Professional

Development Session[1]

Title: Novel Applications of Geo-Technologies in Agriculture and Non-Agriculture IPM Decision Support

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[1] " To be held Monday, March 23, 2014 -3:00–6:00 PM- before the 8th International IPM Symposium IPM: Solutions for a Changing World,"- March 23-26, 2015, Salt Lake City, Utah USA

Overview and Introduction (10 minutes)

Naresh Duggal[2]

Overview: Spatial thinking in pest management has been receiving increased attention over the last decade. One reason could be the rapid expansion of geo-technologies to the IPM (agriculture and non-agriculture) communities. Another reason is greater emphasis on applying integrated approaches to provide sustainable pest solutions. Without spatial thinking, the complex pest issues in ever increasing global commerce and rapidly changing climate facing our world cannot be effectively and completely dealt with.

The acquisition of geo-referenced data sets on pest presence, relative abundance, prevalence, damage, etc., can allow accurate spatial and temporal analysis important for proper and timely decision making to effectively plan and implement integrated pest management (IPM) programs. Also, by integrating information into a common spatial language, geographic information system (GIS) can connect pest management professionals and their work

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worldwide, making this information available to a wider audience which can help improve modelling for pest risk assessment.

Many public and private stakeholders have a responsibility or interest in the control of pests. Many of these stakeholders individually, locally or regionally have made efforts to use geo-technologies (geographic information system – GIS and remote sensing – RS) and develop spatial data collection tools and techniques to understand pest issues beyond their areas of control. The potential of these geo-technologies to facilitate the planning and implementation of IPM projects is enormous but, unfortunately, these methods (software and apps) are still much underused. Primary reasons being that most of these methods are limited in scope or are project specific, or research oriented; some groups have more capacity towards data management than others; many are developed in silos; and often such methods are expensive for large scale adoption and use. Many of these good initiatives never see the light at the end of research. These are shelved as systems, become obsolete or have institutional patents, and lack continued funding for product development.

Spatial data about pests is information that can be geographically referenced and measured (quantified and qualified) in real-time to help make integrated decisions which may require influence above and beyond just pest control. It includes information on the location of pests, their impact and control (where, when and how much?); areas that are surveyed for pests; and the location and status of strategic management areas. Spatial data is used in planning (operations, strategic management, program development and direction), improving efficiency and effectiveness, management decisions, strategic management, time management, understanding of trends, record keeping, evaluation, and succession planning. It helps IPM practitioners create maps, graphs, tables for reporting and planning, better information for estimating control costs, predictive models, and risk assessments for undeclared species. It helps improve awareness and knowledge about pest trends, geographic perspective, extent of infestation, density, presence or absence of pests, knowledge about former infestations, and emerging pest threats. Spatial data helps monitor incursions of new or emerging species, spread of an infestation, and management programs. It also can enhance collaboration among stakeholders and encourage them to become proactive rather than reactive.

This professional development session (PDS) will help create a platform and add value to professional IPM communities where government, community (IPM academia, research, practitioners, statisticians), and industry (GIS groups and software developers) understand common elements of every information system. These elements include standard attributes for IPM data, database designs, GIS applications to pest control programs, and costs in developing effective, efficient, economical and viable on-line, cloud based, and mobile solutions

for spatial monitoring, mapping, data sharing at scale, and IPM decision making which may benefit various IPM projects throughout the world. Together participants can explore a range of benefits, challenges, and options, and work towards developing standards. Through this professional development session, like-minded people will be able to network and learn from others, integrate their knowledge and experience, and accommodate new perspectives towards this subject.

Introduction: On behalf of the International IPM Symposium Program Committee, I would like to thank Ms. Janet Hurley[3], Dr. Norm Leppla[4], and Dr. Nick Birch[5] for their kind assistance in coordinating this workshop. With that said, I would like to introduce three dynamic presenters from three pioneering organizations to share their experiences in spatial mapping applications serving integrated pest management needs.

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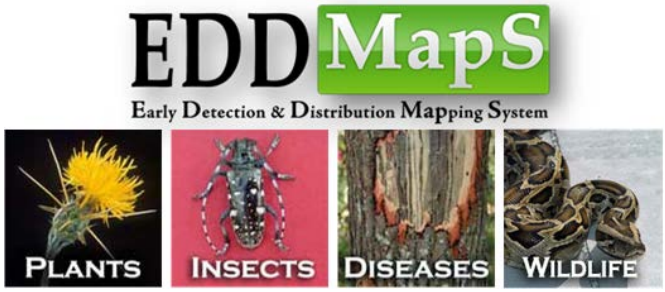
Presentation 1. The Bugwood Center's Early Detection and Distribution Mapping System (50 min., 30-40 minutes presentation, 10-20 minutes questions, demonstration, discussion)

Joseph LaForest and G. Keith Douce[6]

Abstract: An effective program for managing invasive species or other agricultural pests needs to quickly and easily identify the pest distribution so that a response plan can be created and enacted. Many of the species affect multiple environments and therefore require the engagement of many different agencies and stakeholder groups to coordinate detection, monitoring and response activities. The Bugwood Center has created a system that can be used as a central platform for coordinating invasive species and wide-area pest management through the Early Detection and Distribution Mapping System (EDDMapS). This session will showcase the tools that are available and demonstrate several use cases for setting up a new monitoring program, integrating the tools with an existing management effort, and future enhancements that are currently in development.



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Presentation 2. European Union Models for Area-wide IPM: EU PURE and ENDURE (50 min., 30-40 minutes presentation, 10-20 minutes questions, demonstration, discussion)

Graham S Begg, Ph.D., Nick Birch, Ph.D., Burkhard Golla, Ph.D., Silke Dachbrodt-Saaydeh, Ph.D., Jean Noel Aubertot, Ph.D., Wopke vander Werf, Ph.D., Marjolein E Lof, Ph.D. [7]

Abstract: The area-wide approach to IPM is gaining popularity in Europe, a response to the growing recognition of the spatial processes that play out across the agricultural landscape and the impact of these on pest population dynamics, the evolution of resistance, and other aspects important to pest regulation. A number of schemes that incorporate area-wide principles have been deployed in Europe, for example to control Medfly populations in citrus orchards; to sustainably manage cultivar resistance to diseases; or to establish refugia areas for the management of insect resistance to Bt maize. These strategies rely on spatial modelling and GIS based technologies to inform their design and implementation. Despite this there are no "off-the shelf" geo-technology tools or products yet available for the European IPM manager to use. Here we provide a brief overview of the current status of area-wide and other regional scale pest management strategies and underpinning research in Europe and examine the role played by geo-technology, now and in the future.

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Presentation 3. Florida Citrus Health Management Areas (CHMAs) Sectional Mapping Program (50 min., 30-40 minutes presentation, 10-20 minutes questions, demonstration, discussion)

Matthew Albritton[8]

Abstract: Citrus Health Management Areas (CHMAs) are assemblages of neighboring commercial citrus groves where Florida growers work cooperatively to manage the Asian citrus psyllid, vector of the bacterium that causes citrus greening. The CHMA initiative uses geospatial

technologies incorporated from partnering state and federal agencies to place vital pest management information into the hands of growers, researchers, industry leaders and regulators. The Florida Department of Agriculture and Consumer Services, Division of Plant Industry creates up-to-date maps of each CHMA, indicating the results of scouting for psyllids, insecticide spraying and release of parasitoids. The primary use for this information is to coordinate the timing and rotation of insecticides, ensuring the most effective psyllid control while minimizing the development of insecticide resistance. Geospatial data provided through the CHMA website supports coordination, evaluation and extension of current citrus pest management practices.

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