

*MATLAB code to compute population growth rates, stochastic population growths, prospective elasticity, and retrospective contributions to growth rate for Setaria faberi, giant foxtail.*

by

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#### **ABSTRACT**

Most agricultural systems are designed without regard to their intrinsic effects upon weed populations. Yet cropping system characteristics may affect weed population dynamics by altering key demographic rates of weeds. We examined the effects of legume green manure and tillage timing upon giant foxtail (*Setaria faberi*) demography using both prospective and retrospective perturbation analysis of a periodic matrix population model, in which the annual transition matrix is expressed as the product of a period-specific transition matrices. To model giant foxtail, we divided the annual life cycle into four periods: recruitment, spring survival, fall fecundity and seed predation, and winter survival. Such a period matrix model has a simple biological interpretation but the analysis is more complicated. These appendices provide MATLAB code to calculate population growth rates, stochastic population growths, prospective elasticity and retrospective treatment contributions to growth rate. These are Appendices A and B from Davis, Dixon and Liebman (submitted, Weed Science).

To obtain copies of MATLAB codes in pdf form, please click on the Web addresses below.

APPENDIX A: <http://www.stat.iastate.edu/preprint/AppA.pdf>

APPENDIX B: <http://www.stat.iastate.edu/preprint/AppB.pdf>