NAPPO
North American Plant Protection Organization
Organización Norteamericana de Protección a las Plantas

Post-Release Monitoring

[Bruce D. Gill, Research Entomologist
Ottawa Plant Laboratory, Canadian Food Inspection Agency]

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Background

- Why is this needed?
  - Basic reason is to determine if the agent works
    - Lot of effort to bring an agent to the release stage
    - Important to demonstrate efficacy
    - Need to reduce harmful non-target effects

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      → Improve the overall regulatory process by providing feed-back to the screening and review process

Key elements from RSPM 12

6.1) Establishment & spread of agent

- Observations (presence/absence)

- Sampling (trapping, sticky traps, sweep netting, catch and release)

Key elements from RSPM 12

6.2) Agent and target pest densities & distribution over time

- Quantitative sampling

Key elements from RSPM 12

6.3) Impact on selected non-target species highlighted from the Petition

- threatened / endangered species
- taxa closely related to target species
- beneficial species

However - A Few Difficulties

- Few published studies for entomophagous agents
- Difficulty in quantifying the effects
    - especially community-level processes
- Time frames can vary considerably
    - initial responses versus long-term responses

Fortunately – An Example

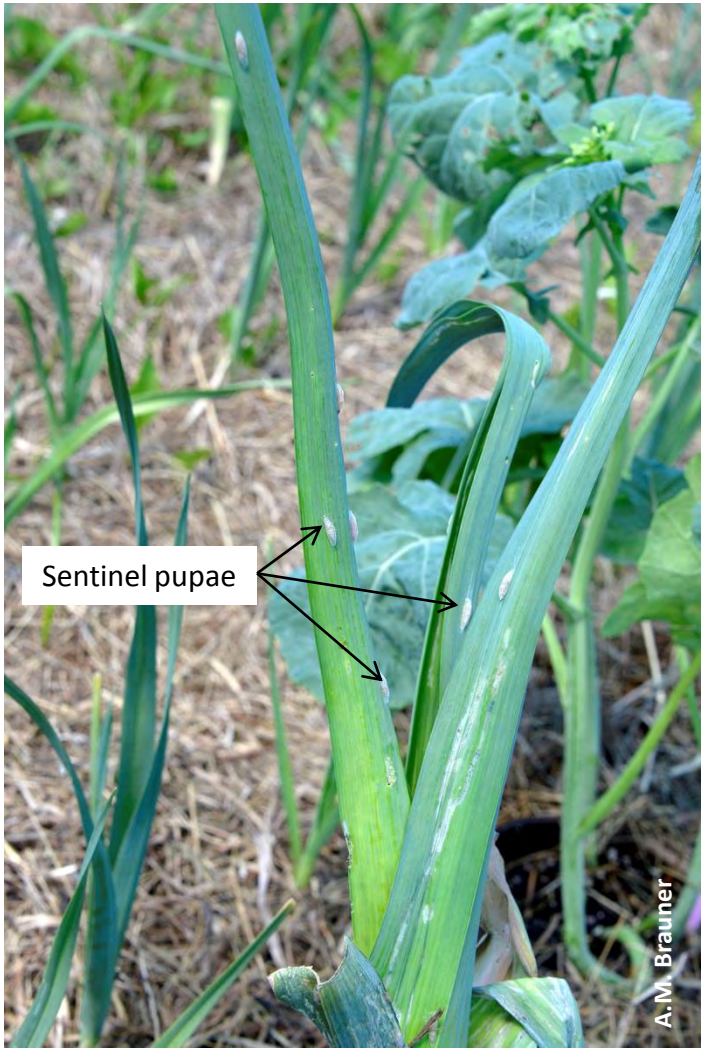
Leek moth project of Dr. Peter G. Mason & colleagues

- *Acrolepiopsis assectella* (Zeller) [Acrolepiidae] is an invasive alien pest of *Allium* spp.; native to Europe

- *Diadromus pulchellus* Wesmael [Ichneumonidae] was approved for release in Canada on September 25, 2009

7.1 Biological control agent establishment and spread

Field release sites will be monitored for *Diadromus pulchellus* Wesmael establishment and dispersal.
Surveys will be conducted in mid to late June and late July for a 5 year period after release. Thereafter, surveys will be recommended every 5 years to monitor dispersal.
… sentinel larvae are placed on the leeks, they will be allowed to feed for approximately 3-8 days before pupating naturally on the external surfaces of the leeks. Each selected leek will be infested with either two or four larvae. …



Slide courtesy of P.G. Mason

7.2 Biological control agent and target densities over time

Field release sites will be monitored for 5 years to assess levels of attack by *D. pulchellus* and densities of leek moth, *A. assectella*. At specified locations, the density of leek moth in 25 randomly-sampled plants will be determined during June, July and August. From each plant 10-15 leek moth pupae will be collected, maintained in the laboratory and the number of *D. pulchellus* larvae and emerging adults will be documented.

Slide courtesy of P.G. Mason

7.3 Host specificity/attack rates on the target species and non-target species for which potential impacts were identified

Diamondback moth, *Plutella xylostella* (L.), which is known to be a suitable host for *D. pulchellus*, will be set out on sentinel plants in close proximity to and at various distances away from the release location. These sentinel diamondback moth pupae will be sampled at the same time that leek moth pupae are sampled.

Non-target host pupa

Slide courtesy of P.G. Mason

A Couple of Useful References

Follet, P.A., and J.J. Duan (eds.). 2000. Nontarget Effects of Biological Control. Kluwer Academic Publishers. 316pp.

Bigler, F., D. Babendreier, and U. Kuhlmann (eds.). 2006. Environmental Impact of Invertebrates for Biological Control of Arthropods. CABI Publishing. 299pp.