Grassland Restoration
It’s about more than Grass!

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Grasslands and the restoration of shrublands to grasslands has received much attention in the past several years. Most people interested in land management and conservation realize how important this community type is to numerous species of wildlife and the ranching and hunting industries. Tebuthiuron (Spike 20P™) has been used very successfully throughout the Trans-Pecos region of Texas to convert creosote flats to grasslands. The focus of much of the success of Spike on desert grassland restoration has been on the dramatic decrease in shrub cover and increase in perennial grass cover that occurs over a two to four year period post treatment. These restored grasslands have high levels of perennial grass canopy and basal cover, which increases the overall health of these ecosystems. But, is this enough? Does perennial grass cover equate to healthy grassland? When we talk about semi-arid and arid vegetation communities, shrubs and grasses receive the bulk of attention, but many species of wildlife rely heavily on the forb component of these ecosystems. The increased interest in grassland wildlife species, including pronghorn, scaled quail, Texas horned lizard and several migratory bird species, has emphasized the need for management, not just of perennial grasses, but forbs as well. Recent research by Sul Ross State University’s Borderlands Research Institute has revealed that grasslands treated with Spike lack a perennial forb component and horizontal and vertical structural diversity. It is suspected that this lack of forbs and structural diversity can have a negative impact on grassland wildlife species. To counter this many land owners have begun applying Spike in strips as part of grassland restoration projects.

Converting creosote flats to functioning grassland communities in the Trans-Pecos is a priority for many different species and has long term impacts on grassland sustainability. Focusing restoration efforts and measures of success only on grass cover is a mistake, thus making treatment with Spike only the first step. Other methods may need to be used after grass establishment to enhance forb growth and increase structural diversity. Prescribed fire in desert grassland communities has been documented to increase forb number and diversity. Spike in the soil can also be bound by charcoal and other soil colloids decreasing the long term impact of this herbicide on forb recruitment. To determine if prescribed fire could help increase forb density and diversity on areas treated with Spike, we applied prescribed fire to approximately 1,000 acres of Spike treated desert grassland.
on the 02 Ranch, located in Brewster and Presidio counties. This application was part of a large scale grassland restoration project, located between Highway 118 and Butcherknife Draw and utilized the areas that were treated with Spike in 2009 and 2010. The prescribed fires were conducted in March of 2014. Plots 1,000 m² were established to compare forbs on areas with 2009 Spike-no fire, 2009 Spike and fire, 2010 Spike-no fire, and 2010 Spike and fire.

Plots were sampled June 2014, August 2014 and November 2014. Sampling has been started in 2015 with June sampling complete, to determine if forb levels change after multiple years.

With the first growing season after the fire having a normal precipitation cycle, with some rainfall in the spring and a monsoon season in late summer, forb response to prescribed fire was phenomenal. Forb species showed a great increase in areas treated with fire, with only five species documented in the 2009 Spike no fire treatment and only 16 species documented in the 2010 Spike no fire treatment, while fire treatments had 24 and 26 species. Interestingly, tumbleweed was only found in the no fire treatments. The largest response in forb number was in the 2009 Spike and fire treatment. On average 31 forbs/1000 m² were documented in the 2009 Spike no fire treatment while an average of 515 forbs/1000 m² were counted in the 2010 Spike fire treatment.

This suggests that waiting a minimum of five years after Spike and then applying a prescribed fire will maximize forb response in desert grasslands treated with Spike. To have a fully functioning grassland ecosystem that provides for a diverse wildlife community, plant diversity must be addressed across shrubs, grasses and forbs. We tend to forget that forbs are a vital part of grasslands. Following Spike treatments with a prescribed fire five years post treatment can get land managers closer to the goal of a fully restored desert grassland with a diverse grass and forb community.

Five years post Spike treatment, showing grass recovery but almost no forbs.

View of strip Spike application showing the decrease in creosote in the treated strips.