

## Demography of *Abutilon theophrasti* and *Setaria faberi* in three crop rotation systems

A H Heggenstaller & M Liebman

Department of Agronomy, Iowa State University, Ames, IA, USA

Received 7 April 2005

Revised version accepted 25 October 2005

### Summary

Field experiments were conducted to characterize the demography of *Abutilon theophrasti* and *Setaria faberi* in a conventionally managed 2-year (maize/soya bean) rotation, and in 3-year (maize/soya bean/triticale + red clover) and 4-year (maize/soya bean/triticale + lucerne/lucerne) rotations managed with 72% and 79% lower herbicide inputs respectively. Rates of weed seedling recruitment, seedling survival and adult plant fecundity were determined for populations in each phase of each rotation and used to calculate annual rates of weed population change,  $D$ . In both years of the study,  $D$  for *A. theophrasti* populations declined or remained stable in all three rotation systems. Despite greater rates of seedling survival and fecundity in maize and soya bean in the 3- and 4-year rotations, increases in  $D$  for *A. theophrasti* populations were prevented in these systems because of low fecundity in triticale and low seedling survival and fecundity in lucerne. For *Setaria faberi* populations,  $D$  remained stable in the 2-year rotation, increased in the 3-year rotation in both years, and increased in the 4-year rotation in 1 year. The results of this study indicate that when herbicide use is reduced, rotations that include triticale and lucerne can facilitate the suppression of *A. theophrasti*. Rotations that include lucerne can contribute to restraining *S. faberi* population growth, given adequate levels of seedling mortality in this crop.

Keywords: crop rotation, weed demography, population dynamics, *Abutilon theophrasti*, *Setaria faberi*, maize, soya bean, triticale, red clover, lucerne.

HEGGENSTALLER AH & LIEBMAN M (2006) Demography of *Abutilon theophrasti* and *Setaria faberi* in three crop rotation systems. *Weed Research* 46, 138–151.