

## SEASONAL DEVELOPMENT OF SOYBEAN ARTHROPOD COMMUNITIES IN EAST CENTRAL ILLINOIS

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### ABSTRACT

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Numbers of individuals of arthropod species were sampled by direct observation at four sites in each of three different east central Illinois soybean fields at weekly intervals from plant emergence until harvest. Soybean plant development at each field was monitored throughout the season.

The number of species detected in a field was greater at the edge (site A) than in the middle (site D). Site A vs. site D differences in numbers of herbivore species were greater than for predator/parasitoid species. Habitat space development (i.e. plant growth) was correlated with the pattern of soybean field colonization by arthropods: a relatively constant number of species per habitat space existed throughout most of the season in all three fields. The mean number of species per habitat space was higher at site A than at site D for both herbivores and predators/parasitoids.

A windbreak at the edge of a field concentrated certain aerially dispersed herbivores at the leeward edge early in the season. Arthropod food webs during most of the season were very complex compared to early season trophic relationships. Suggestions for further study, including investigation of the effects of planting time, row-width, and inter-planting on seasonal development of the soybean arthropod community are discussed.

### INTRODUCTION

Relatively few studies dealing with arthropod colonization have been made. Price and Waldbauer (1975) emphasized the merit of regarding crops as islands available for colonization by arthropods. Price (1976) investigated the colonization of a soybean field with island biogeographical theory (cf. MacArthur and Wilson, 1963, 1967) as a conceptual basis.

A community approach to crop arthropod studies provides a solid basis for development of insect pest management systems. For example, such an approach necessitates chronological observations and analyses which permit viewing the studies as part of the group of theories and data on ecological succession and related areas (e.g. Odum, 1969; Root, 1975). Seasonal studies