Hatch Multistate Research and Extension 2005 IMPACT REPORT

North Central Association of Agricultural Experiment Station Directors

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Documenting the Impact of Multi-state Research and Extension

NCERA-148 Migration and Dispersal of Biota

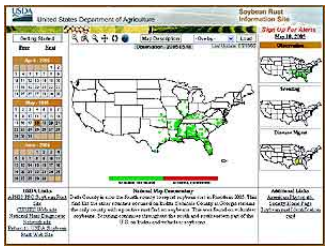
Issue

Pests negatively impact the health of plants, animals, and humans, and degrade the quality of rural and urban settings and natural landscapes. International trade and enhanced travel have increased the rate at which exotic pest species have entered and become established in North America. Containment of exotics, a primary concern, can be greatly exacerbated by dispersal once they arrive. Rapid response plans that include the ability to predict the spread of high-risk organisms are needed. In effect, the lack of understanding of the principles underpinning migration and dispersal of pest and beneficial organisms across a wide range of spatial scales has dramatically impeded the development and deployment of effective and socially acceptable IPM programs.

Actions

The NCERA committee promotes interdisciplinary research focused on the biotic and abiotic processes directly influencing migration and dispersal of biota. This committee also assists in developing management strategies for migratory and dispersing biota to meet the needs of IPM practitioner. Other areas of activity include: researching the impact of movement on population genetic structure related to resistance management, adaptation of exotic species to new environments, the genetics of migratory biota, and biosecurity implications of mobile biota, including invasive plants, insects, and pathogens (e.g., soybean rust). A major goal is to facilitate communication among individuals and organizations with an interest in migration and dispersal.

Due to information disseminated through the USDA Soybean Rust Information website, sprays for soybean rust were minimized and consequently saved growers spray expenses. An estimated 10 to 20 million acres of soybeans that were not sprayed suffered no yield loss from soybean rust. Hundreds of individuals and several agencies including USDA-APHIS, USDA-ARS, USDA-CSREES, USDA-RMA, state Departments of Agriculture, LGUs and industry contributed to the success of the project.



The USDA Soybean Rust Information System constructed and operated by Joe Russo and Scott Isard had a major impact on the U.S. soybean industry in 2005. So much so that the USDA Risk Management Agency has contributed $2.4 million to expand it into the Pest Information Platform for Extension and Education (PIPE) for 2006, including additional pests and crops.

Researchers have determined that large colonies of Brazilian free-tailed bats, which are predators of crop insect pests, save cotton producers in the Texas Winter Garden region about $740,000 annually in the form of avoided crop losses and pesticide treatments.

Discovery that a corn-wheat crop rotation allows corn production without use of soil insecticide for rotation-resistant western corn rootworm management will save growers $17/acre.

Multi-state Project NCERA-148

Migration and Dispersal of Biota

Who is Responsible?

Researchers and Extension faculty at the following State Land Grant Universities and ARS laboratories are involved in this project: AZ, IL, IA, ME, MI, MN, MS, NE, NYC, OH, PA, TN, VA, WI, USDA/ARS, IA, USDA/ARS, TX.

Contact Information

Contact Names and Email addresses for state/federal scientists participating in this project may be viewed at:
http://lgu.umd.edu/lgu_v2/pages/appendixE.cfm?trackID=3850

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Knowing that intrafield movement rates for western corn rootworm adults are somewhat limited played a role in the requirement that non-transgenic (Bt) refuges for western corn rootworm be placed in or immediately adjacent to rootworm Bt corn. Information that properly places refuge corn in relation to transgenic corn helps preserve pest susceptibility to Bt.

A recent genetics study using DNA markers has demonstrated that western corn rootworm is being repeatedly introduced to Europe from North America. These results highlight the role of transoceanic transport of harmful pest species and suggest that more attention should be paid to controlling pest species on intercontinental flights.

Demonstration of genetic similarity of western corn rootworm populations in US led to modification of designs and objectives of ongoing population and gene flow studies in Illinois, France, and at EPA.

Development of beetle-infecting nematode traps for improved control of Japanese beetles will help reduce the economic impact of this invasive pest in nursery and fruit crops, home lawns, and public landscapes.

Understanding the dispersal capabilities of emerald ash borer beetles will provide information critical to the deployment of appropriate management strategies aimed at minimizing further spread of this pest into the United States and Canada.

Dissemination of principles of aerobiology as they have been applied to soybean rust, through the recent paper in BioScience, will increase international awareness of research into pest movement and the collaborative work of members of NCERA-148.

Research on migration and dispersal of aster leafhopper, vector of aster yellows disease of vegetable crops, has led to a pest monitoring and management program that has greatly reduced unnecessary applications of insecticides in Ohio vegetable crops and prevented disease loss

Multi-state research activities are funded by Hatch Act base funding to Land Grant University Agricultural Experiment Stations by the USDA, Cooperative State Research, Education and Extension Service. The NCERA-148 committee is administered through the North Central Association of Agricultural Experiment Station Directors.

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