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Tropical Forest Dynamics  
Biodiversity In Agricultural Ecosystems  
Theoretical Community Dynamics

**Vandermeer's** research program is focused on the three interrelated general projects listed above. The **first project** is located on the eastern seaboard of Nicaragua in a forest that has been recuperating from massive hurricane damage since 1988. Current foci are on the secondary dispersal dynamics, by rodents and ants, of 24 tree species and how that relates to the more general dynamics of fragmented landscapes. The **second project** is located in the state of Chiapas in southern Mexico in the coffee agroecosystem.



" PhD candidate M. Jahi Chappell, here shown examining a termite nest in Southern Brazil, is currently working on food security and biodiversity issues in Brazil.

The current emphasis is on the metapopulation dynamics of a particular ant species, *Azteca instabilis*. These dynamics are driven by the complex interaction web focused on this species, including scale insects that are parasitized by at least two hymenopteran parasitoids and attacked by ladybird beetles and a specialist fungus, and are protected from these enemies by the ants. The ladybird beetles in turn are parasitized by at least five species of hymenopteran parasitoids. Finally the ants are attacked by a parasitic fly that dramatically changes their behavior when present, such that foraging efficiency is reduced to almost zero. This complex dynamic picture is thought to determine the overall spatial distribution and metapopulation dynamics of the ant.

The **third project** is theoretical and focuses on simultaneous differential equations to model the long term dynamics of tropical rain forest and similar systems, specifically investigating the role of natural enemies in stabilizing an otherwise unstable system. Another part of the theoretical work is tying the interaction dynamics in the coffee agroecosystem to the metapopulation function of the key ant species. **Undergraduate participation is welcomed in any of these three areas.** It should be understood that working in Nicaragua or Mexico requires relative fluency in Spanish. Laboratory work in Michigan involves working directly with insects or theoretical work with computer modeling.