From Forest Nursery Notes, Winter 2010

15. © The effects of seeding sterile triticale on a native plant community after wildfire in a pinyon pine - mountain mahogany woodland. Waitman, B. A., Draper, T. M., and Esque, T. C. International Journal of Wildland Fire 18:659-664. 2009.

CSIRO PUBLISHING

www.publish.csiro.au/journals/ijwf

International Journal of Wildland Fire **2009**, *18*, 659–664

The effects of seeding sterile triticale on a native plant community after wildfire in a pinyon pine–mountain mahogany woodland

Benjamin A. Waitman[A], *Trent M. Draper*[A] *and Todd C. Esque*[A,B]

[A]US Geological Survey, Western Ecological Research Center, Las Vegas Field Station, 160 N Stephanie Street, Henderson, NV 89074, USA.

[B]Corresponding author. Email: todd_esque@usgs.gov

Abstract. Post-fire seeding with grasses is a common practice for emergency rehabilitation of burned woodlands. However, most post-seeding monitoring does not address consequences to native flora. In November 2004, the US Forest Service hand-seeded triticale (× *Triticosecale* Wittm. *ex* A. Camus), a sterile wheat–rye hybrid, on a small burned area in the Spring Mountains of southern Nevada, United States. A monitoring project using paired plots was designed to quantify the effects of seeding triticale on density and species richness of native annual and perennial plants, cover of perennial plants, and aboveground production of annual plants. We did not find any effects of triticale seeding on annual plant species or most responses of perennial plants. However, the density of woody perennial seedlings was significantly lower 2 years after triticale was added. Although we found a smaller impact from seeding with exotic grass than other studies, quantifiable costs to native vegetation were observed. We caution against the use of non-native grass for seeding in areas with naturally low perennial recruitment.

Additional keywords: *Cercocarpus ledifolius* var. *intermontanus*, mitigation measures, *Pinus monophyla*, rehabilitation, Spring Mountains National Recreational Area, *Triticosecale*.

Introduction

Post-fire seeding with non-native grasses has been a common practice in the western United States. Several papers have recently been published that pursue long-standing concern regarding seeding as a method of rehabilitation or erosion control and state the need for more information about the effects of seeding on native vegetation recovery (Beyers 2004; Keeley *et al.* 2006). Post-fire soils, and the seed banks within, are inherently unstable and vulnerable to perturbation by erosion or the establishment of invasive species. This is particularly true in semiarid environments such as the interior deserts of North America, hence the concern for rehabilitation by land managers.

Aerial or hand seeding is used to supplement vegetation cover in the wake of wildfire. Seeding is attractive because rapid replacement of vegetative cover can reduce erosion (Gutierrez and Hernandez 1996) and, in addition, can help stave off establishment by invasive species (Burke and Grime 1996; Reid *et al.* 1999; Symstad 2000). Once protective vegetation has been destroyed, even moderate rainfall can cause severe erosion (Johansen *et al.* 2001). Land managers are tasked with preventing large-scale changes to the landscape, such as mass soil movement. Mass erosion events can threaten anthropogenic infrastructure such as buildings and roads and may also hinder the re-establishment of pre-burn vegetation through changes in soil dynamics.

Annual grasses are often selected for post-fire seeding operations, though their use has been increasingly challenged (Beyers 2004; Keeley *et al.* 2006). Rapid growth of the grass promotes rapid accumulation of live cover above and root mass below the soil surface that can reduce the impact of rain (Grime and Hunt 1975). Although the use of exotic grasses for post-fire seeding is common, it is not without complications (Keeley *et al.* 2006). Post-fire seeding with exotic grasses can negatively affect the establishment of those native species that typically colonize burned and disturbed areas (Schultz *et al.* 1955; Eliason and Allen 1997; Beyers 2004). It is reasonable to be concerned about negative effects on native flora because species chosen for rapid growth and cover can be, by those very traits, good competitors with native species (Young *et al.* 1972; Milbau *et al.* 2003).

Post-fire seeding is not uniform in either its effectiveness or its possible detrimental effects on the landscape, and each seeding operation is likely to deal with different sets of challenges (Robichaud *et al.* 2000). Every burned area has a post-burn carrying capacity for vegetation, which may or may not be met by seeded grasses. It is not always clear whether the native flora will respond well to competition from seeded species. Seeding at low densities may restore some vegetation cover to a denuded area without significantly affecting the native flora. There is very little published literature in which the effects of seeding at low density are monitored with respect to the native flora.

On 26 July 2004, an overturned truck started a fire that burned through 118 ha in a pinyon pine woodland community in Kyle Canyon of the Spring Mountains National Recreation Area in Clark County, Nevada. The fire occurred on the steep north-east slope of Mt Charleston in a site later referred to as the Robber's Burn site. In an emergency response, the US Forest Service

10.1071/WF07157 1049-8001/09/060659