

# Post-wildfire revegetation in southwestern ponderosa pine forest: Native seeds versus annual ryegrass

## 2007 Accomplishments

Severely burned areas of large wildfires are often seeded with the goal of establishing quick cover and reducing erosion. The Forest Service spent nearly \$10 million on seeding wildfires in this region between 2000 and 2005. Non-native annual species are usually used in seeding projects due to their low cost and the perception that they will not persist. Unfortunately, non-native annuals do sometimes persist for more than one year after seeding and may impede natural revegetation of native species. Native seed is often more expensive, can be difficult to procure in large quantities, and data on native species performance are limited. Further, seeding, whether with non-native or native species, can unintentionally introduce undesirable invasive species. The goal of our research was to compare the competitive attributes of a suite of native species with non-native species commonly seeded on wildfires. Our approach involves 3 initial screening tests followed by experimental seeding on areas severely burned in wildfires.

We selected 27 species native to southwestern ponderosa pine forests and 2 non-native species (annual ryegrass and barley) for initial screening in the first 3 phases. We assessed viability in an incubator and germination and production in both a greenhouse and an outdoor planter. Our preliminary results suggest that native cool season grasses such as western wheatgrass and squirreltail have comparable or better belowground production than the non-natives.

We selected a subset of 7 native species and 2 non-native species for seeding three areas burned by wildfires in northern Arizona. Native grass species selected for seeding include Indian ricegrass, blue grama, squirreltail, mountain muhly, and muttongrass. Native forbs selected include scarlet gilia and purple locoweed. Non-native plants selected include annual ryegrass and common wheat. In 2006 we established experimental plots and applied seeding treatments at the Warm Fire on the Kaibab National Forest and at the Potato Fire on the Apache-Sitgreaves National Forest.

In 2007 we re-measured all 105 plots established in 2006 on both the Warm Fire and the Potato Fire. We quantified abundance and persistence of seeded species, establishment of non-native plants, and effects on plant revegetation. We also established 45 plots on the Birdie Fire in the Coconino National Forest, which included 15 replicates of three treatments: seeding with wheat, seeding with a native seed mix, and an unseeded control. On this fire we applied a total of 800 lbs of non-native seed and 75 lbs of native seed mix which covered a total of area of over 20 acres.

In 2008 we will quantify abundance of seeded species on all plots, plus assess persistence of seeded species, establishment of non-native plants, and effects on plant revegetation. Preliminary results from this study will be presented at the Association of Fire Ecologists meeting in January 2008.



Wheat was a dominant species on seeded plots in 2007 on the Warm Fire on the Kaibab National Forest.

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**Northern Arizona University**

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- Dr. Peter Z. Fulé, Ken Stella, and Barbara Satink Wolfson

**Apache-Sitgreaves National Forest  
Kaibab National Forest  
Coconino National Forest**

*Contact Person & phone number:*

Dr. Carolyn Hull Sieg: 928-556-2151



**USDA Forest Service  
Rocky Mountain  
Research Station  
2500 S. Pine Knoll Dr.  
Flagstaff, AZ 86001**