Weed Manager-Driven Local Research Projects

In April 2015, 25 weed managers from across Montana met in Bozeman for Level 3 Noxious Weed Management Certification. The two-day course covered methods for monitoring vegetation and evaluating effectiveness of weed management, including plant sampling techniques and data analysis. Participants returned home with the task of completing a research project that answered a weed management question relevant to their own program. Participants could work independently or in small groups. Field work occurred between May and October 2015. In all cases, a two-tailed t-test was used to compare treatments (α=0.05, unless otherwise indicated). Following are short synopses of some of the projects that were completed. Stay tuned for more synopses in May!

Reed Canarygrass Response to Livestock Exclusion at The Wall Campground/Bottom—Upper Missoula River Breaks National Monument (Kenny Keever, BLM, Havre; *kkeever@blm.gov*). The problematic grass reed canarygrass (RCG) is found along riparian areas in the Upper Missouri River Breaks National Monument. A previous riparian assessment revealed that distribution and density of RCG seems to be influenced by season of livestock use, and observed occurrence of RCG was low in grazed areas. However, it may only be aesthetics in that grazed areas appear to have less RCG due to the fact they are grazed. This inquiry looked into the possible differences between grazed and excluded vegetation at one river bottom that is known as "The Wall." Measurements were taken using the Standardized Implementation Monitoring Protocol (SIMP) that is currently used for monitoring vegetation response to biological control agents. This process uses 20 m transects that place a Daubenmire frame at 2 m intervals for a total of 10 frames. Within the frames, basal cover was estimated in 5% increments for the following groups: RCG, cottonwood/willow, other forbs/shrubs, perennial grass, bare ground/litter, rushes/sedges, smooth brome, and quackgrass. Three replications were conducted inside and outside the grazing-excluded area. The only significant difference across the categorized vegetative groups was with RCG (α=0.1). The average basal cover and frequency of RCG was greater within the grazing-excluded area. This small study would suggest that the exclusion of grazing over 10 years or more may well be contributing to an increase in RCG. However, at this site and at this time, other functional groups seem to be relatively the same between grazed and un-grazed areas.

Comparing Picloram + 2,4-D to 2,4-D Alone for Controlling Spotted Knapweed along Rights-of-Way (Jack Eddie and Amber Burch, Beaverhead County Weed District; *Contact: aburch@beaverheadcounty.org*). County weed districts primarily treat road ways in a right-of-way setting. Many weed districts use a tank mix of picloram and 2,4-D amine, but for the past few years Beaverhead County has not observed residual control from the picloram and treatment in many areas is needed every year. The purpose of this research project was to examine the level of control when using the typical tank mix on spotted knapweed versus a lower cost option of 2,4-D amine alone. The site selected for the project is located roughly 25 miles south of Dillon around the Kidd exit. Two sample areas were set up within the site. The first sample area was treated with picloram and 2,4-D amine at 16 and 32 ounces per acre rates, respectively. The second site was treated with 2,4-D amine at 32 ounces per acre. A total of 4 sampling transects were done in each of the two sample areas. Each transect was 100 feet in length. A random number generator was used to determine a starting point of 6 feet and a sample was collected every 4 feet. A Daubenmire frame was used to record the number of spotted knapweed plants at each sampling point. We found that applying a tank mix of picloram and 2,4-D amine as opposed to applying 2,4-D amine by itself had no statistical difference in the presence or density of spotted knapweed plants in a roadside treatment. Next spring additional data should be collected to determine if the picloram and 2,4-D amine provided any longer term control of spotted knapweed as opposed to applying 2,4-D amine alone.

Revisiting a Bluebunch Wheatgrass Revegetation Study 15 Years after Treatment (Steffany Rogge, Lindsey Bona, and Bryce Christiaens, Missoula County Weed District; *Contact: bryce@missoulaeduplace.org*). Our research objective was to compare the results, 15 years post treatment, from a revegetation study that

combined a broadleaf herbicide and revegetation to restore highly degraded prairie communities. The study was initiated in 2000, with the goal of describing the response of degraded prairie communities to autumn picloram application (1 pint/acre) for spotted knapweed control combined with heavy seeding rates of bluebunch wheatgrass (10, 20, 30, 40 or 50 pounds per acre; non-seeded control). Data was collected pre-treatment in May of 2000 and plots were treated in October of that year. Results from the 2002 data collection (2 years post-treatment) concluded that increasing the seeding rate above 20 pounds per acre had no significant effect on bluebunch wheatgrass establishment. Also, the researchers observed a rapid increase of cheatgrass following the 2000 treatment. Our research questions were to see if 1) increasing the seeding rate for bluebunch wheatgrass had a significant effect on establishment after 15 years as compared to the two years in the original study and 2) the increases of cheatgrass percent cover observed on the site maintained itself 15 years after treatment. We measured percent cover of cheatgrass and bluebunch wheatgrass using a ½ meter by ½ meter frame. We took 5 frame readings in each of the 18 plots. We found that across all 6 treatments (control, 10, 20, 30, 40 and 50 lbs/acre) there was no significant change in the percent cover of bluebunch wheatgrass when comparing data collected from 2002 to 2015. Across all 6 treatments there was a significant decrease in percent cover of cheatgrass from 2002 to 2015. However, we found that there was no significant difference in percent cover of cheatgrass across all 6 treatments when comparing the 2000 pre-treatment data to our data from 2015. The results of the earlier study found that increasing the seeding rate of bluebunch wheatgrass above 20 lbs/acre did not increase establishment 2 years after treatment. Our results indicate that even 15 years was not enough time for higher seeding rates to increase establishment of bluebunch wheatgrass. While the original researchers saw a 10-fold increase in cheatgrass from 2000 to 2002, we found no significant difference in cheatgrass cover on any of the plots when comparing pre-treatment data to our data 15 years after treatment.

Determining the Most Effective and Economic Weed Control Method for Outlying Areas of MSU Campus
(David Hawkins, Facilities Services, Montana State University; *daveh@montana.edu*). The purpose of my research was to determine the best/cheapest method to deal with weed control in outlying, non-maintained areas of the MSU campus. Previously used methods were mowing and spraying, which are the only two methods easily available. Use of these methods was random and there was no consistency, so my goal was to determine what would be the most effective plan based on both cost and results. I chose to do three tests: mow only, mow and spray, and spray only. The spraying was done once in late spring with Vengeance Plus. Mowing was done every two weeks in the "mow only" areas and once per month in the "mow/spray" area. The area tested was in a field on the south edge of campus, just west of 7th Street, and south of the track complex. Weed density data were taken using random sampling using a 1 square meter frame. Four samples were taken in the east strip of each test method and 4 from the west strip. Samplings were done approximately 10 feet apart in each strip. My expectations were that the mow/spray areas would be the most effective in terms of weed control, followed by the mow only and then the spray only. However, the spray only areas actually had the fewest weeds, with some 1 meter areas having zero weeds and over half having less than 5 weeds per square meter. Next most successful was the mow/spray method, with the mow only area being the least successful. The cost per acre for spraying, mow/spray, and mowing was $36, $76 (five mowings, one spray), and $80 (10 mowings), respectively. So the cheapest method also produced the lowest weed counts.

Due to the length of this Weed Post, there is no word puzzle. It shall return in June!

MONTANA STATE UNIVERSITY EXTENSION

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