WEED MANAGEMENT SYSTEMS IN TOMATO PRODUCTION**.** David E. Hillger, Stephen C. Weller, Elizabeth Maynard, and Kevin D. Gibson, Graduate Research Assistant, Assistant Professor, and Professor, Purdue University, West Lafayette, IN 47907.

Although weed communities respond to the cumulative effect of farm management systems, the influence of management practices at a system level are rarely studied in weed science. On-farm visits and detailed grower surveys were used to objectively classify 66 Indiana tomato fields into management systems. Fields were chosen to represent a mix of fresh market and processing fields that used herbicides or were organically managed. Multivariate statistical analyses identified five distinct management systems where differences existed in practices involving hours spent hand-weeding, whether the farmer used plastic mulch or irrigation, type of row spacing and whether tomatoes were staked. Fields were sampled during the 2003 and 2004 season for weeds and relationships between weed communities and the management systems examined. Conventional and organic fresh market systems had greater weed densities and more diversity of weed species than conventional processing farms. However, organic fresh market fields were not weedier than conventional fresh market. Although some weed species were common to all systems, each management system had problematic weed species that were related to management practices unique to that system. For example, barnyardgrass, goosegrass, and yellow nutsedge were strongly associated with the organic fresh market system. However, eastern black nightshade was common in all conventional systems but not present in the organic system. The association of weed species with particular systems suggests that species become well-adapted to specific weed management practices in a particular system. Further research on rotational schemes and past weed management practices are planned to further delineate weed management practices on species abundance.