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Multi-Agency Team Uses University Archival Tool to Conserve Vital Project Information

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Abstract: The Western Cereal Leaf Beetle Team culminated a successful integrated pest management project on the cereal leaf beetle (CLB) by archiving their materials at <http://clbarchive.wsu.edu> in an open, digital repository hosted by Washington State University (WSU) Research Exchange. This archive enables researchers to store materials under a stable, searchable URL that is found easily by online search engines. Materials stored may be added or removed to maintain relevance, and file formats may be updated as software changes over time. Creative Commons licensing of the archive enables researchers to use these materials freely, with credit given to the authors.

Introduction

The Internet and virtual communities are transforming access to research (Haviarova & Vlosky, 2009). Academic libraries are assisting in this process by creating digital repositories (archives) as discovery and retrieval tools. Most information stored is pre-prints of research articles published in traditional journals. Land-grant university archives may include unpublished Extension information—thus helping Extension educators avoid repeating previous research. These archives are, however, often under-used. This article describes the process the Western Cereal Leaf Beetle Team used to preserve information from a successful project to manage a key pest in western North America.

The Western Cereal Leaf Beetle (CLB) Team was formed in 1999 following the detection of the cereal leaf beetle, *Oulema melanopus* (Coleoptera: Chrysomelidae) in Oregon and Washington State (Roberts & Rao, 2012). The team grew to include 37 scientists from seven western states and two Canadian Provinces. Led by a Washington State University (WSU) Extension field faculty member, the team adopted a classic integrated pest management (IPM) model to conduct regulatory, research, and control activities on the pest.

The team released two parasitic wasps to suppress the pest. The most successful was a larval parasitoid *Tetrastichus julis* (Walker) (Hymenoptera: Eulophidae). By 2008, in most cereal-producing regions of Oregon and Washington, *T. julis* had attained equilibrium with CLB, keeping the pest below economic thresholds. The wasp dispersed to adjacent regions in Canada following the natural movement of CLB.

Biological control provided major economic benefits to the region. Unchecked, CLB could cause yield loss worth \$39 million per year to spring wheat (450,000 acres) in Washington State alone. Successful biological control saves Washington State farmers potentially \$6.75 million per year in spray costs. A joint survey by USDA-APHIS-PPQ (Animal and Plant Health Inspection Service – Plant Protection and Quarantine) and Oregon State University (OSU) Extension showed that insecticide spraying for CLB in Oregon dropped 70% by 2007.

Need for a Digital Archive

Despite the successful biocontrol of CLB in the Pacific Northwest (PNW), the pest recurred in Ohio in 2007. This prompted the Western CLB Team to archive their data, research reports, and methodologies so that in the event of a local resurgence, scientists would have a complete database to aid in their work. It would be time consuming and expensive to restart the project.

Location of the Archive

USDA-APHIS was the logical place for an archive because traditionally this agency leads biological control projects nationwide. However, the USDA reported that they did not store such data longer than 3 years (J. Bentz-Blanco, personal communication, November 10, 2008).

WSU Libraries manage an institutional repository that met the team's need for a permanent archive. In collaboration with WSU's Scholarly Communication Librarian, the team assembled critical

information into a database for Cereal Leaf Beetle Research from Western North America. The archive is located within the WSU Research Exchange, an open digital repository built on the open source software DSpace (DuraSpace, n.d.).

Description of the Archive

The DSpace software uses the Open Archives Initiative-Protocol for Metadata Harvesting (OAI-PMH)—a standardized format for information (author, title, keywords, etc.) about each document (Open Archives Initiative, n.d.). This method of describing materials is a system that search engines such as Google Scholar prioritize, so these articles rank near the top of search results.

Most materials within the Research Exchange are in "communities" based on the work of individual university departments. The CLB community contains collections for each participating state and Canadian province, with an additional section for general information. The normal process in creating collections assigns a numeric URL to each item in the collection, based on the Handle System (Corporation for National Research Initiatives, 2009). This results in a URL like <<http://handle.net/2376/2241>>. The numerical segments represent the archive, the community, and the specific collection item. Access to the material is through the archive Website. For easier access to the CLB material, a simpler referring URL was created: <<http://clbarchive.wsu.edu>>.

The team chose Creative Commons licensing for the CLB collection to allow other CLB scientists to use the material for further research. This type of licensing enables authors to inform others how they may use the work without relinquishing copyright. There are several versions of Creative Commons licensing with different parameters. The license chosen is the most open; it allows others to use the work freely as long as they credit the original author.

The CLB Collection comprises mostly information the team did not publish elsewhere. It includes annual reports from team projects; survey data for CLB; field and laboratory protocols for rearing, collecting, or dissecting insects; and contact information for team members. Some of the items are previously published articles with copyright held by either professional associations or commercial publishers. Generally, associations holding copyrights granted permission to post the entire article in the collection. Commercial publishers, however, allowed posting of the abstract but withheld permission to post the article.

Benefits of a Digital Archive

There are several advantages to choosing an institutional archive for collections like the CLB materials.

- The repository provides a stable, durable URL.
- The collection is dynamic; information may be added or removed to maintain relevance.
- The OAI-PMH system describing the collection ensures that browser searches prioritize the information.

- The archive has a preservation scheme to enable file formats to be updated to current versions of software to aid in their accessibility over time.

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