



COOPERATIVE EXTENSION
UNIVERSITY OF HAWAII AT MĀNOA
COLLEGE OF TROPICAL AGRICULTURE AND HUMAN RESOURCES

Diamond Back Moth Resistance Management Program

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Diamondback Moth (DBM)

- *Plutella xylostella*
- Life Cycle is 17-51 days depending on temperature
- Host Plants
 - Cruciferae Family
 - Broccoli, cabbage, etc.
- Plant damage caused by larval feeding on foliage



Adult





Larvae





Pupae



Photograph by [Lyle Buss, University of Florida](#)

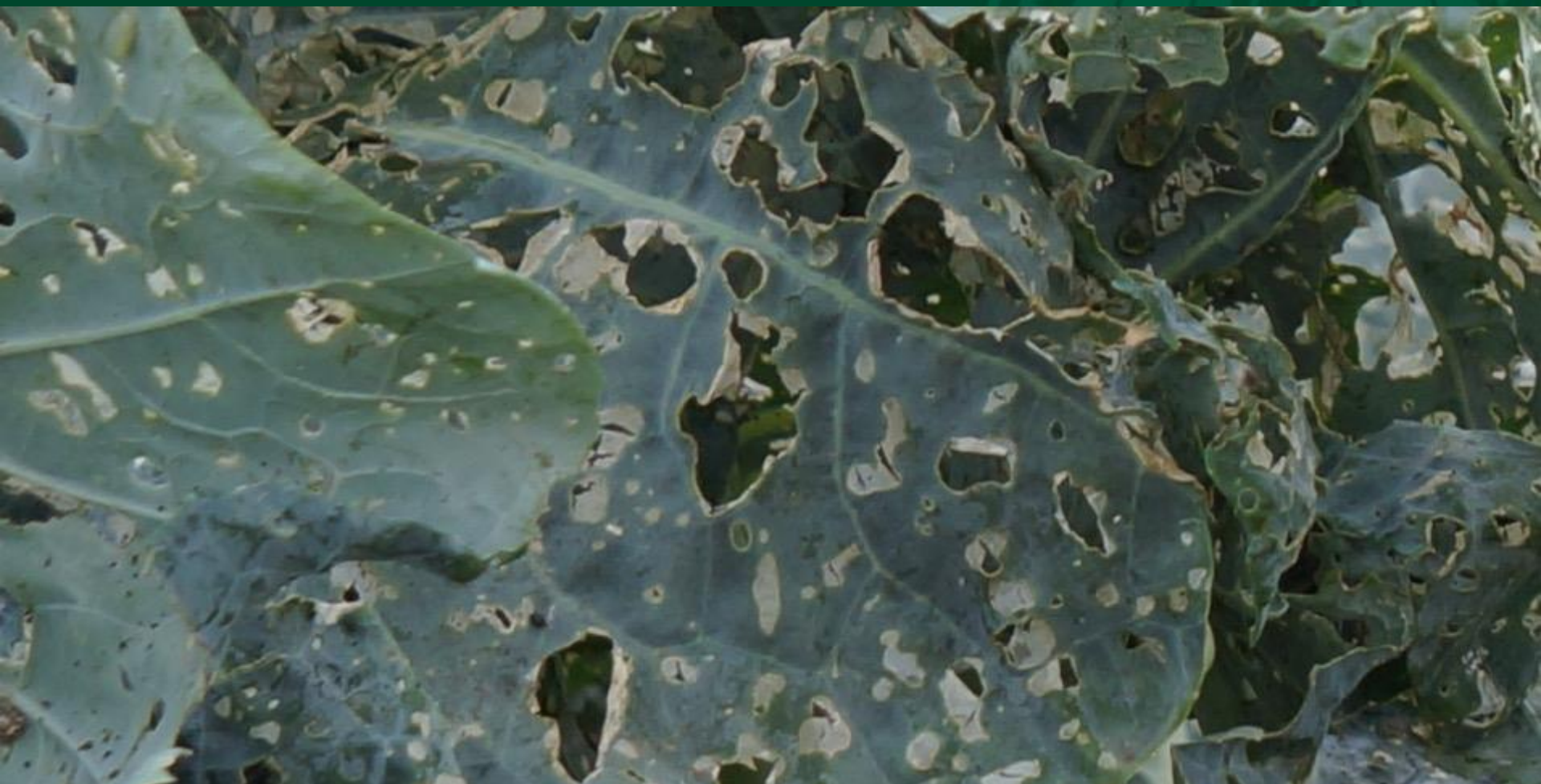


DBM Spray Rotational Program

- Objective:
 - Maintain DBM susceptibility
 - Monitor statewide resistance levels
 - Identify ineffective products
 - Delay the evolution of resistance
 - Provide spray rotation recommendation

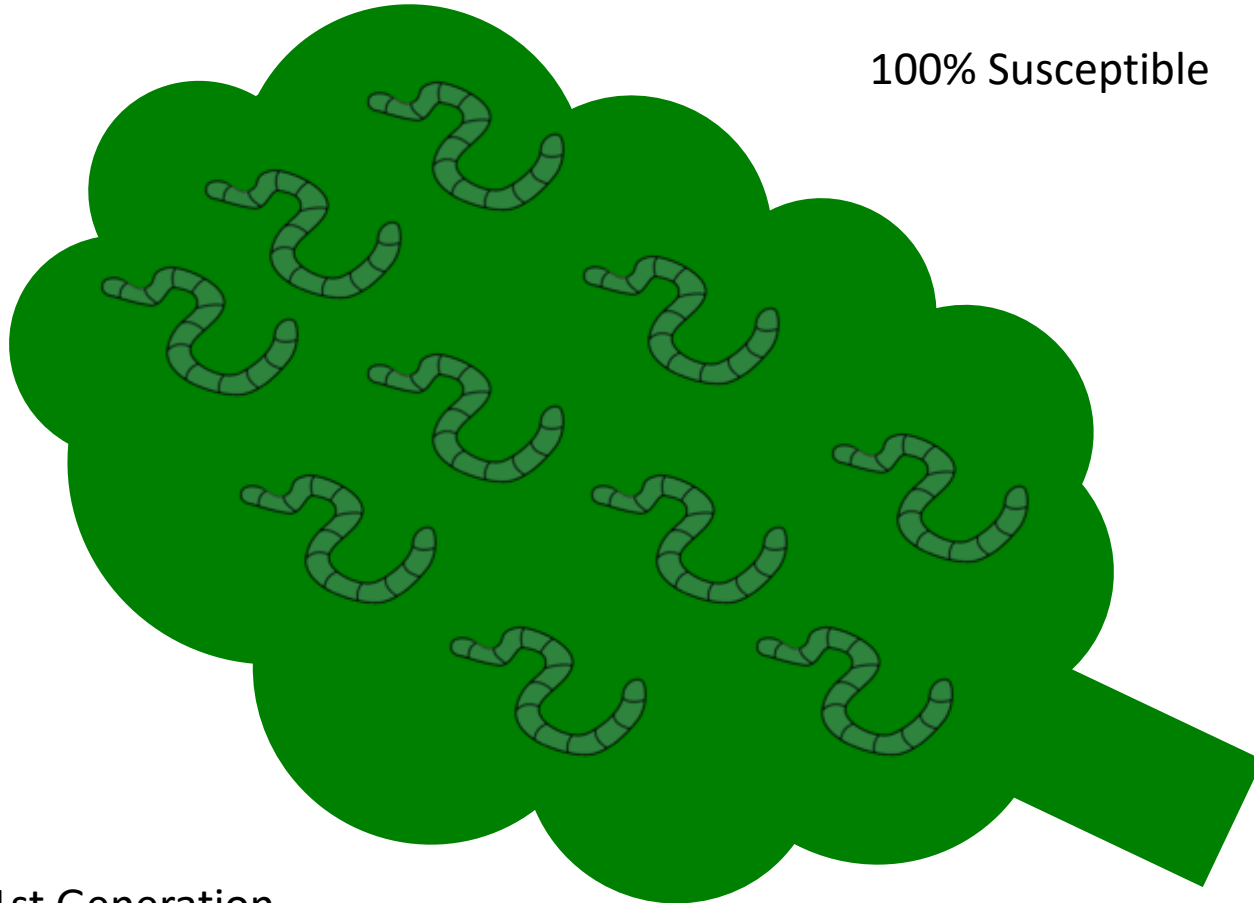


Damage

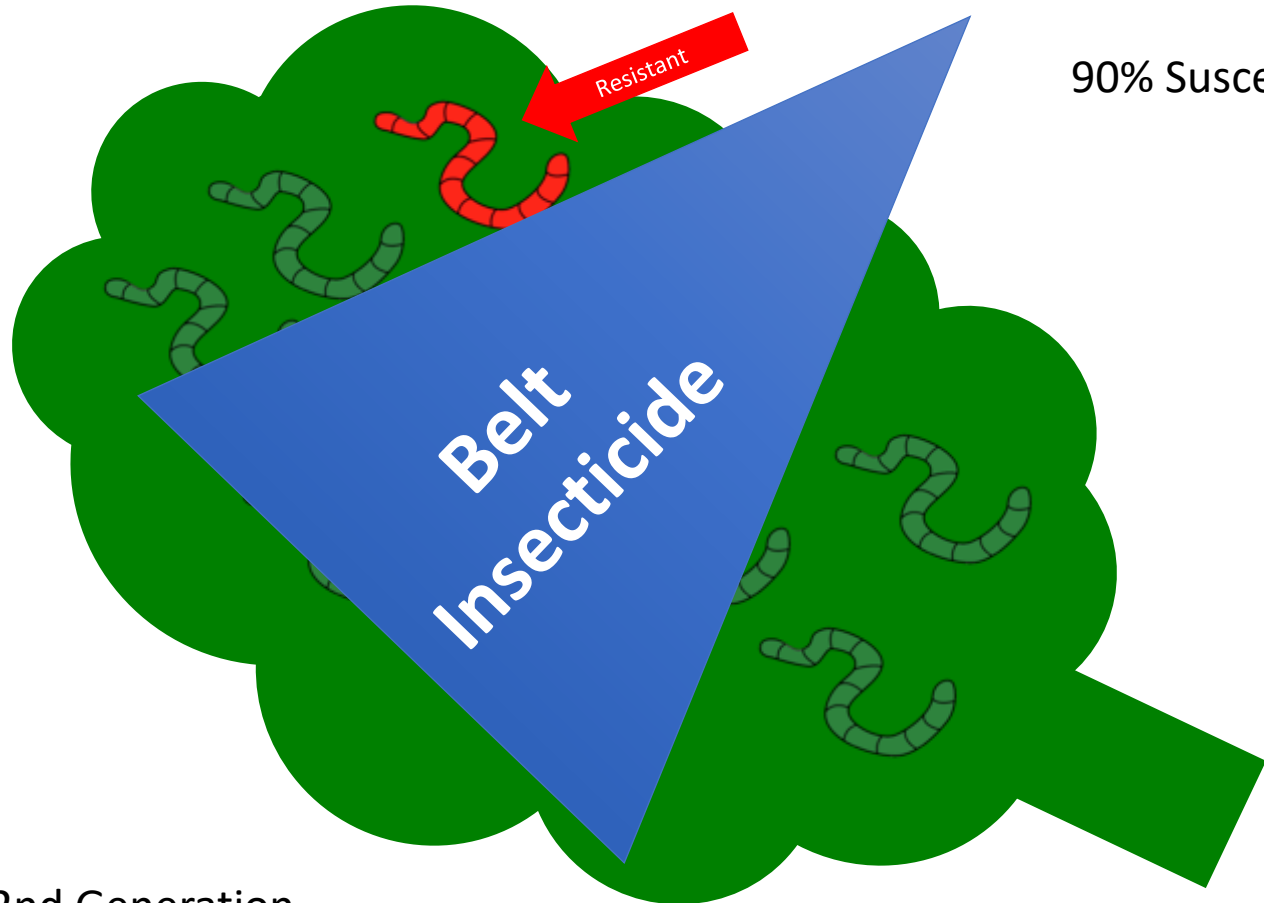




100% Susceptible



1st Generation



90% Susceptible

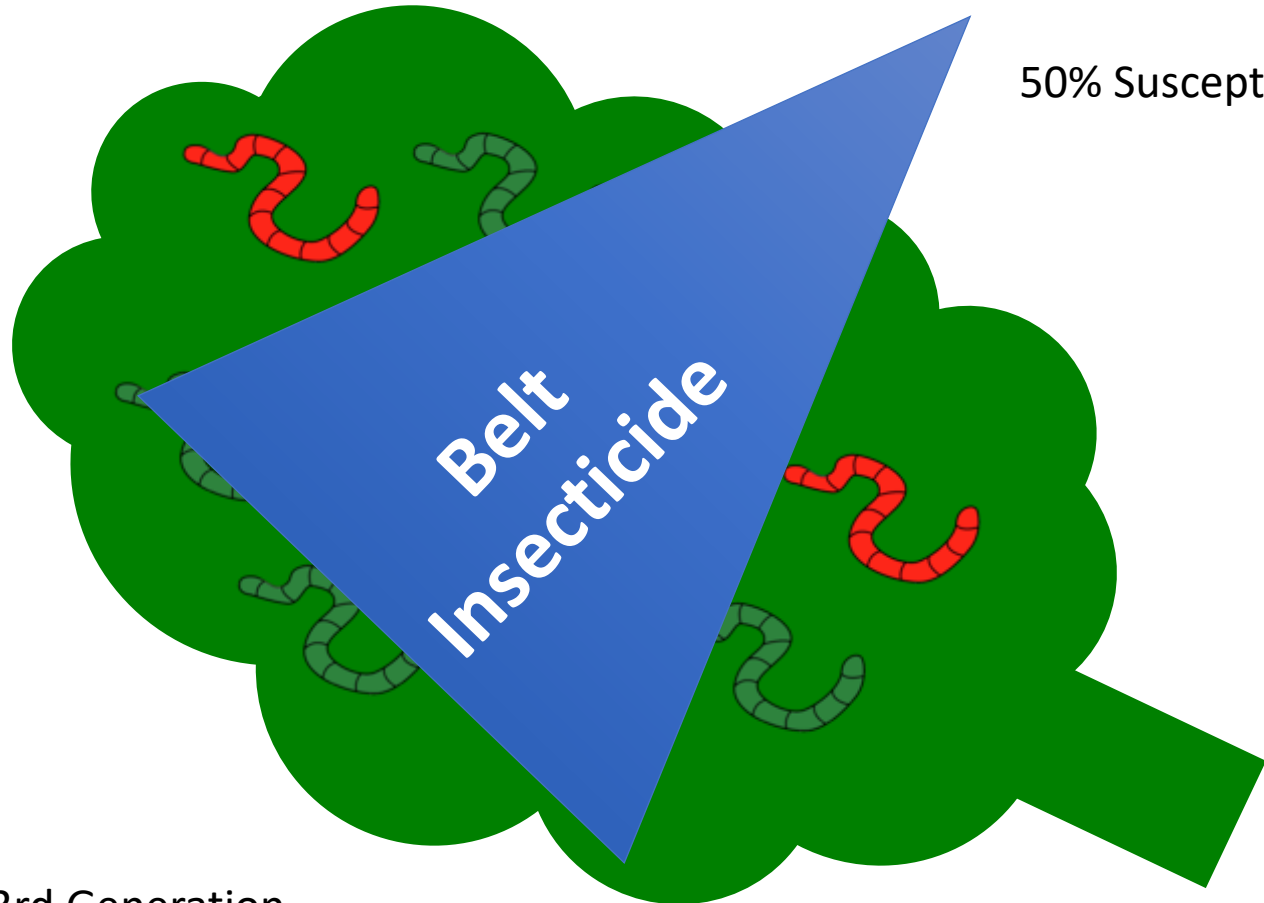
2nd Generation



20% Kill



2nd Generation

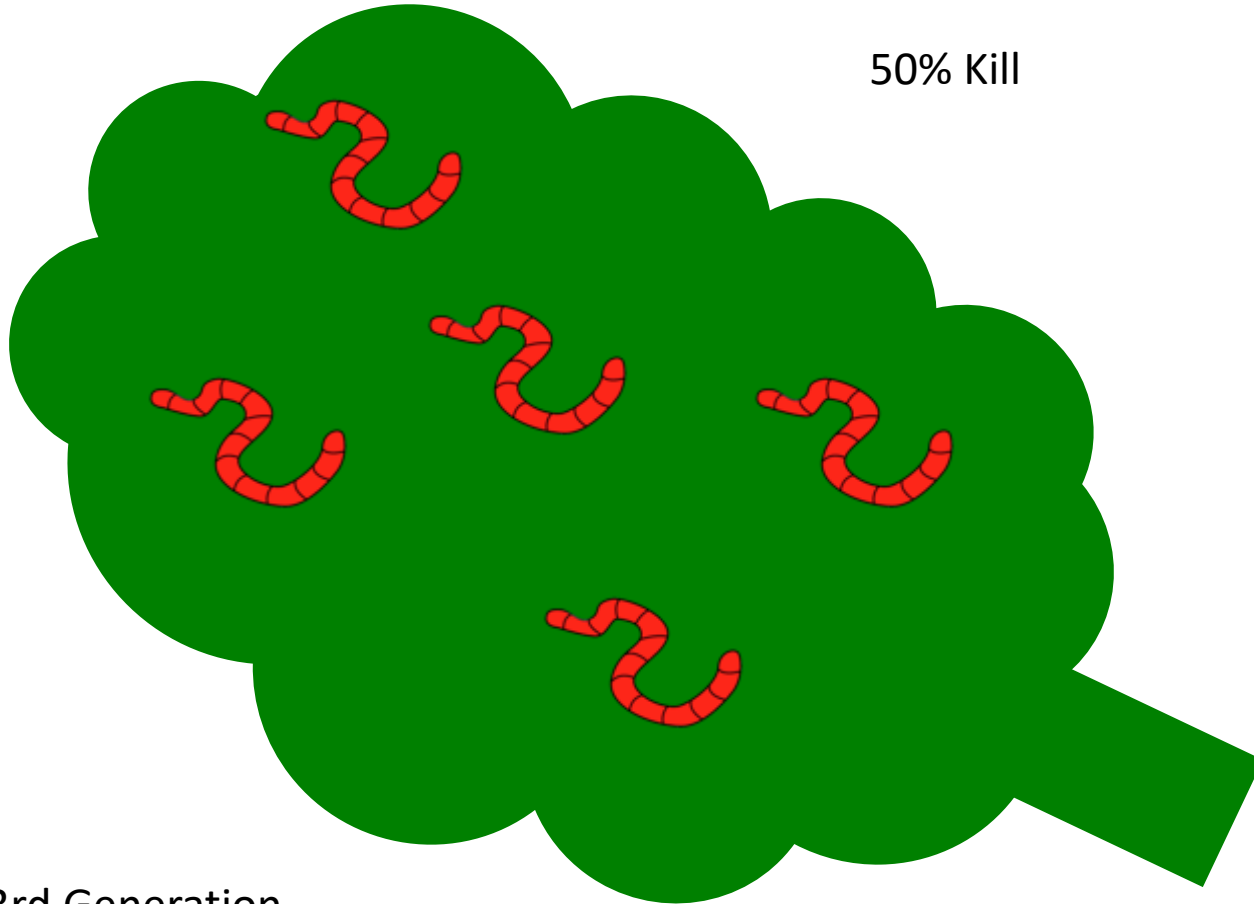


50% Susceptible

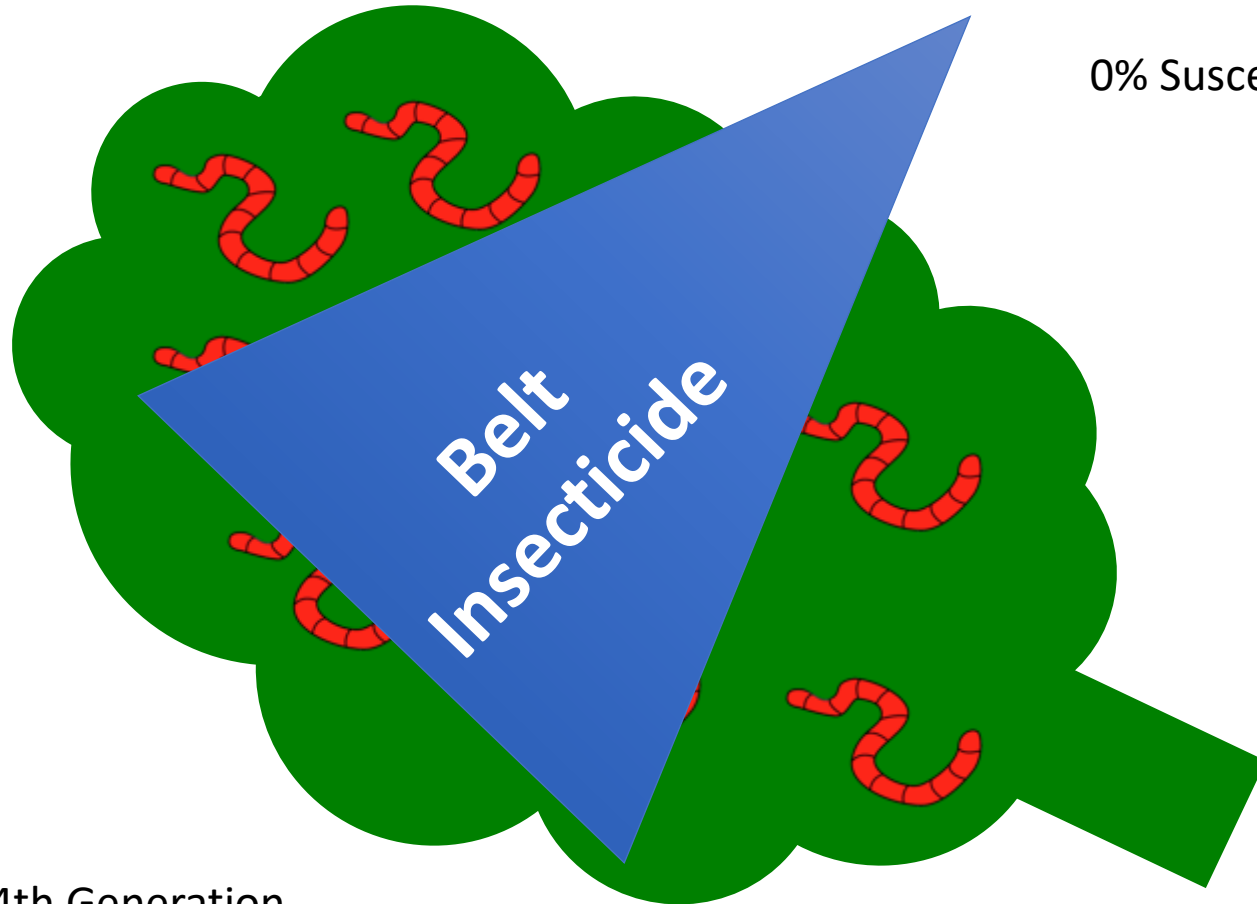
3rd Generation



50% Kill



3rd Generation

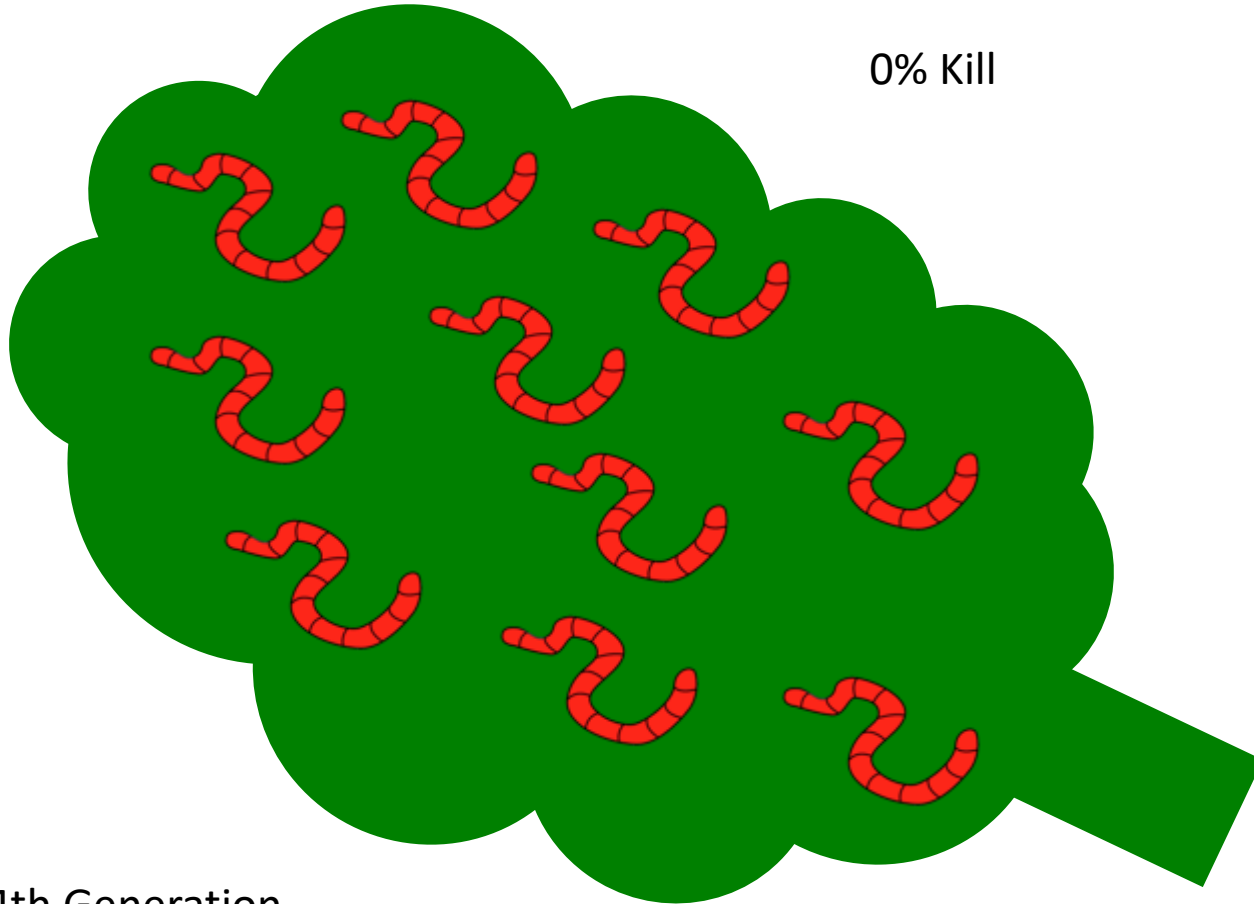


0% Susceptible

4th Generation



0% Kill



4th Generation



DBM Bioassays





DBM Products List

- Proclaim
- Avaunt
- Radiant
- Rimon
- Diamides
 - Belt, Coragen, Vetica, Synapse, Verimark, Exeril



Proclaim

- **Group 6**
- Active Ingredient
 - Emamectin benzoate
- Rate
 - 4.8 oz/A
 - 28.8 oz./A per crop per season. (6 applications)
- Do not make more than 2 sequential applications w/out rotating with another worm controlling product with a different mode of action.



Avaunt

- **Group 22**
- Active Ingredients
 - Indoxacarb
- Cleared for use on Cabbage (tight head varieties only)
- Rates
 - 3.5 oz./A (Do not make more than 6 applications/year)
 - 14 oz./A per season. (4 applications)



Radiant

- **Group 18**
- Active Ingredient
 - spinetoram
- Rates for foliar application
 - 10.0 oz./A
 - 34 fl.oz. per acre per crop. (3 applications)
 - Do not make more than 6 applications per calendar year.
 - Do not make more than 2 sequential applications w/out rotating with another worm controlling product with a different mode of action.



Rimon

- **Group 15**
- Active Ingredient
 - Novaluron
- Rates for foliar application
 - 8 - 12.0 oz./A
 - 24 fl.oz. per acre per season. (2-3 applications)
 - Do not make more than 2 sequential applications w/out rotating with another worm controlling product with a different mode of action.



Belt

- **Group 28**
- Active Ingredients
 - Flubendiamide
- Application rates
 - 2.4 fl.oz./A (0.075 lb ai/A) per 5-day interval.
 - 7.2 fl oz per acre (0.225 lb ai/A) per crop season.
 - 3 applications



Coragen

- **Group 28**

- Active Ingredient

- Chlorantraniliprole

- Rate

- *Drip Chemigation* – 3.5 – 5.0 fl.oz/A.

- 10.0 oz./season (2 applications)

- *Foliar*- 3.5 – 5.0 fl.oz/A.

- 15.4 oz./season (3-4 applications)

- 6 applications per farm per calendar year.



Torac

- **Groups 21**
- Active Ingredient
 - Tolfenpyrad
- Application rates
 - 21.0 oz./A
 - 42.0 oz./season (2 applications)



Bioassays





2018 Central Oahu Diamondback Moth Resistance Management Program

Month of:	Rotation Product
July	Proclaim
August	Avaunt
September	Rimon
October	Radiant
November	Torac
December	Proclaim



2018 West Oahu Diamondback Moth Resistance Management Program

Month of:	Rotation Product
July	Proclaim
August	Torac
September	Movento
October	Coragen
November	Xentari
December	Torac