SEEDS OF DIVERSITY

Frosty Pale purple coneflower photo by Susan Clark

Iowa DNR Prairie Resource Center **December 2006**

Canada Thistle Control in Native Seedings

By Greg A. Schmitt

Canada thistle is one tough customer. Unfortunately, there is no silver bullet to use in keeping your prairie reconstruction or natural area completely free from Canada thistle. No magic herbicide, or cultural, biological or mechanical practice alone exists that will totally rid your prairie of this Hydra of the noxious weed world.

Photo from http://ipcm.wisc.edu/uw_weeds/extension

Mow it down or till it up, and it spreads through root buds. Spray it with the latest and greatest herbicide, and you're likely to kill something beneficial. Burn it at the wrong time, and it will come back stronger. Don't do anything, and it will release seeds that will spread in the wind and are able to germinate 20 years later, even after being submerged in water for 4 years!

But, all is not lost. Unless your planting is only a few acres, total eradication is not economically feasible or even possible. However, control is certainly an attainable goal. It's kind of like playing against Michael Jordan. You can't stop him; you can only hope to contain him.

To kill thistle, we have to understand thistle. Extensive research has provided us with a few facts about our nemesis of the natural area.

1. Canada thistle is a perennial that spreads by seed and rhizomes. Root fragments only 5 inches long can produce shoots.
2. It has a relatively high light requirement. Death occurs when light is reduced to 20% of full sun.
3. Shoots emerge when the soil temperature reaches 41 degrees F. Warm season grasses don't get going until about 50 degrees F.
4. Root reserves are lowest just before flowering (bud stage) and greatest in early fall.
5. Average seed production is 1,500 seeds per plant.

Control Methods

The absolute best way to fight thistles in a prairie seeding is to do as much control and eradication before even planting any native grasses or forbs. Minimize tillage to prevent raising more weed seed, and then, apply glyphosate 2 or 3 times to emerging weeds as an excellent way to start a prairie planting. Planting an area to glyphosate-resistant corn or beans for several years before seeding natives is another method to prepare the seed bed.

Canada thistle infestation

An integrated approach using a combination and/or repetition of control practices is the best method to contain already established Canada thistle populations in natural areas. In most cases, an herbicide application is part of all management techniques.

Tillage

Not an option. See Number 1 above.

Hand Pulling

This is probably only an option in very small areas or early infestations.

Mowing

Canada thistles can be managed by diligent mowing, if you're willing to mow in June, July, August and September at 7-28 day intervals for 4 years!

Keep in mind that root reserves are lowest at bud to bloom. A mowing in mid-to-late June, followed by an herbicide application in the fall before a killing frost, is your best way to utilize mowing to reduce thistle patches.

Do not mow thistle plants lower than 8 inches. Surprisingly, removing ALL thistle leaves stimulates root growth.

Burning

Burning by itself doesn't work unless you burn every year in late April or early May. Unfortunately, you will also suppress many native forbs.

A burn followed by an herbicide application at the bud-to-bloom stage works better than just spraying. The burn will enhance native species and also the age of the thistle stand, making your herbicide more effective.

Spraying

Spraying alone can control Canada thistle infestations. However, herbicide applications need to be done multiple times in the same growing season, and it is very difficult not to harm desirable forb species. Some better herbicides utilized to control thistles are glyphosate (Roundup), clopyralid (Stinger), triclopyr (Grazon) and 2,4-D amine. Products that use a combination of these active ingredients are also available and more effective. A precise spot application at bud to bloom (late June) and then again at fall regrowth (late September) for 2 successive years will greatly reduce a thistle population.

Some things to keep in mind when using herbicides: Follow label directions. Use recommended rates; more is NOT better. Use a nonionic surfactant. Apply herbicide as precisely as humanly possible, and at the time the label recommends; most times this is bud-to-bloom or early regrowth/rosette stage.

Competition

Any management practice that increases the health of native prairie seedings will help in the fight against Canada thistles. One study has shown that Switchgrass can crowd out thistles by shading and root zone competition. Unfortunately, it took about 8 years to finally accomplish this intended task. It would seem then, that the best way to keep thistles at bay in natural areas would be to give in and just plant a thick stand of prairie grasses that can be sprayed with a broadleaf herbicide. But, giving in is not an option. The best option is to meticulously deplete the seedbed of weeds like Canada thistle and then plant MORE forbs. Planting the most

diverse mix possible allows for all growing zones above and below ground to be occupied, leaving very little room for Canada thistle to prosper.

The Poweshiek Skipper Project

On June 21, 1870 H. W. Parker caught 32 small butterflies in Grinnell, Iowa. He recognized his find as a new species and within a week had written and submitted a scientific description of it, naming it after the county in which it was found. He called his new butterfly *Hesperia poweshiek.* The butterfly is now called *Oarisma poweshiek,* or the Poweshiek skipper.

Poweshiek skipper on Black-eyed Susan above and below

O. poweshiek is a prairie obligate butterfly, and it seems to need good prairie to survive. With the disappearance of the prairie, this butterfly has also disappeared. The last recorded instance of Poweshiek skipper in its namesake county was 1917, and it seems unlikely that it occurs anywhere in the area now. A survey conducted in 1995 found twenty-nine sites where this butterfly occurred in Iowa, but all were in the northern two tiers of counties. Since then, it is believed that several of the original 29 sites have lost this skipper and several more still have them but in reduced numbers. Most of those sites have not been resurveyed. The status of the species in Iowa is unknown, but it is a real possibility that it is doing poorly.

A project has been started to promote the conservation of this species. The reintroduction of the Poweshiek skipper to its namesake county needs community support and involvement. Volunteers are needed to help survey butterflies in Poweshiek and surrounding counties. Classroom training will be March 3rd and field survey training in May. Actual surveys take place in the timeframe when adult *O. poweshiek* can be found in mid-June to mid-July.

Project coordination is through The Center for Prairie Studies, which is part of Grinnell College. A newsletter about the project can be found at: http://web.grinnell.edu/cps/Special_Projects/Regional_Collaborations/newsletter1.pdf

General information can be found at: http://web.grinnell.edu/cps/Special_Projects/Regional_Collaborations/regional_collaborations.htm

Surveying butterflies is a great way to get involved. It, also, provides a good excuse to get out in nature. No previous experience is needed. Contact Harlan Ratcliff by e-mail at bugs@crosspaths.net for more information or to volunteer.

WHAT'S IN A NAME? IF ONLY A SNEEZE

By Brenda Vargas

Just as our day was about to end on a warm, sunny afternoon in early October, Bill asked Susan and I to go on a prairie walk. Our goal: discover any new species that were not on our plant list. As we walked through the still-blooming goldenrods, the ready-to-pick cinquefoil, and the reddish-tinted Big bluestem, we noticed a plant that we don't see everyday.

Bill picked it and said "Have you ever seen Sneezeweed seed?"

"No, I've never heard of Sneezeweed," I replied.

As I observed the seed in the palm of my hand, I began to wonder why it was called Sneezeweed. I smelled it; nope, it didn't make me sneeze. Where did it get its name, I wondered?

Helenium autumnale or Common sneezeweed (some of you might know it as Helen's flower, or Dogtooth daisy) has developed a shocking reputation with modern day botanists. Why, you might ask? Well, let's start with the basics. It belongs to the sunflower or Asteraceae family. Blooming time for the bright, yellow flowers starts in late July or early August and it's ready to harvest in October. Talk about a rapid life stage! It is easy to establish in a prairie reconstruction because it is an early successional species. It can be found in swamps, marshes, moist prairies, and it's becoming ever so common on our Iowa roadsides today.


Photo by Susan Clark

Sneezeweed at Rice Lake Wildlife Unit

So, why is it shocking to botanists? Well, Sneezeweed is a precious attractant to bees and butterflies, but when it comes to other creatures it can be deadly. The plant contains toxins such as glucoside, degaldin, and plenol among others. When these toxins are digested by livestock, discomfort or sometimes death occurs. Sheep men call this illness "spewing sickness" because of its vomiting effect on their sheep. Cattle have also been known to be affected by the toxins of this eye-catching bystander, although not as seriously.

For those of you looking for a natural insecticide, the plant contains helenalin, a compound that has insecticidal properties. Though, helenalin is, also, toxic to fish and worms.

For those, also, looking for a natural way to protect your gardens from those cute, little rabbits, Sneezeweed is a natural repellant for them. As much as we love the cute and cuddly creatures, we know that they can cause considerable damage.

So, how did Sneezeweed get its name? The early American Indians and pioneers would use common sneezeweed as a tonic or as snuff to induce sneezing. It was believed that this would rid an individual of evil spirits, or it was used to simply clear an individual's congestion. Other examples of home remedies from the prairie include: using the leaves as a laxative; the stems to make a poultice to reduce fever; and making tea to treat individuals for intestinal worms. In California, sneezeweed was used by the Ohlane Indians to treat burns, cuts and colds.

So sneezeweed is not just any old weed like everyone thinks. Botanists have been struggling with the fact of whether it's good or bad. Don't take it from me, but I think it's a multi-tasking plant. It can be good or bad. It just depends on how you want to use it. Just remember home-remedy or toxic, sneezeweed is still a beautiful, beneficial flower that we can enjoy in the summer months.

A Seed Jumble

By Susan Clark

Crosswords - love 'em, Jumble - love it, Rubik's cube - loved it (couldn't solve it, but loved it). I've always been the kind that liked to solve puzzles, word games, and yes long division - things that challenged my mind (which wasn't very hard). So when it came time to figure out how to clean over 70 species of prairie wildflower and grass seed, I was up to the challenge. The winter of 2002 was my first opportunity with the Prairie Resource Center to begin this new endeavor. The challenge was to find the best combination of sieve shaker screens to clean the seed to near perfection (or in other words- a lot of trial and error). At the time, fellow AmeriCorps member Chris Vandello and I had few notes or records to guide us through this journey. The challenge began.

Surprisingly, the species that produce tiny seeds are the easiest to clean. Culver's root, Great blue lobelia, and Mountain mint turn out nearly perfect. The seeds are small and they easily separate from the larger inert material. Species with larger seeds like Compass plant, Cup plant, and Rosinweed are more difficult to clean because the inert material is generally the same size and weight as the seed, making it difficult to separate. (this sometimes leads to a lot of hand cleaning).

Some species are best cleaned by hand. Either they are too delicate for the hammermill or in such small quantity that hand cleaning is preferred.


Photo by Susan Clark

Hammermill with dust collection system attached

The first step in the seed cleaning process is to put each species through the hammermill. The hammermill is essentially a large blender that chops up the plant material- knocking the seed free of the plant, plume, or out of the seed pod. The "blender" is made up of twelve hard plastic blades attached to a wheel. The wheel is spun by a variable speed electric motor up to 2000 rpm. The speed used depends on the species. The blazing stars, goldenrods, asters, and others with "fluff" (plumes) are chopped at a much slower speed (400-900 rpm). These seeds are long and narrow and at any faster speed they could be damaged or blown out of the hammermill. Trial and error played a large role when determining the speed at which to hammer the plant material. To determine a speed setting for a species, the speed was set slow initially, the seed was checked for damage, and if needed the speed was increased. Hammermilling can begin once an appropriate speed has been determined for a species. When the motor reaches the specified speed for a species, the plant material is carefully pushed into the spinning blades from the hopper located above the blades. A curved screen (of varying sizes) is below the blades holding the large material and allowing seed and other debris to fall through and collect in a container below. Occasionally, the screen needs to be removed and cleaned when stem and leaf debris plug it. More than likely the material will need hammermilled at least two times to properly separate the seed from the inert matter.

After a species is hammermilled the material is placed in the hopper at the top of the sieve shaker and allowed to gravity flow out the hopper door and onto the top screen of the machine. Some species are a little more difficult and have to be forced through the hopper opening- sticks and other material plug the opening. The large material is scalped off with the top screen of the sieve shaker and into a bucket outside the machine. The seed, dust, and small inert material fall through the top screen and onto the bottom screen. The bottom screen, with smaller holes than the top screen, allows the seed to flow over the top as the dust and smaller chaff fall through and out the machine and into a bucket.

One of the Prairie Resource Center's sieve shakers

The seed (and inert material of similar size) is moved down a chute towards a collection container. A "squirrel cage" fan is the third separation stage- blowing any lightweight inert material out to a separate container. The seed then drops down into the collection container. Two air vents can be adjusted to control the amount of airflow from the fan.

For small, lightweight seed, like June grass, Cardinal flower, and St. John's wort, the vents are only opened slightly. The vents are fully open for large or heavy seed like Purple prairie clover, Pale purple coneflower, and Ohio spiderwort. The whole process is repeated a number of times depending on the species and the amount of inert material present.

For example, Blue vervain can be "run" four times and be nearly 100% seed. Yet for Rough blazing star the process can be repeated fifteen times and still not be as clean as I would like it to be. (I'm a bit of a perfectionist– thanks to Eliot I now have the nickname "seed-nazi"). At that point, the decision is made to call the product finished and move on to the next species. The screens are removed and checked for any seed that did not fall out of the machine- this seed is added to the finished product. The final product is bagged and the weight is recorded. The seed is now ready for distribution to other DNR Conservation and Recreation Division entities. The sieve shaker is then completely taken apart and cleaned. All of the screens must be cleaned of any seed and inert material and every nook and cranny of the machine must be vacuumed. This prevents any cross contamination of seed and Ecotype zones. The inert material that is collected is dumped on a compost pile.

Then the jumble begins again….

Check out the Prairie Resource Center's website

http://www.iowadnr.com/wildlife/files/seedharvest.html