INTRODUCTION: IMPLICATIONS OF NOCTUID MIGRATION

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The ability to disperse is an integral survival strategy of most organisms. However, the impact of movement on agricultural production is the least understood of the processes that affect populations of insects (Rabb 1985). Most agricultural pests are highly mobile and noted for their ability to move between fields and even regions. This characteristic allows insects to effectively compete with man for products produced in unstable annual agroecosystems (*viz.* most of our row crop agriculture). The study of insect movement and its impact on population dynamics relative to development and implementation of control strategies is complicated by the large areas involved and by our inability, in most instances, to distinguish between migrant and local population effects. Another factor complicating the study of insect movement is the necessity of forming interdisciplinary teams incorporating both biological (ecology, population dynamics, physiology, and genetics) and physical (meteorology, engineering, and radar technology) science expertise to provide an holistic research approach.

Noctuids are among the most important agricultural pests world wide, and Fitt (1989), in discussing the ecology of *Heliothis* species, lists mobility as a major feature in their adaptation to agroecosystems. Numerous investigations involving a myriad of techniques have demonstrated this mobility (*e.g.*: Jia et al. 1985, Li et al. 1964, Showers et al. 1989, Showers et al. 1993, Wolf et al. 1990, Sparks et al. 1989, Tucker and Pedgley 1983, Rose et al. 1985, Pair et al. 1991, Riley et al. 1992, Farrow and Daly 1987, Farrow 1984, Westbrook et al. 1990, Pedgley et al. 1987, Lingren et al. 1993, and Raulston et al. 1992). Control of the noctuid complex relies primarily on application of pesticides on a field-by-field and crop-by-crop basis with such negative side effects as soil and water contamination, deleterious impact on non-target species and development of insecticide resistance. Pesticide technology has allowed the noctuids to continue as recurring pests. However, the continuously shrinking arsenal of pesticides available for crop protection coupled with social pressures to further reduce their usage is resulting in a redirection of current research to develop alternative control strategies.

Many of the suggested control strategies such as hybrid sterility (Laster and Hardee 1992), inherited sterility (Carpenter 1993), control on early season hosts (Knipling and Stadelbacher 1983), cultural control (Bradley et al. 1986) and adult control (Lingren et al. 1989) will be efficacious only when applied on an area-wide basis and in many instances in

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population source areas. Implementation of these technologies will require a thorough knowledge of all aspects of the ecology of the target pest including their dispersal and migratory patterns. Indeed, a knowledge of the impact of their movement is required to adequately research many of the alternative control strategies. The purpose of this supplement is to provide an update on research of migratory movement of noctuids in the United States. Hopefully, future research can be focused to provide a better understanding of how insect migration impacts populations relative to the economic damage they effect within our agricultural systems.

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