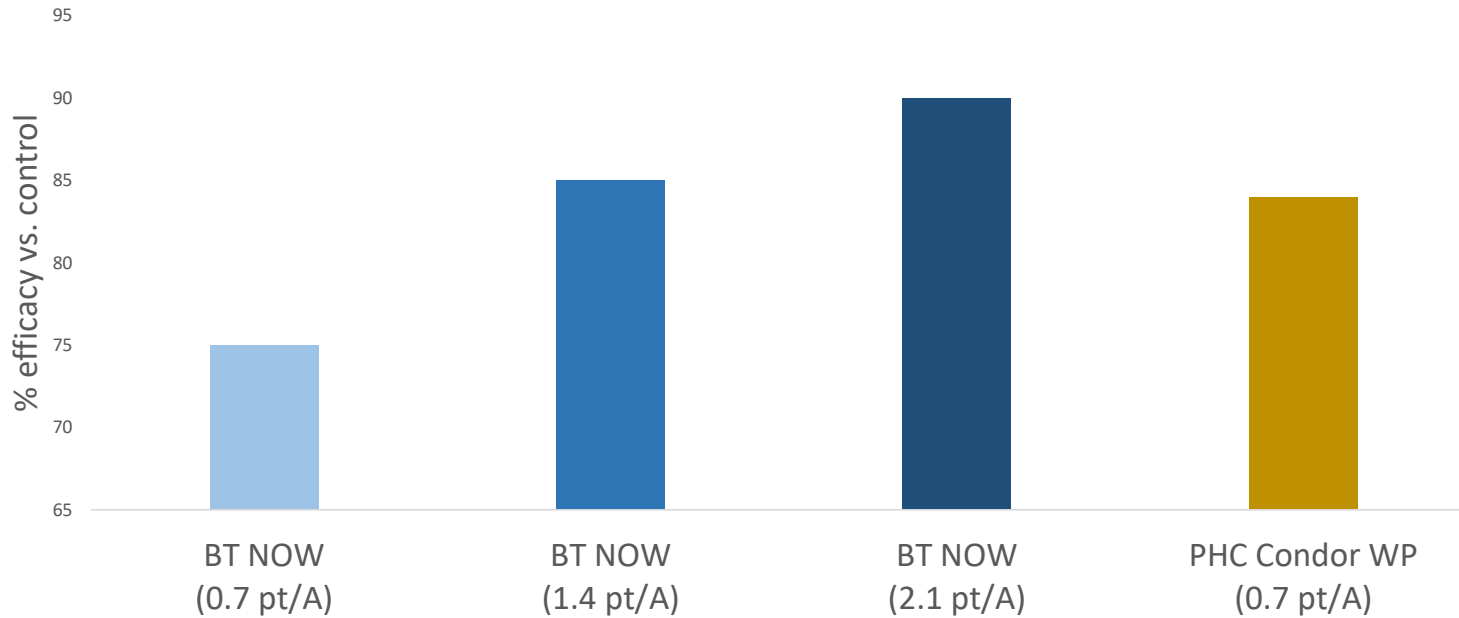


Study conducted in Tepeaca, Puebla, Summer 2020, on broccoli for Diamondback moth (*Plutella xylostella*).  
Treatments applied 4 times at 65 GPA.

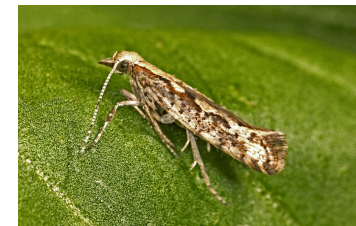
# BT NOW<sup>®</sup> Insecticide on broccoli



% efficacy vs.  
diamondback moth on broccoli



**Diamondback  
moth**

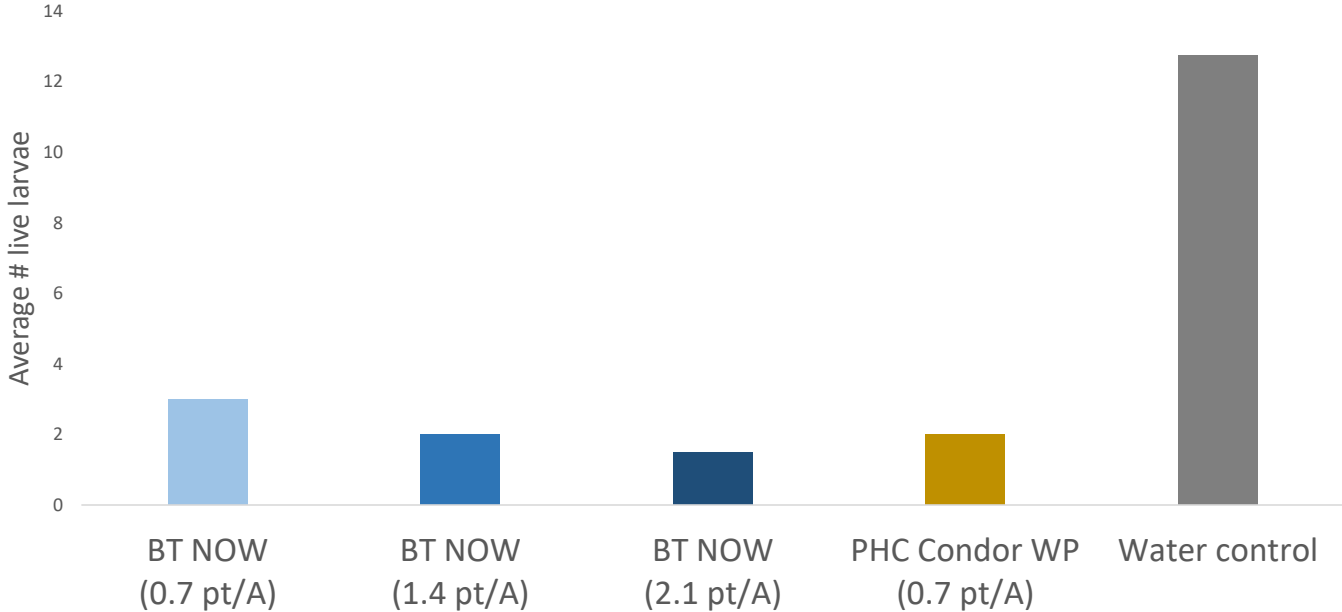


Study conducted in Tepeaca, Puebla, Summer 2020, on broccoli for Diamondback moth (*Plutella xylostella*).  
Treatments applied 4 times at 65 GPA.

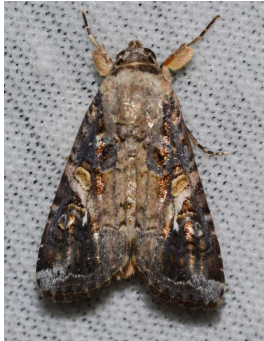
# BT NOW<sup>®</sup> Insecticide on corn



Fall armyworm (*Spodoptera frugiperda*) on corn



Fall armyworm

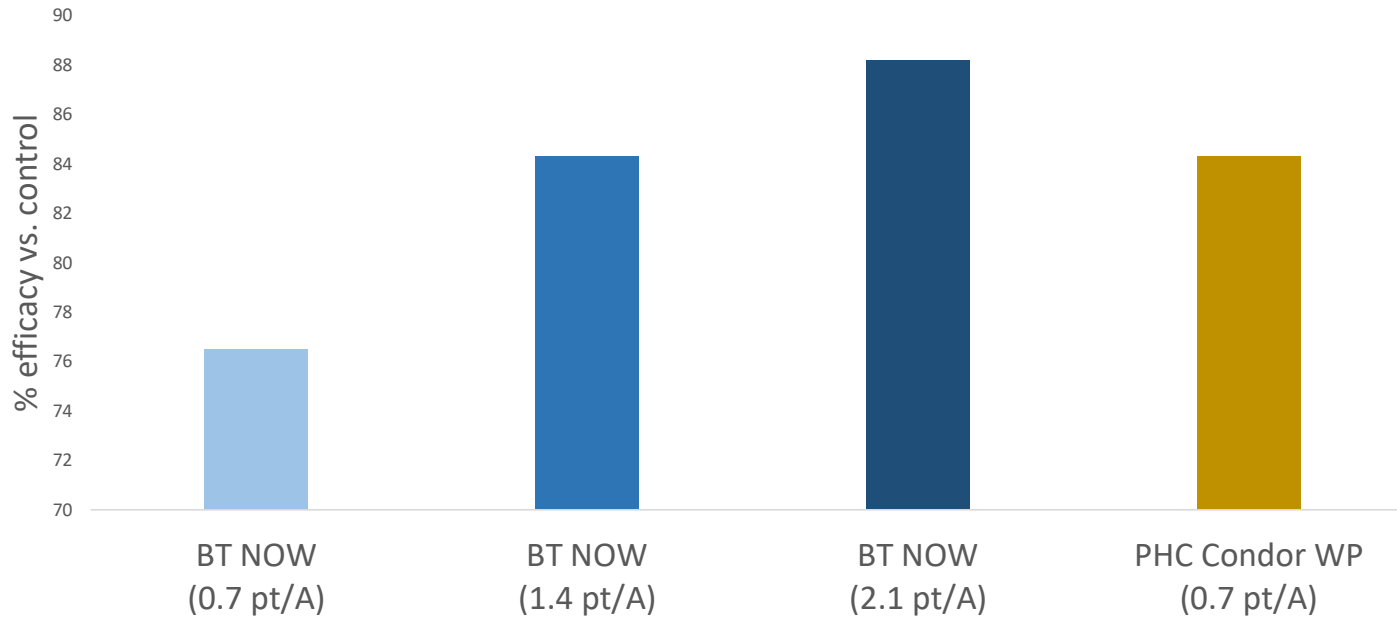


Study conducted in Jantetelco, Morelos, Summer 2020 on corn (*Zea mays*) for Fall armyworm (*Spodoptera frugiperda*). Treatments applied 4 times at 90 GPA.

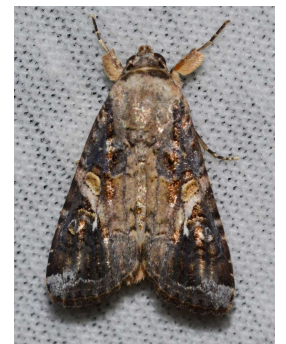
# BT NOW<sup>®</sup> Insecticide on corn



% efficacy vs.  
fall armyworm on corn



**Fall  
armyworm**



Study conducted in Jantetelco, Morelos, Summer 2020 on corn (*Zea mays*) for Fall armyworm (*Spodoptera frugiperda*). Treatments applied 4 times at 90 GPA.