

Environmental risks related with dispersal and establishment



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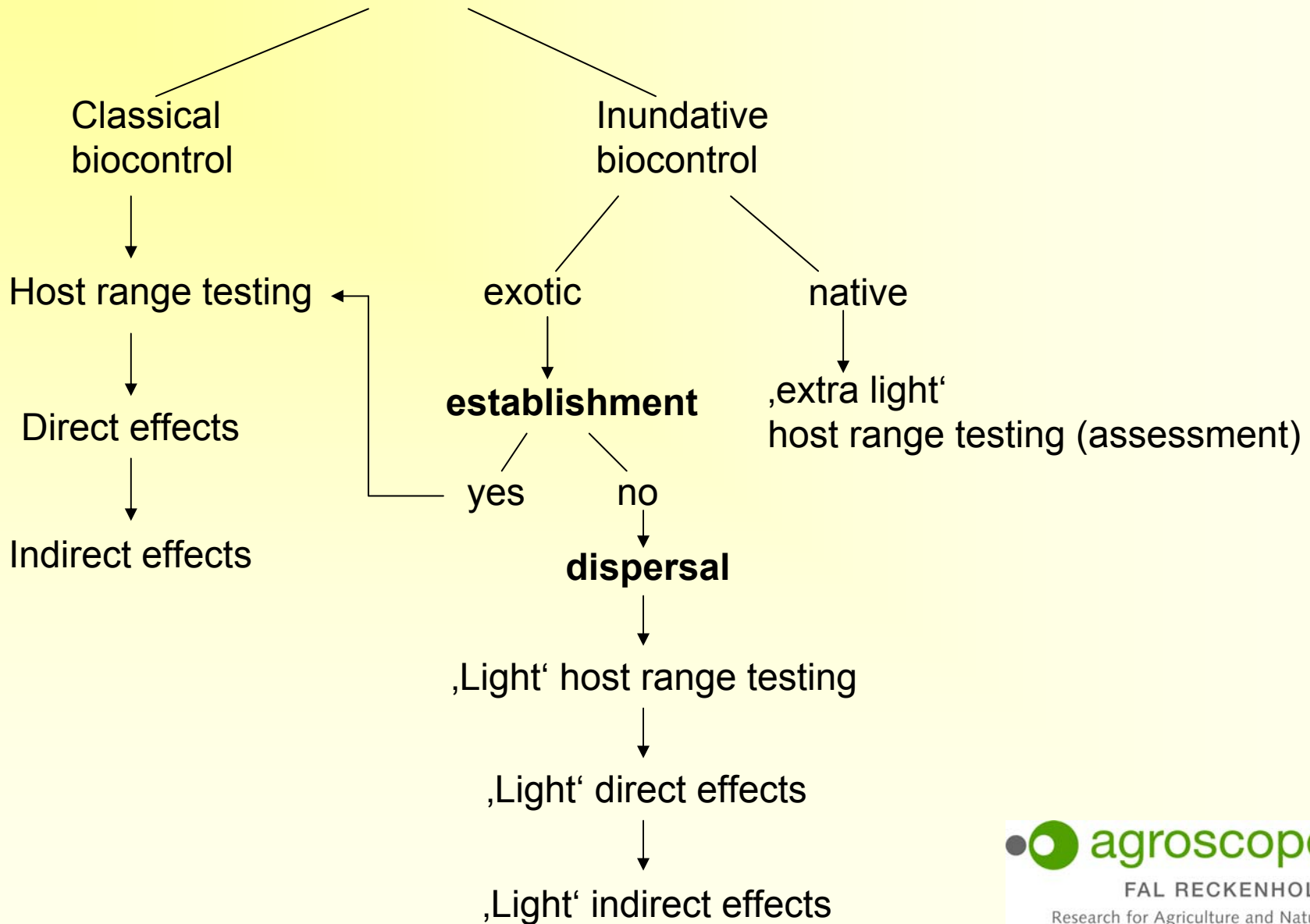


The important parameters for environmental risk assessment

(ERBIC, van Lenteren et al., 2003)

- Overwintering/establishment
- Dispersal
- Host range (habitat specificity?)
- Effects on non-targets (mortality etc.)
- Indirect effects

Risk assessment



Trichogramma brassicae...



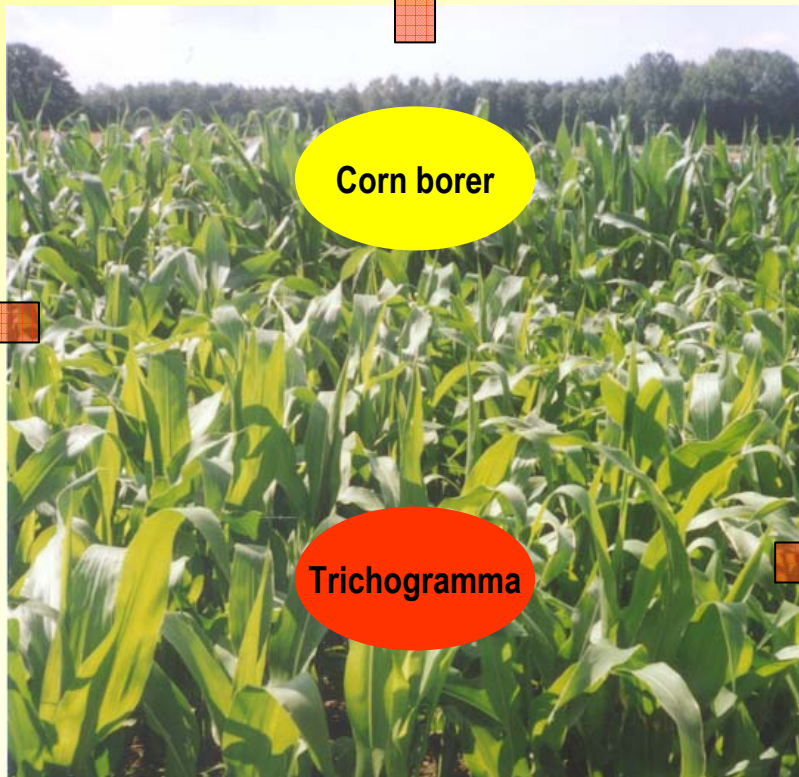
...a threat for native butterflies
or beneficial insects ?



Meadow



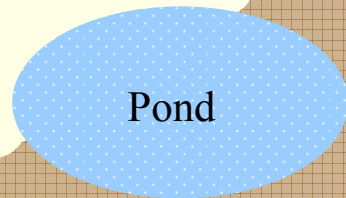
Hedge



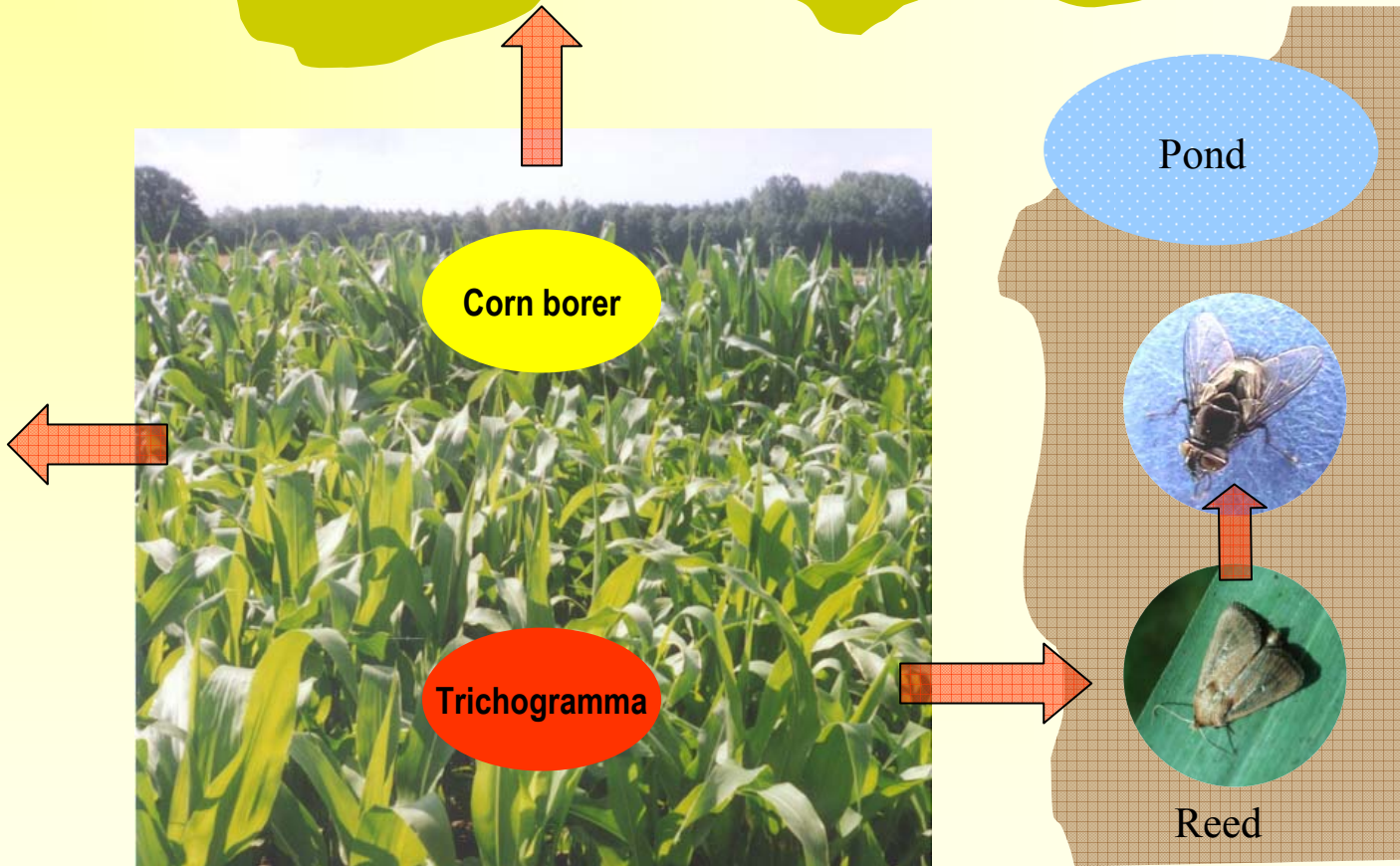
Corn borer

Trichogramma

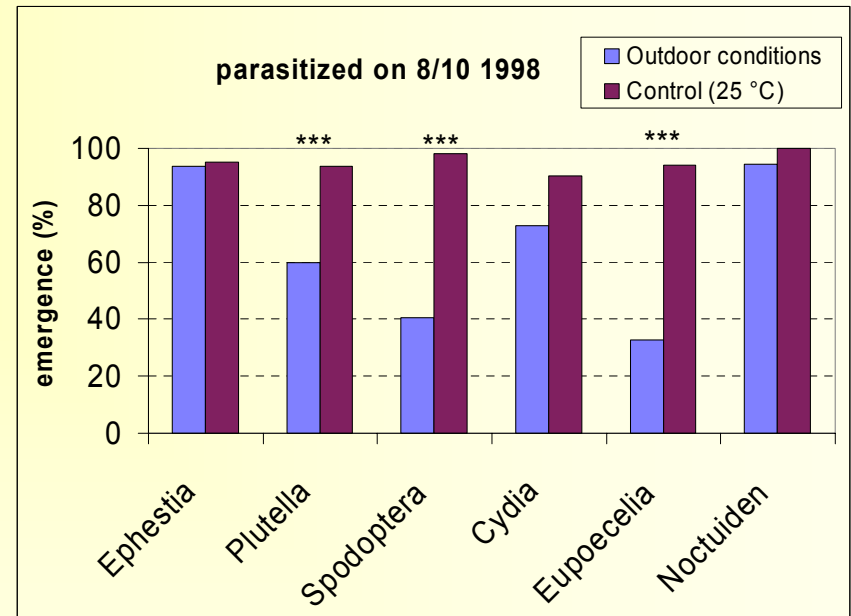
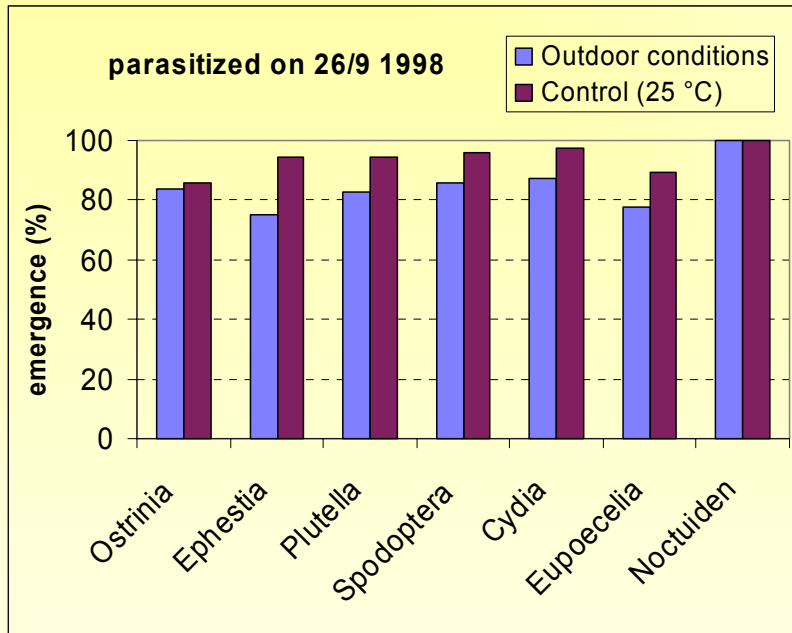
System



Reed



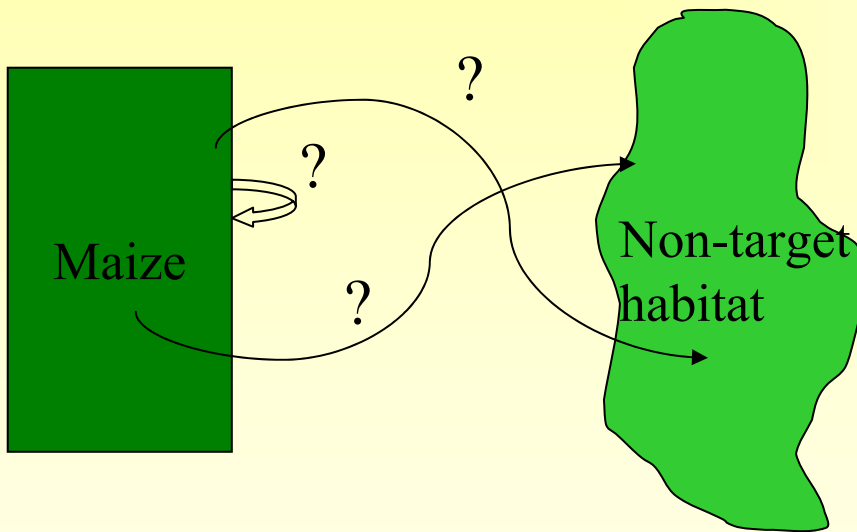
Overwintering 1998/99 at FAL Reckenholz



→ Overwintering possible on all tested host species

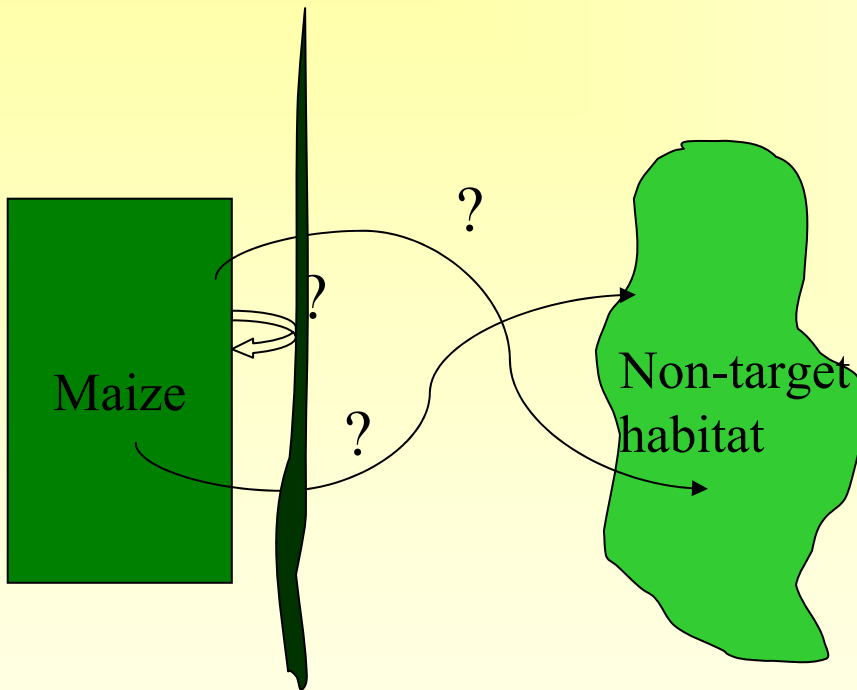
Confirmed by collections of field populations prior to release

Dispersal: Our Questions



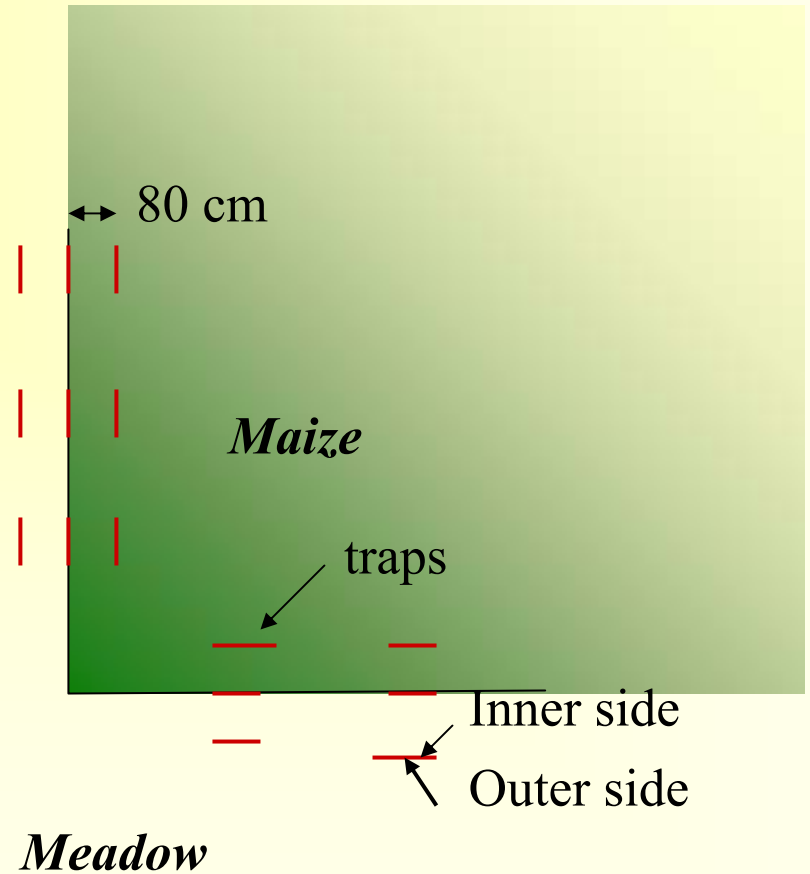
- Do they leave the target habitat?
- How far do they disperse outside the target habitat?
- Differences between males and females?

Dispersal: Our Questions

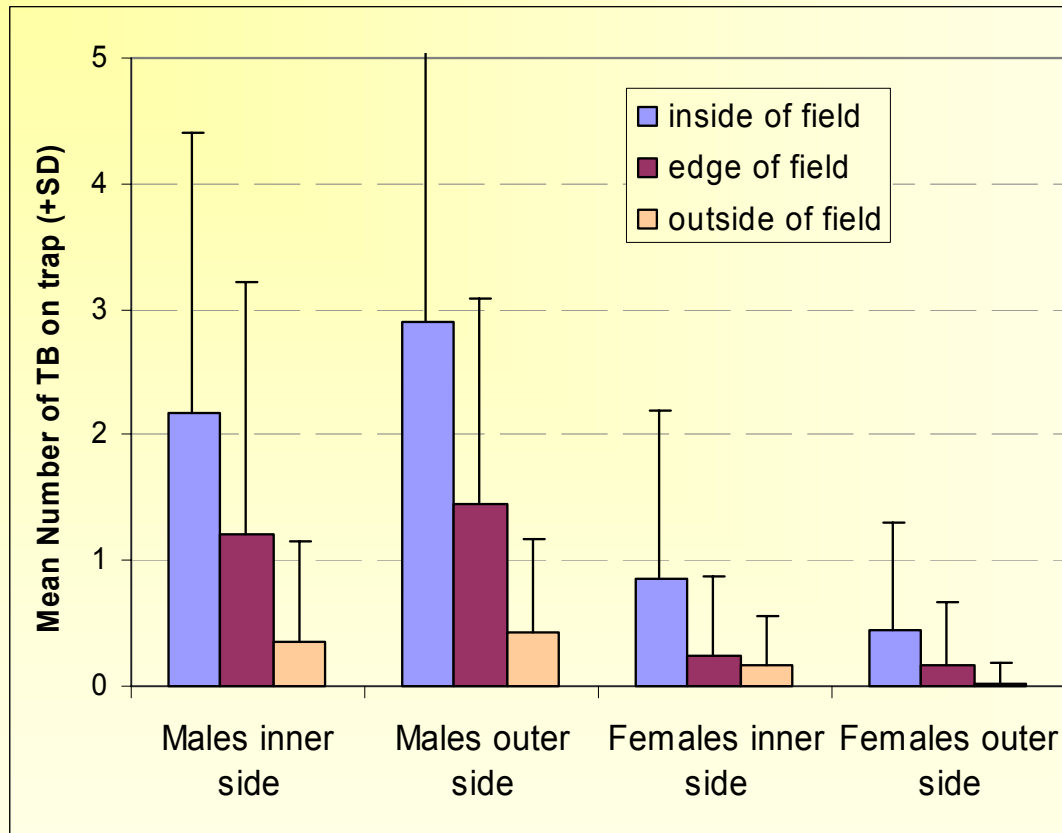


- Do they leave the target habitat?
- How far do they disperse outside the target habitat?
- Differences between males and females?
- And, are barriers potentially important factors?

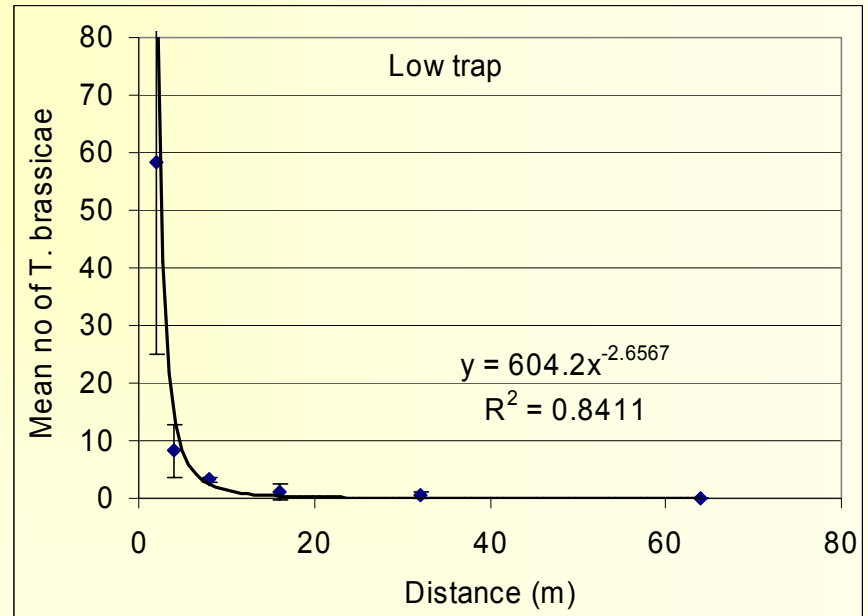
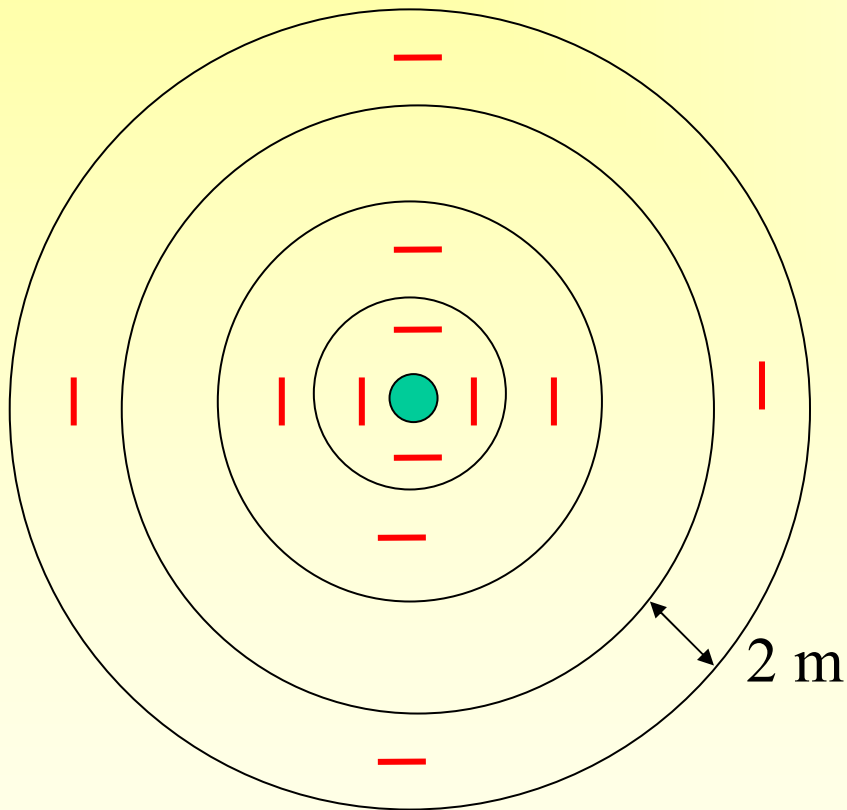
Dispersal out of the maize



Dispersal out of the maize



Dispersal from point source releases



Original data from day 1

No. caught on the first two days

	Males	Females
day 1	145	133
day 2	133	31

$$\chi^2 = 37.0$$

$$df = 1$$

$$p < 0.001$$

No. caught on day 1 in different strata

	Males	Females
Low trap	145	133
High trap	18	40

$$\chi^2 = 8.6$$

$$df = 1$$

$$p < 0.01$$

A photograph of a field of green plants, likely corn, with two white markers on black stakes. The text is overlaid on the image.

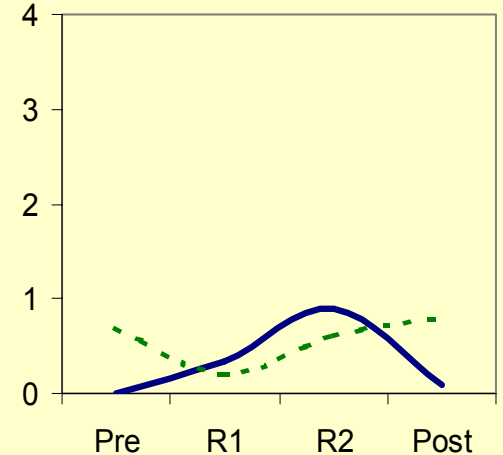
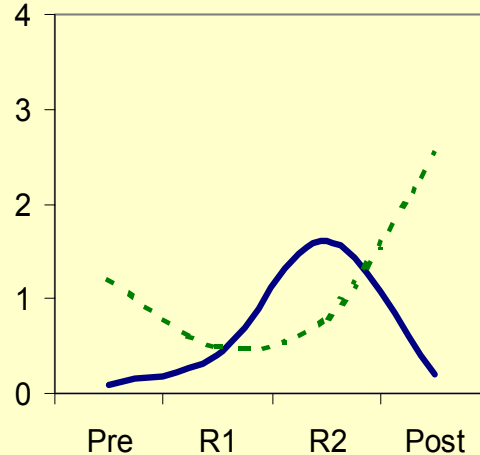
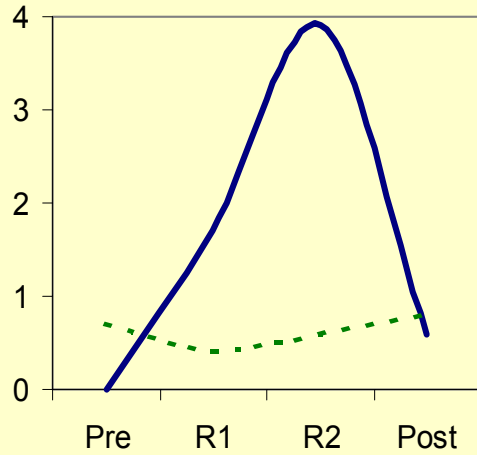
What about the spatio-temporal
dynamics after releases?

Maize

Wildflower strips

Reeds

Wespen pro Falle (Mittelwert)



- Released *Trichogramma brassicae*
- - - Native *Trichogramma* population

Conclusions

- Establishment important if exotic species are considered
- Dispersal important mostly for those exotic candidates where establishment is not expected
- Direct methods may generally be better suited to measure dispersal than indirect methods.
- We need to know: numbers and distance!

Conclusions

- Personally, I believe that nematodes have special features but that they nevertheless can be treated within the same framework as other inundatively released bca's