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SPRING Newsletter 2012

Western Range & Wildlands Edition

DILIGENCE AND PLANNING ARE KEYS TO SUCCESSFUL COOPERATIVE WEED MANAGEMENT AREA IN NORTHEAST OREGON

Wallowa Canyonlands Partnership uses a science-based approach for managing noxious weeds


Sarah Ketchum, Wallowa Resources

by Celestine Duncan, Editor

The headwaters of the Grande Ronde and Imnaha rivers originate in the high elevation peaks of the Wallowa–Whitman National Forest in northeast Oregon. These rivers flow northward, descending from 9,000 feet as they meander through a diverse mix of federal and private lands before emptying into the Snake River in southeastern Washington.

The two watersheds include some of the most biologically diverse canyon country in the Pacific Northwest, supporting unique plant and animal communities. The steep walled canyons and narrow valleys are prime winter range for elk, bighorn sheep, deer, game birds and non-game wildlife. Native plant communities include federally listed plants of interest such as Spalding's silene (*Silene spaldingii*) and MacFarlane's four o'clock (*Mirabilis macfarlanei*).

"Invasive weeds are one of the most serious natural resource and economic issues facing the canyon country in Wallowa County," says Mark Porter, Watershed Stewardship Director for Wallowa Resources and lead for the Wallowa Canyonlands Partnership. Porter began working with the Wallowa Canyonlands Partnership (WCP) in 2000 when a group of committed individuals and

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agencies realized that without increased coordination, planning, and management noxious weeds would continue to spread in the region.

The Wallowa Canyonlands Partnership encompasses about 1.7 million acres of private and government-owned lands in parts of four counties and three states (**Figure 1**). Partners in the weed management effort include private, state, Tribal and federal entities that provide technical expertise, local coordination, and funding for noxious weed control (**Table 1**). "The Bureau of Land Management was one of the driving forces behind the WCP and continues to be a key partner in our effort," explains Porter.

The mission of the WCP is to protect the ecological and economic values of Hells Canyon along the Imnaha, Lower Grande Ronde and part of the Snake Rivers from weed invasion by coordinating control and restoration projects across jurisdictional boundaries. "Partners work closely toward a shared goal," Porter explains. "Unfortunately weeds don't respect land ownership boundaries, and in mixed ownership areas it's mutually beneficial to cooperate and communicate to avoid duplicate or disparate efforts." Natural and human-caused factors put the area at high risk for invasion by non-native invasive plants. The WCP focuses primarily on the river corridors because the rivers themselves are significant vectors of weed seed transportation. Floods bring weeds downriver and create a seed bed, thus spreading weeds throughout the watershed.

Ecological change to the area from invasive perennial plants such as St. Johnswort (Klamath weed or goatweed; *Hypericum perforatum*) began as early as the 1920s in the Clearwater River watershed. Since that time, a host of invasive non-native plants have been introduced, established, and spread. This includes spotted and diffuse knapweed (*Centaurea stoebe* and *C. diffusa*), leafy spurge (*Euphorbia esulae*), hawkweeds (*Hieracium* spp.), rush skeletonweed (*Chondrilla juncea*) and others. Today there are 32 "A" designated noxious weeds and 15 "B" designated weeds reported in the project area, with 11 of those prioritized for intensive treatment.*

Figure 1. Land ownership within the Wallowa Canyonlands Partnership area

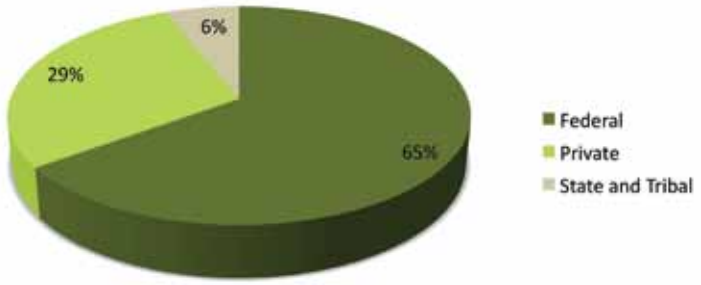


Table 1. Major partners involved in the Wallowa Canyon Partnership

Asotin, Baker, Union and Wallowa Counties
Blue Mountain Elk Initiative
Blue Mountain Habitat Restoration Council
National Forest Foundation
Oregon and Washington Agriculture and Fish and Wildlife Agencies
Oregon Parks and Recreation Department
Oregon State Weed Board
Oregon Watershed Enhancement Board
Private landowners (100+)
Rocky Mountain Elk Foundation
The Nature Conservancy
The Nez Perce Tribe - Precious Lands
Tri-County CWMA (Baker City, OR)
Tri-State CWMA (Cottonwood, ID)
USDA Forest Service, Wallowa-Whitman and Umatilla National Forests
USDI Bureau of Land Management-Vale District of the Baker Resource Area
Wallowa County Natural Resource Conservation Service
Wallowa County Soil and Water Conservation District
Wallowa County Vegetation Department

INVENTORY

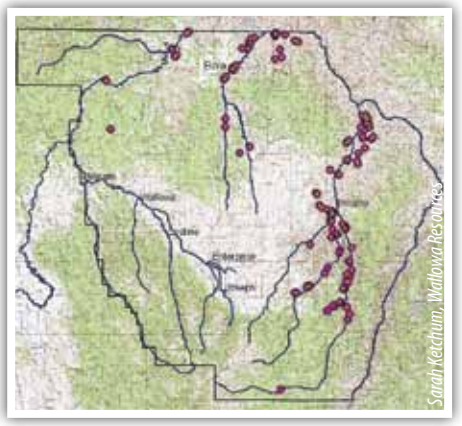
Successful management of invasive plants hinges on the ability to prevent introduction, and detect and quickly eradicate new infestations before they spread. "It's impossible to manage

*In Oregon, noxious weeds are classified as either "A", "B", or placed on the "Target (or T) List", with "A" and "T" listed weeds receiving priority for control efforts. The weed list is reviewed and updated annually.

invasive plants well if you don't know the location and magnitude of the infestation you need to manage," says Porter. Because of the large size of the project area and budget constraints, WCP was interested in a quick, efficient, and reliable method to survey noxious weeds. "We were lucky when we first started the noxious weed project to be able to work with Jason Karl of The Nature Conservancy (TNC) who introduced us to sketch mapping [**BOX 1**] noxious weeds on large landscapes. It's worked great for us, when invasive plants are blooming and highly visible we can map up to 60,000 acres of rough canyon country in a day at less than $0.20 per acre. This method doesn't replace ground-based inventories for newly invading plants such as rush skeletonweed, but the survey data we collect is invaluable as a planning tool," Porter explains.

Priority weeds such as rush skeletonweed (above) in the lower Grande Ronde and Imnaha watersheds are targeted for complete containment and control with the goal of eradication.

The map below shows the location of rush skeletonweed populations in the project area.



Sarah Ketchum, Watershed Stewardship Coordinator for Wallowa Resources manages GPS data for the project. "We have good data for multiple years so we can measure change in weed populations over time to determine whether populations are expanding or receding," Ketchum explains. As an example, yellow starthistle (*Centaurea solstitialis*) populations exploded in 2010 and 2011 with increase in moisture during spring and summer. "Since we had good inventory data on yellow starthistle populations we could see that we needed to move quickly with containment and control measures or we would lose 10 years worth of work," says Ketchum. "It's important to be ready with solid landowner relationships, maps, partner funding, and an action plan so you can move forward quickly when needed."

EARLY DETECTION and RESPONSE

Most weed species actively managed within the WCP area are at low levels of infestations. Keeping these populations in check and finding new infestations before they can spread is critical to the long-term health of the resource. One way the WCP finds newly invading priority weeds in the lower Grande Ronde and Imnaha is through a unique bounty program. The bounty program pays $200 to the first 10 people who find and report new sites of select weeds in the project area. The Rocky Mountain Elk Foundation provided seed money for the program in 2004, and Wallowa Resources has continued the bounty program since. "It sounds like a lot of money, but we do a good job of inventory so it isn't that easy for people to find a new location of a priority weed," explains Porter. "It's a great public education tool and its priceless if we find a new location before the weed has a chance to spread. It can also be a good way for youth organizations to make a little money and learn about

BOX 1

AERIAL SKETCH MAPPING

was developed in the 1940s as a technique for quickly identifying and mapping infestations of forest pathogens and insects. Observers sketched the locations of infestations on paper maps while flying transects over a survey area. With new technology of touch-sensitive computer displays and integrated GIS/GPS software, it's possible to enter survey data directly in a computer. The Nature Conservancy (TNC) became interested in this technique as an alternative to traditional image-based remote-sensing methods for early detection and monitoring of infestations of invasive plants in the Hells Canyon region of Idaho and Oregon. Working from the Unites States Forest Service (USFS) Digital Area Sketch Mapping (DASM) system, TNC customized ArcPad software and added custom tools to assist with aerial mapping.

Although chartered aircraft time can be expensive, the DASM technique allows surveying of large landscapes in a manner that is more cost efficient than either ground-based surveys or other remote-sensing techniques. ArcPad is a powerful mapping application that is easy to use and affordable. This should allow land management agencies and other organizations to train existing personnel in these survey techniques for their invasive species survey and monitoring needs. More information is available online at **http://www.esri.com/news/arcnews/fall05articles/tnc-uses.html**

ArcPad, displayed here on a handheld device, is a powerful mapping application that is easy to use and affordable.

["WALLOWA" continued on page 4]

["WALLOWA" continued from page 3]

Progress on restoration efforts on the Magpie Ranch in the Lower Imnaha Canyon. This project is the result of a determined land manager (Mike Hale) who found resources in the WCP program to restore a river bar feedlot to a productive seasonal pasture for both cattle and wildlife.

the resource at the same time."

Priority weeds such as rush skeletonweed in the lower Grande Ronde and Imnaha watersheds are targeted for complete containment and control with the goal of eradication. Survey and detection work for rush skeletonweed is done mainly on the ground since the plant is so difficult to map from the air. Porter explains, "We try to treat all infestations of rush skeletonweed each year—in 2011 that was about 100 sites. On non-federal lands, we apply Milestone® at 5 to 7 fluid ounces/acre (fl oz/A) and it's doing an excellent job of controlling rush skeletonweed. The benefit of Milestone over other herbicides such as Tordon® 22K is that we can treat when the plants are most visible at bloom stage rather than waiting until fall.

LONG-TERM MANAGEMENT

The WCP relies on a science-based approach for managing noxious weeds with a goal of restoring functional plant communities. Preventing introduction of newly invading plants, public education and outreach, releasing biological control agents, using herbicides judiciously, and restoring disturbed sites are critical components of the weed management effort.

"We have biological agents successfully established on yellow starthistle, diffuse knapweed, leafy spurge, St. Johnswort and Dalmatian toadflax (*Linaria dalmatica*)," explains Porter. "Even though infestations of yellow starthistle expanded the previous two years, we believe that the seed-feeding weevil *Eustenopus villosus* is slowing the spread of the plant especially in native bunchgrass communities." The toadflax stem weevil *Mecinus janthinus* has effectively reduced Dalmatian toadflax, and several other biological agents have been effective on diffuse knapweed.

Noxious weed treatment with herbicides in 2010 and 2011 averaged about 1,550 acres per year in the WCP. The largest acreage treated included yellow starthistle, Scotch thistle (*Onopordum acathium*), and sulfur cinquefoil

BOX 2

WALLOWA RESOURCES was established in 1996 to work through partnerships with a diverse group of people to design and realize a new, healthier, rural community in Wallowa County, Oregon. The Wallowa County Court gave Wallowa Resources a leadership role for some aspects of natural resource management in the County. In 1999, Wallowa Resources was one of the first groups in the nation to sign a Memorandum of Understanding with the United States Forest Service that commits both parties "to work cooperatively to demonstrate new watershed management approaches that improve and restore the ecosystem health of the Wallowa-Whitman National Forest." The Wallowa Community Forest Stewardship Program was designated as a National Reinvention Laboratory in 2000 with the specific goal of "Uniting the public, conservation and industry groups and government agencies in a common goal: the restoration of the forest ecosystem to secure the social, cultural, ecological and economic health of Wallowa County." Community leaders have been involved with the organization since its inception and the volunteer base is steadily increasing.

More information about Wallowa Resources and the Wallowa Canyonlands Partnership project can be found at **www.wallowaresources.org**

Stewardship Community Education
WR
Wallowa Canyonlands Partnership

(*Potentilla recta*) with the goal to contain populations. Cost-share programs for weed control encourage private land managers to control infestations of priority noxious weeds. The WCP targets 50/50 cost share ratio for approved projects. Depending on the priority of the weed and funding availability, total cost of control may be paid through the program. "We track what herbicides are applied on specific infestations, application rates, environmental conditions, and treatment results in our database," explains Ketchum. The herbicides selected are based on efficacy on the target plant, land ownership, proximity to water and other environmental conditions. Depending on site conditions and land ownership, either Milesone at 5 fl oz/A or Transline® at 2/3 pints/A is applied on hawkweeds, yellow starthistle, and Scotch thistle.

Although desirable plants respond favorably on many sites once invasive weeds have been removed, restoration is needed in some areas. The goal for restoring a site is to move from annual grass or weed-dominated sites toward a more functional and weed resistant plant community. "We choose seed mixes based on management objectives and site needs," explains Porter. Depending on the size of the site seeded, either hand tools, rangeland drills or aerial seeding is used along with moderate disturbance to break up litter and prepare a seed bed.

The keys to success in the WCP are strong partnerships and consistent funding for noxious weed control projects. "All of our partners are important to us, but three have consistently provided funds to our project for 12 years including Oregon State Weed Board, Bureau of Land Management and the Rocky Mountain Elk Foundation," explains Porter. "Our funding partners allow flexibility on where and how the WCP allocates dollars and that has enabled us to put together a system that works. We have the trust, financial support, and good working partnerships with agencies, Tribes, and private landowners. This relationship is priceless and gives us the ability to efficiently manage invasive plants within the WCP. Effective noxious weed control is based on long-term commitment, diligence, and persistence. If you practice those basic tenants you will be successful," says Porter.

Skip Royes uses a horsepack sprayer to apply herbicides for noxious weed control in the rugged landscape of the Wallowa Canyonlands Partnership area (Wildcat Creek).

EDITORS NOTE: Pending completion of the necessary documents and funding, the use of aminopyralid (Milestone) and its tank and pre-mixes will be available for use on BLM lands in fall of 2012.

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Label precautions apply to forage treated with Milestone and to manure from animals that have consumed treated forage within the last three days. Consult the label for full details.

State restrictions on the sale and use of Transline apply. Consult the label before purchase or use for full details.

Tordon 22K is a federally Restricted Use Pesticide.

Always read and follow label directions.

CORRECTION
In the article, "Native Grass Establishment Following Herbicide Applications" (Fall 2011), seeding dates for North Dakota and Minnesota were incorrect in Table 1. The correct dates are April 22 for North Dakota and November 17 for Minnesota . Thank you, Dr. Rod Lym, for bringing this to our attention.

Wyoming Counties Unite to Control Russian Olive and Saltcedar Along the North Platte River

by Celestine Duncan, Editor

The North Platte River flows through Colorado and Wyoming before joining with the South Platte River in western Nebraska near the city of North Platte. The river drains a large portion of southeastern Wyoming, providing critical services to the region ranging from irrigation to recreation.

The impact of noxious weeds and invasive trees, particularly Russian olive (*Elaegnus angustifolia*) and saltcedar (*Tamarix* spp.), on the ecosystem of the North Platte watershed became evident to longtime weed superintendent Steve Brill with Goshen County Weed and Pest District. "The North Platte River is critical to the economy and natural resource base in Goshen County," explains Brill. "We started a saltcedar control program along the river in fall of 2006 and included Russian olive in our efforts by 2007. It didn't take us long to realize that this was a huge task and we needed to coordinate with upstream counties and landowners in order to make the control program successful."

The five counties encompassing the North Platte River in Wyoming joined forces in 2007 and formed the Upper North Platte River Weed Management Area (WMA) to control Russian olive and saltcedar along the river and its tributaries. Starting at the Colorado state line, the counties within the project area include Carbon, Natrona, Converse, Platte and Goshen [**BOX 1**]. The goal of the project is to protect and improve water resources, wildlife habitat, and native plants and animals by controlling invasive trees. A side benefit of the control effort is maintaining a more open river channel to minimize potential flooding along the river and its tributaries.

"Although the North Platte watershed includes a diverse mix of ownership, the majority of land along the river is privately owned," explains Dana Erdman, coordinator for the project. "We need these landowners to support our control effort, so public education and outreach on the impact of invasive trees to watershed values is a critical component of our plan." Russian olive has been planted in windbreaks in Wyoming for many years, so the education program focuses on impacts caused when these invasive trees

Russian olive trees are cut at ground level and stumps are treated with Garlon 4 Ultra with bark oil immediately following cutting.

BOX 1

Map credit: Kim Johnson, Freemont County Weed and Pest District

The Upper North Platte River Weed Management Area includes Carbon, Natrona, Converse, Platte and Goshen counties in Wyoming.

County	Management Effort
Converse County	Initiated an eradication program on saltcedar and Russian olive along the North Platte in 2004 and treated about 18 acres along the river.
Natrona County	Treated 650 acres of saltcedar by ground since 2004 with a designated saltcedar crew focused primarily on shorelines surrounding Pathfinder Reservoir. In addition the City of Casper is removing and replacing Russian olive with non-invasive trees along the North Platte River within their jurisdiction.
Carbon County	Medicine Bow Coordinated Resource Management Area has treated 931 acres of saltcedar along the Seminoe Reservoir, 42 miles of saltcedar along the Medicine Bow River and 6 acres of Russian olive. Survey and treatment of Russian olive and saltcedar is ongoing along the North Platte. In addition, *Diorhabda elongata* was released on saltcedar on Seminoe Reservoir.
Platte County	Treated 1,750 acres of Russian olive and saltcedar along the North Platte River and 800 acres of saltcedar on Gray Rock Reservoir.
Goshen County and many cooperators	Treated more than 1,000 acres of Russian olive 2,000 acres of saltcedar since 2006. In addition, *Diorhabda elongata* was released and confirmed to be established along the North Platte River.

Partners are working together to investigate potential uses for tree biomass removed from sites. Piles of cut trees are stacked to create windbreaks for livestock, whereas others are mulched (shown above).

establish in riparian areas. Counties also focus on removal efforts along waterways, allowing Russian olive to remain in upland windbreaks or ornamental plantings.

One of the public education hallmarks of the project is a video highlighting the value of the North Platte River and impact of invasive plants on watershed values, agriculture and recreation. "The North Platte river is famous for fly fishing," explains Brill. "So there was interest from fishing organizations and other recreational groups along with private, county, state and federal partners to expand the video." [**BOX 2**]

MANAGEMENT EFFORTS on saltcedar within the five-county area started as early as 2004 but quickly expanded when Russian olive was added to the Wyoming noxious weed list in 2007. Control methods include saltcedar foliar, basal bark, and cut-stump herbicide applications, mechanical removal of larger Russian olive and saltcedar trees, and release of the biological control agent *Diorhabda elongata* on saltcedar.

Dedication, hard work and persistence typify the control effort. In Goshen County, two to three individuals using backpack sprayers did the bulk of saltcedar treatments along 86 miles of the North Platte and Laramie River. "It really gets us in shape for hunting season," jokes Brill about the number of miles walked as part of the control effort. "We started at the Wyoming and Nebraska state line and progressed upstream treating both sides of the North Platte and Laramie River banks, islands and reservoirs in Goshen County."

Since 2007, county weed districts and other partners in the Upper North Platte River WMA have treated about 4,400 acres of saltcedar and 2,800 acres of Russian olive. "The progress we've made to date is just great," says Brill. "We are restoring open stands of native cottonwood and willows that have a productive grass understory. Several years ago these riparian areas were choked with saltcedar and Russian olive."

Partners directly involved in the control effort include county weed and pest districts, conservation districts, private landowners, Bureau of Reclamation, Wyoming Game and Fish, Natural Resource Conservation Service, Northern Great Plants Exotic Plant Management Team and others. The scope of control and containment programs varies among counties based on the level of infestation and available resources.

The majority of control has been basal bark or cut stump herbicide treatments with a 25% solution of Garlon® 4 Ultra (1 quart Garlon 4 Ultra to 3 quarts bark oil). "We selected Garlon because grasses are very tolerant to the herbicide allowing us to maintain a desirable understory plant community. Overall, Garlon is providing good control especially with basal bark treatments on smaller trees, but we had some re-growth on large Russian olive," explains Brill. "Based on our treatment techniques and label guidelines, we increased our rate to a 50% solution of Garlon 4 Ultra in bark oil in October 2011 for both basal bark and cut stump application and will monitor results of the treatments." A 5% solution of Habitat* was also used as a cut stump treatment on limited sites. "We only use Habitat as a retreatment on a small percent of our cut stumps,"explains Brill. "You have to be very selective where you use Habitat since it kills all the other vegetation around the stump. You have to reseed the site or end up with bare ground which is susceptible to establishment by other invasive plants."

The management plan also includes mechanical shearing (cutting) large Russian olive trees at ground level and applying Garlon® 4 Ultra with bark oil immediately following cutting. Goshen County is still trying to find the best use for the woody biomass once trees are cut. In some areas the wood is stacked to make natural windbreaks for cattle and provide wildlife habitat. Trees are also mulched and the material sold, given away or used by the county.

["NORTH PLATTE" continued on page 8]

BOX 2

RIVER OF TIME

River of Time - Wyoming's Evolving North Platte River is a 34-minute video highlighting the origin, history, and importance of the North Platte River in southeast Wyoming. The video discusses the introduction, impact and management of Russian olive and saltcedar on watershed values, agriculture, recreation and traditional lifestyles in the region. Financial contributors to the project include the five county weed and pest districts in southeast Wyoming, Goshen County Coordinated Resource Management Weed Team, Wyoming Privet Grazing Lands Team, and the National Park Service. The video was produced and directed by Becky McMillen, Insight Creative Independent Productions.

This video will be available for viewing online early summer 2012. For more information, visit www.bytescameraaction.com or contact: Steve Brill at (307) 532-3713, gocoweeds@embarqmail.com.

Steve Brill, Goshen County Weed & Pest, Torrington, WY

["NORTH PLATTE" continued from page 7]

"Dealing with residual biomass from tree and brush management projects is a real challenge," explains Scott Bockness, leader for the Missouri River Watershed Coalition Conservation Innovative Grant (CIG) Project, which includes the Upper North Platte River WMA. Bockness has been working with partners in the WMA to investigate potential uses for the biomass. "Current test results indicate that biomass generated from the Russian olive and saltcedar management projects could be used for local biomass energy conversion," says Bockness. " It would be great to incorporate these plant materials into local and regional bioenergy assessments for future alternative energy projects."

The Upper North Platte River WMA is committed to a long-term program to control Russian olive and saltcedar on the river and its tributaries. The project has united conservation organizations, private landowners, county weed and pest districts, and a host of other private, county, state and federal partners. "Even though there are a lot of partners in this project, Steve Brill is the real champion of our efforts," explains Erdman. "He has been a leader and promoter for this project, and his hard work, vision and dedication is improving and protecting the watershed value of the North Platte River."

Before (top) and after photos where Russian olive trees were removed. Maintaining a desirable grass understory reduces invasion of weedy plants, provides protects soil from erosion, improves wildlife habitat and provides livestock grazing.

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OPTIMAL HERBICIDE APPLICATION TIMING FOR

Canada Thistle Control

by Darrell Deneke, Mike Moechnig, Dave Vos, and Jill Alms, South Dakota State University, Brookings.

Canada thistle (*Cirsium arvense*) is a widespread noxious weed throughout the northern United States.

Selective herbicides provide effective control if applied at the early bud growth stage (late June) or at fall re-growth stage (mid-September to October), preferably after a light frost. However, there are few recent studies evaluating the effect of herbicide application time on Canada thistle control.

Field studies were established on Canada thistle in two counties in eastern South Dakota. Herbicide treatments included a fall application of Milestone® at 5 and 7 fluid ounces per acre (fl oz/A) and Tordon® 22K at 1 pint per acre (pt/A) applied in September, October or November in 2007 in Brookings and Clark Counties. A summer application of Milestone at 5 and 7 fl oz/A was also applied at multiple times from May through October in 2009 in Clark County. Plot design was a randomized complete block with three replications of each treatment. Evaluations of herbicide treatments were made one year following treatment. Control was determined from visual estimates of Canada thistle shoot growth reduction relative to the non-treated control. Treatment means were compared using analysis of variance (P=0.10).

Figure 1. Canada thistle growth stage at the May application timing. This growth stage is too early to apply Milestone herbicide. Applicators should wait until early emerging plants are in the bud growth stage.

RESULTS

Results of these studies showed that Canada thistle control was slightly more consistent with Milestone at 7 fl oz/A compared to Milestone at 5 fl oz/A.

FALL APPLICATION TIMING: Milestone and Tordon 22K resulted in similar or greater control when applied in September compared to October or November indicating that September may be the optimal time for fall applications (**Figure 2** and **3**).

SUMMER APPLICATION TIMING: Canada thistle control with Milestone® at 5 fl oz/A in Clark County was more consistent when applied in July and August compared to May, September and October. Canada thistle control with Milestone at 7 fl oz/A was significantly lower when applied in May compared to applications made from July through October (**Figure 4**). Canada thistle plants are not fully emerged in May, which reduces effectiveness of herbicide treatments.

CONCLUSIONS

Results of these studies indicate that the optimal time to control Canada thistle in the summer with Milestone herbicide is after Canada thistle plants are fully emerged in June through August. For fall applications, the optimal application time for Canada thistle control with Milestone or Tordon 22K herbicides is September when green basal re-growth is present. Milestone at 7 fl oz/A was more consistent than lower rates of Milestone® or Tordon 22K at later fall application timings of October and November. Additional articles on Canada thistle control with Milestone herbicide are available at techlinenews.com.

Effect of Milestone on Canada Thistle and the Native Plant Community in a Restored Tallgrass Prairie
http://techlinenews.com/fall2010_canadathistle.pdf

Tips for Managing Canada Thistle with Herbicide
http://techlinenews.com/2010tn_canadathistle.pdf

Tips for Fall Application of Milestone Herbicide Canada Thistle
http://techlinenews.com/CIRAR_FallAppTips.pdf

EDITOR'S NOTE:
This article summarizes a poster presented at the Western Society of Weed Science Annual Meeting, March 2012. The entire poster can be viewed on-line at: **http://techlinenews.com/denekeCT.pdf**

Figure 2. Canada thistle control one year following treatment with Milestone and Tordon 22K applied in September, October or November in Brookings County, South Dakota. Data bars with the same letters are not significantly different.

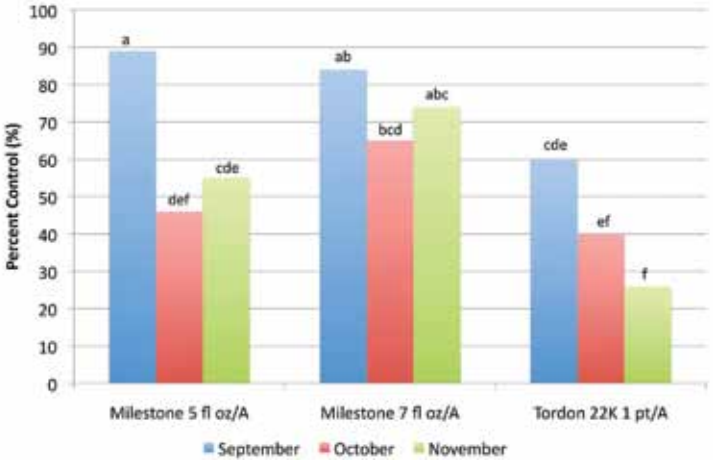


Figure 3. Canada thistle control one year following treatment with Milestone® and Tordon® 22K applied in September, October or November in Clark County, South Dakota. Data bars with the same letters are not significantly different.

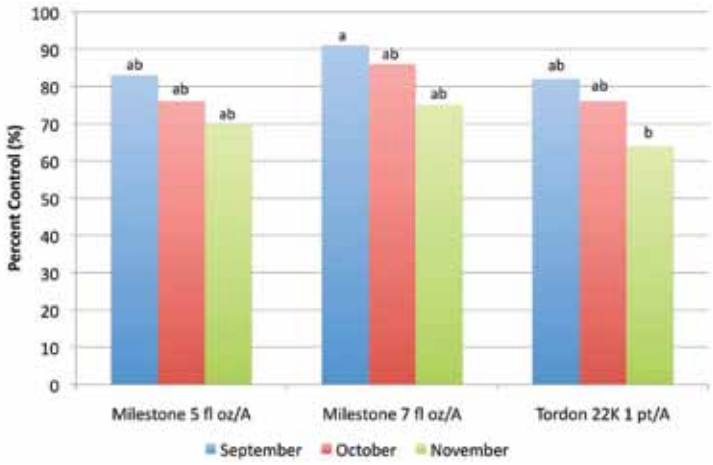
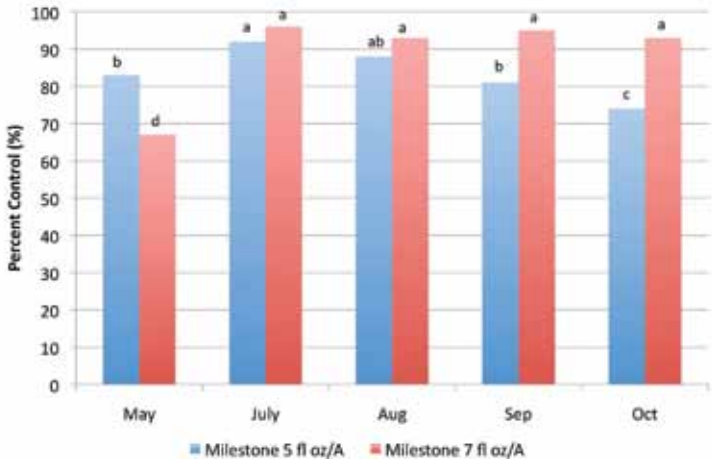


Figure 4. Canada thistle control one year after treatment with Milestone applied at 5 or 7 fl oz/A in May, July, August, September, or October in Clark County, South Dakota. Data bars with the same letters are not significantly different.



The term "meadow hawkweed" often includes both meadow hawkweed (pictured above) and king devil hawkweed since the two species are very similar in appearance.

HERBICIDE APPLICATION TIMING CRITICAL TO CONTROL

Exotic Hawkweeds

by Celestine Duncan, Editor

Exotic hawkweeds are relatively new invaders to the Pacific Northwest and southern Canada. Introduced from Europe into North America in the late 19th century, exotic hawkweeds were reported in the Pacific Northwest as early as the 1920s and became more common by the mid-1950s.

Although there are 14 exotic hawkweeds in western North America, eight are relatively common in the Pacific Northwest. Orange hawkweed (*Hieracium aurantiacum*) is easily recognized by its bright orange flower. Mouse-ear hawkweed (*H. pilosella*) has a single yellow flower and is found in coastal Washington and Oregon, and southeastern British Columbia. Other exotic hawkweeds have multiple yellow flowers and are more difficult to distinguish from one another. The term "meadow hawkweed" often includes both meadow hawkweed (*H. caespitosum*) and king devil hawkweed (*H. floriundum*), a species that may have resulted from hybridization between *H. caespitosum* and *H. lactucella*. The two species are very similar in appearance [**BOX 1**]. Basal leaves of king devil hawkweed do not have hairs on the upper sides of the leaves and may have a grayish wax on the surface that rubs off .

Exotic hawkweeds are poor competitors on sites with fertile soils, perennial grass cover and minimal disturbance. However, once established on disturbed sites exotic hawkweeds may quickly develop into a patch covering a site with a solid mat of rosettes. Selective herbicides such as Milestone® have shown to control hawkweeds and release grasses and desirable native forbs. Strategically timed herbicide applications can improve hawkweed control and promote establishment and maintenance of grass cover.

Field studies were established on meadow hawkweed at two sites near Santa, Idaho in 2009 by Dr. Tim Prather, University of Idaho. The objective of the study was to evaluate meadow hawkweed control with Milestone applied at four hawkweed growth stages, and measure the response of Idaho fescue (*Festuca idahoensis*) and other perennial grasses to the herbicide treatments. Milestone at 5 and 7 fluid ounces of product per acre (fl oz/A) with a nonionic surfactant was applied in September (senescence) and November (fall rosette) of 2009, and May (spring rosette) and June (bolt) of 2010 (**Table 1**). While a nonionic surfactant was used in this study, prior research on surfactants could not detect differences among surfactants suggesting that ammonium sulfate or a blend of organosilicone plus methylated seed oil worked as well as a nonionic surfactant. The experiment was designed as a randomized complete block with four replications of each treatment. Evaluations of cover and biomass were conducted in July 2011, 13 to 22 months following application. Data were analyzed with Tukey's Studentized Range HSD (P=0.05) and pooled across the two sites.

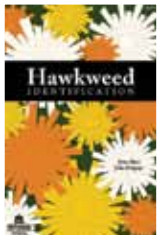
RESULTS

COVER - Meadow hawkweed cover was significantly lower with Milestone at either 5 or 7 fl oz/A applied at the spring rosette (May) or bolt (June) growth stage when compared to later application timings (**Figure 1**). There was no significant difference in meadow hawkweed, Idaho fescue, or perennial grass cover between Milestone at 5 or 7 fl oz/A when applied at the spring rosette or bolting growth stage. Spring applications of Milestone® were associ-

BOX 1

HAWKWEED IDENTIFICATION GUIDE

An excellent guide for hawkweed identification was developed by Peter Rice, University of Montana and John Halpop, Montana State University Cooperative Extension Service. Since exotic and native hawkweeds share some similar characteristics, the guide provides useful diagnostic tips for separating orange hawkweed and two yellow-flowered exotics from four native hawkweeds. The guide 'Hawkweed Identification' is available on-line at http://msuextension.org/publications/AgandNaturalResources/EB0187.pdf or by contacting Montana State University Extension Publications at:



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*Gleason, H. A. and A. Cronquist. 1991. Manual of Vascular Plants of Northeastern United States and Adjacent Canada. Second Edition. The New York Botanical Garden, Bronx, NY. Pp. 621-625.

Spring applications of Milestone were associated with a significant increase in Idaho fescue (above) cover, likely in response to removing hawkweed competition.

ated with a significant increase in Idaho fescue cover, likely in response to removing hawkweed competition. At the senescent growth stage (September) Milestone at 7 fl oz/A provided significantly better hawkweed control than the same rate applied to fall rosettes (November).

BIOMASS - Milestone applications made at the senescence, spring rosette, and bolting stages resulted in significantly lower meadow hawkweed biomass compared to untreated plots. Treatments applied to spring rosette stage resulted in greater perennial grass biomass than untreated plots (**Figure 2**).

CONCLUSIONS

Results of these field trials are similar to previous studies with Milestone and indicate that herbicide application timing is critical for controlling exotic hawkweeds. Milestone at either 5 or 7 fl oz/A should be applied in the spring to hawkweed at the rosette growth stage to early flower growth stage to maximize exotic hawkweed control and increase desirable grass production.

BOX 2

EFFICACY AND APPLICATION TIMING OF MILESTONE HERBICIDE ON HAWKWEEDS

Dr. Linda Wilson, Invasive Plant Ecologist discusses her experiences with herbicide application timing on exotic hawkweeds. Read more online at: **http://www.techlinenews.com/TLFall2007.pdf**

Table 1. Milestone® application and evaluation dates for meadow hawkweed control in Idaho

Weed Growth Stage	Senescence	Fall Rosette	Spring Rosette	Bolt
Application date	16 Sep 2009	4 Nov 2009	13 May 2010	2 Jun 2010
Evaluation timing (12 July 2011)	22 MAT	20 MAT	14 MAT	13 MAT

Figure 1. Cover estimates of meadow hawkweed, Idaho fescue, and other perennial grass following treatment with Milestone at 5 or 7 fluid ounces of product per acre (fl oz/A) applied at four plant growth stages.

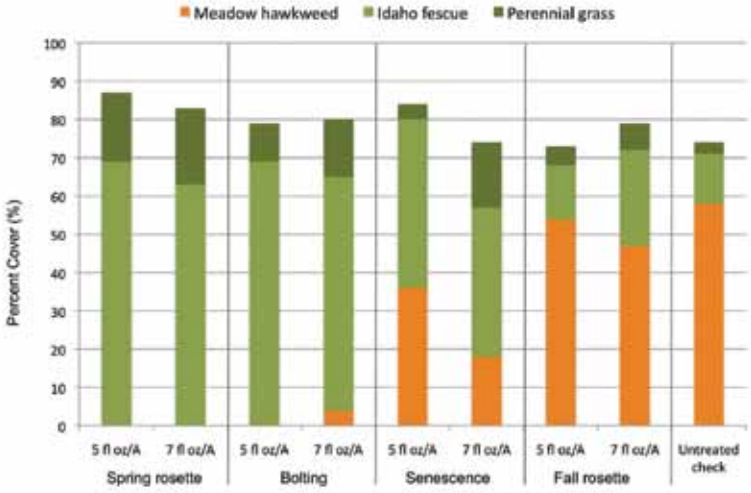
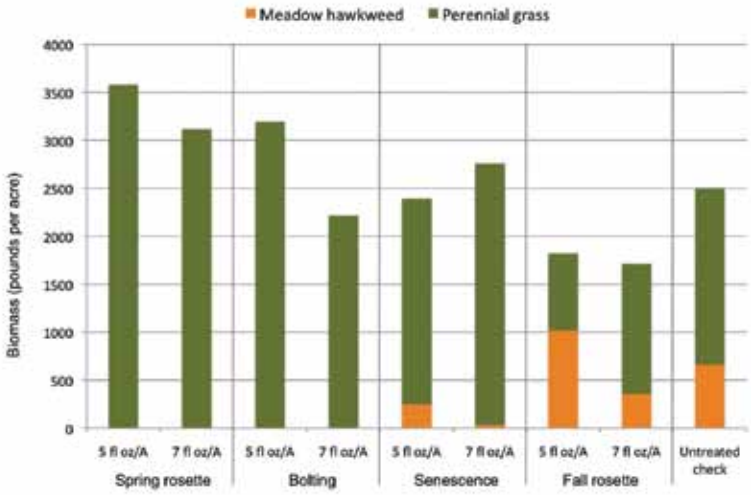


Figure 2. Biomass of meadow hawkweed and perennial grass following treatment with Milestone at 5 or 7 fluid ounces of product per acre (fl oz/A) applied at four plant growth stages.



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