Northeastern IPM Center – IPM Partnership Grants – 2010

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PROJECT TITLE Pest Resources Online (PRONewEngland) website
PROJECT TYPE IPM Publications

2B. PROJECT SUMMARY

The PRONewEngland web site (http://pronewengland.org) provides a single access point to the best IPM resources among the six New England states. The site provides the public with links to people and information from each state in an organized, coherent format.

The People directories provide email, web, telephone, and U.S. mail information for expert contacts for each pest topic in each state; all of the university, state and Federal programs active in each state; and for private sector groups with an interest in pest management issues active in each state (i.e. commercial agriculture associations and environmental organizations).

The best online resources for addressing New England pest problems are those produced within the region and which deal with specific needs. A key feature of the site is a database of 1099 pest fact sheets published by New England Land Grant Extension, Experiment Station, and state government agencies that site users can search by keyword.

For more direct access to the very best resources, there are subject-oriented directories for the topics of Biotechnology in pest management, Crop and Livestock pests, Health and Indoor pests, Invasive and Natural Resource pests, Integrated Pest Management and Biocontrol, Organic, Ornamental, Turf and Greenhouse pests, and Pesticide safety and reference information. The site features results from pest management tactic surveys, crop profiles, and pest management strategic plans produced in and for New England.

In addition, during the growing season PRONewEngland provides real-time site-specific weather based apple pest development and risk models for six locations in Maine, New Hampshire, and Rhode Island. This system is known as Orchard Radar as it addresses apple insect and disease pests, as well as horticultural development models. The groundwork has been done to extend this methodology of site specific pest models to other sites and other crops (woody ornamentals pest, corn growth stages, etc.), and to allow users to download models with the latest weather observation and forecast data, and then customize model output according the growth stage and pesticide application dates for their specific situation.

The information provided in the contact directories, factsheet database, and publication directory links changes constantly. Staff assignments change, people change email addresses and phone numbers, new publications are issued and older ones are replaced, and web sites are routinely reorganized causing changes in web URL addresses. The purpose of this project is to keep the PRONewEngland website in operation; to validate and update all of the contact person and information links on the site; to move the apple pest phenology models to a more robust software platform; and to implement recently introduced capability for site visitors to customize pest model output by filtering it with their pesticide application dates.

2C. BACKGROUND AND JUSTIFICATION

For help with a variety of common problems, more people turn to the internet than any other source (Estabrook et al. 2007). Increasing client access to reliable IPM information through web pages appears numerous times in Northeastern IPM Center priority lists (e.g. Northeastern IPM Center, 2009). Google and other web search engines do not distinguish the true and tested from the inaccurate or biased. As one web analyst stated: "The valuable gets lost in the dross ... It's up to the reader to separate out the dregs. What's missing … are genuine editors." PRONewEngland provides the editing function to enable New England citizens reach information that is research-based, geographically relevant, and free of commercial or other bias.

The relatively small Extension IPM programs in the New England states cannot provide expertise and programs to address the full gamut of pest issues. The pest management information on web sites of the six New England Land Grant universities and state agencies varies in coverage, quality, navigation, and style. This gives the public a balkanized interface to look for regionally specific and reliable IPM assistance online. The PRONewEngland.org web site provides a single coherent access point to the best IPM resources among the six New England states, with additional original content. Annual traffic on the PRONewEngland.org website is 566,362 hits; 226,557 page views; and 131,080 visitor sessions.

With 2,612 pages and 24,255 external links, (plus the 1,099 linked documents in the factsheet database), PRONewEngland, like any website of comparable scale, requires ongoing maintenance as content moves or disappears, and new content becomes available. This requires replacing outdated and broken links, and trolling the IPM websites of the six New England Land Grant universities and state government agency websites, for new material to include in the PRONewEngland factsheet database.

This grant will pay three weeks of wages for a student technician, working under the supervision of an IPM staff professional who authored the website, to validate and replace all links on the site and to check for online resources that have become available since the website was last funded in 2008. Without funding to update the site we can not afford to continue providing it. We have cooperative agreements from a liaison person in each New England state to assist with keeping state listings for private sector, university and government contact directories up to date, and to assist in locating new online publications.

This grant will also pay for three weeks salary for Glen Koehler, Associate Scientist for IPM, to do site maintenance and upgrades. Koehler will work with Cindy Eves-Thomas, webmaster for the University of Maine Cooperative Extension, to explore how the new Content Management System can be used to facilitate PRONewEngland functionality.

Most of Koehler's three weeks on this project will be spent updating the Orchard Radar pest phenology model platform. The models are currently run as VBA scripts in Microsoft Excel 2003 that incorporate updated weather observation and forecast data, analyze it, and output the results as charts and tables saved to web pages. This involves processing workbooks with 35 spreadsheets, some as large as 5,521 rows and 123 columns = 679,000 cells on a single sheet. In many cases a single cell will have multiple layers of dependent formulae, up to seven layers in some cases. These workbooks are too large for Excel 2003, and occasionally exceed the memory limits resulting in file corruption and an occasional system crash. These incidents are recoverable but they cause service interruptions and add to the staff time required to operate the models. Excel 2010 which is available as a pre-release beta version, and on track for commercial release in June 2010, provides much deeper memory access and is a much more stable platform for hosting the weather pest models.

A second key advantage from rebuilding the models in Excel 2010 is that the new version allows saving the database as a file that web users can interact with to customize the output to reflect their pesticide application record and growth stage. Microsoft is providing a free web-browser version of Excel 2010 to allow this implementation of "cloud computing" whereby a file can be shared between an online host site (PRONewEngland) and remote users accessing a copy of the file by a web browser by a computer, smart phone,

or other internet capable device. This opens up a new realm of opportunity for use of weather-based models as decision support tools for site-specific IPM. For example, a grower in the field with a smart phone could access the online model database that has been automatically updated with the most recent weather forecast, enter the most recent fungicide application date for a field, and receive an instant analysis of when protection needs to be renewed in that field due to the cumulative effects of rain on fungicide residue and temperature on tissue growth.

Rebuilding the Orchard Radar platform in Excel 2010 brings other operational advantages. Excel 2010 has greatly improved chart and graph capabilities over the 2003 version. Excel 2010 also has greatly expanded the number of formula dependencies available within a single cell. And the new version makes better use of multi-core processors to speed calculation time which currently takes two minutes per site three times a day. With six sites in the processing queue, the last site spends 36 minutes a day reflecting old information when new information is already on hand to update it. Plans to expand the pest models to more sites in all six New England states require faster processing speed. At the current processing speed, in order to run 20 sites, the total delay lag for the last site would be two hours out of each 24 hour day. All of these changes offer opportunity for a more robust, capable, and rapid system for processing the weather-pest models.

Rebuilding models requires recoding because simply translating the Excel 2003 code into Excel 2010 runs the risk of carrying along hidden "genetic defects" in the code which has been in use for 13 years. However, only the top cell in each column of each sheet needs to be rewritten, the rest can be installed by drag and copy operations can be completed within the time limits of this project.

2D. OBJECTIVES AND ANTICIPATED IMPACTS

Objective 1
– Validate and update links to contact persons and information resources on the PRONewEngland.org website. Update entries in the Pest Factsheet database.
Impact 1 – A more effective and efficient site for New England citizens to reach research-based, geographically specific, unbiased pest management information.

Objective 2 – Upgrade the Orchard Radar pest phenology models to a more robust software platform.
Impact 2 – Fewer service interruptions, less maintenance time, ability for users to customize output with farm specific growth stage and pesticide application dates, better graphing and less lag time between receipt of updated weather data and updated model output.

2E. APPROACH AND PROCEDURES

1. A cooperator in each New England state will review the contact person and organization directories for their state to check for outdated or missing entries and sent corrections to Glen Koehler.

A student technician under the supervision of Glen Koehler will check the validity of links on the website, and troll New England university and state agency pest management web sites for new entries to add to the

2. Purchase a copy of Excel 2010, transcribe cell formulas for 35 spreadsheets from the existing Excel 2003 Orchard Radar base file workbook into a new Excel 2010 workbook. Take advantage of new capabilities in Excel 2010 to improve formula efficiency and formatting of chart and table outputs.

2f. EVALUATION PLANS

We have installed Google Analytics to the web server to provide detailed web traffic information on the number of site visitors, which pages receive the most traffic, and how visitors arrive at the site. A Google Analytics report of 2010 traffic to previous year will be compared to traffic in previous years.

References Cited:

Estabrook, L, E. Witt, and L. Rainie; 2007. *Information searches that solve problems*, Pew Internet & American Life Project. http://www.pewinternet.org/PPF/r/231/report_display.asp

Northeastern IPM Center, 2009. Community IPM Working Group: Priorities 2009. http://northeastipm.org/work_commpriority2009.cfm

2g. COOPERATION, INSTITUTIONAL UNITS, AND KEY PERSONNEL INVOLVED

Glen Koehler will coordinate with cooperators in each of the other five New England states to acquire updated contact and information links for the PRONewEngland website, be responsible for supervising a student technician to update links on the website, upgrade the Orchard Radar pest phenology models, and manage grant contracting and invoices. James Dill will provide administrative oversight.