

Proceedings of the Canadian Forum for Biological Control Symposium – 2011

***Science and Society: Striking a balance between the risks and benefits
in biological control***

November 9, 2011

at the Entomological Society of Canada's Annual Meeting in Halifax, Nova Scotia

Dr. Kevin Floate (AAFC, Lethbridge)

Introducing new species of dung beetles into Canada to improve pasture productivity

Dr. Floate reported the negative consequences of undegraded cattle dung on pastures. These include increased breeding sites for parasites and insect pests of cattle, reduced soil productivity, and removal of pasture available for grazing. Losses to the livestock industry have been estimated as high as \$100M annually in Canada. Insects are among the most important factor in dung degradation in Canada, particularly certain functional groups of dung-breeding beetles in Family Scarabaeidae. The presentation focussed on the characteristics of these functional groups (rollers, tunnelers, dwellers), the species that comprise these groups in Canada, and work underway to introduce new species of 'tunnelers' into the country to accelerate the degradation of cattle dung on pastures.

Dr. Tim Haye (CABI Switzerland)

From theory to practise: Progress and problems in host specificity testing of biological control agents

Dr. Haye provided an overview of the approaches which have been used to determine appropriate host range testing for potential new biological control agents. In general, the literature has been the starting point for identifying relevant species for the ecological host range, looking at phylogenetics, related feeding and ecological niches, and other factors which may be relevant such as timing. He illustrated the challenges inherent in some of the standard tests which have been used such as "no choice" tests, which can over estimate the host range, and field cage tests, which tend to be quite impractical and thus are rarely done. While there has been good progress on approaches to such testing with weed biological control agents, fewer studies have been conducted on host range setting for arthropod biocontrol. Newly developed testing guidelines still do not provide useful methods to interpret test results accurately and the question of how to translate attack rates into potential population level impacts on non-target organisms remains unclear. This is an area requiring greater emphasis in future.

Dr. Tara Garipey (AAFC, London)

The utility of molecular diagnostics in biological control: Evaluating trophic interactions and non-target effects

While the use of molecular tools to help to identify species in the field is a fairly obvious application of this sort of "insect forensics", Dr. Garipey introduced her work to use tools such as multiplex PCR and DNA hybridization techniques to tease apart trophic interactions and non-target effects, and showed how these new techniques could be used to complement classical techniques such as rearing studies to gain a better understanding of these relationships. The utility of these approaches for identifying and characterising new biological control species was discussed, as was the relevance of the techniques for host range determination.

PANEL DISCUSSION – Moderator Dr. Bruce Broadbent (AAFC, London)

Dr. Broadbent opened the discussion with a few observations related to the nature of our communication of risks and benefits around biological control. As biologists, do we have a tendency to focus too much on the risks, given our training and drive for accuracy? Does this make it difficult for the public to determine what the take home message about biological control is?

The group talked about the media's interest in sensational or "bad news" stories about biological control as being more newsworthy, citing old stories like the Australian cane toad and the tachinids vs. silkmoths as the examples. These releases were made long before the modern safeguards and non-target testing protocols were in place.

Ideas which were brought forward in a discussion of how to counter this included:

- proactively flooding the media with stories highlighting successes with biological control and our good track record of protecting Canadian agriculture, forestry and the environment;
- incorporating the cost or risk associated with doing nothing into the narrative in order to sensitize the risk-averse public to the risks associated with everything, including failing to act.

In the context of the problem of invasive alien species, it was suggested that we need to do a better job of positioning biological control as a mechanism by which we can re-establish the checks and balances inherent in nature. The public should be made aware that the problem of invasive species has arisen as a result of human activities such as trade and travel, so it is appropriate that we work with nature to establish a complex of natural enemies, when the new pest is present within a new environment.

A discussion followed regarding the regulatory framework for release of biological control agents in Canada, and the degree to which Canada has the resources to implement the framework. There was a general consensus that Canada does have in place an appropriate and robust framework governing the release of these organisms; however concerns were expressed regarding the capacity within the federal government to oversee the existing level of activity in this area, let alone any increase. The question was raised: can we respond fast enough to the arrival of new invasive species before they become so widespread?