

Can insecticide seed treatments protect carrots from damage by carrot weevil and carrot rust fly?

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Plant  Agriculture



Two major insect
pests of carrots in
Ontario and Quebec,
Canada

Carrot rust fly (*Psila
rosea* (Fabricius))

Diptera

Carrot weevil
(*Listronotus
oregonensis* (LeConte))

Coleoptera



Carrot rust fly damage



Carrot weevil damage



Carrot rust fly may be the most important of the two because the damage is harder to grade out





Carrot weevil



Both can cause major crop losses and cause fields to be abandoned and not harvested



Rust fly

Carrot rust fly

Overwinters as pupae in the soil. Adults emerge after 329 day degrees at base 3 C. Deposit eggs at the base of the carrot plant, larvae tunnel into the root

Two generations a year
Second generation of adults emerges at 1399 DD
Monitoring and insecticide application



Carrot rust fly management

Monitoring and insecticide application.

10 yellow/orange sticky traps per field, scouted 2x week

Spray threshold is very low:

0.1 fly/trap/day for fresh market carrots

0.2 for processing carrots



Carrot rust fly management



Recommended insecticides:

Diazinon

Ripcord and Upcyde (cypermethrin)

Matador (lambda cyhalothrin) – new minor use in 2009

Foliar sprays may not be effective for control

Carrot weevil

One generation a year –
mostly

Overwinters as adults in
vegetation at the edge of
fields.

Deposit eggs, starting at
138 DD at base 7,
in overwintering carrots
and carrot seedlings
90% egg deposition at 455
DD



Carrot weevil

One generation a year –
mostly, a second
generation has been
identified in Quebec

Monitoring with bait or
baited traps

1 or 2 sprays at 4 leaf
stage

Imidan (phosmet) and
(recently) Matador are
registered



Insecticides for control of carrot insects 2007- 2009



Entrust (spinosad 80%, 2.5, 3.75, or 7.5 g a.i.),

Cruiser (thiamethoxam 47.6%, 2.5 or 3.75 g a.i.)

Sepresto (clothianidin 56.25% plus imidacloprid 18.75%, 5.63 or 11.25 g a.i.)

Seed treatments applied with film coat at Prof. Alan Taylor's seed technology lab, Cornell University, Geneva, N.Y.

Insecticides for control of carrot insects 2009



Seed treatments Entrust, Cruiser and Sepresto

plus

Ripcord (cypermethrin)

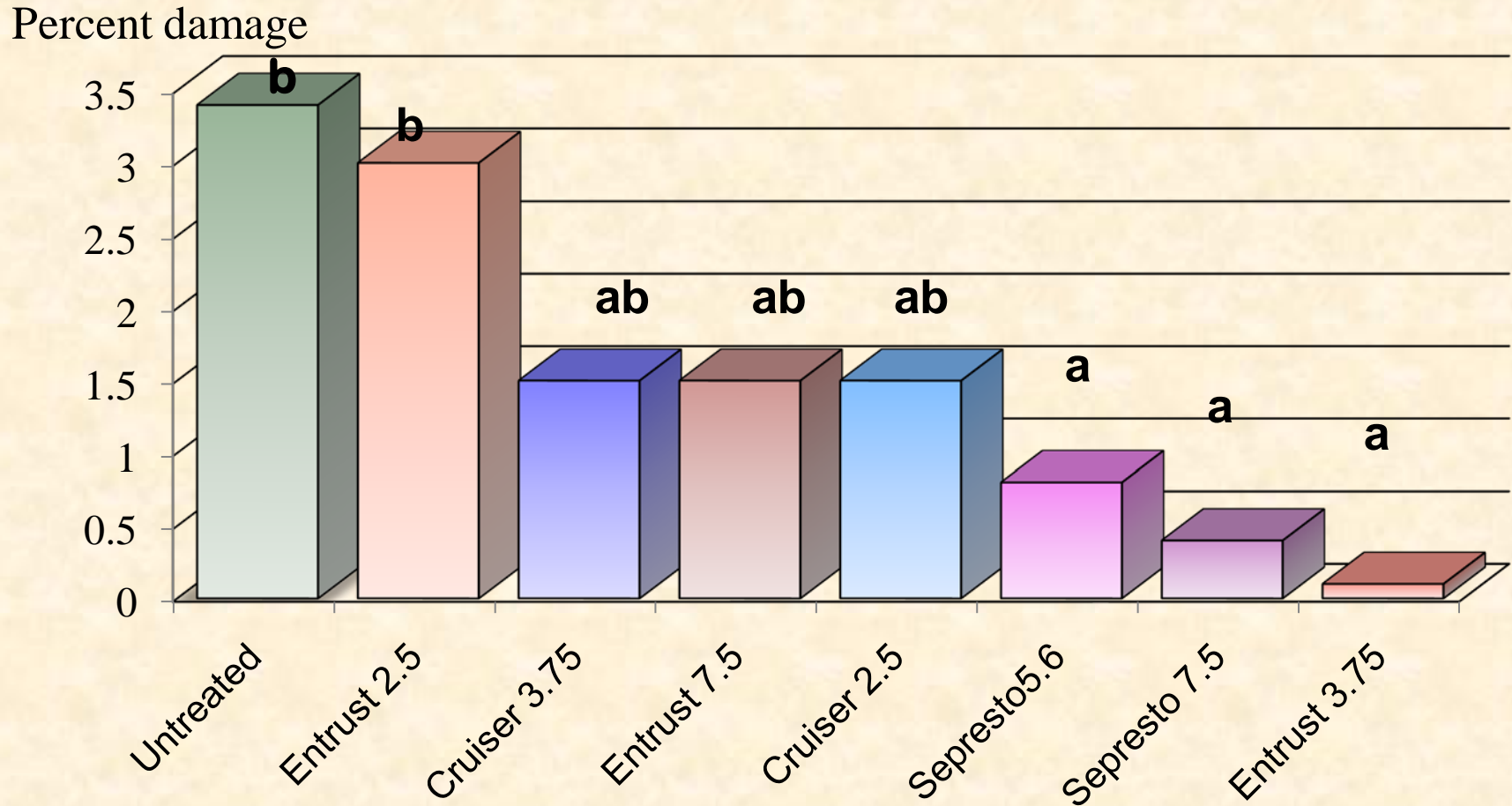
Perma Guard (diatomaceous earth)

and Movento (spirotetramat)

were sprayed 4 times, starting 8 Aug, to look at control of second generation carrot rust fly

Movento was sprayed twice in combination with seed treatments Entrust and Cruiser

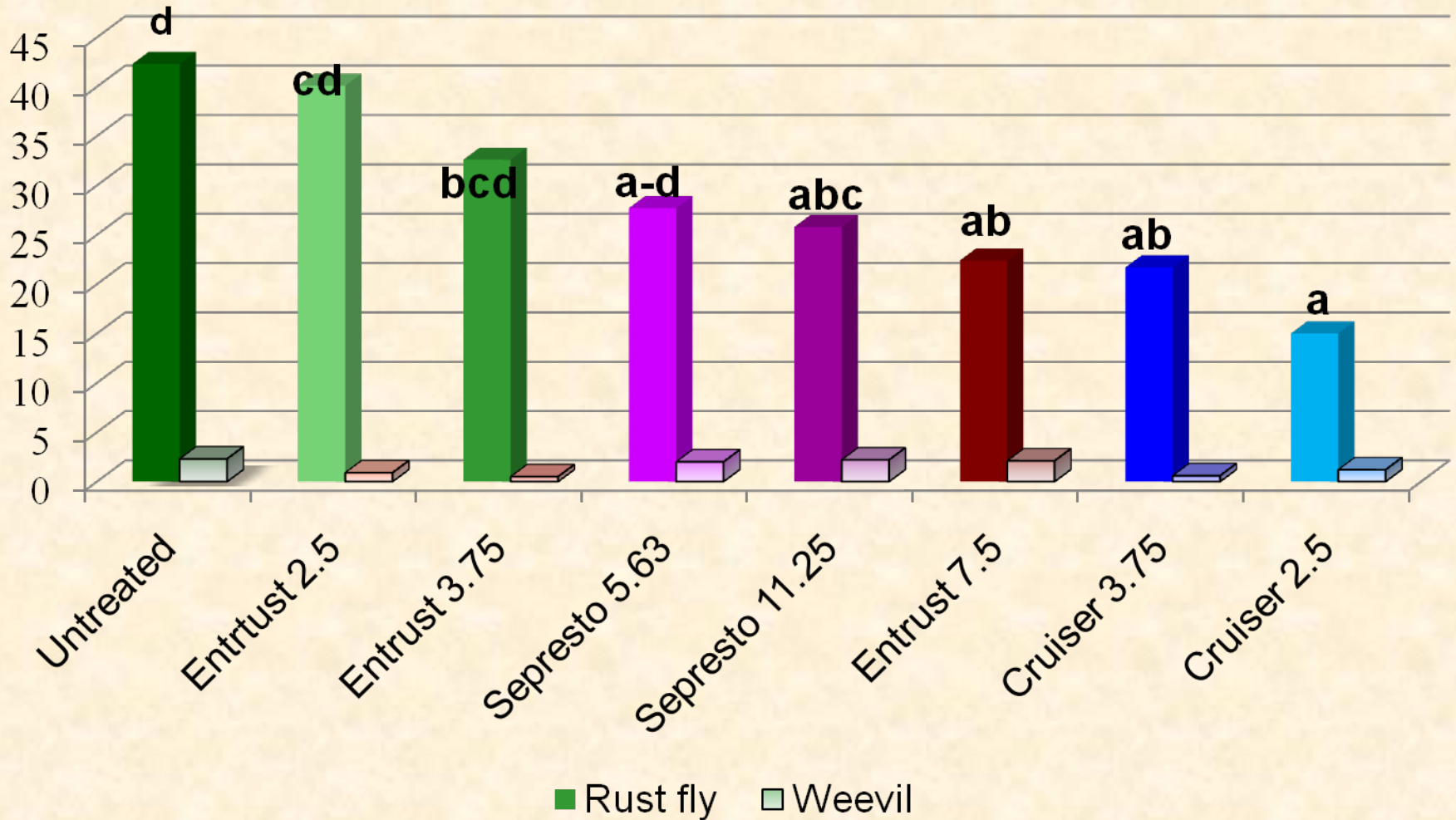
Insecticide seed treatments for control of carrot weevil 2007



Low levels of weevil damage, but some differences

Insecticide seed treatments for carrot insects 2008

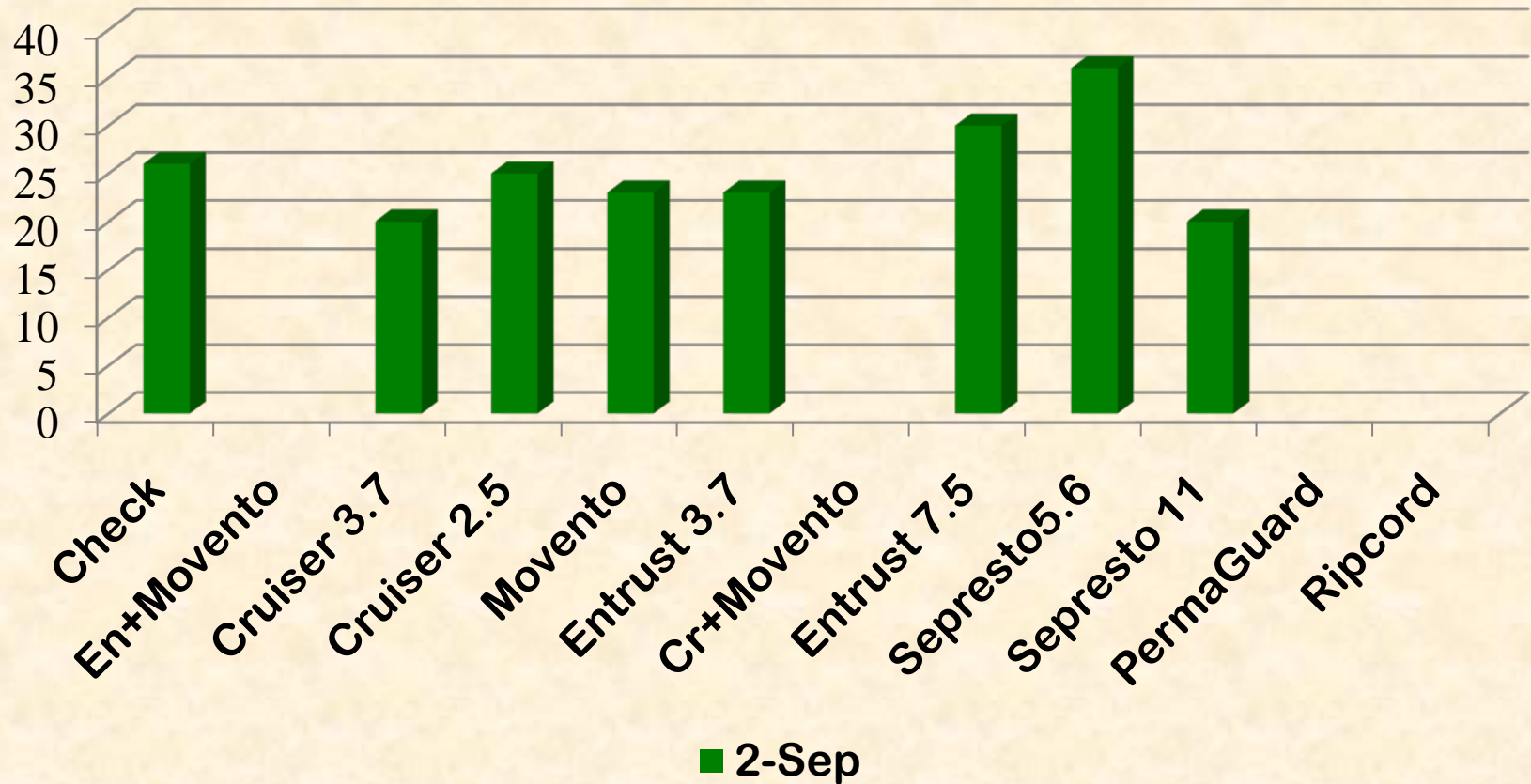
Percent damage



High rust fly damage, low weevil damage

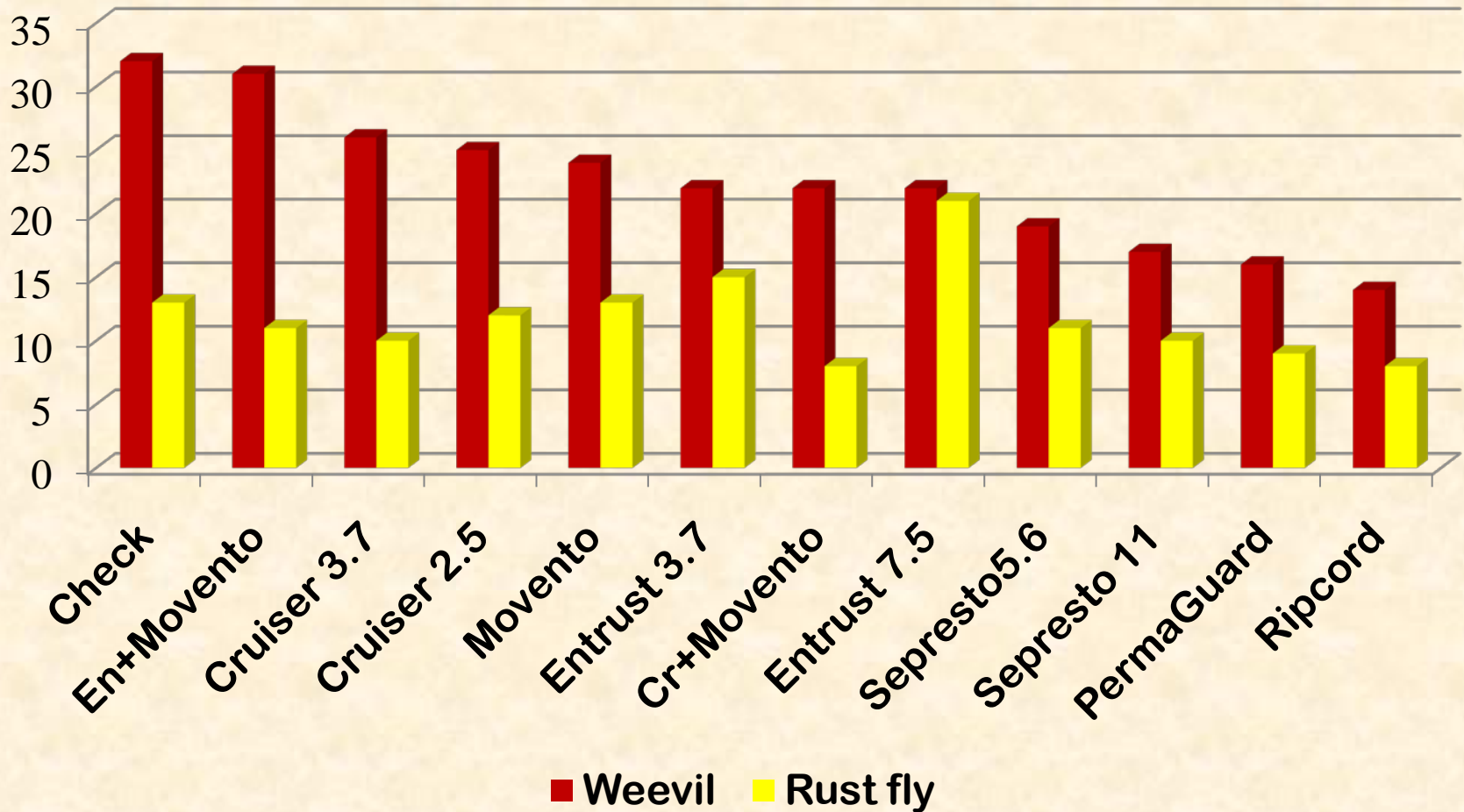
Total insect damage, early assessment Sept 2, 2009

2-Sep



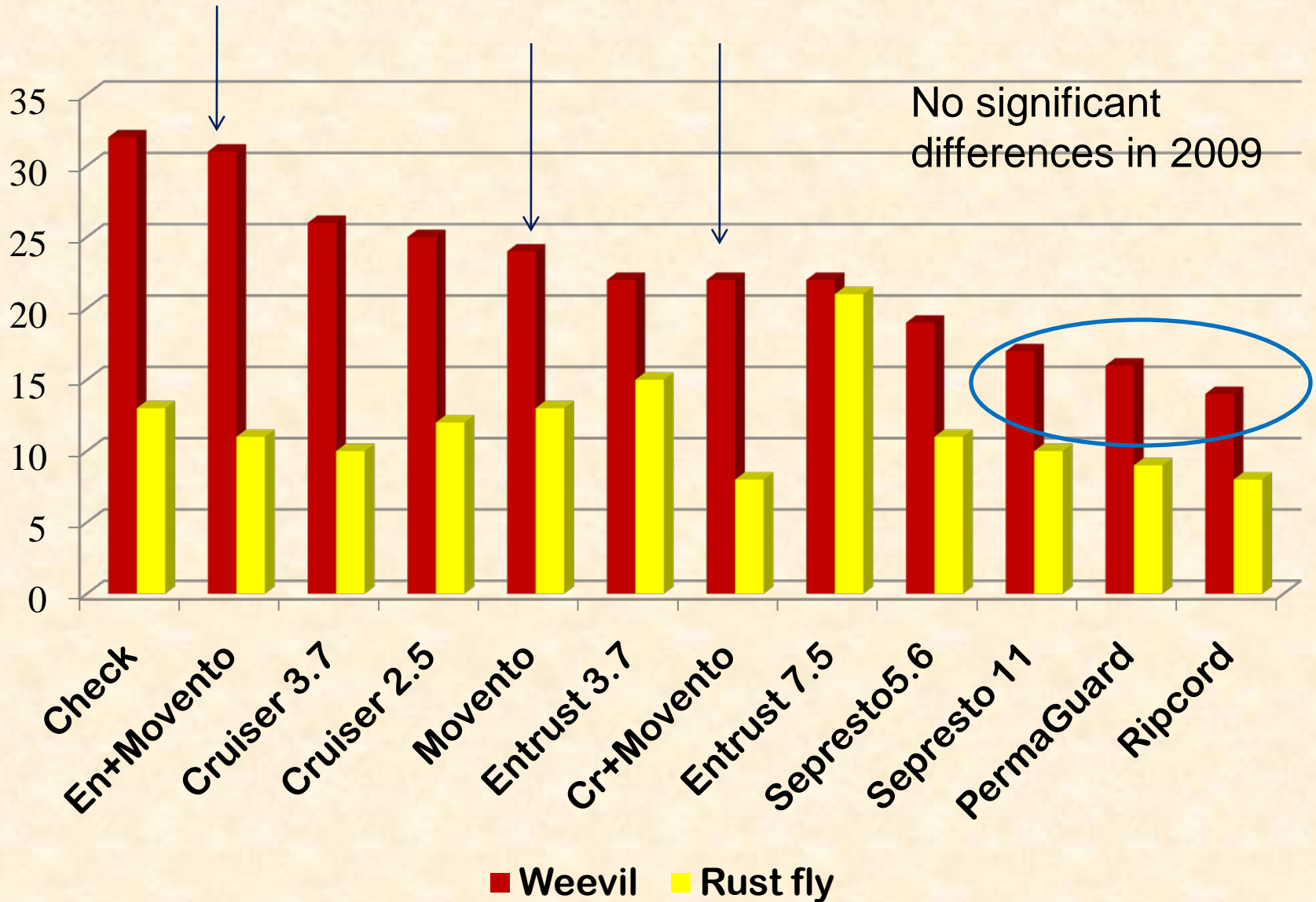
Total damage at early assessment, carrot weevil and first generation rust fly

Insecticides for carrot insects 2009, harvest assessment

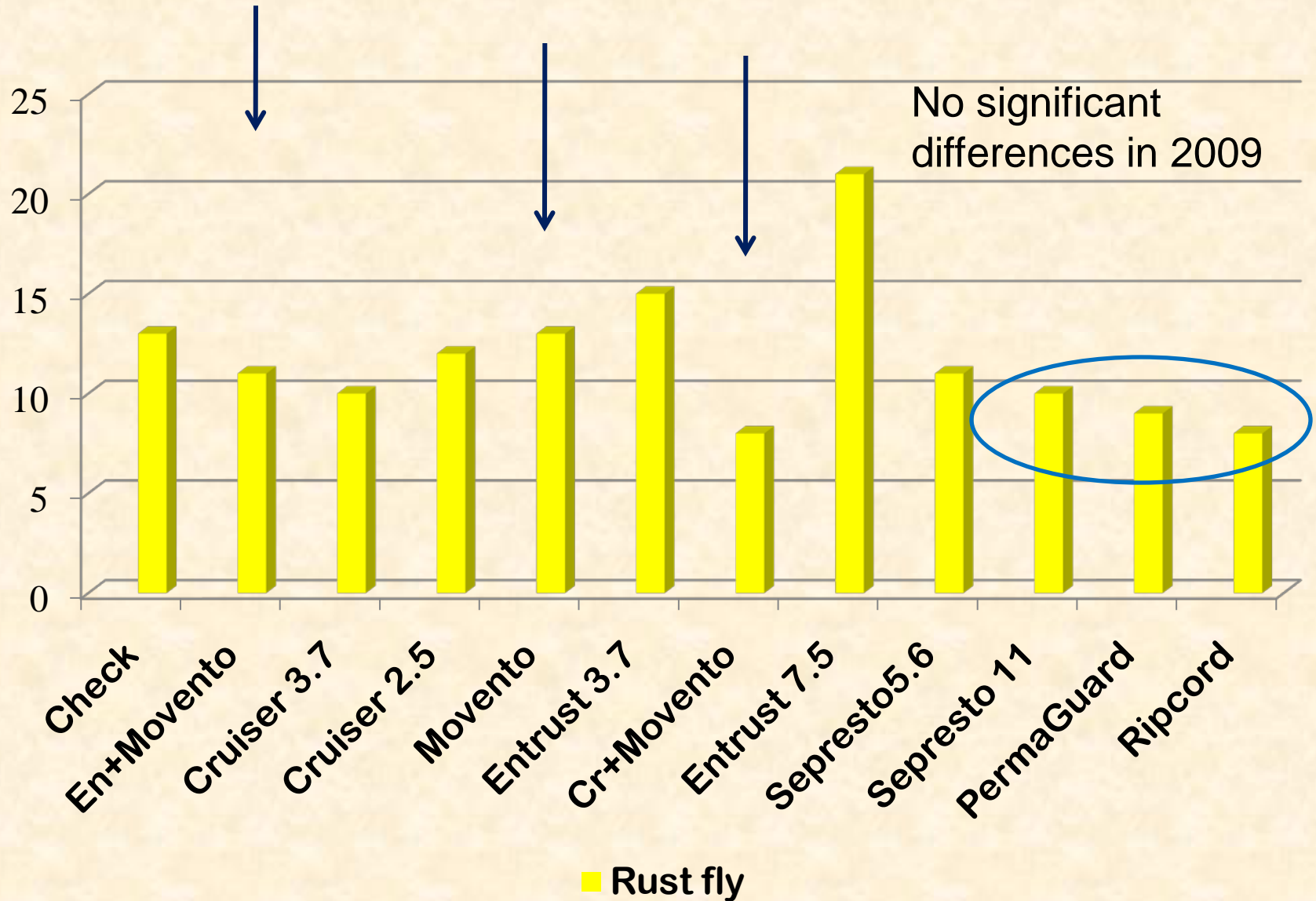


High weevil damage, but also rust fly damage, no differences

Insecticides for carrot insects 2009

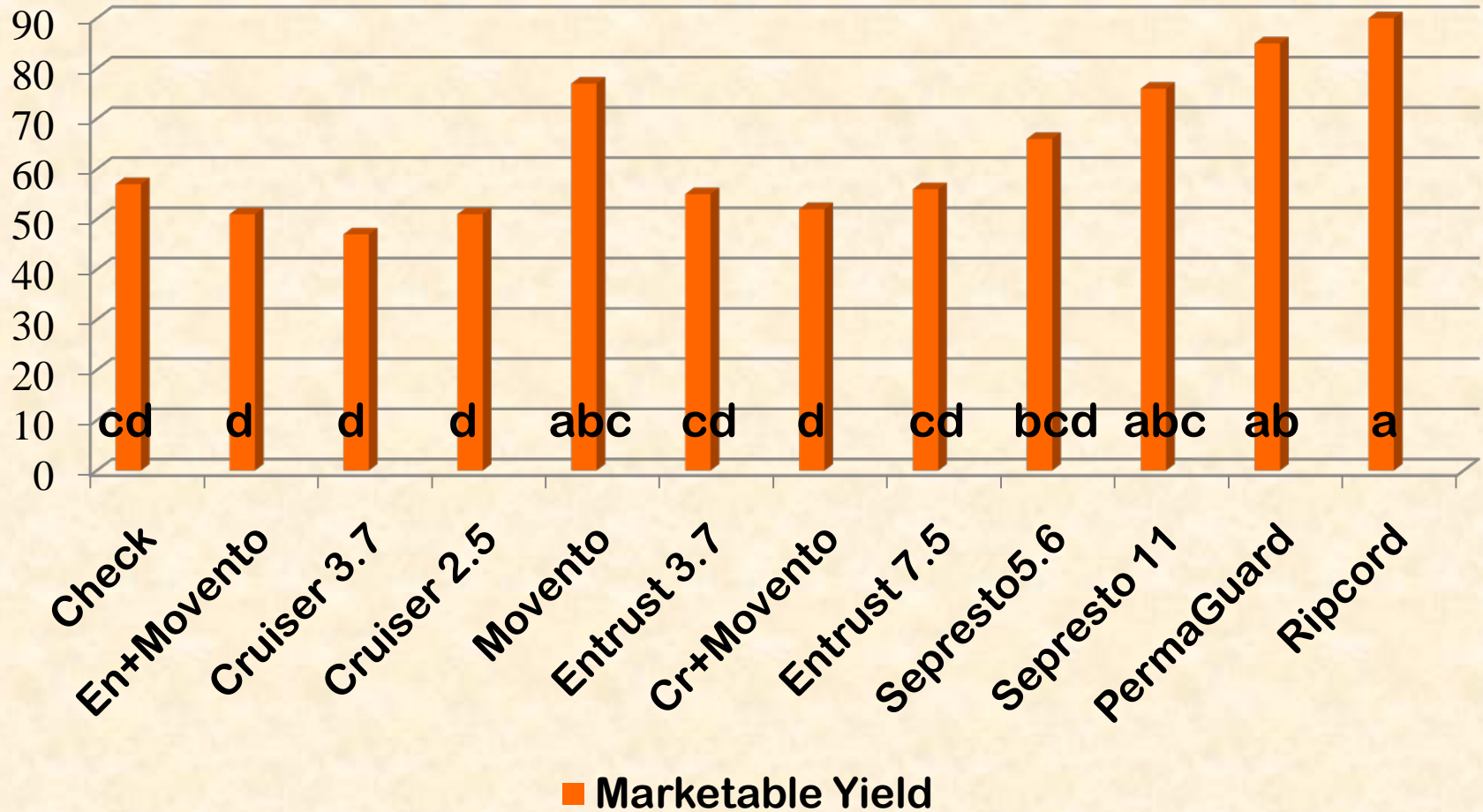


Insecticides for carrot insects 2009



Marketable yield in relation to insecticide application, Oct 20, 2009

Tonnes/ha



Summary: Insecticides for control of carrot insects

- Damage from carrot insects varies greatly from year to year
- The high rate of Sepresto (11 g/kg seed) provided most consistent control
- High rates of Cruiser and Entrust should be tested further.
- It may not be possible to find one seed treatment that is effective for both insect pests.
 - Entrust and Sepresto for weevils, Sepresto, Entrust? and Cruiser for rust fly

Perma Guard (diatomaceous earth) looks promising, but only one year of trials.

2010 Trials

Seed treatments alone and in combination with foliar sprays for second generation rust fly

Seed treatments:

Entrust + Cruiser

Sepresto

cyantraniliprole (HGW86)

Chlorantraniliprole (Dermacor X-100)

Foliar sprays:

Imidan - early

Matador- early and late

Movento- late

Combinations: Sepresto + Movento

Sepresto + diatomaceous earth

Can insecticide seed treatments protect carrots from damage by carrot weevil and carrot rust fly?

Yes, some of the time

Because of the low rates per acre, it would be worth using these every year.

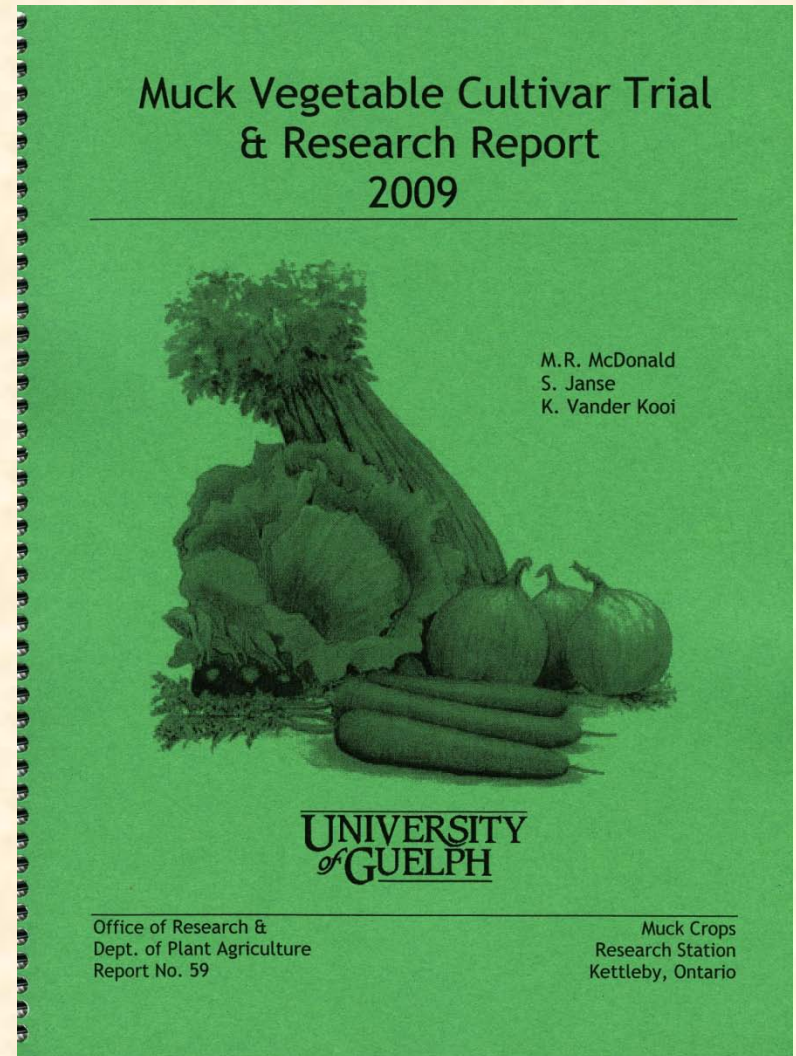
May have to be supplemented with sprays for 2nd generation rust flies.

All research trials are summarized in the Annual Report

Download at the Muck Station web site:

www.uoguelph.ca/muckcrop

The report will also be on the web site of the Ontario Ministry of Agriculture, Food and Rural Affairs.



Muck Vegetable Cultivar Trial & Research Report 2009

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Muck Crops
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Thank you

Questions?



