

# Using groundcover to Outcompete Tall Fescue (*Festuca arundinacea*) without outcompeting tree seedlings on a legacy mine site<sup>1</sup>

M. Aldrovandi\*<sup>2</sup> and J.A. Franklin

**Abstract.** The purpose of this study was to determine which of nine ground cover species would outcompete tall fescue (*Festuca arundinacea*) without outcompeting tree seedlings on a legacy mine site. Horseshoe Mountain, a former mine site reclaimed in the 1990s, located in Claiborne County, Tennessee was ripped in fall 2016. Prior to ripping, autumn olive (*Elaeagnus umbellata*) and other invasives were removed using a chainsaw and herbicide. The site was planted in February 2017 with 49% shortleaf pine (*Pinus echinata*); 13% chinkapin oak (*Quercus muehlenbergii*); 9% American chestnut (*Castanea dentata*); 7% each of black oak (*Quercus velutina*), northern red oak (*Quercus rubra*), and southern red oak (*Quercus falcata*); plus woody wildlife species totaling 158 stems per ha. Fifty permanent plots were installed in May 2017. Ground cover treatments were applied to 20 trees per plot. A 1m<sup>2</sup> hoop was placed over trees; 9 different species of groundcover seeds were dispersed within the hoop. It was hypothesized that ground cover species that do not have shallow root systems with extensive surface area will be less competitive with tree seedlings than species that have shallow root systems with extensive surface area. Of the 9 ground cover species planted, 3 species showed good establishment. Sunn hemp (*Crotalaria juncea*) produced an average of 16.7g dry weight/m<sup>2</sup>, ragweed (*Ambrosia artemisiifolia*) produced an average of 13.7g dry weight/m<sup>2</sup>, and sorghum (*Sorghum bicolor*) produced an average of 10.0g dry weight/m<sup>2</sup>. Competition will be further determined by tree growth (RCD and height), transpiration rate, and chlorophyll content.

Additional keywords: mining, groundcover, competition, *Festuca*.

- 
1. Oral paper presented at the 2018 National Meeting of the American Society of Mining and Reclamation, St. Louis, MO: The Gateway to Land Reclamation, June 3 - 7, 2018. Published by ASMR; 1305 Weathervane Dr., Champaign, IL 61821.
  2. Matthew Aldrovandi is a Master's Candidate in the Department of Forestry, Wildlife and Fisheries, University of Tennessee, 274 Ellington Plant Science, Knoxville, TN, 37996. (865) 974-8659, [maldrova@vols.utk.edu](mailto:maldrova@vols.utk.edu). Jennifer A. Franklin is a Professor in the Department of Forestry, Wildlife and Fisheries, University of Tennessee, 274 Ellington Plant Science, Knoxville, TN, 37996. (865) 974-2724, fax (865) 974-4714, [jafranklin@utk.edu](mailto:jafranklin@utk.edu)
  3. Work reported here was conducted near 36° 31' 21" N; 83° 55' 17" W.