Clearwater Soil and Water Conservation District

The Clearwater SWCD Conservator

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Our mission is simple - to promote the wise use and improvement of our county resources, in order that future generations will inherit an economically viable county that has made wise choices in resource management.

In this issue:

Clearwater SWCD
312 Main Ave North
Bagley, MN 56621

218-694-6845, ext. 4
clearwaterswcd.org

Water Quality: A Family Farm Legacy

By Nathan Nordlund, Program Technician, Clearwater SWCD

Farming and working the land is often a family affair and the case is no different for Brian and Dianne Johnson, their daughters Ashley and Meghan, and their sons Michael and Tyler. Brian is the third generation to head up this family operation after it was started by his grandfather in the 1940's. Brian's brother Todd and his son Luke also participate in this family adventure.

Like many producers in this area, beef cattle are an important component of the Johnson business. This cow calf operation focuses on the backgrounding of calves up to 1,000 pounds. The production of alfalfa, corn, soybeans and small grains helps to support and diversify this operation, especially as certified seed producers.

The Johnsons' operation lies within northeastern Clearwater County. A landscape of hardwood hills, streams, lakes and wetlands lends itself to the beauty of this area. All of these features can be found within or near the Johnson operation. One feature of particular interest is Bagley Lake. At just over 100 acres, Bagley Lake is a small but popular local fishing lake.

New fencing through one of the forested pastures on Johnson's land.

In 2009, the Minnesota Pollution Control Agency reported the occurrence of a harmful algae bloom on the lake. High algae blooms happened in subsequent years as well. Water quality testing done by the Clearwater Soil and Water Conservation District (SWCD) showed

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Purge the Spurge!

By Kathy Rasch, District Manager, Clearwater SWCD

Leafy spurge is a relative newcomer to Clearwater County. Leafy spurge is native to Europe and Asia. Although introduced to the United States in the early 1800's, up until about 15 years ago, it was not known to exist in the county. Now there are multiple known local infestations with new ones just identified this year. Ranchers in the western U.S., including North Dakota, have been plagued with leafy spurge for decades. Leafy spurge is toxic to cattle and horses and most other grazing animals, so they won't eat it or even graze in heavily infested areas. This only increases the leafy spurge infestation and reduces the pasture productivity. If leafy spurge is present in a hayfield, the hay should not be cut. Leafy spurge is designated as a noxious weed because of its ability to take over and replace desired or native vegetation and because of the economic losses for livestock owners and producers. In Minnesota it is legally mandatory to control leafy spurge.

Leafy Spurge Flowers

Leafy spurge is a perennial forb belonging to the Euphorbia family (the same family as poinsettias). Euphorbias share the trait of secreting a thick, white, milky latex liquid when stems or leaves are broken or injured. Other characteristics which help to identify leafy spurge are the distinctive terminal clustering of flowers that are surrounded by paired heart-shaped yellowish or bright green bracts. Flowering is generally in May through June

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A Brief Glacial History of Clearwater County

By Patty Burns, Soil Scientist, Natural Resources Conservation Service, Bemidji MLRA Soil Survey Office

The beautiful landscapes and different topography we see across Clearwater County is a direct result of the last period of glaciation, known as the Wisconsin Stage of the last Ice Age. This period of glaciation began about 30,000 years ago and lasted approximately 18,000 years. Different lobes of the ice sheets advanced, retreated and readvanced across Minnesota. As these massive ice sheets moved they ground up the soil and rock material they passed over and when they retreated or melted they deposited the different soil types in different parts of the state. In Clearwater County the Wadena and Des Moines Lobes advanced into the area from the north and northwest and left a complex landscape of end moraines, grounds moraines, lake plains and outwash plains as well as many lakes and rivers.

The Wadena lobe was the first to advance into Clearwater County. It advanced from the north through the Winnipeg lowlands and followed the Red River lowlands into Minnesota. As it moved along it deposited a sandy loam till rich in limestone and granite but contained very little cretaceous shale. The Wadena Lobe was responsible for the formation of the Itasca Moraine complex in the southern part of Clearwater County which is characterized by steep, rugged hills and scattered kettle lakes. This moraine complex extends into Mahnomen and Becker Counties and into central Hubbard County. It is known as an end moraine and marks the edge of this specific glacial advance. The area south of Highway 200 has been virtually untouched by subsequent glacial advances and is the oldest landscape in the county. North of the Itasca moraine is a ground moraine known locally as the Guthrie till plain. This ground moraine includes areas in central Clearwater, northern Hubbard and southern Beltrami Counties and is characterized by gently rolling hills and broad flat areas dissected by several meltwater channels. The Guthrie till plain is made up of the same sandy loam till soil type as the Itasca moraine complex but looks different than the Itasca moraine complex because it was overridden by subsequent advances of the St. Louis sublobe of the Des Moines lobe or ice sheet. This sublobe advance, along with its meltwaters, created the gently rolling landscape that is present today. It is also responsible for the high content of stones and cobbles on the surface of the Guthrie till plain which is indicative of an eroded surface such as this.

After the final retreat of the Wadena lobe the Des Moines lobe advanced, retreated and advanced again across Clearwater County creating several different moraine complexes. The Des Moines lobe advances moved in a northwest-southeast direction and travelled across the shale beds of the Williston Basin in North Dakota and Manitoba and deposited a finer textured loamy and clayey till rich in Cretaceous shale and limestone. The first advance of this lobe deposited a clayey glacial till in a prominent stagnation moraine feature known locally as the Lengby moraine which runs across the county from Leonard to Lengby in Polk County and into Mahnomen and Becker Counties too. These soils tend to have the highest clay content of any soils in Clearwater County. This advance of the Des Moines lobe was stopped by the Itasca moraine to the south and partially overrode some of what is now the Guthrie till plain. The glacier then retreated to the north for a period of time and later advanced again into Clearwater County. The second advance of the Des Moines lobe was stopped in Clearwater County by the Lengby moraine complex left behind from the first advance. This second advance of the Des Moines lobe deposited a loamy glacial till, with less clay than the first advance, in another moraine complex in northern Clearwater County in the area around Clearbrook and Gonvick and extends eastward into Beltrami and Itasca Counties too. When this sublobe retreated it released a large volume of meltwater which helped to create the sand and gravel outwash plain sediments known as the Bemidji-Bagley outwash plain. This glacial event is responsible for the sand and gravelly soils that are present around Bagley.

The last glacial activity in Clearwater County was the formation of Glacial Lake Agassiz. As the last of the ice sheets melted and retreated from this area the meltwaters began to form an enormous glacial lake that covered the northern one-fourth of the county and continued up into Canada and over towards International Falls and into North Dakota. The landform that was left behind when Glacial Lake Agassiz drained is known as the lake plain and consists of a broad flat landscape that is occasionally interrupted by relict sandbars and beach ridges, with the most prominent beach ridge in Clearwater County known as Herman Beach. Deeper pockets within the glacial lake bed consist of fine sands, silts and clayey glaciolacustrine sediments laid down on the ancient lake bottom, other areas within the lake plain consist of loamy glacial till that was reworked and wave washed into the flat landscape that is present today.

Each of the different advances across Clearwater County helped to shape the landscape we see today. If we could turn back the hands of time and be present when the ice sheet melted from Clearwater County we could see what forces created the different soil types that are associated with the individual landforms that occur throughout the county. So next time you dig in your garden, plow your field or just plain enjoy the natural beauty throughout Clearwater County you can thank the Ice Age for helping to make this county what it is today.

Natural Resources Conservation Service

Helping People Help the Land

NRCS—Bagley Field Office
312 Main Ave North
Bagley, MN 56621

218-694-6584, ext. 3
www.mn.nrcs.usda.gov

SWCD Education Updates:

Bagley Elementary Winners of "Our Soil - A Layer of Life" Poster Contest

The Clearwater Soil and Water Conservation District (SWCD) congratulates Gracie Highberg, Ariah Wangstad and Abby Stevens for winning the 2014 "Our Soil - A Layer of Life" poster contest for Clearwater County.

Highberg, from Ms. Dunn's class, won first place. Wangstad, from Mrs. Anderson's class, earned second place. Stevens, from Mr. Loehlein's class, finished in third place. All three are fifth graders at Bagley Elementary School.

Clearwater SWCD congratulates these students for their excellent posters conveying the importance of taking care of our soil. The winning students' posters effectively showcase conservation messages, originality and artistic merit.

The top three local placers advanced to judging on the area level along with other winners from SWCDs throughout north central Minnesota. At the area level, one of the Bagley participants, Ariah Wangstad, earned third place.

The winning posters will be displayed at the Clearwater SWCD booth at the Clearwater County Fair this summer.

Clearwater SWCD invited all fifth and sixth grade educators to participate in this competition. Several teachers taught educational units about soil resources and students submitted many beautiful and informative posters. The commitment of these teachers will prepare local youth to be the conservation leaders of tomorrow.

Local Students Successful at North Central Envirothon

By Emily Lindell, Office Manager, Clearwater SWCD

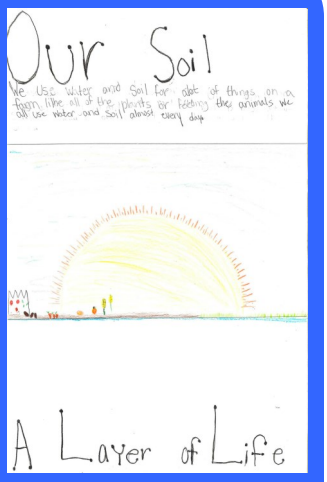
On Wednesday, May 7th, a team representing Bagley Elementary School won third place in the North Central Junior Envirothon at Lake Bemidji State Park. Coached by Bagley 6th grade teacher Matt Cage, the winning team included Kylli Anderson, Blake Erickson, Kelby Fultz, Chase Lavine and Jenika Moen. Finishing just one point behind the third place team was the other Bagley team consisting of Cori Bonik, Grace Jones, Briar Maruska, Lucas Maruska and Aleah Nelson. Approximately 75 students from around the area participated in this event on the junior and senior high levels.

Envirothon is North America's largest high school environmental education competition. For many years our region's high school teams have competed in the North Central Envirothon. Our Envirothon also includes 6th-8th graders who compete alongside the older students in a Junior Envirothon. Soil and Water Conservation Districts from Beltrami, Cass, Clearwater, Crow Wing, Hubbard, Itasca, Koochiching, Lake of the Woods and Wadena counties collaborate to put on the North Central Envirothon each year.

Envirothon is an outdoor learning experience. During the event, participants attend sessions on aquatics, wildlife, forestry, soils and current events. Natural resource professionals use the outdoor environment to present hands-on problems and questions to the competitors. Students take quizzes and earn points at each station. High school teams also deliver a prepared presentation based on a specific conservation challenge. This year's oral presentation topic was "Sustainable Local Agriculture and Locally Grown in Minnesota."

In addition to Bagley's third place finish, Nevis teams took first and second place in the Junior Envirothon. This year's top high school Envirothon team represented Northome High School, with Grand Rapids High School teams taking second and third places. The winning high school teams advanced to the Minnesota State Envirothon on May 19th at St. John's University in Collegeville.

Special thanks goes out to all who contributed to the North Central Envirothon, including local donors Clearwater-Polk Electric Operation Round Up and Garden Valley Telephone. Clearwater Soil and Water Conservation District would also like to thank local Envirothon judges Mike Stenseng of Clearwater County Environmental Services and Cari Roepke of the Natural Resources Conservation Service, Bagley Field Office. Thanks also to Bagley Elementary School and Lake Bemidji State Park for supporting youth conservation education and to all event volunteers and participants.



Local first place poster by Gracie Highberg. The text of the poster describes the importance of soil to the people, plants and animals on a farm.

All winning posters will be on display at the Clearwater County Fair.

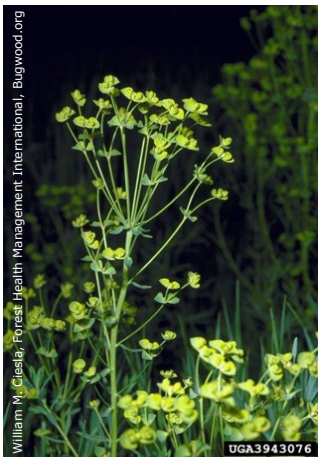
Got Nitrates?

Get a FREE well water Nitrate test at the Clearwater SWCD booth at the Clearwater County Fair!

Clearwater SWCD will perform well water nitrate tests for limited hours on Friday and Saturday (August 1-2) during the fair. Call our office for details on what hours the testing will be available and information on how to properly collect your water sample, 218-694-6845, ext. 4

(Leafy Spurge, continued from page 1)

although they will flower later if mowed. Leafy spurge have erect stems that can become somewhat woody and shrublike in appearance. They can be either a single stem or branched. Mature plants generally grow in clumps and often range from 1-3 feet tall, although they can be taller. Below ground, leafy spurge has a strong, well developed root system with both primary roots and numerous rhizomes. The roots and rhizomes are thick and fleshy. This enables the plant to store a lot of reserve energy, be very drought tolerant and resistant to control through mowing as well as herbicide control.



Leafy spurge plants

Leafy spurge propagates from both the rhizomes and from seed. One plant can produce 100-200 seeds annually. Seeds have high germination rates and can remain viable up to 10 years. A unique trait of the plant is its ability to "throw" its seeds up to 20 feet away on warm dry late summer days. This makes it even more effective at colonizing an area once introduced. The plant can easily spread to new areas through transport of the seed by wind, water, vehicles and contaminated soil and hay.

This is not a plant to be encouraged or dismissed. With its toxicity to most grazing animals and its tenacious methods of colonizing and spreading, control efforts should be started at the first identification.

For more information on identification or control of this plant, contact the Clearwater SWCD office at 218-694-6845, extension 4, or Clearwater County Environmental Services at 218-694-6183.

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(Johnson farm, continued from page 1)

phosphorus levels were high and sometimes exceeded Minnesota water quality standards. Phosphorus is a natural component of the soil all around us, but additional contributions from animal wastes, lawn and agricultural fertilizers or failing septic systems can all be detrimental to water quality. When phosphorus is introduced to a waterbody it stimulates excess plant and algae growth. In some cases, when enough phosphorus is added to the system, toxic algae blooms can occur.

Brian said that he wanted to do his part to make his operation "neighborhood friendly" and "eliminate any future phosphorus" that may result from his beef operation. To do this, Brian partnered with the Clearwater SWCD and the Natural Resources Conservation Service (NRCS) to put together a plan to eliminate phosphorus his operation could add to Bagley Lake.

Designs for the project shifted as new ideas or complications arose. However, all parties agreed to a final project design that would preserve the function of the pastureland for the Johnson cattle operation while adequately addressing the resource concerns. The final project plan included a new well, two large tire water tanks and over a mile and a half of barbed wire fencing.

Brian and his sons went to work last summer clearing fencing lanes, pounding posts and pulling wire. Tyler took the reins of the fencing project once it got underway, which allowed Brian to keep up with the rest of the regular farm operations. The hilly terrain and mix of wetland and forest made the job a challenge. However the Johnsons were able to complete the rigorous fencing project.

One of the large tire water tanks installed by Brian Johnson.

The next step was to establish an alternative water source for the cattle. Two large tire tanks serviced by over 7,000 feet of shallow buried pipeline were centrally placed in the pasture ground. In addition to protecting water quality, this element improved the Johnson cattle operation. As Brian noted, "Centrally located tanks and a constant supply of fresh water make the pasture more functional."

Brian Johnson's interest in good stewardship combined with SWCD and NRCS expertise throughout the collaborative planning process achieved multiple benefits. The Johnson project created a naturalized area between the pasture and the lake, upgraded fencing and improved water sources for his cattle. The efforts the Johnsons put forth on this project will ensure that their cattle operation will not impact the water quality of the adjacent lake. It will also provide quality habitat for ducks, grouse, deer and a variety of other animal species. Funding for the project was provided by the Clearwater SWCD, NRCS and Red Lake Watershed District.

This project would not have been possible without the commitment of the Johnson family to protecting the land and water for generations to come. If you are interested in learning how Clearwater SWCD can help meet conservation challenges on your operation, please give us a call (218-694-6845, ext. 4).