

Controlling Annual Bromes

Using Rangeland ‘Greenstrips’ to Create Natural Fire Breaks

The skyrocketing cost of fighting wildfires in the western United States is driving land managers and government agencies to seek effective, long-term methods for controlling fires. In 2003, the U.S. Forest Service spent \$1.2 billion fighting wildfires – costing taxpayers more per acre than any other season in history. To control the mounting costs of wildfires, a growing number of land managers and government officials are looking to innovative fire management techniques such as “greenstripping,” the creation of long, narrow bands of fire retardant vegetation that serve as natural fire breaks.

Eliminating Ladder Fuels

Greenstrips, which introduce fire-resistant broadleaf plants and grasses in areas prone to wildfires, can be a particularly effective fire-prevention tool in the West, where millions of acres of range and prairie lands are dominated by fire-prone invasive weed species such as medusahead and cheatgrass. Because such non-native species dry earlier in the season than native plants, they play a key role in the growth and spread of massive wildfires, providing ignition fuel that triggers

rangeland fires to burn faster, further and longer. Similarly, because cheatgrass is fine-textured and flattens to form a continuous mat on the ground, it can dramatically increase fire danger. Conversely, native Western species such as low-growing sagebrush, serviceberry, bitterbrush, rabbitbrush and perennial bunch grasses typically hold moisture throughout a season, forming natural firebreaks that can slow or stop the spread of fire.



Restoring Nature’s Cycle

While wildfires have always been a natural part of the sagebrush grassland ecosystem, such fires have historically only occurred at intervals of 60 to 100 years, typically burning only a few hundred acres. Today, with millions of rangeland acres infested by invasive weeds, the picture is much different. In fact, rangelands infested with cheatgrass typically burn every three-to-five years, consuming hundreds of thousands of acres in a single wildfire. The fires destroy native plants, which are often replaced entirely by non-native species, creating a

monoculture that makes it virtually impossible for native plants to naturally re-establish themselves. “Creating a greenstrip that replaces invasive weeds like cheatgrass with native and fire-resistant vegetation really promotes a safer, better environment,” said Dr. Jennifer Vollmer, Environmental Resource Specialist, BASF Corporation. “It’s a strategy that not only helps minimize the incidence and size of wildfires, but also promotes the growth of native shrubs and grasslands that can provide cover and concealment for native wildlife.”

Greenstrips Form Natural Fire Barriers

Greenstrips work by combining careful vegetation management strategies with prudent land management to reduce the fuels and conditions that lead to massive wildfires. Plants in a greenstrip are normally widely spaced, with little or no fuel growing in between. So, if one plant is ignited, fire cannot as easily spread to nearby plants.

In areas prone to wildfire, greenstrips can be particularly helpful in slowing the spread of a wildfire. Because they are typically populated by plants with shorter height and higher moisture content than non-native species such as cheatgrass, greenstrips can dramatically reduce the speed at which a fire moves. The drop in intensity and speed can give firefighters a stronger opportunity for controlling and extinguishing the blaze. Creating natural firebreaks, greenstrips help form barriers and anchor points where firefighters can more safely and effectively fight a fire's growth. Greenstrips can also:

- **Improve fire control in high-risk areas. Alongside roads and railways, where cigarettes from cars or sparks created by passing trains can ignite fires, greenstrips can help prevent ignitions or slow the spread of fire.**
- **Protect local communities. Creating a fire-fuel break around urban areas can dramatically reduce property losses from a rangeland fire. Used around individual homes or neighborhoods, greenstrips can break up blocks of flammable non-native vegetation.**
- **Restore natural habitat. By eliminating invasive species such as cheatgrass, greenstrips can help improve wildlife populations and restore native plant habitats, protecting winter rangeland for mule deer and habitat for threatened species such as sage grouse.**



Greenstrip Species and Size Varies by Region

Typically, the specific plant species used to create a greenstrip will depend on the region in which the barrier is established. Greenstrips planted in Nevada, for example, will likely contain species that are far different from those in Washington State, due to changes in climate and soil conditions. However, in establishing a greenstrip, land managers generally select plant species that will:

- **readily establish themselves after planting,**
- **be difficult to ignite,**
- **burn with low intensity.**

"Ideally, you want to select species that will grow low to the ground with a bit of space between plants, so, if a fire occurs, they won't spread flames or embers to neighboring areas," Vollmer said. "Or, you can use brush-type species that have a high moisture content – plants that tend to stay lush and green during fire season. The real goal is to focus on fire-resistant plants – preferably native species that help suppress fire and are capable of growing without a great deal of supervision."

The length and width of a greenstrip generally depends on where it will be planted and the types of plants that are native to the region. For example, in a flat area typically populated by wildland grasses, a greenstrip as little as 30 feet wide may be adequate. Conversely, in forested areas with steep slopes – areas in which fire sparks and embers can spread from treetop to treetop – greenstrips may need to be substantially wider, perhaps as wide as 200 feet. Man-made fuel breaks such as roads and railways can help reduce the width of the greenstrip planting. Natural firebreaks, such as streams or rocky areas, can also be incorporated to reduce greenstrip width.

For recommendations on what species and strategies may work best for greenstrips in specific communities or regions, contact your nearest Natural Resources Conservation Service. Local service center contact information is available via the agency's web site at www.nrcs.usda.gov.

Site Preparation and Seeding

Establishing a greenstrip generally involves a three-step process: first removing existing vegetation, then preparing a seedbed and, finally, seeding desired native plants. The first step involves preparing the site by removing existing vegetation that act as ignition or ladder fuels. It is particularly important to eliminate competition from invasive weeds, giving newly seeded plants improved access to light, moisture and nutrients. Landowners and managers typically use one or more site-preparation method to remove existing vegetation.

- 1 Mechanical methods**, using mowing or chipping or similar techniques to eliminate unwanted brush. Discing and cultipacking may be used to aid in preparing the land for re-seeding, but this is not usually necessary.
- 2 Intensive grazing, mowing and raking, or controlled burns** to reduce the amount of undesirable weeds and ground cover.
- 3 Selective residual herbicides**, specifically targeting invasive weeds to provide long-term control, helping to eliminate competition and improve growth rates for re-seeded vegetation.



Proper seedbed preparation methods will likely vary depending on the region, terrain and resources in which the greenstrip is established, but common seedbed techniques generally involve preparing the soil for drill seeding and the application of an herbicide to eliminate plant competition.

Drill seeding, which includes no-till and rangeland drills, can enable precise control over the amount and depth at which seeds are planted. It is generally considered the best method for seeding a greenstrip. However, the technique is not always feasible, particularly in hard-to-access areas. In rough terrain, land managers may need to use an aerial seeding method, followed by chaining or other methods to cover the seed – a step that helps protect seeds from wind and water erosion. Aerial seeding followed by chaining may also be more practical when establishing greenstrips over a very large acreage, because the method is generally faster than drill seeding.

Herbicides Can Boost Greenstrip Effectiveness

In preparing a site for seeding, **Plateau**[®] herbicide or **Journey**[™] herbicide – both **Smart Herbicides**[™] from BASF – are particularly effective in preparing greenstrip sites overgrown with cheatgrass. **Smart Herbicides** like **Plateau** and **Journey** work by attacking a specific enzyme found only in plants – not birds, animals, insects, fish or humans – and move throughout targeted plants like cheatgrass to eliminate them at the root.

Unlike other herbicide products, **Plateau** can control fire fuels like cheatgrass while still allowing desirable native plants to flourish. In fact, it is the first product to achieve effective control of cheatgrass while releasing other, desirable types of plants. **Plateau** or **Journey** can be used in site preparation treatments and are especially effective for control of cheatgrass when used in conjunction with a competitive plant re-seeding program. Re-seeding can be done directly after herbicide application.

“**Plateau** selectively removes cheatgrass to protect existing shrub communities and release sites to native bunch grasses and sagebrush species,” Vollmer said. “Similarly, **Journey** removes cheatgrass in restoration sites to be re-seeded with fire-resistant vegetation. Both herbicides are particularly suited in applications where the intent is to revitalize native ecosystems and restore the natural fire cycle. **Plateau** and **Journey** can eliminate cheatgrass and other invasive weeds that compete with desirable native plants, which serve as effective firebreaks.”

A 2002 study by BASF and Synergy Resource Solutions Inc. shows that fire intensity and spread can be significantly reduced in areas where cheatgrass was removed using **Plateau**. The height of flames in treated areas can be reduced by as much as 88 percent and the rate at which fire spreads can be lowered by as much as 95 percent, compared to untreated areas. Research shows that the use of an herbicide such as **Plateau** or **Journey** can help lower biomass production, decrease plant litter accumulation and increase space between plants – desirable outcomes in creating a greenstrip area.

Fall Application Is Recommended

When used for controlling cheatgrass and creating greenstrip areas, **Plateau® herbicide** works best when applied in the fall, before cheatgrass germination. **Journey™ herbicide** has the same residual activity as **Plateau**, while also providing control of emerged cheatgrass. **Journey** can be applied for cheatgrass control anytime prior to re-seeding.

“**Journey** offers the ability to control emerged cheatgrass while still providing long-term residual control for successful re-seeding projects,” Vollmer said. “Applying **Plateau** in the fall can help eliminate cheatgrass recurrence, helping desirable plants re-establish themselves. Both products, in turn, help create effective, natural fire breaks and restore native wildlife habitats.”

BASF recommends an application rate that depends on several different factors. These factors include the tolerance of existing desirable species, length of soil activity desired, amount of cheatgrass seed already in the soil and the amount of plant litter on the ground. In general, a **Plateau** application ranging from 4 oz. to 8 oz. per acre, or a **Journey** application ranging from 10 oz. to 20 oz. per acre, can provide good to excellent control of annual bromes such as cheatgrass. Such an application also provides for additional control of annual grasses and broadleaf weeds.



Key Questions to Consider in Establishing a Successful Greenstrip

Before you begin steps needed to establish a greenstrip, be sure to consider several key questions that can have a significant impact on the size and scope of your project:

- *How wide will your greenstrip need to be?*
- *What type of vegetation needs to be removed to reduce flame height?*
- *Will re-seeding be needed after brush removal, or does the area contain adequate fire-resistant vegetation?*
- *Is the area prone to cheatgrass invasion? Or, is the area already populated by cheatgrass?*

Many of the answers to these key questions can be found by consulting your local extension agent, Natural Resources Conservation Service (NRCS) office or visiting the Firewise web site at www.firewise.org, which contains key guidance from the National Wildfire Coordinating Group, a consortium of wildland fire agencies.

To determine whether or not your proposed greenstrip has the potential for cheatgrass invasion after brush removal or seedbed preparation, consult your local Department of Natural Resources (DNR) or state game department. If the potential for cheatgrass invasion exists, most experts will strongly recommend using a herbicide for cheatgrass control.

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For more information about **Plateau® herbicide** or **Journey™ herbicide** and their application, visit the BASF Professional Vegetation Management Web site at www.vmanswers.com.

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