1077-92-690 **Matthew H Holden*** (mhh88@cornell.edu), 657 Frank T. Rhodes Hall, Cornell University, Ithaca, NY 14853, and **Stephen P Ellner**, **Doo-Hyung Lee**, **Jan P Nyrop** and **John P Sanderson**. *Mathematical modeling for the improvement of sustainable pest management: a trap cropping example.*

Trap cropping, the use of alternative host plants to reduce damage to a focal cash crop or other managed area, can be a sustainable strategy for pest control, but in practice often fails to reach management goals. In order to explain past failures and suggest guidelines for future improvements, we developed a simple model to understand how a trap plant's spatial configuration within a field, its attractiveness, and its ability to retain pests affects pest density on a target cash crop. The model predicts that when trap crop retention is low, small differences in retention have little effect on pest populations in the cash crop, but when retention is high, these differences have a large effect. The opposite is true for attraction. Compared to uniformly located trap plants, clumping trap plants close together, while most often deleterious to trap cropping, can potentially reduce pest densities for frequently moving insects. These results suggest that trap cropping must be supplemented with complimentary management tactics in order for it to successfully control pest populations. (Received September 10, 2011)