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Turf love: Challenges and opportunities in the residential arena

Michael Brownbridge and Pam Charbonneau



Ontario's Cosmetic Pesticides Ban

- Pesticides cannot be used for cosmetic purposes on lawns, vegetable and ornamental gardens, patios, driveways, cemeteries, and in parks and school yards; **there are no exceptions...**
- >250 pesticide products banned for sale
- >95 pesticide ingredients banned for cosmetic uses

April 22, 2009

Contact Us | Français

document was published on April 22, 2009 and is provided for informational and research purposes.

News

[250+ Pesticides Banned For Cosmetic Uses](#)

The province has introduced new municipal pesticides bylaws to create one clear, transparent and understandable set of rules for the province.

Pesticides cannot be used for cosmetic purposes on lawns, vegetable and ornamental gardens, patios, driveways, cemeteries, and in parks and school yards. There are **no** exceptions for pest infestations (insects, fungi or weeds) in these areas, as lower risk pesticides, biopesticides and alternatives to pesticides exist. More than 250 pesticide products are banned for sale and over 95 pesticide ingredients are banned for cosmetic uses.

Exceptions

- **Public health or safety:** Pesticides can be used to control plants that are poisonous to humans or animals, insects that bite, sting, are venomous or are disease

news.ontario.ca/en/2009/03/250-pesticides-banned-for-cosmetic-uses.html

7:52 PM
11/11/2014

Pest management

Five years after the ban, where are we?

- Moved from pest and weed 'control' to 'management'
- 'Preventative' vs 'curative' actions
 - Healthy soil, healthy lawn first
- New management tools
 - Integrated lawn management strategy
 - Greater emphasis on the 'system'
 - Biopesticides and reduced-risk insecticides
 - Understanding the pest and the control agent(s)



Pest management in residential areas

Primary pests

Review research for:

- White grubs
 - European chafer
 - Japanese beetle
- Chinch bug
- Leatherjackets



Lawn Maintenance

- Cut
- Water
- Aerate
- Seed
- Feed



Season-long activities
Establish a healthy, resilient lawn



Where did the grubs go in 2014?

- Winter kill?
- Cool, wet spring?
- Cyclical nature of many insect pests



White grubs

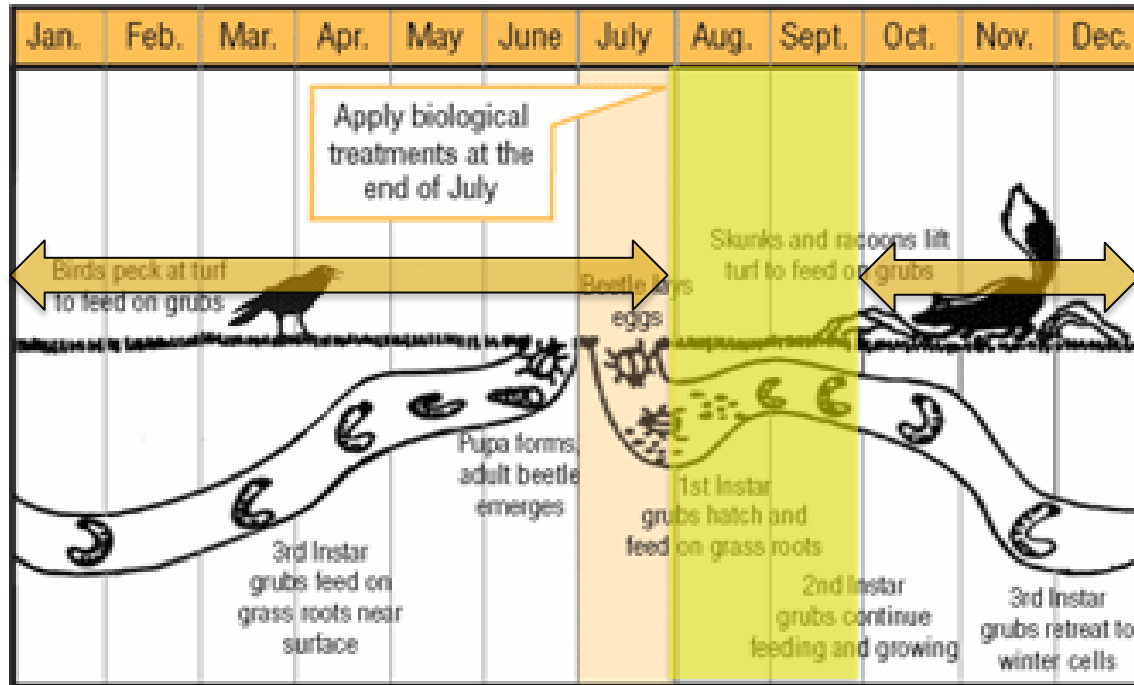
European chafer, Japanese beetle

'When white grubs are an issue, we know that turf that was damaged last year has, on average, about an 80% chance to suffer grub damage again'

- Turf Magazine - March, 2012



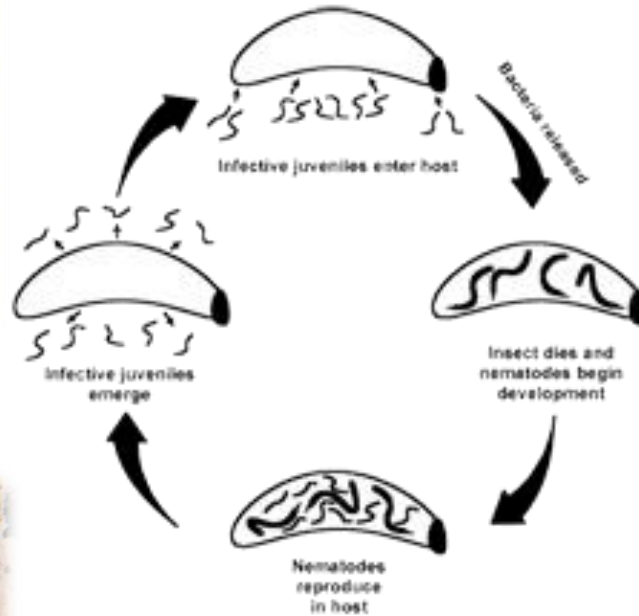
Life cycle and control



Eur. Chafer, Japanese beetle



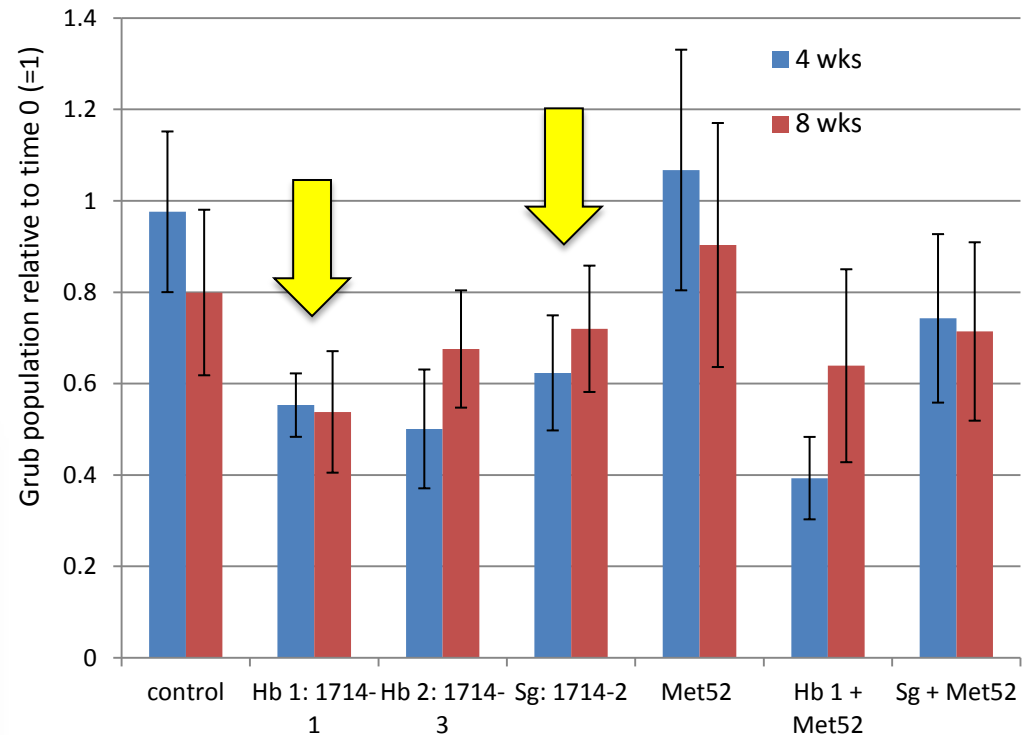
Grub control with nematodes



- *H. bacteriophora* (Hb)
- *S. glaseri* (Sg)

Successful grub control with nematodes

- Nematodes (Hb or Sg) provide 40-60% control
- Two consecutive applications (ca. 14d apart) more consistent
- Timing of application critical to efficacy – August in Ontario



Getting the best out of nematodes

- Refrigerate after purchase, limited shelf life
- Apply sufficient nematodes to a moist lawn
- Overcast conditions or evening application
- Irrigate lawn after application
- Nematodes a useful tool, not a 'silver bullet'



New management tools

Bt galleriae

MASTER LABEL

Phyllom grubGONE! G

Biological Insecticide Granule
Controls Annual White Grubs in Turf and
Ornamentals

ACTIVE INGREDIENT:

Bacillus thuringiensis subsp. *galleriae*, Strain SDS-502 fermentation
solids, spores and insecticidal toxins*..... 9.0% w/w

OTHER INGREDIENTS:..... 91.0% w/w

TOTAL:..... 100.0% w/w

*Contains a minimum of 1×10^8 CFU per gram.

**KEEP OUT OF REACH OF CHILDREN
WARNING - AVISO**

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle. (If you do not understand the label, find someone to explain it to you in detail.)

See side/back panel for additional precautionary statements.

Net Weight: _____ Lbs _____ Kg
Batch Number: _____

EPA Reg. No.: 88347-E
EPA Est. No.: 9198-OH-1

Manufactured for:
Phyllom, LLC
922 San Leandro Avenue, Ste. F
Mountain View, CA 94043
Tel: (650) 322-5000
E-mail: johnlibs@phyllom.com

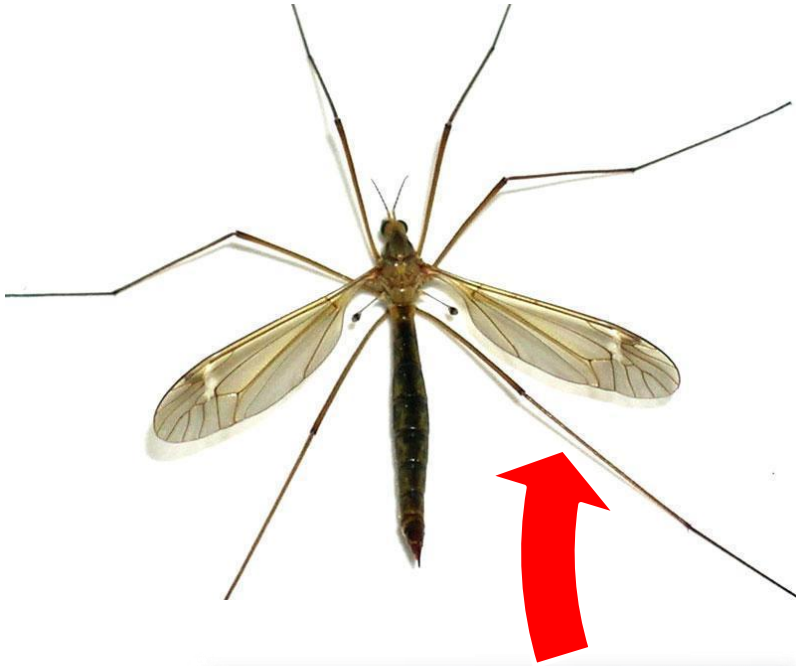


ACCEPTED

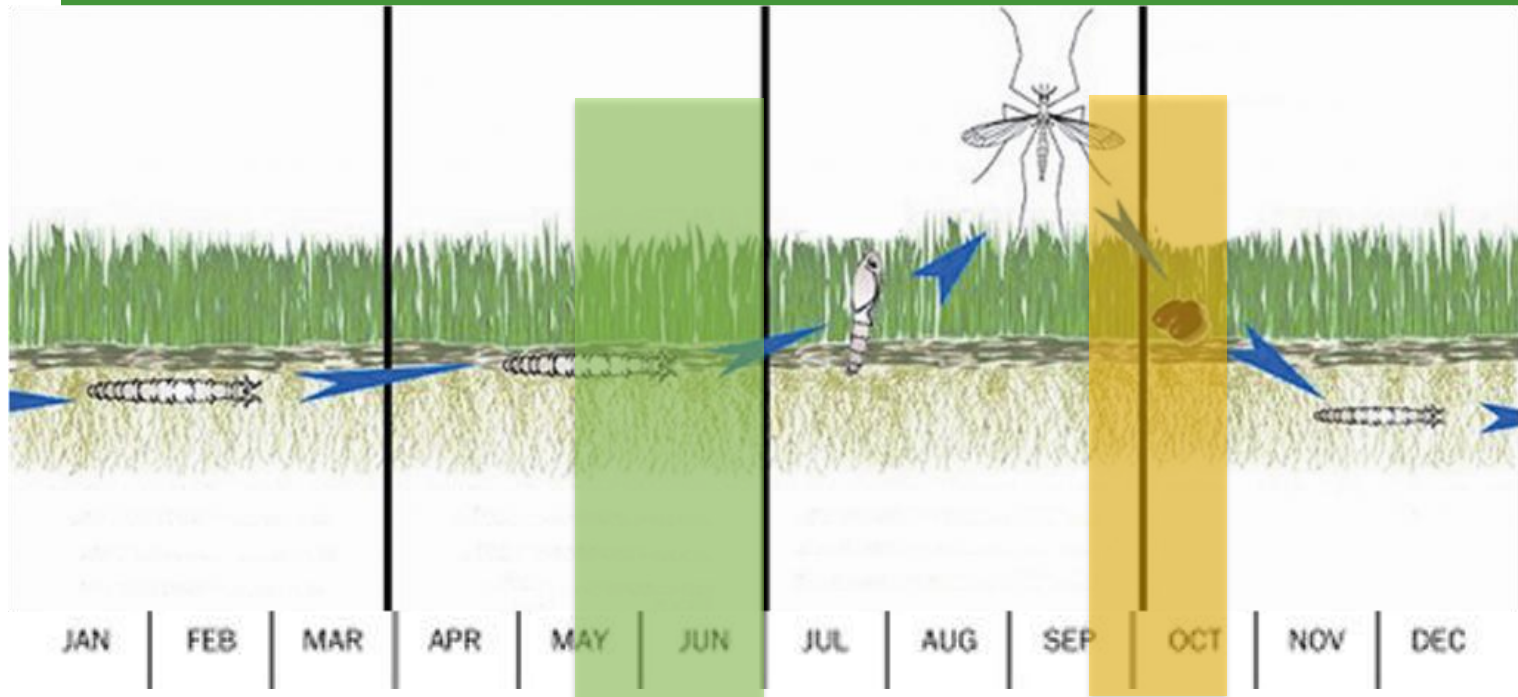
JUN 06 2013

European crane fly

Tipula paludosa



European crane fly



Leatherjacket control in home lawns

Nematodes

Early fall:

- *Steinernema feltiae*
 - 1,000,000/m²
- 50:50 mix of *S. feltiae* and *Heterorhabditis bacteriophora*
 - 500,000 each/m²

Spring

- *S. carpocapsae*
 - 1,000,000/m²
- *S. feltiae*
 - 2x at half rate, 7d apart



Hairy chinch bug

Blissus leucopterus hirtus



Chinch bugs



- Eggs May/June
- Nymphs June – July, adults July – Aug
- Crown and stem feeders
- Damage rapidly visible in hot, dry weather
 - sunny areas, well-drained soils



Monitoring

- Direct observation
 - Gently part the base of the grass
 - Adults ~4mm long; nymphs bright red
- Flootation method
 - Place 10 cm diam plug into bucket of water
 - Chinch bugs float to the surface;
 - ≥ 10 bugs/sample damage likely



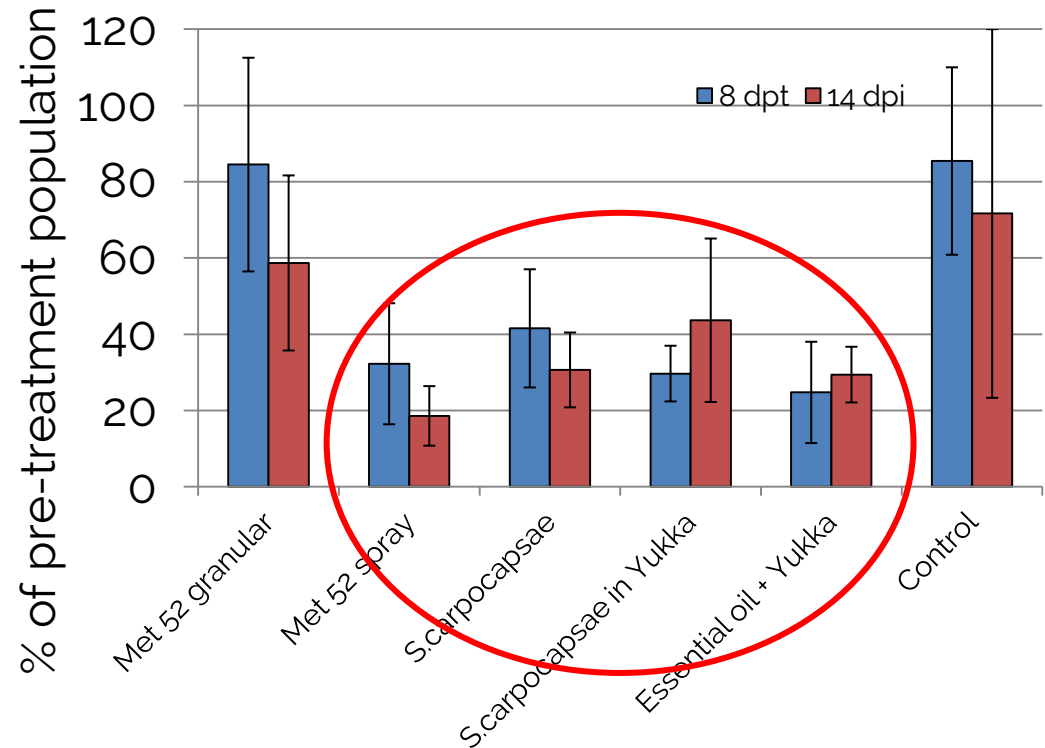
Chinch bug challenges



Biopesticide efficacy

2010, 2011 trials

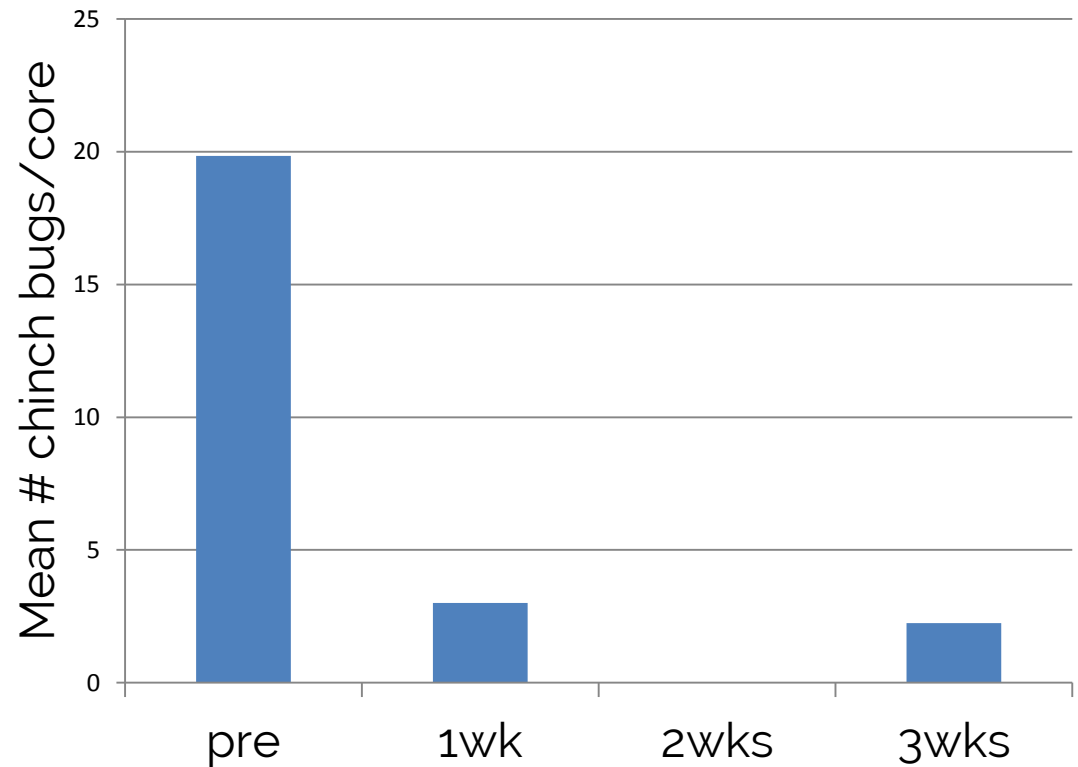
- *S. carpocapsae*
- Met52 (WP) spray
- Essential oil (rosemary)



Super Green 5

Based on rosemary oil

- Applied 1x as a spray
- Rapid knock-down
- Limited residual



'Bioceres'

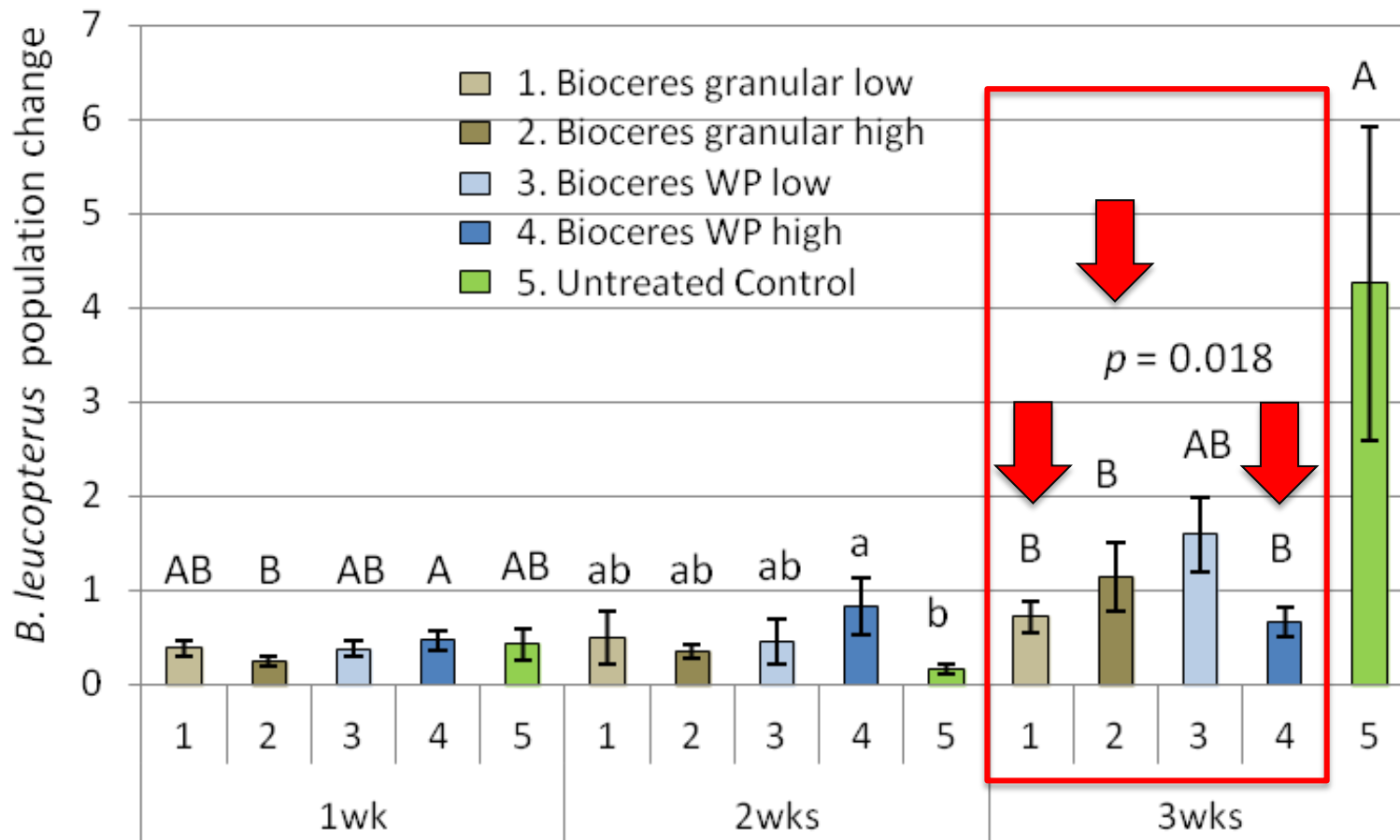
Beauveria bassiana

- WP and granules
- WP applied as a spray
 - 3x at weekly intervals
- Granules applied 2x
 - 14d apart



Biopesticide efficacy

'BioCeres' 2014



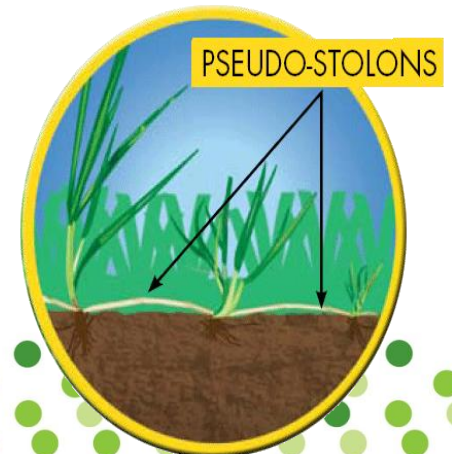
New grasses

- **'Creeping' grasses**

- Tall fescue
- Perennial ryegrass

- **Benefits**

- Faster establishment
- Denser establishment
- Deep extensive root system
 - Water, fertilizer
- Insect tolerance

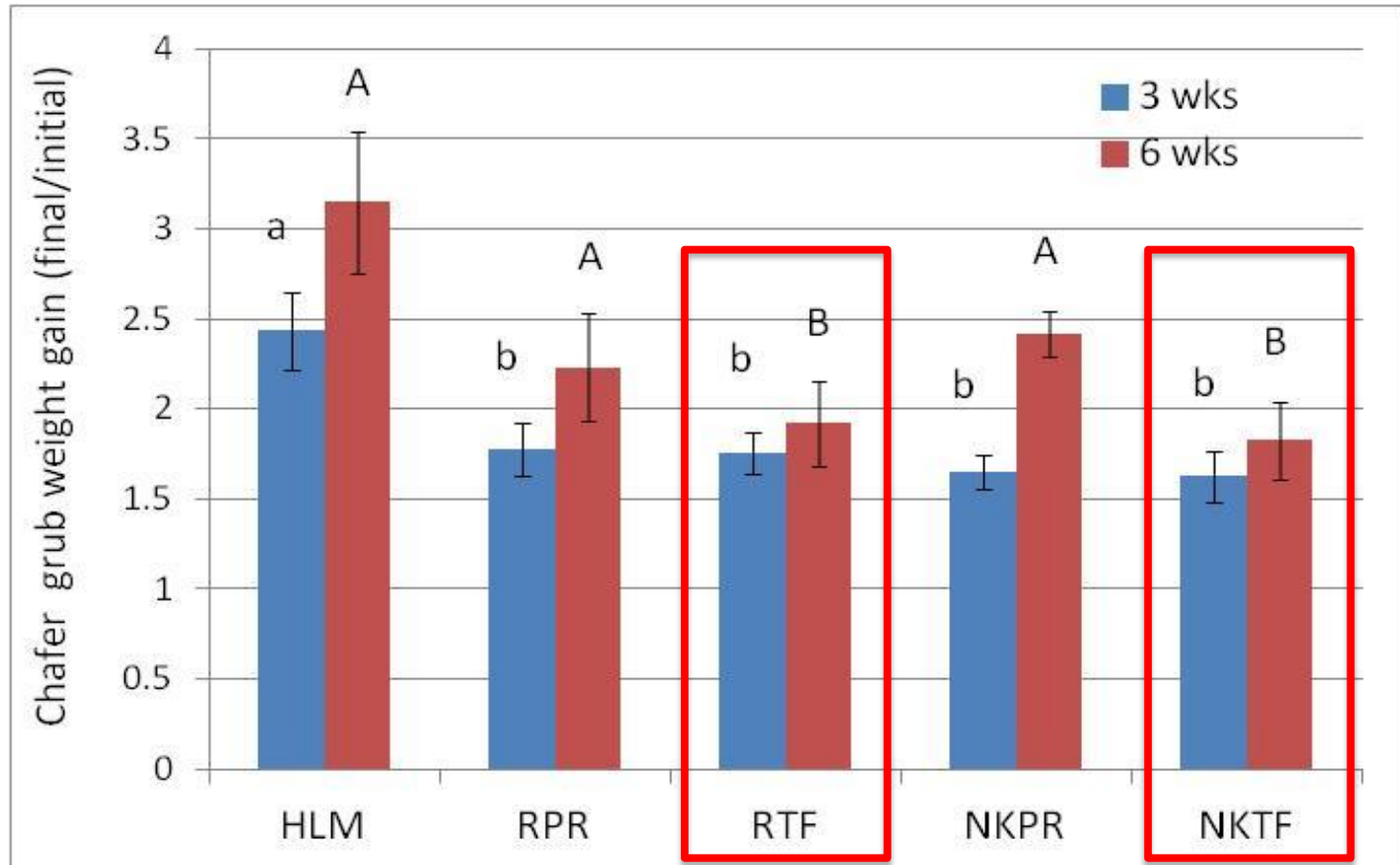


Endophytic grasses

- Can impact a range of insects
 - Chich, webworm...
- Effects if 35-40% of grasses carry the endophyte (US results)
 - Opportunities for overseeding
- Performance in Canada?

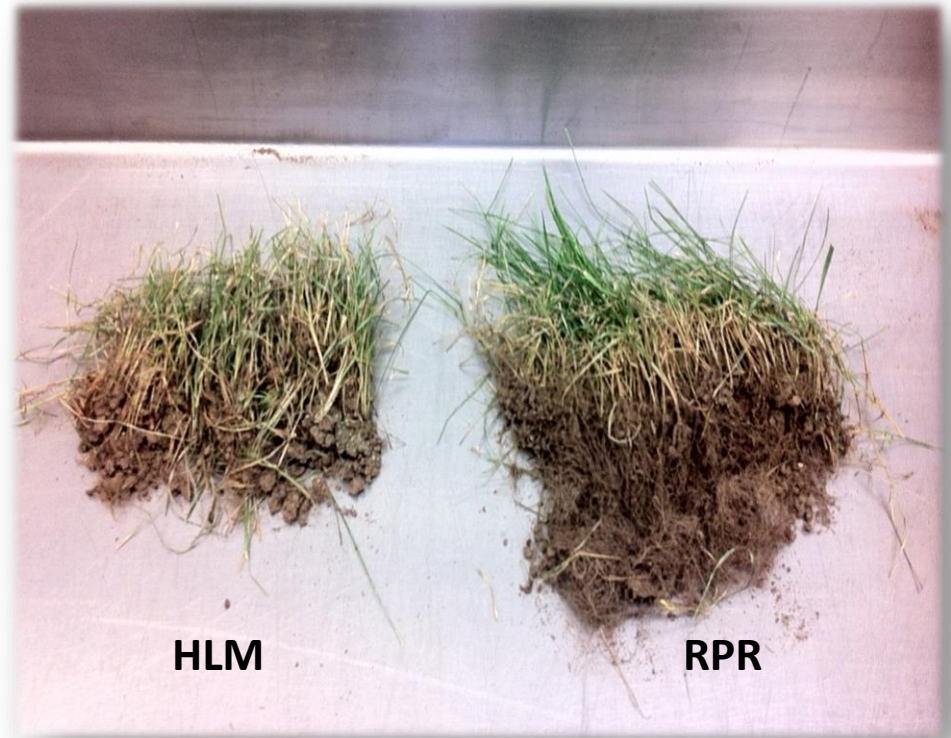


Effects of turfgrass on chafer growth



Chafer feeding preference

- Home lawn mix preferred over ryes and fescues
- Grubs fed on ryegrass roots when HLM roots consumed
- Overall, best performance seen in fescues



Performance of grasses in Ontario

- See *Pam Charbonneau*
This session at 12.30

'In Search of the Magic Bullet'



Other beneficial microbes

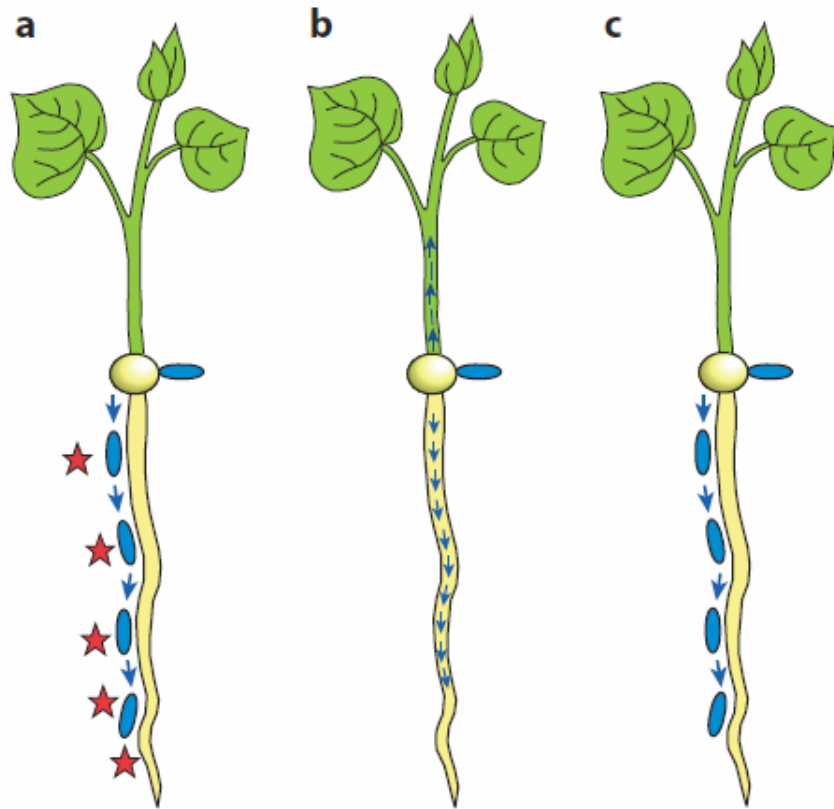
Root-colonizing microorganisms

A = Antibiosis

B = Induced resistance

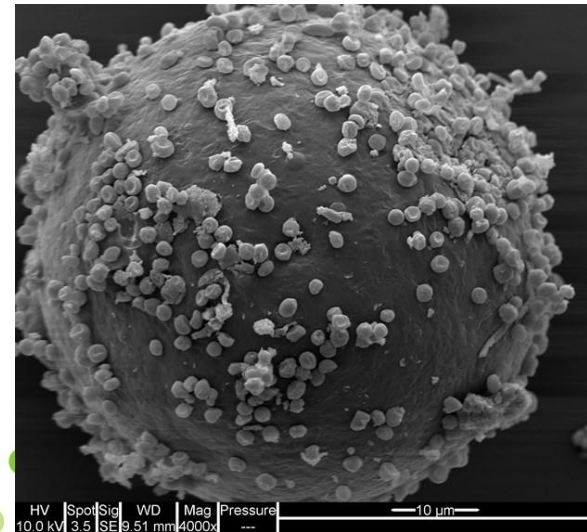
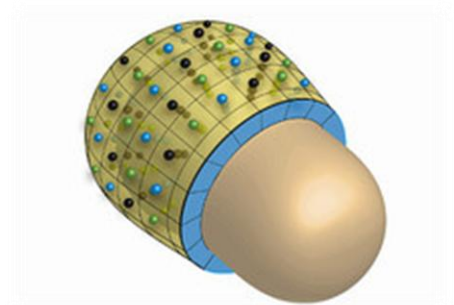
C = Competition

- Fungicidal
 - *Trichoderma* spp.
 - *Bacillus subtilis*
- Growth stimulation
 - Mycorrhizae
 - Rhizobia
- Insecticidal
 - *Metarhizium*



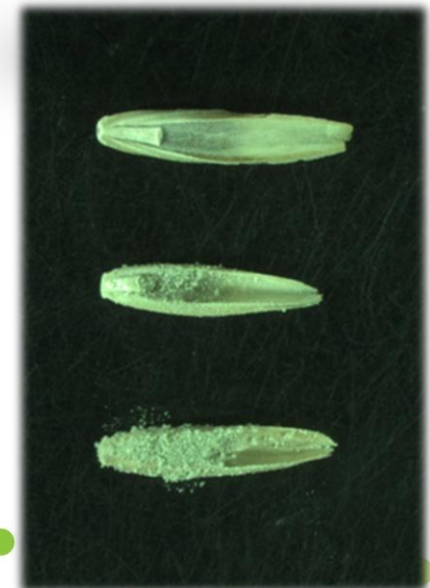
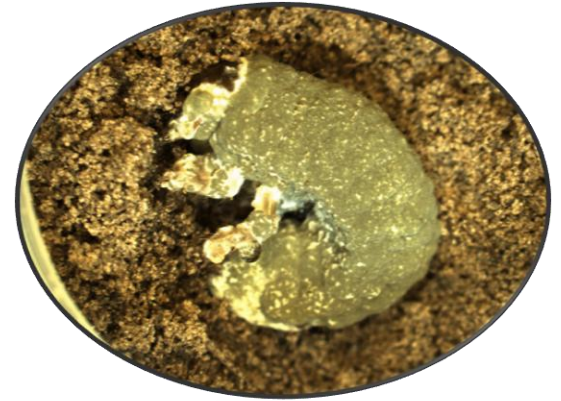
Application and use: seed coatings

- Spray, broadcast, inefficient
- Seed coating

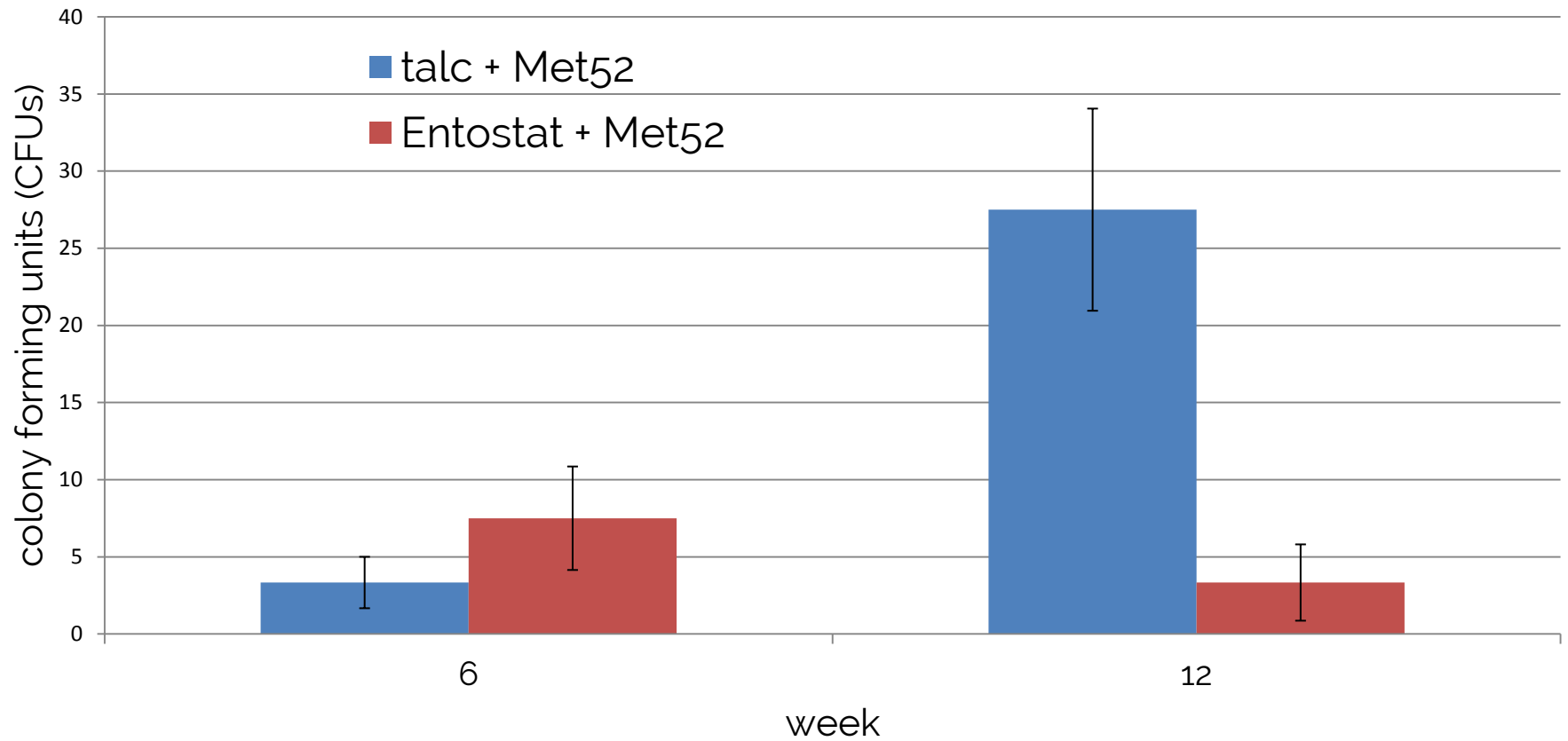


Metarhizium anisopliae

- Can you get enough spores on grass seeds?
- Does the fungus establish on roots?
- Does the plant benefit?
 - Growth
 - Stress tolerance
 - Protection against insect feeding

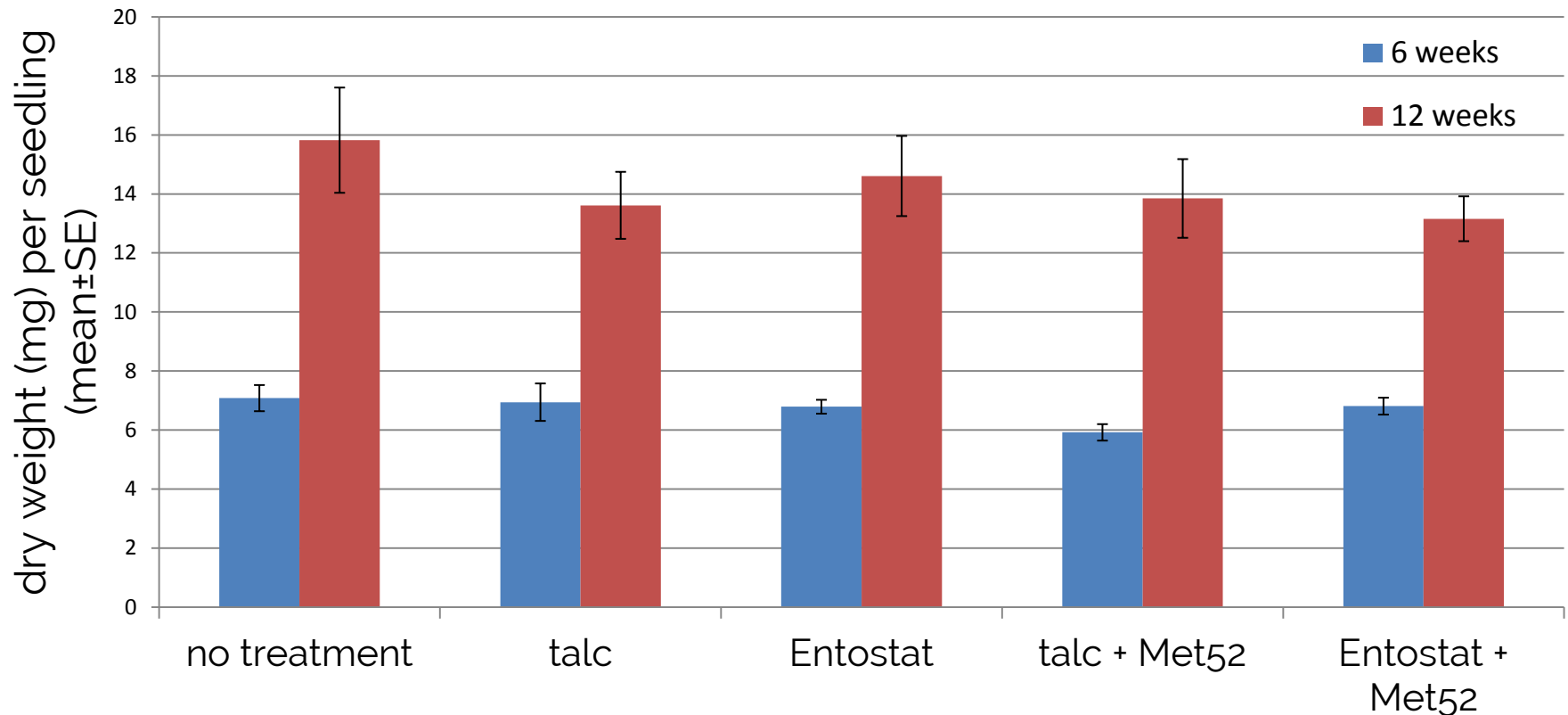


Root colonization



Effect of *Metarhizium* on grass growth

Seedling biomass after 6 and 12 weeks



Take-homes

- The pesticide ban has meant that lawn pest control has to be done differently
- Understand the pest and the 'needs' of the control agents
- Manage clients' expectations – difficult!
- Biopesticides provide 50-60% control
- Timing of application is critical to efficacy
- **Essential to take an integrated management approach**



Acknowledgements

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Contact Information: Michael Brownbridge

michael.brownbridge@vinelandresearch.com

vinelandresearch.com



@vinelandrsrch



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