

**“Target the Pest, Not the Rest[®]”, Novel *Bt galleriae* with
Cry8Da Protein (grubGONE![®], beetleGONE![®] &
boreGONE![®]) provides Selective Control of *Popillia*
japonica, *Agrilus planipennis*, *Hypera brunipennisi* and
Other Pests while Preserving Beneficial Insects**

Kurt Schwartau
Entomology Society of America
November 17, 2015

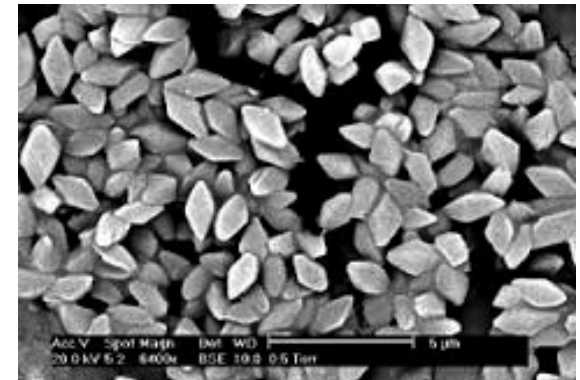


Bacillus thuringiensis (Bt)

- First isolated in 1901 by Ishiwatari from diseased silkworms then by Berliner from diseased flour moth larvae
- Bt galleriae SDS-502 isolated by Asano from diseased Japanese beetle
- (Over 82 distinct Bt serovars)
- Produces crystal composed of δ -endotoxin (Cry protein) during sporulation
- Spore/crystal mixtures used to produce microbial insecticides

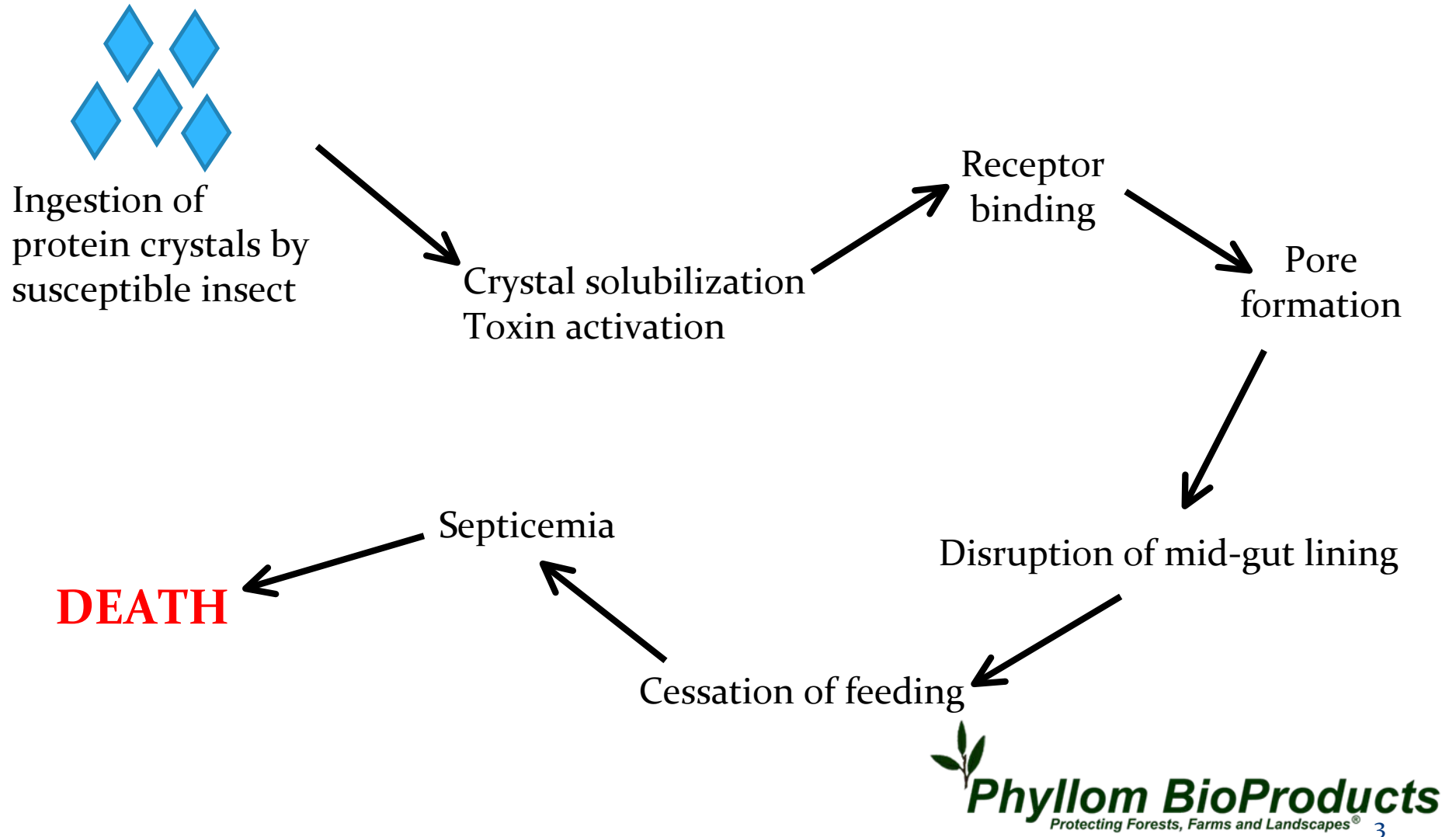


From
<http://bacillusthuringiensis.pbworks.com/w/page/9916080/FrontPage>



Microscopy by Jim Buckman

Bt Mode of Action





grubGONE!®, beetleGONE!® & boreGONE!®

Novel & Natural
Bacillus thuringiensis
galleriae SDS-502

Novel beetle active
Cry8Da protein

Soil and Foliar active
Btg formulas
EPA reg. 88347-2
EPA reg. 88347-3

No adverse risk for all
non targets tested for
EPA registration

40 CFR 180.1011
Exemption from
requirement of a
tolerance for edibles

grubGONE!®, beetleGONE!® & boreGONE!® delivery options based on pest target & life cycle

delivery
options

- Spread granules on surface
- Spray foliage by ground/air
- Spray soil surface or T band in furrow
- Apply via biogation
- Pre-mix with soil media



Coleopteran Pests controlled by grubGONE!, beetleGONE! or boreGONE!

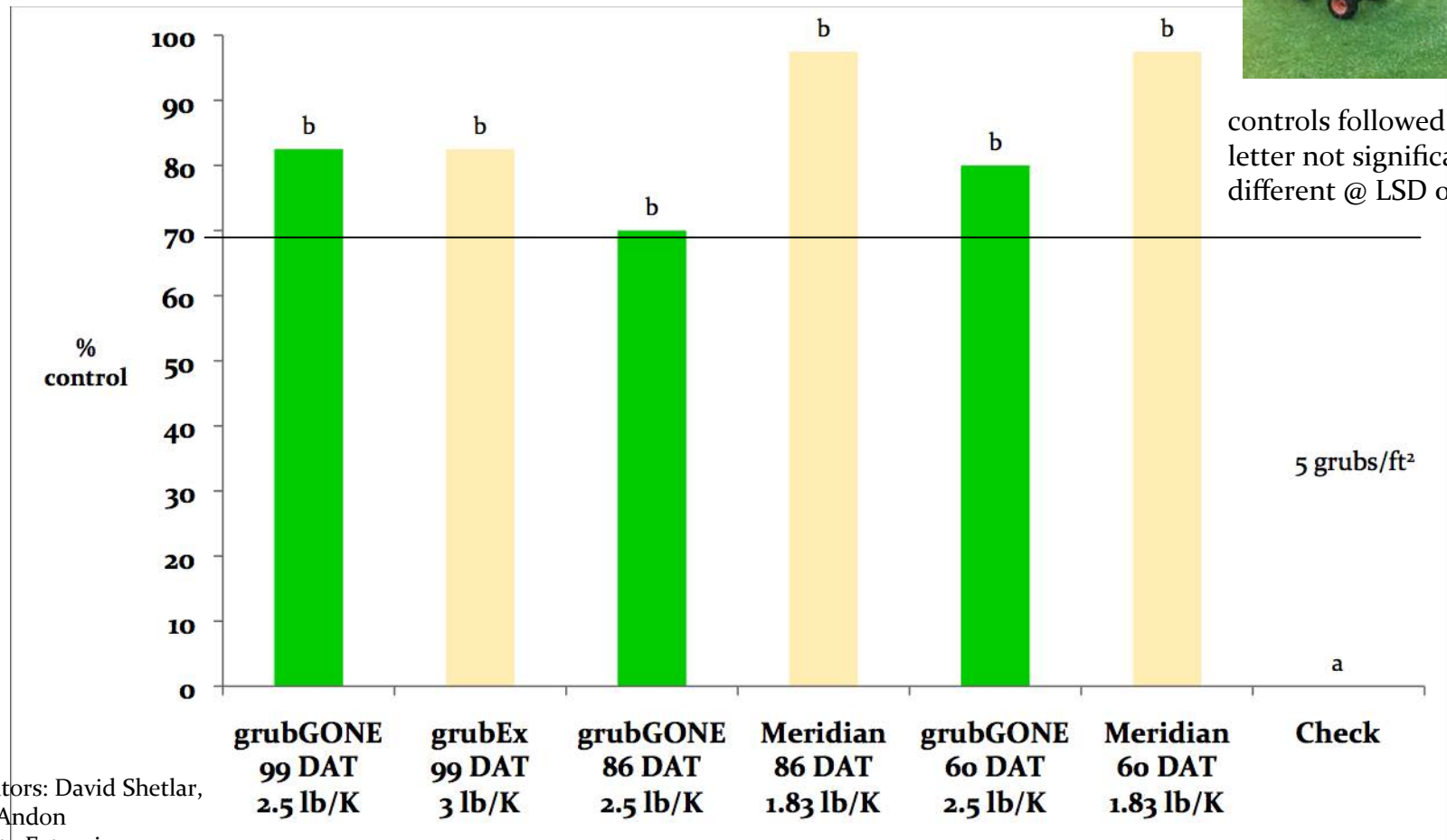
Family	Common Name	Latin Name	Stage
Scarabaeidae	Asiatic garden beetle	<i>Maladera Castenea</i>	adult/larva
	Japanese beetle	<i>Popillia japonica</i>	adult/larva
	May/June beetle	<i>Phyllophaga spp.</i>	larva
	Green June beetle	<i>Cotinis nitida</i>	adult/larva
	Oriental beetle	<i>Anomala orientalis</i>	adult/larva
	European chafer	<i>Rhizotrogus majalis</i>	larva
	N. masked chafer	<i>Cyclocephala borealis</i>	larva
	S. masked chafer	<i>Cyclocephala lurida</i>	larva
Cuculionidae	Annual bluegrass weevil	<i>Listronotus maculicollis</i>	larva
	Egyptian alfalfa weevil	<i>Hypera brunipennis</i>	larva
	Rice water weevil	<i>Lissorhoptrus oryzophilus</i>	larva
Chrysomelidae	Rice leaf beetle	<i>Oulema oryzae</i>	larva
	Alder leaf beetle	<i>Agelastica alni</i>	adult
Buprestidae	Emerald ash borer	<i>Agrilus planipennis</i>	Adult
	Gold spotted oak borer	<i>Agrilus auroguttatus</i>	Adult
Tenebrionidae	Darkling beetle	<i>Alphitobius diaperinus</i>	adult/larva

Successful control depends upon life cycle and feeding habits

grubGONE!® Japanese Beetle/Chafer Larval Control

Preventative vs. Curative compared to standards, Ohio 2011

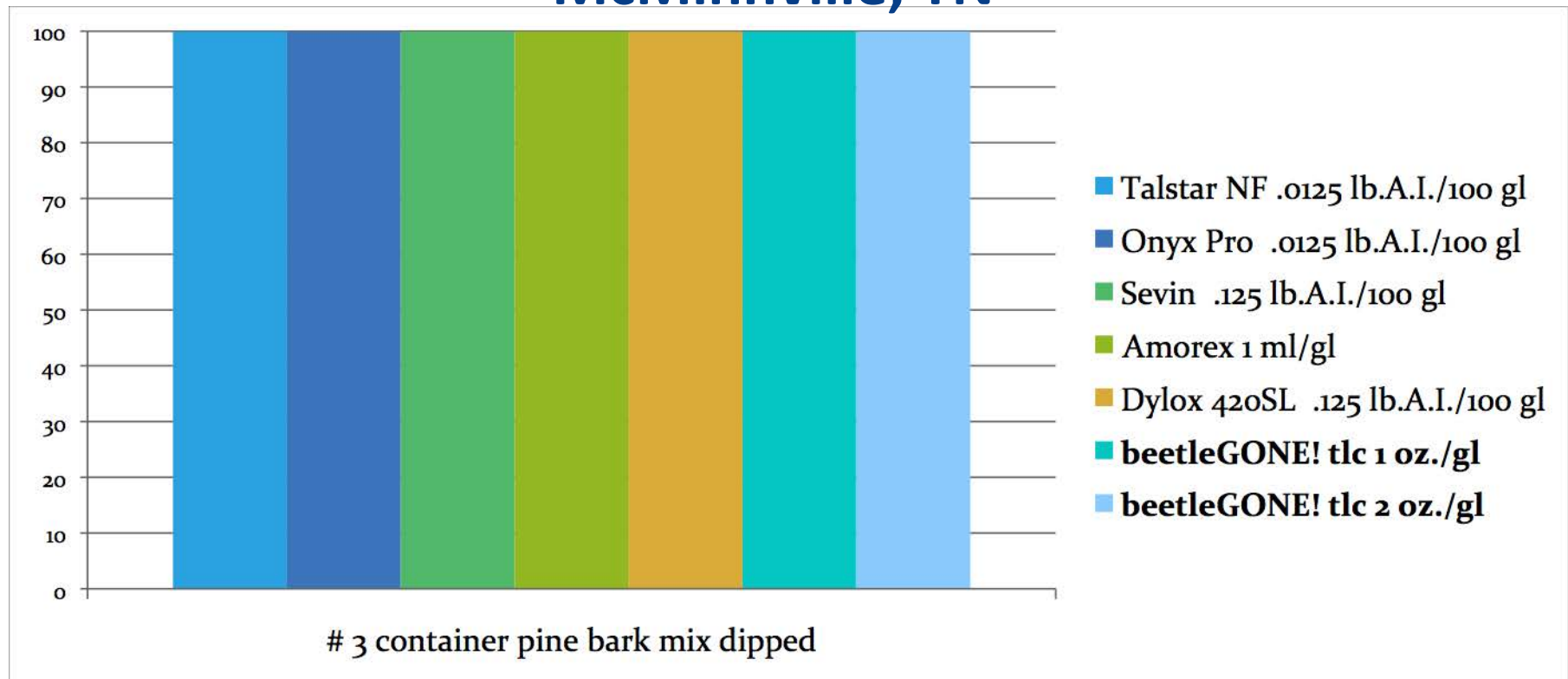
All Treatments Assessed Oct. 7th



Contributors: David Shetlar,
Jennifer Andon
Ohio State Extension

grubGONE! is a registered trademark of Phyllom BioProducts Corp. grubEX is a registered trademark of Scotts Co. Meridian is a registered trademark of Syngenta.

3rd Instar Japanese Beetle Grub % Control with October Nursery Insecticide Dip & Assessed 150 DAT McMinnville, TN

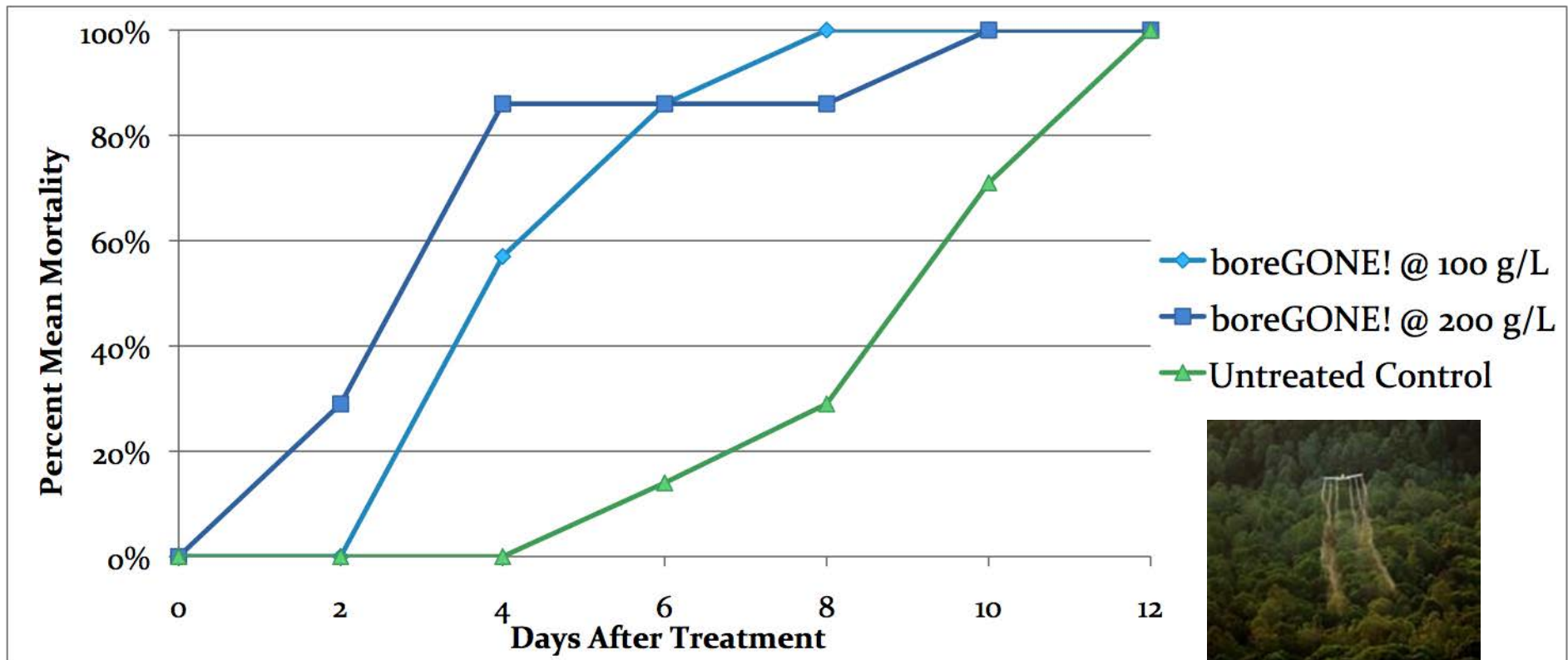


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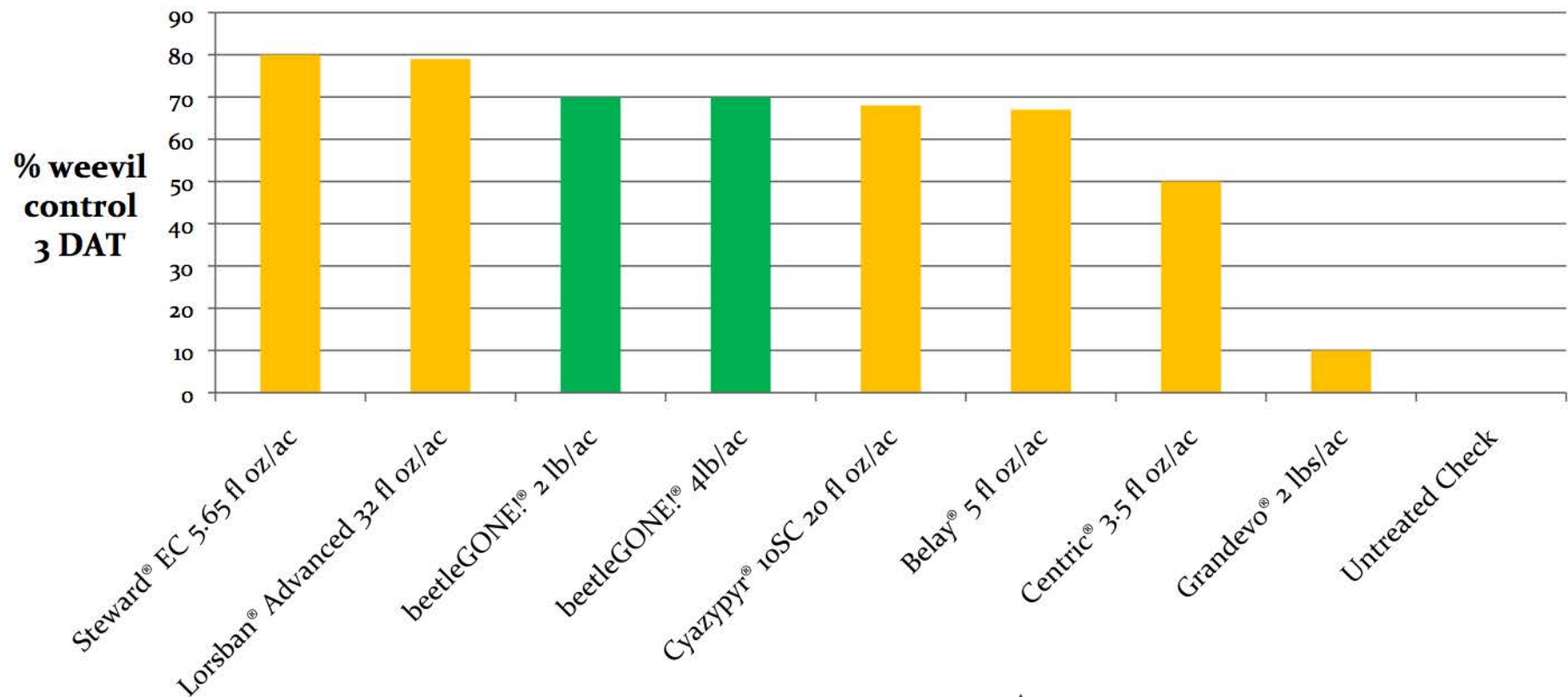
Adult Emerald Ash Borer Mortality Post boreGONE!® Treatment



Study conducted by Fredric Miller, PhD, Morton Arboretum and Joliet Junior College Dept. of Horticulture

beetleGONE!® Alfalfa Weevil IPM Study, UC Davis 2014

Larry Godfrey¹, Rachael Long², Kevin Gooding¹,
¹UC Davis, Entomology & Nematology; ²Yolo Co., UCCE





Conclusions

grubGONE!®, beetleGONE!® & boreGONE!®

- Provide effective & selective control of certain susceptible Coleoptera spp. with minimal harm to non targets and the environment
- Meet an urgent need for effective new insecticide A.I.s



Questions?

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