

# CONSERVATION PRACTICES TO PROMOTE QUALITY EARLY SUCCESSIONAL WILDLIFE HABITAT

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## INTRODUCTION

The loss of quality early successional habitat has had a negative impact on several wildlife species in Tennessee. Northern bobwhite (*Colinus virginianus*) populations have declined approximately 70 percent since 1980 as a result of habitat loss. To address this problem, the USDA-NRCS has promoted native warm-season grasses (NWSG) on lands enrolled in the Conservation Reserve Program. However, if left unmanaged, NWSG grow dense over time and habitat benefits are reduced. The renovation of tall fescue (*Festuca arundinaceae*) is a priority of the Northern Bobwhite Conservation initiative (NBCI), but there are questions regarding the most effective methods to eliminate tall fescue and stimulate desirable native plants. Additionally, many old-field habitats in the South have been invaded by undesirable woody species.

## OBJECTIVES

1. Determine effects of management practices on vegetation structure and composition of previously unmanaged NWSG fields.
2. Determine effective methods for renovating tall fescue fields using herbicide applications and disking.
3. Determine effective management practices for reducing undesirable woody encroachment in old-field habitats.

## PROGRESS TO DATE

Six management practices (fall disking, dormant-season mowing, spring disking, dormant-season burning, growing-season burning, and alternate-tip application of clethodim (Select 10 oz/ac)) with control areas were replicated within each of 3 previously unmanaged NWSG fields across Tennessee, 2003-2004.

Eight treatments with control areas were replicated within each of 3 tall fescue fields across Tennessee, 2003-2004. Treatments included fall application of glyphosate (Gly-4 Plus 2qts/acre) and fall application of imazapic (Plateau 12 oz/acre) (both with and without discing the following spring) and spring application of glyphosate (2qts/acre) and spring application of imazapic (12 oz/acre) (both with and without discing the following fall).

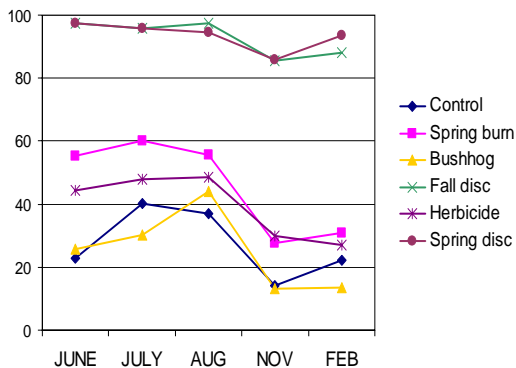
Six treatments with control areas were replicated on an old-field with substantial invasion by sweetgum (*Liquidambar styraciflua*), red maple (*Acer rubra*), and other woody species in 2004. Treatments included dormant-season burning in March, applications of triclopyr (Garlon-4 5qts/acre), imazapyr (Arsenal AC 24 oz/acre), and glyphosate (Gly-4 Plus 4qts/acre) in July, mowing in August, and growing-season burning in September.

Vegetation structure and species composition were recorded in NWSG and tall fescue fields, June – August and November 2004, and February, April, and June – August 2005. Invertebrate abundance and biomass were recorded in the early (June) and late (August) growing season, 2004 and 2005. Seed rain was monitored summer 2004 through winter 2005. Soil loss was estimated using RUSLE 2 software. Vegetation species composition and effectiveness of woody control were recorded for old-field treatments one growing season post treatment (July 2005).

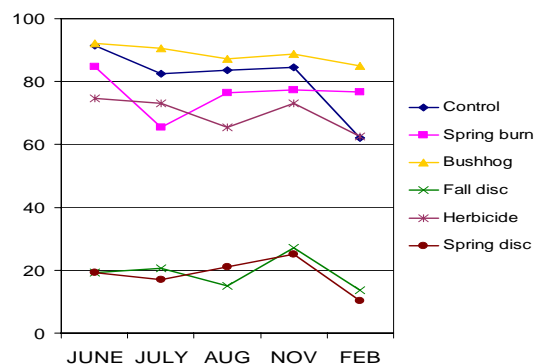
## RESULTS

First-year results for one NWSG field in McMinn County, TN are presented. Treatment effects were observed across all sampling periods for 8 of 14 structural parameters. Spring and fall discing had greater percentage forb cover and openness at ground level than all other treatments. Discing and burning treatments increased percentage bare ground and decreased percentage litter and litter depth. Percentage cover of NWSG was reduced in discing treatments, but remained similar to control in all other treatments.

**Percentage forb cover**



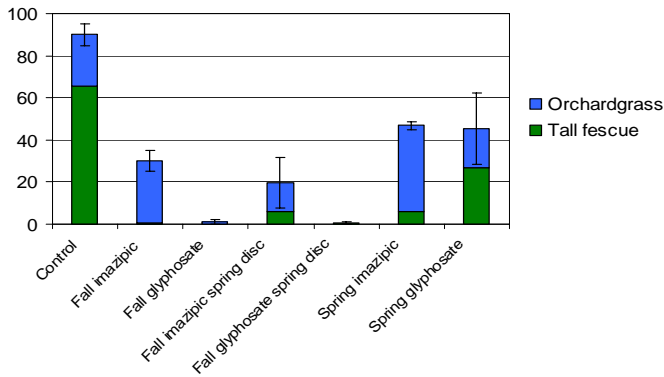
**Percentage WSG cover**



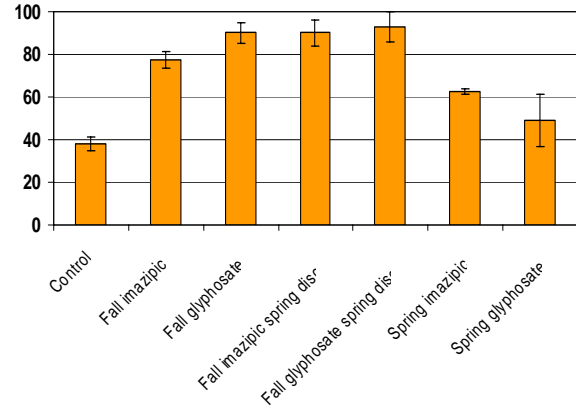
First-year results for one tall fescue field in Rhea County, TN are presented. Fall glyphosate application was effective in eliminating cool-season grass coverage. Fall imazapic eliminated tall fescue coverage, but did not control orchardgrass (*Dactylus glomeratus*), which presented the same structural characteristics as tall fescue. Spring

herbicide applications reduced tall fescue coverage. Imazapic was not effective in controlling orchardgrass. Discing after eliminating tall fescue increased desirable forb coverage.

**Percentage CSG cover one growing season post-treatment**

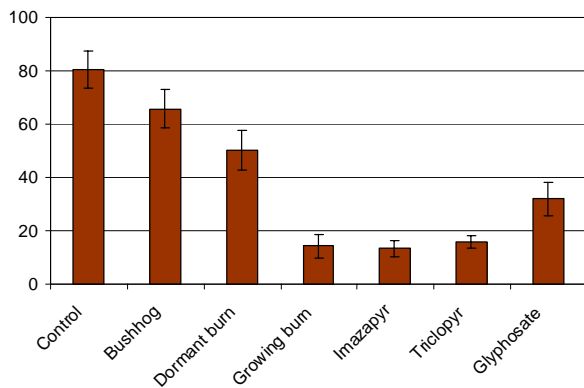


**Percentage forb cover one growing season post-treatment**

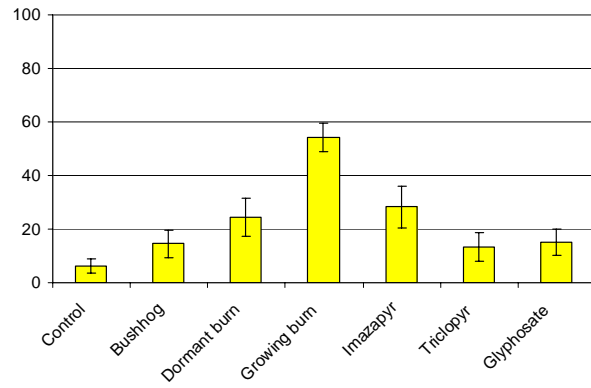


All treatments except mowing reduced woody cover in an old-field. Growing-season burning (September) and spraying with triclopyr or imazapyr were most effective. Both growing- and dormant-season burning and imazapyr application increased percentage cover of desirable legume species.

**Percentage woody cover one growing season post-treatment**



**Percentage legume cover one growing season post-treatment**



## PRESENTATIONS

Gruchy, J.P. and C.A. Harper. An evaluation of mid-contract management practices on native warm-season grass fields. The Wildlife Society 12<sup>th</sup> Annual Conference. Madison, WI, September 27, 2005.

Harper, C.A. and J.P. Gruchy. Managing native warm-season grasses for wildlife. NRCS training meeting. Hartman Farm, Meigs Co., TN, August 25, 2005.

Gruchy, J.G. and C.A. Harper. Managing quality early successional habitat. 11<sup>th</sup> Annual Meeting Southeast Quail Study Group. Gilbertsville, KY, August 15, 2005.

Gruchy, J.G. Evaluating management techniques for NWSG. TN Chapter of The Wildlife Society, Fall Creek Falls State Park, March 16, 2005. *Awarded Most Outstanding Student Presentation*

## **PUBLICATIONS**

None to date.

## **PARTICIPATING AGENCIES AND LANDOWNERS**

Mark Gudlin, TWRA Private Lands Liaison. Helped organize TWRA involvement in the project.

J.M. Huber Corp. Provided a tall fescue study site in Rhea County, TN.

Scotty Mayfield, Mayfield Dairy Farms. Landowner who provided a NWSG study site, McMinn County, TN.

Kathy Patton. Landowner who provided a NWSG study site, Benton Co., TN.

University of Tennessee. Provided tall fescue study site at the Plateau Experiment Station, Cumberland County, TN.

Joe Whitworth, Lockhart Farms. Landowner who provided a tall fescue and NWSG study site in Benton County, TN.

Quail Unlimited.

## **NRCS INVOLVEMENT**

Mike Hansbrough, NRCS Biologist. Served as local contact with NRCS and helped identify landowners to participate in study.

James Woodall, NRCS District Conservationist. Served as local contact in Benton County.