

Summary of the Midwest Entomologist Termite Biology, Ecology, and Management Research Planning Workshop

November 2-3, 2000

This document is a summary of discussions among university and product developers on November 2-3, 2000, at Purdue University in West Lafayette, IN. This workshop was sponsored by Purdue's Industrial Affiliates Program in the Department of Entomology, and financially underwritten by Dow AgroSciences and Aventis Environmental Science. The Industrial Affiliates Program supports research and education efforts in Purdue's Center for Urban and Industrial Pest Management, including sponsorship of a workshop series designed to bring together parties sharing the common goal of urban and industrial pest management.

This summary is organized into two sections, which reflects the order of topics discussed during the meeting. The first section is a Priority List of data gaps/key research questions (biology, ecology, monitoring, and pest management principles) for termites in the Midwest. The second section outlines an Action Plan for the first steps in conducting any significant research: educating potential supportive and impacted parties (including extension program development), garnering their support, and preparing research funding proposals.

The intent of this summary is two-fold: (1) it is to be used by the research community to focus efforts in termite management, and (2) it is meant to promote multi-university and industry collaboration on high-priority areas of termite research.

Data Gaps in Midwestern Termite Research

The group brainstormed Data Gaps or key research questions in each of the four sub-sections. After combining similar points, the resulting general research questions were prioritized based on the value of answering these in advancing termite management in residential, commercial, and sensitive accounts. Each participant voted a 3 for the highest priority, 2 for the 2nd, and 1 for the 3rd priority. Highest total value any data gap could receive was 8 participants \times 3 = 24.

General

1. Political Leadership

- Industry (NPMA) should be the driving force to fund research to answer key questions
- If the termite or structural pest management industry is not the driving force, then determined leadership in government is needed
- Building from this group's impetus, a core group of Industry members needs to define a mission or vision for termite management and research to achieve that vision.
- Quantify/identify the need for research and write convincing position papers for funding.

2. Information Organization and Outreach Programs (a.k.a. Technology Transfer)

- A list of termite-related websites needs to be generated
- A mechanism for efficient, clear, comprehensive technology (information) transfer is needed. Advertise what's available to facilitate use of available information.
- A leader is needed to organize an Outreach Communication Plan.

3. Funding Source List/Description

- Identify who/what the funding sources are
- Which political tie-in motivates funding? See above Political Leadership actions.

Basic Biology Priorities

1. Identify which termite species occur in the Midwest (Highest priority, 24 pts)

- Researchers to collect termite samples from urban and rural areas statewide
- Conduct a survey of PCO's and county extension agents, have them send samples to us
- What is the geographic distribution of individual termite species in the Midwest?
- Why do some termites occur in cities or certain areas and not in others?

2. Chemical communication (23 pts)

- Which compounds are used to communicate with colony members?
- Can these compounds be used as attractants for monitors or baits?

3. Seasonal variation of molting and egg production (22 pts)

- When does molting occur and when are eggs laid?

- How does warm housing affect termite population dynamics?
 - How many eggs can primary and secondary reproductives lay?
- 4. Life cycle and developmental pathways (22 pts)**
 - Population dynamics
 - Workers
 - How many instars occur in each caste?
 - 5. Trophallaxis (17 pts)**
 - Rate of transfer from food consumer to different recipients in the colony
 - 6. Can the Formosan termite survive in the Midwest (12 pts)**
 - 7. Terminology (Lowest priority, 9 pts)**

Ecology

- 1. Habitat (Highest priority, 24 pts)**
 - Where are the termites physically located? – in mulch, logs, landscape timbers, etc.
 - Are there preferred mulch or soil types, and how does this differ from southern habitats?
 - Which habitat conditions are conducive to termites (e.g., moisture, soil, wood species)?
- 2. Foraging ecology (21 pts)**
 - Foraging depth – do we really need to rod and trench so deep into the soil?
 - What time of year is the foraging range expanded?
 - Landscape ecology – what are the patch dynamics, how does optimal foraging theory fit in, can computer modeling assist somehow?
 - How much wood does a colony consume & how fast? (Homeowners want to know)
- 3. Colony foundation and colony dynamics (Lowest priority, 20 pts)**
 - Do colonies “bud” off from the main colony (i.e., as a result of chemical treatment, barrier, etc.)?
 - Can nymphs (secondary reproductives) start new colonies without swarming?
 - What is the importance of budding vs. swarming in colony foundation/establishment?
 - What’s the impact of budding on termite management?
 - Do budded colonies still recognize members of the main colony after a given time?

Monitoring

- 1. Protocol development (Highest priority, 24 pts)**
 - How is colony size accurately assessed?
 - Dye use and standardized methods for using dyes
 - Molecular techniques
- 2. Introduced species and transport to uninfested areas (19 pts)**

- Formosan termite transport via mulch, landscape plants, and pallets
 - What are the regulatory issues?
- 3. Factors affecting monitoring/baiting (15 pts)**
 - Criteria for switching from monitoring to bait: effect of termite numbers vs. time of year
 - Will recruitment to bait be “better” if more termites are present 1st in monitoring station?
 - How does disturbance affect termites in a station?
 - 4. Damage assessment (forensic termitology) (13 pts)**
 - How to tell the difference between old and new termite damage? What are the criteria?
 - 5. Monitoring/bait station checking (13 pts)**
 - Ways to improve training and reduce amount of time spent at each station

Pest Management Principles

- 1. Risk assessment (Highest priority, 13+ pts)**
 - Can we determine a building’s risk of being infested?
 - What is the probability of having termites in a structure?
 - How can homeowners reduce their risk of termite entry and damage to their home?
 - How far will termites move; if found in the yard, will they necessarily move into a home?
 - How long are “treated” pieces of wood actually protected?
- 2. Building construction effects on termite infestations (13 pts)**
 - What are the building codes for each state in the Midwest, and do they need to be changed?
 - How can we involve wood product manufacturers, engineers, construction workers, and realtors?

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