New Technology for Fuel Breaks and Green Strips in Urban Interface and Wildland Areas

Jennifer L. Vollmer

Abstract

Threat from wildfire can be greatly minimized through proactive efforts that reduce and slow spread through use of green strips or fuel breaks, and decrease fire volatility by reducing fuel load. This results in greater safety to fire fighters and protection to key urban interface areas or wildlife habitat. The fight against western wildfire is typically reactive as suppression, with splintered efforts toward vegetation management. Annual grass management is often over looked in prescriptions for firebreaks. Annual grass, such as cheatgrass, is a fine fuel responsible for fire ignition, enhanced spread and increased volatility. These annual weeds are often present or invade western brush/grass or PJ/grass communities after fuel break development. A new technical advance in fuel break and green strip production is to apply Plateau® or Journey® herbicide, to control annual grass growth and encourage growth of desirable fire retardant vegetation after brush or tree removal. Studies using BehavePlus indicate that when annual grass was removed by herbicide to release perennial bunch grasses, a reduction of flame height of up to 90% was possible. Model results show the herbicide treated areas reduced flame height from levels where aerial assault is required to the level, 1 meter(m), where hand control is effective and spread slowed to less than 1.5 miles/hr. Thus indicating, that a fire moving across a herbicide enhanced firebreak could be controlled by hand and the area easily evacuated. Demonstrations with this new technology have successfully stopped fire spread and reduced risk to communities and fire fighters. This same technology can reduce the danger to fire fighters, the number of acres burned and save critical habitat areas.

Introduction

Risk to fire fighters and threat to urban interface communities and wildlife habitat can be greatly minimized through proactive efforts that reduce and slow fire spread. Effective fire breaks can be produced through use of green strips or fuel breaks with decreased fire volatility and reduced fuel loads. The fight against western wildfire is typically reactive as suppression, with splintered efforts toward vegetation management. level, where hand control is effective and spread slowed to less than 1.5 miles/hr

Annual grass management (cheatgrass) is often over looked in prescriptions for firebreaks. Annual grasses, such as *Bromus* species and medusahead rye, are fine fuels responsible for fire ignition, enhanced spread and increased fire volatility. The

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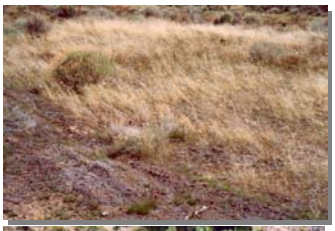
sometime thick duff layer and tinder dry cheatgrass plants are a significant fire hazard by early summer. These annual weeds are often present or invade western brush/grass or Pinyon,/Juniper(PJ)/grass communities after fuel breaks are developed. Often removal of brush or PJ complexes opens land to cheatgrass invasion. The resulting cheatgrass infested strip acts as a "wick" to aid fire in quickly crossing these breaks and increasing rather than decreasing hazards to fire fighters and communities



Fuel break not treated for control of cheatgrass

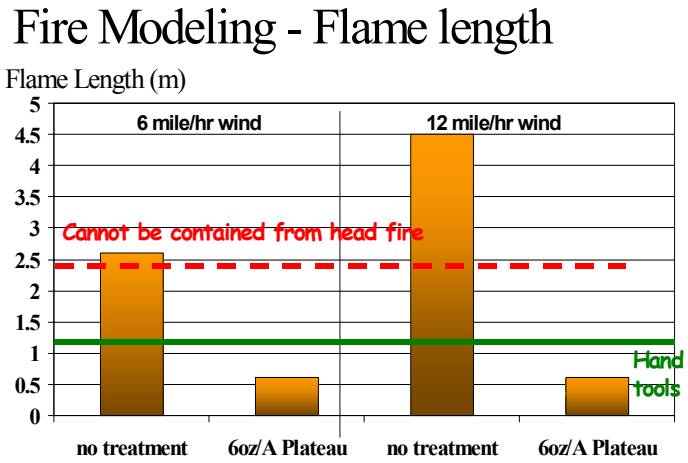
Fuel break treated for control of cheatgrass

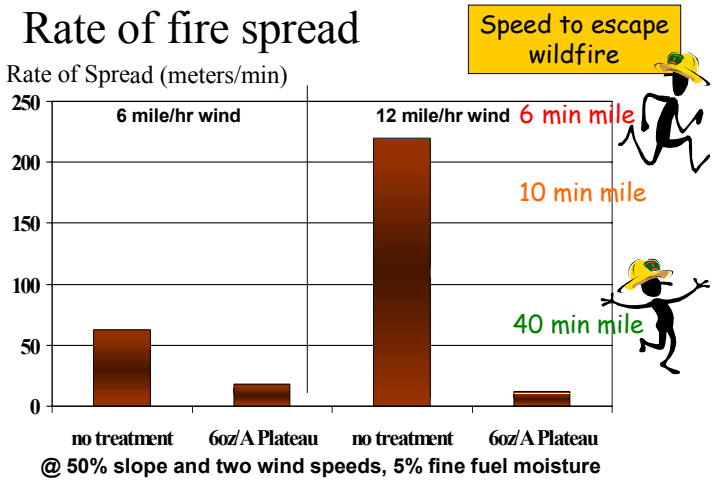
Discussion

New technical to advance fuel break and green strip fire suppression success is the use of Plateau® or Journey® herbicide, to control annual grass growth and encourage growth of desirable fire retardant vegetation. Plateau is applied prior to cheatgrass emergence to release desired bunch grass. Research plots located near Boise, ID were analyzed at three years after treatment, using BehavePlus to determine if fire hazard had been reduced by removal of cheatgrass and release of desired bunch grass species. Data collected included biomass. Biomass results for the 6 oz/acre Plateau rate compared to the non-treated check are represented in Table 1. Modeling results indicated that when annual grass was removed by herbicide to release perennial bunch grasses, a reduction of flame length of up to 90% was possible (Table 2). Model results show the herbicide treated areas reduced flame length from levels where the fire cannot be controlled from a head fire to the level, where hand control is effective and spread slowed to less than 1.5 miles/hr.

Table 1. Plant Biomass as litter (majority cheatgrass duff), forbs, bunchgrass and cheatgrass, in Boise ID research plots.

Table 2 & 3. Fire modeling results from Boise, ID research plots. Modeling and data collection by Synergy Resource Solutions, Inc.





Data collected and analyzed by Synergy Resource Solutions, Inc.

Data reference: Synergy Resource Solutions, Inc. 2002. Data Collection and Fire Modeling Determine Potential for the Use of Plateau® to Establish Fuel Breaks in Bromus tectorum-Dominated Rangelands. BASF Corporation, Laramie, WY.

The following is the application of this new technology in Wellington Crescent subdivision, Carson City, NV. Prior to fuel break creation, vegetation in the wildland area surrounding the sub division was dominated by Wyoming big sagebrush and antelope bitterbrush shrub over-story, with a squirreltail, Indian ricegrass and cheatgrass under-story. In 2002, The City of Carson City c developed a fuel break along the north and west boundaries of the subdivision, adjacent to the wildland area. The fuel break consisted of 100% shrub removal at 0 to 50 feet out from the from the subdivision, with the final 50 to 100 feet from fence having 50% antelope bitterbrush retention (for

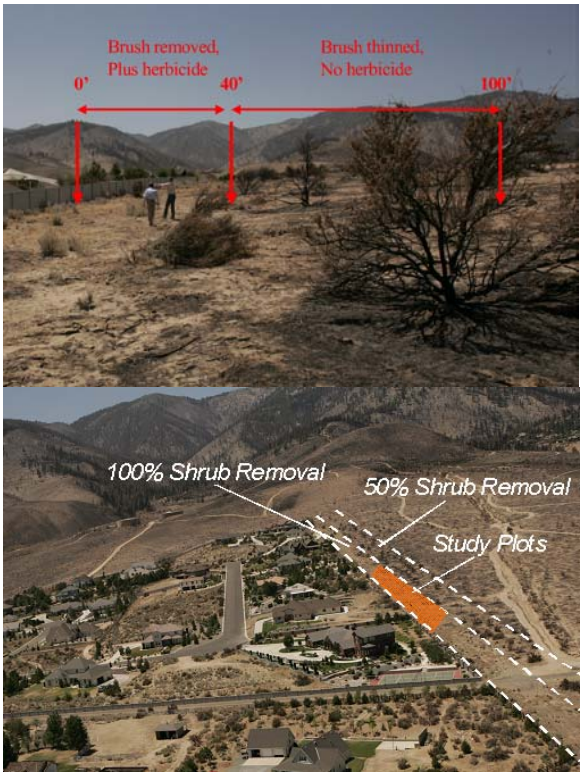
wildlife) and all other shrubs removed. By the spring of 2003, annual weedy species (cheatgrass, mustards, filaree) dominated fuel break resulting in shrub fuel being replaced by a highly flammable, continues fuel. Stands or mats of cheatgrass act as a hazardous fuel that can carry very hot fires, quickly. When cheatgrass dominates a fuel break, it acts as a wick, able to bring fire in to the subdivision or take fire from the subdivision to the wildland. In addition, fire fighter safety is jeopardized due to the fast fire spread and difficulty of getting in front of the fire because blowing embers quickly spread the fire to new areas.


Cheatgrass infested fuel break 1 year after 100% brush removal

In fall 2003 the fuel break was enhanced with a pre-emergence application of Plateau herbicide at 6oz/acre + 1qt/acre methylated seed oil, applied in 20 gal/acre water for annual weed control. The herbicide was applied to the first 40 feet of the 100% brush removal section of the fuel break. To avoid creating a bareground situation after removal of the annual species, perennial bunchgrass species were drill planted immediately after herbicide application. For the purpose of data collection to back actual fire behavior or aid in predicting fire behavior, three sets of 4 treatments were established in the 100% brush removal area for data collection: Treatment 1) Non-treated (only 100% brush removal), Treatment 2) No herbicide, drill seeded, Treatment 3) Herbicide treatment for pre-emergence annual weed control, no drill seeding (for release of remnant bunchgrass species), Treatment 4) Herbicide treatment for pre-emergence annual weed control and drill seeded. Data was collected in July of 2004 with results showing plant biomass to be greatly decreased in the herbicide treated data collection plots as compared to the no herbicide plot and check plot..

Table 4. Total plant biomass from research plots established in Wellington Crescent subdivision, Carson City,NV.

Two weeks after data collection, the Waterfall Fire swept across the adjacent wildland area, burning 9000 acres and destroying 31 homes. However, the fire diminished at the fuel break and was completely stopped by the portion of the fuel break with annual weedy vegetation controlled, saving homes and fire fighting resources.



Summary

Removal of cheatgrass from fuel breaks results in a safer fire-fighting environment due to slowing the speed of the fire and reducing flame height, and as in the demonstration area, laying down the fire completely. Production of a network of fuel breaks that are free of annual weeds, including cheatgrass, would greatly benefit suppression efforts by giving fire fighters a network of known safe environments to pursue suppression efforts from the ground.

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The Author

Jennifer L. Vollmer, Ph.D. has been employed by BASF Corporation since the purchase of American Cyanamid. She started with American Cyanamid in 1989 as a Weed Scientist in the field Research and Development group. In the 1990s she helped develop the use of imazapic herbicide for control of annual weeds in establishment of native prairie species. This technology is now a common practice for Conservation Reserve programs throughout the Midwest. In 1999 she started working with Bureau of Land Management and several western state wildlife agencies to develop imazapic herbicide for cheatgrass control in sagebrush steppes. This technology has expanded from the release of critical winter range areas to the development of firebreaks in cheatgrass prone areas. She is currently the Environmental Resource Specialist for the Professional Vegetation Management group of BASF Specialty Products and on the steering committee of the Western Wildfire Impact Reduction Coalition to create more awareness for the need of annual weed control in brush and woodland fuel breaks.