



TechLine

Sharing innovative research, success stories, and tips with invasive plant managers.

SPRING Newsletter 2011

Prairie & Grasslands Edition

OVERCOMING CHALLENGES TO RESTORE NATIVE TALLGRASS PRAIRIE

University and U.S. Fish and Wildlife Service Partner to Find Solutions



The Kufrin Waterfowl Production Area (WPA) is the heart of some of the best remaining waterfowl habitat in Minnesota. Located northeast of Ortonville, Minnesota near the South Dakota state line,

this 739-acre WPA is part of the Morris Wetland Management District. JB Bright, wildlife refuge specialist for the district is tasked with managing habitat to meet the needs of prairie wildlife. “The goal of the Morris Wetland Management District is to restore and protect wetland and grassland habitat and manage the lands to benefit breeding waterfowl and other wildlife,” explains

Bright. “Much of the land that we acquire is former cropland that we need to restore to native grassland species.” In an average year, the district may restore several hundred acres of tilled land back to native grassland species and restore numerous drained wetlands. Restoring these wetlands not only provides habitat for wildlife but also helps prevent downstream flooding and provides sites

by Celestine Duncan, Editor

for public recreation such as hunting and wildlife photography.

Invasive plants can be a serious problem when restoring native grasslands. “When we make a decision to restore a site, we often open up a ten-year ‘Pandora’s box’ of problems in the form of invasive plants such as Canada thistle (*Cirsium arvense*), plumeless thistle

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photo courtesy of JB Bright



photo courtesy of JB Bright

Forbs remaining in herbicide treated plots were larger and more robust across application timing compared to forbs in mowed or nontreated plots.

The level of sweet clover present in 2009 is visible in the border areas (foreground). There was a trend for cover of this and other exotic forbs including, perennial sowthistle, and dandelion to be higher with herbicide treatments applied in September compared to June.

(*Carduus acanthoides*), absinth wormwood (*Artemisia absinthium*), common mullein (*Verbascum thapsus*), yellow toadflax (*Linaria vulgaris*), sweetclover (*Melilotus* sp.) or sulfur cinquefoil (*Potentilla recta*)," says Bright. "Invasive plants present some real management challenges and can out-compete our desirable native species. During the first three years of these native seedings we needed to know how to proceed with our restoration program, whether we should mow or apply herbicides, and what impact our control methods were having on desirable plants."

"The herbicide treatments greatly reduced competition from Canada thistle and opened a niche for native forbs and grasses to thrive."

To answer some of these management questions, Bright teamed up with Dr. Roger Becker, weed scientist from the University of Minnesota to determine if selective herbicides could play a role in native prairie restoration. "We established field trials to compare the effectiveness of herbicide treatments applied in June and September for controlling Canada thistle, and to measure the impact of herbicide treatments on desirable forbs," explained Becker. Bright added, "We also wanted to determine if applying herbicides early in the restoration program would improve overall establishment of grasses and forbs."

Table 1. Canada thistle control and visual cover 12 to 15 months after treatment (MAT) in response to Milestone® and Transline applications in June compared to September on the Kufrrin Waterfowl Production Area.

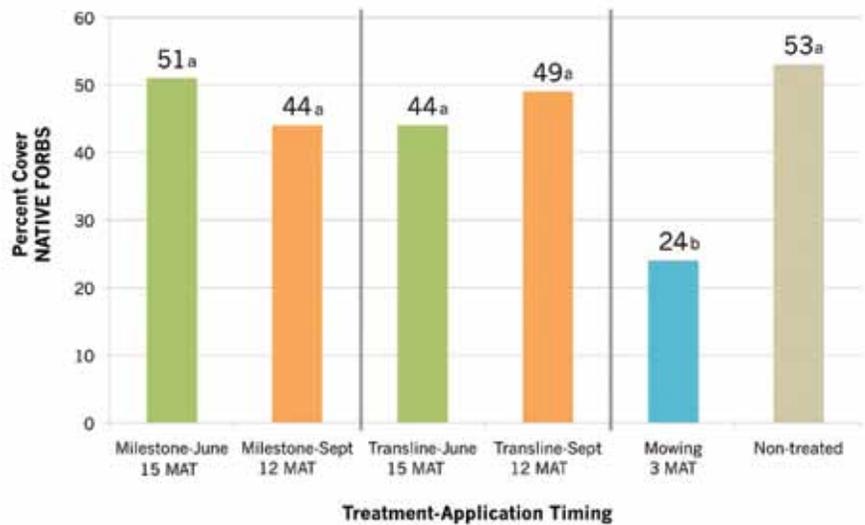
Treatment	Rate (fl oz/A)	Application Timing	Canada Thistle Rating: 9/21/2010 (12 or 15 MAT)	
			% Control*	% Cover*
Milestone	5	June	83 ab	4 bc
Transline	10.6	June	65 b	9 ab
Milestone	5	September	93 a	1 c
Transline®	10.6	September	90 a	2 bc
Non-treated	-		0	13 a

*Numbers followed by the same letter are not significantly different at the 0.05 level

The study site was located in an 88-acre restoration project that was seeded to native species in June of 2007. When the trials were initiated native perennial grasses such as little bluestem (*Schizachyrium scoparium*), big bluestem (*Andropogon gerardii*), indian grass (*Sorghastrum nutans*) and side oats grama (*Bouteloua curtipendula*) were established on the site. There were also many native forbs including golden Alexander (*Zizia aurea*), purple prairie clover (*Dalea purpurea*), wild bergamot (*Monarda fistulosa*), yarrow (*Achillea* spp.) and goldenrod (*Solidago canadensis* and *S. rigida*). The restored area was mowed in June of 2008 to stop Canada thistle seed production and the research study initiated the following year. Milestone® and Transline® were applied June 25, 2009 when Canada thistle was at the late bolt to bud growth stage. Fall treatments of these herbicides were applied September 23, 2009. The area outside of the herbicide treated and non-treated plots was mowed June 2009, August 2009 and June 2010 to prevent Canada thistle seed production and flight. Four quadrats were randomly established in September 2010 in this mowed area and data were collected to compare the effect of mowing to herbicide treated and non-treated plots.

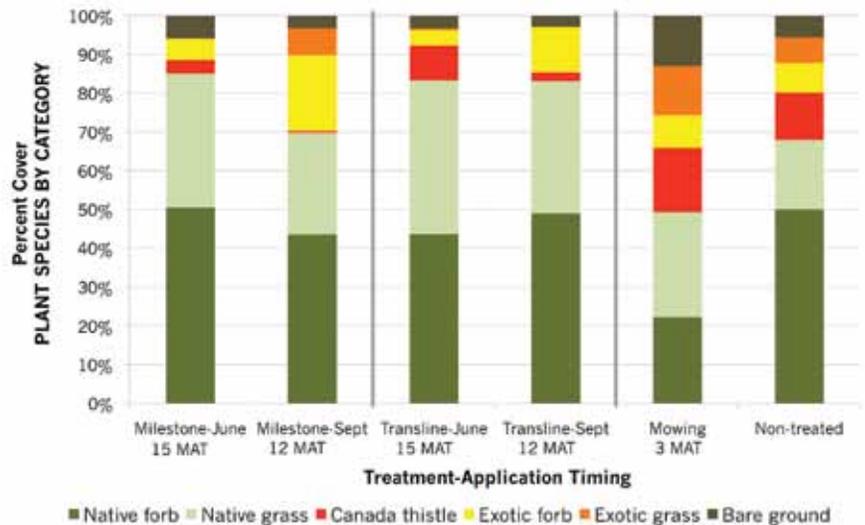
Results of the study to date show that Milestone at 5 fl oz/A and Transline at 10.6 fl oz/A (2/3 pints/acre) applied in September provided greater than 90% control of Canada thistle the season following treatment (Table 1). There was no significant difference in Canada thistle control between September and June applications of Milestone although control was slightly less in June (83%) compared to September (93%). There was a significant difference in control with Transline with the September application providing 90% Canada thistle control compared to 65% when applied in June.

Figure 1. Percent cover of native forbs in response to Milestone at 5 fl oz/A and Transline at 10.6 fl oz/A applied in June and September 2009 compared to mowing and non-treated plots. Data collected September 21, 2010.



*Cover values with the same letter are not significantly different at the 0.05 level [LSD= 13.63]

Figure 2. Percent cover of plant species by category in response to Milestone at 5 fl oz/A and Transline at 10.6 fl oz/A applied in June and September 2009 compared to mowing and non-treated plots. Data collected September 21, 2010.



Note: Exotic forbs include sweetclover, perennial sowthistle, and dandelion.

There was no significant difference in visual percent cover of forbs based on herbicide application timing. However, forb response in herbicide treated and non-treated plots was significantly different compared to mowed plots (Figure 1). Forbs remaining in herbicide treated plots were larger and more robust across application timing compared to forbs in

mowed or non-treated plots. There was a trend for cover of exotic forbs including sweetclover, perennial sowthistle (*Sonchus arvensis*), and dandelion (*Taraxacum* spp.) to be higher with herbicide treatments applied in September compared to June. Since most vegetation was removed with mowing, this treatment had a significantly higher negative impact

["KUFRRIN" continued on page 4]



JB Bright, wildlife refuge specialist for the Morris Wetland Management District

on native forb cover compared to herbicide treatments or non-treated plots when evaluated in September 2010 (Figures 1 and 2).

Although long term monitoring of the plant community is needed to understand impacts of the various

treatments, results of this evaluation indicate that mowing had a greater negative impact on the cover of native forbs than the herbicide treatments. Bright noted that, "Results were very enlightening because native forbs were visually more robust in herbicide treated plots compared to mowed plots. The herbicide treatments greatly reduced competition from Canada thistle and opened a niche for native forbs and grasses to thrive. In mowed plots, Canada thistle is still present and continues to compete with seeded species, impacting our desirable plant community." Current research results suggest that forb response may be similar with herbicide treatments applied in either June or September.

Plant counts were also taken in each of four replicates for each treatment in June using a square yard (yd²) frame. The only forb showing

STUDY SITE HISTORY: KUFRIN WPA

6/21 and 6/25/2007

Broadcast seeded (Vicon and culti-packer) into bean stubble with about 78% grass/22% forb mix, consisting of both purchased seed and remnant prairie harvest. At least 44 species were seeded at a rate of approximately 38 seeds per square foot.

6/20/2007

sprayed with Round-up and 2,4-D amine at 1 quart each product/acre

7/07/2008

mowed

6/30/2009

mowed outside plots (did not mow herbicide treated plots or non-herbicide treated plots within the study site)

8/12/2009

mowed outside plots (did not mow herbicide treated plots or non-herbicide treated plots within the study site)

6/23/2010

mowed outside plots (did not mow herbicide treated plots or non-herbicide treated plots within the study site)



WATERFOWL PRODUCTION AREAS

Waterfowl production areas (WPAs) are considered the prairie jewels of the U.S.

Fish and Wildlife Service National Wildlife Refuge System. These wetlands and the surrounding uplands provide breeding, resting and nesting habitat for millions of waterfowl, shorebirds, grassland birds and other wildlife. Waterfowl production areas also protect native plants, provide habitat for resident and migratory wildlife, help filter groundwater, control runoff and flooding, and capture carbon from the atmosphere. These lands are either acquired as public land, or protected through perpetual easement. With more than 36,000 separate fee and permanent easement tracts

covering nearly three million acres, waterfowl production areas account for 18 percent of National Wildlife Refuge System lands in the lower 48 states. Approximately 95 percent of these WPA lands are located within the Prairie Pothole states of North Dakota, South Dakota, Minnesota and Montana. The smallest is less than one acre (Ward County WPA in North Dakota) and the largest is 7,468 acres (Phillips County WPA in Montana).

By law, WPAs are open to hunting, fishing, trapping and other wildlife-dependent recreation including wildlife observation, photography, and environmental education.

The Kufrin WPA was dedicated in 2005 to Steve Kufrin, a life-long outdoorsman and former U.S. Fish and Wildlife Service partnership coordina-

tor, for his commitment to wetland conservation.

INTERESTING FACTS ABOUT WATERFOWL PRODUCTION AREAS:

- When you purchase a Federal Migratory Bird Hunting and Conservation Stamp (a.k.a. "Duck Stamp") 98 percent of your \$15 purchase goes toward creating waterfowl production areas.
- Dozens of threatened or endangered species, especially prairie plants such as the western prairie fringed orchid, rely heavily on WPA habitat for survival.
- WPAs protect a large portion of the remaining tallgrass prairie in the Midwest. For example, Helikson WPA in northwest Minnesota contains 1,373 acres of virgin prairie with grasses over 6 feet tall.

a significant response ($P=0.05$) to herbicide application timing was purple prairie clover. The June application of Milestone at 5 fl oz/A showed no significant impact on this forb (6 plants/yard² in treated versus 4 plants/yard² in non-treated) compared to complete removal of the plant with the September application. There was no significant impact to purple prairie clover with applications of Transline at 10.6 fl oz/A regardless of application timing. These plots will be monitored in 2011 to measure plant community response to various treatments.

A secondary benefit of herbicide treatments is that there is less physical disturbance to upland bird habitat compared to mowing. "Our herbicide application equipment treats an area 52 feet wide compared to our mower which is 24 feet, so we have less disturbance and fewer tracks, both of which can impact upland bird habitat. Applying herbicides also saves time compared to mowing," says Bright.

"Our goal is to have diverse native plant communities that will include different levels of canopy cover and structural diversity to serve a wider array of birds, pollinator insects and other wildlife," explained Bright. Information from this research will help us select native forbs for seeding that are more tolerant to herbicide treatments, and time herbicide applications to achieve the best results." Restoring a diverse, healthy, native plant community will not only benefit wildlife but will be more resilient to invasion by non-native plants.

EDITORS NOTE: Forb response to Milestone applied in spring and fall over five locations in four states, including the Kufirin WPA, is summarized in a power point presentation "The Effect of Application Timing on Forb Tolerance to Aminopyralid". The summary was presented at the Western Society of Weed Science annual meeting in March, 2011 and is available at www.techlinenews.com/wswstimingforbtolerance.pdf

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Always read and follow label directions.

Some states require an individual be licensed if involved in the recommendation, handling or application of any pesticide. Consult your local extension office for information regarding licensing requirements.

State restrictions on the sale and use of Transline apply. Consult the label before purchase or use for full details. Milestone is not registered for sale or use in all states. Contact your state pesticide regulatory agency to determine if a product is registered for sale or use in your state.

BRIEFS

TechLine Expands

Since our new production team signed on in spring 2010, TechLine has grown from a printed/mailed newsletter to an entire suite of print and electronic resources for invasive plant managers. We've expanded our audience, refined our message, and streamlined delivery so that we can send you—our reader—more of what you DO want and less of what you DON'T. Read on to learn more about how your TechLine subscription just got better.

NEW! Weed District TechAdvisor

This spring TechLine launched a new informational series specifically for county weed district professionals.

Weed District TechAdvisor provides timely resources to help ensure safe and effective field use of herbicides manufactured by Dow AgroSciences. The goal is to provide answers to technical questions and enhance education of weed district staff and the public about invasive plant management with herbicides. TechAdvisor is available online and delivered to subscribers in hardcopy and email formats.

IMPROVED! www.techlinenews.com

TechLine launched a new website to house our suite of resources for invasive plant managers. Use improved navigation and search features to quickly find issues of TechLine Newsletter, TechNotes, and much more.



Montana offers new invasive plant curriculum for K-12

The kNOweeds curriculum, developed by Missoula County Weed District in Montana, includes 46 hands-on, ecologically-based lessons for K-12 students. Lessons encourage student inquiry, incorporate a variety of learning styles, and are place-based to reflect the diversity of ecosystems, land values and users throughout the state.

The kNOweeds Curriculum is available for free at http://missoulaeduplace.org/weeds_curriculum.shtml or by writing Steffany at steffany@missoulaeduplace.org.