

*THE H. R. MacCARTHY LECTURE COMMITTEE
IS PLEASED TO PRESENT THE 15TH ANNUAL*

***H. R. MacCARTHY
PEST MANAGEMENT LECTURE***

ENTITLED

**The need for longitudinal study of the dual roles
of insects as pests and food resources in
agroecosystems**



SPEAKER:

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***SIMON FRASER UNIVERSITY
Halpern Centre, Room #126
3:30 PM, Friday October 29, 2004***

LECTURE FOLLOWED BY AN INFORMAL RECEPTION

The need for longitudinal study of the dual roles of insects as pests and food resources in agroecosystems

Dr. Dan L. Johnson

Abstract:

In our discipline, pest management systems are often viewed as simple population interactions between arthropods and the cultured plants that they affect. In some cases, other trophic levels (including so-called biocontrol agents) that may help to regulate pest numbers are considered. We too rarely anticipate, let alone address, the question of lasting ecosystem effects that result from perturbations of pest populations that serve as food web resources. The pest is rarely considered in the dual role of resource and subtractive agent, with gains and losses to manage. Such a view should be applied more frequently, in order to anticipate and perhaps ameliorate non-agricultural losses that result from extreme events in agricultural ecosystems. Pest populations (and their harmless but often co-targeted relatives) may be simultaneously affected by pest control efforts and natural ecological relationships, for example in trophic cascades. Control actions may inadvertently starve predators at higher positions in food chains. Similarly, the impacts of the physical environment may disrupt the arthropod food source that supports non-agricultural but valued populations, such as prairie bird and fish life, and result in long-lasting population declines of species at risk, and natural enemies of pests. In many cases, more carefully directed control can save money for producers and protect wildlife food supplies at the same time. Best practices for cost-effective IPM can also serve the cause of species at risk.

Cross-sectional surveys and experiments are necessary but not sufficient to allow understanding of trophic relationships, and to anticipate the impacts and recovery times of extreme events. Longitudinal studies of the ecology, activities and even the chemical constituents of multiple species (microbe, plant, insect and vertebrate) can clarify the longer term impacts of weather on insects (such as grasshoppers, c.f. early work by H.R. MacCarthy and colleagues).

The remarkable case of the population extremes of key prairie grasshoppers and other insects in 2000-2004 is presented, in relation to the joint impacts on farm income and the well-being of wildlife that depend on these insects for reproduction and survival.

Biographical Information

Dan L. Johnson is a student of grassland insects, plants and landscapes. He lives in Lethbridge, Alberta, where he moved from Vancouver in 1983, after graduate work at UBC. His research includes ecological methods related to integrated management of insects pests, including prevention or amelioration of negative environmental impacts on wildlife. He is currently a Professor of Environmental Science in the Department of Geography, University of Lethbridge, where he has taught Biogeography, Geographic Information Systems, and Agroecosystems, and, in 2005, Environmental Science. He joined the University of Lethbridge this year as Canada Research Chair in Sustainable Grassland Ecosystems. Previously, Dr. Johnson served for over twenty years as a research scientist with Agriculture and Agri-Food Canada Research Branch. He has conducted research on alternative methods of pest management, (including microbial, chemical and biological control), pesticide impacts on birds, foodwebs, biodiversity, biometeorology, forecasting, epizootiology, subarctic ecology, soil biology, parasites, predator-prey interactions, fruit tree diseases and pests, and prairie agriculture. Among other things he is recognized as an expert on grasshoppers and locusts. He chairs the organizing committee for the 9th World Meeting of the Orthopterists' Society, Canmore, Aug 14-19, 2005 (www.orthoptera2005.org).

Dan has served overseas on short assignments for the governments of Canada, the US, and the UK. He served as President of the Entomological Society of Canada, and in several editorial positions. He is currently Secretary of the American Institute of Biological Sciences and a member of three Canadian Species at Risk Recovery Teams (Burrowing Owl; Western Spiderwort; Yucca and Yucca moth). He is the author of over 60 refereed scientific articles, and over 200 other science and technology articles, proceedings, reports, chapters, maps and reviews. In 2004, he was made a Fellow International of the Explorers Club. His undergraduate degree was in Biology (BSc., 1978, Magnis cum honoribus, University of Saskatchewan), and he holds two graduate degrees from the University of British Columbia (MSc. 1980, and PhD., 1983, Plant Science, and Animal Resource Ecology).

Dr. H. R. ‘Mac’ MacCarthy

Dr. MacCarthy began his career in agricultural research in 1948 as a student assistant at the Field Crop Insect Laboratory at Kamloops. Mac grew up in England, was an agriculturalist in Australia, a cattle rancher at Princeton, B.C. for 9 years, and spent nearly 6 years in war service with the Canadian Infantry Corps. After returning from war service in 1946, Mac attended the University of British Columbia, receiving his B.A. in Zoology in 1950. He went directly on to graduate studies at the University of California at Berkeley and was awarded his Ph. D. in 1953.



He returned to Kamloops and worked there until 1955, when he was appointed Officer-in-Charge of the Field Crop Insect Laboratory on the campus of the University of British Columbia. He was named Head of the Entomology Section of the Vancouver Research Station in 1959. Mac's research was largely on the transmission of potato leaf roll virus by aphids. Collaborative work by him and other scientists at the station led to almost complete control of potato leaf roll virus in the province.

Mac was an adjunct professor at Simon Fraser University's Centre for Pest Management since 1974. Immediately following his retirement from Agriculture Canada in 1976, he became a sessional lecturer at Simon Fraser University, and was acting director of the Centre for Pest Management for more than two years. His specialty was always improving the English of thesis writers and others who needed it - a category for which he never found an exception. Mac passed away on April 7th, 2004.

The H. R. MacCarthy Pest Management Lecture

The purpose of the H. R. MacCarthy Pest Management Lecture is to present an annual lecture by a distinguished pest management scientist or practitioner. The venue of the lecture will alternate between Simon Fraser University and the University of British Columbia. The Lecture is managed by the H. R. MacCarthy Lecture Committee, consisting of representatives of the Professional Pest Management Association of B.C.; the Entomological Society of B.C.; the Association of Professional Biologists of B.C.; Agriculture and Agri-Food Canada; the Centre for Pest Management, Simon Fraser University; and the Faculty of Agricultural Sciences, the University of British Columbia. It is funded by revenues from the H. R. MacCarthy Endowment Fund held by Simon Fraser University.

Research Support for material presented in this keynote address was provided in part by:

Interdepartmental Recovery Fund, Environment Canada

Climate Change Action Fund, Natural Resources Canada

Canada Research Chairs

Agriculture and Agri-Food Canada

Travel expenses were paid by the H.R. MacCarthy Lecture Committee