

ROOT RIVER SWCD CONSERVATION HIGHLIGHTS

Cost Share for Natural Resource Protection



The mission of the Root River Soil and Water Conservation District is to provide assistance to cooperators in managing the natural resources on their land. In addition, the district will continue to educate people on local conservation issues and concerns, in order to fortify and perpetuate the conservation movement. The best way to make sure we have the land we need to live on is to keep the soil in place through soil conservation measures. Soil conservation measures should aim at preventing or at least minimizing soil loss and water pollution.

Root River SWCD has cost share funding available to cooperators to help install conservation practices on their property. Many engineering practices can be funded up to 90% cost share for eligible expenses. Ecological practices generally have a flat rate payment per acre. All of the practices that are installed and are provided cost share dollars must follow Natural Resources Conservation Service standards and specifications for installation and a resource concern must be met.

This year the Root River SWCD provided technical assistance and cost share to cooperators for the installation of grassed waterways, diversions, grade stabilization structures, contour strips for crop rotation, cover crops, native grasses and forbs to enhance wildlife habitat including monarch butterflies and honey bees, stream bank protection and fish habitat improvement, timber stand improvement and removal of invasive species was also completed. By installing these conservation measures cooperators are helping to preserve our natural resources and also prevent soil loss and water pollution. Soil loss is a process that involves the wearing away of the topsoil by loosening soil particles and blowing or washing away of the soil. This soil ends up in the valley and faraway lands or is washed to the rivers and streams causing water pollution. We are thankful to all the cooperators of Houston County for all their conservation minded ethics and the many years of installing best management practices to help protect our ground and surface waters along with enhancing our wildlife areas.

If you have any conservation concerns or questions please call the Root River SWCD for technical advice, 507-724-5261 ext. 3.



Pictured to the left is a 2,500 linear foot grassed waterway serving as a drainage area for 258 acres in Section 25 of Spring Grove Township.

Pictured below is a grade stabilization structure installed in Section 5 of Mayville Twp.



Pictured to the left are two different brush management projects. The photo with the tree is a before treatment view. The lower photo is an example of a treated area. The cost share focuses strictly on pasture areas.

NOVEMBER 2022

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Root River SWCD

Office Location:

805 N. Hwy. 44/76, Suite 1
Caledonia, MN 55921

HOURS

7:00 a.m. - 4:30 p.m.

Monday—Friday

(507) 724-5261 ext. 3

[https://
www.co.houston.mn.us/
departments/soil-and-water/](https://www.co.houston.mn.us/departments/soil-and-water/)

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Streambank Enhancement Project Completed

Houston County is home to many miles of spring-fed, cold water streams. Many of these streams are home to trout including fair to good populations of brown, brook, and rainbow trout. MN DNR manages the trout populations in several Houston County streams by doing regular inventories and stocking. Other streams within the county have become quite populated and have better-than-average natural reproduction.

Stream habitat improvements and streambank protection strategies are important conservation practices that can drastically improve the stream ecology. One recently completed project in Money Creek Township does just that. A stretch along Campbell Creek in Section 8 used several conservation practices to enhance approximately 600 ft. of streambank. It also incorporated practices to enhance trout habitat within the stream.



Before



The project included excavation to grade the slope of the banks back to a 2:1 or less of a slope. The finished grade was seeded and mulched to provide erosion protection and a buffer to infiltrate nutrients. The toe of the excavation included the placement of rock rip rap to further protect the edge of the stream and provide habitat for fish. Other habitat improvements included the placement of boulder clusters and lunker structures. Both of these practices enhance the habitat of trout in cold water streams such as those in southeast Minnesota.

Boulder clusters are groups of rocks placed in a stream to improve habitat and create scour holes and places of reduced velocity. Clusters are used to create eddies or vortices in their wake, which create overhead cover for fish by partially diffusing sunlight. In addition, the boulder clusters create scours or deeper pools of water to further increase



the physical diversity of the stream. There were six clusters of three rocks each placed in strategic areas of the Campbell Creek project. These low cost practices will enhance trout habitat along that stretch.



Lunker Being Placed

Lunker structures are crib-like structures use to provide overhead cover and resting areas for fish. Typically made of rough-sawn oak, these structures are staked into the stream bed along the outside bend of a stream. On the Campbell Creek project sets of two lunker structures cover approximately 7' x 16' of area. Once staked in place, they are covered with geotextile and face rock to provide a good cover for trout. The structures were placed at three different locations along the project site.

Funding for this project included a share derived from state funding through Root River One Watershed, One Plan regional watershed funds. In addition, a share of local ARPA (American Rescue Plan Act) funds were appropriated to create a 90% cost share with the landowner covering 10% of the cost.

Root River One Watershed, One Plan funds are used on local conservation projects for many uses including engineered practices such as those mentioned above as well as grade



stabilization structures, grassed waterways, etc. in addition to ecological practices such as cover crops.

If you are interested in addressing the resource concerns on your land, call the Root River SWCD office at 724-5261 ext. 3 for assistance.





Steps to Increase Soil Organic Matter

The benefits of increased soil organic matter are many but increasing those levels takes some strategy and management. Incorporating strategies to improve soil organic matter will take time but will enhance your soil's ability to produce a bountiful crop with potentially lower input costs.

1. **Reduce or Eliminate Tillage.** Tillage improves the aeration of the soil and causes a flush of microbial activity that increases the speed of decomposition of organic matter. The incorporation of oxygen into the soil essentially helps to ignite and burn the organic matter like a fire burns wood.
2. **Reduce Soil Erosion.** Most of the organic matter in a soil is in the topsoil. When soil erodes, organic matter goes with it. Saving soil and organic matter go hand in hand.
3. **Fertilize Properly.** Proper fertilization encourages growth of plants, which increases root growth. Increased root growth can help build or maintain soil organic matter, even if much of the top growth is removed.
4. **Grow Cover Crops.** Growing cover crops can help build or maintain soil organic matter. The best results are achieved if growing cover crops are combined with a reduction in tillage practices.

The benefits of a no till system can improve your soil's ability to improve at a remarkable rate. Not only will you be reducing the potential for sheet and rill erosion, you will also be lowering the flush of oxygen that can quickly decompose that valuable organic matter. For more information about soil health, call Bob Scanlan at (507) 724-5261 ext. 3.

I-90 Soil Health Tour Stop in Hokah

As winter approaches, so does the farmer workshop season. Coming up in February of 2023, Root River SWCD will be hosting a stop on the "I-90 Soil Health Tour". Soil and Water Conservation Districts from SE Minnesota will be putting together four stops in January and February with one stop in Houston County. The workshop will be held at the Hokah Fire Station and will include two producers from out of the area who will share their experiences with soil health practices. Be sure to attend, enjoy a good meal, and get your questions answered regarding soil health.



MYCORRHIZAL FUNGI AND ITS IMPORTANCE TO SOIL HEALTH

Mycorrhizal fungi are a very important soil microbe when it comes to the overall health of soils. These fungi are present in all soils but can be depleted due to factors such as tillage and mono cultures.

Mycorrhizal fungi (fungi) are known to create a symbiotic relationship with plants. They utilize carbohydrates derived through photosynthesis from the plant and, in return, provide nutrients to the plant (phosphorus, sulphur, and nitrogen). This relationship is one of the most important when it comes to improving such things as aggregate stability, water infiltration, soil stability, organic matter, and nutrient cycling.

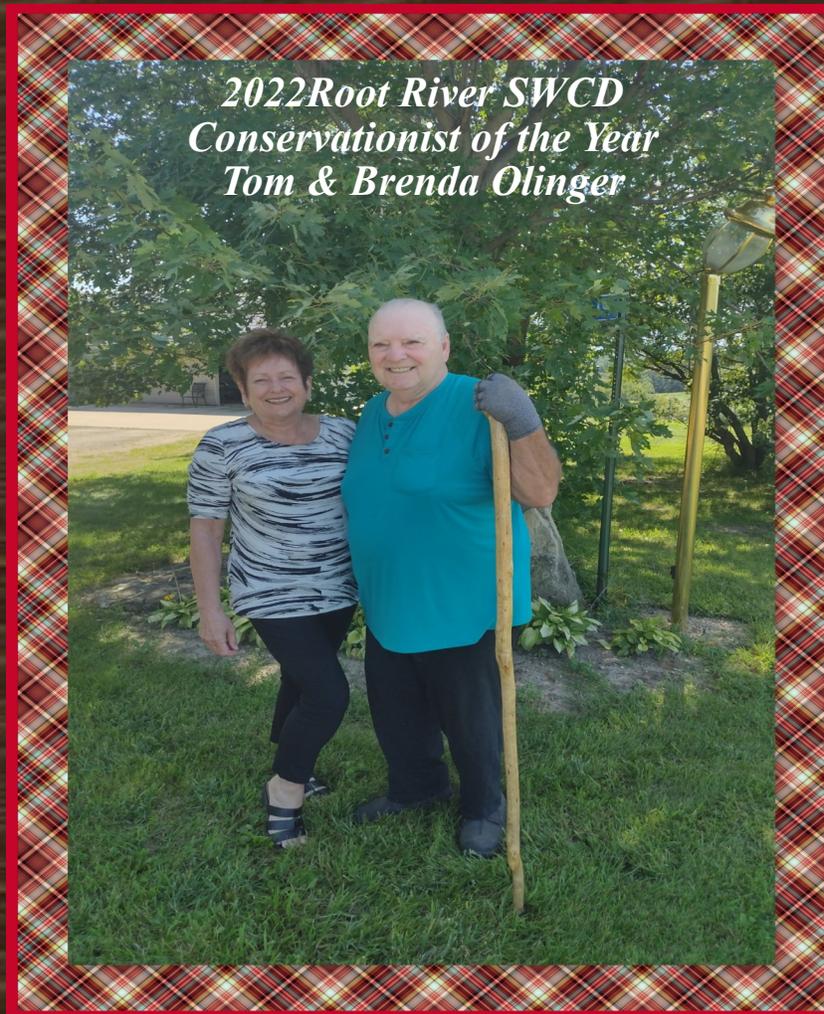
The symbiotic relationship between fungi and a plant is made possible through the use of hair-like threads of cytoplasm called hyphae. These hyphae are small (one millionth of a meter) but provide a connection between the plant root and the soil matrix. It is through this connection that important processes occur to provide improved soil health.

Practices that destroy soil fungi include: tillage (breaks the hyphae connection), mono cultures, and lack of a living root.

Practices that improve soil fungi include: no till, plant diversity, cover crops, living roots during longer periods of time.

Producers can improve their soil mycorrhizal fungi populations by (1) reducing tillage or going to a no till system, (2) by integrating another crop such as hay into a corn/soybean rotation, and (3) by utilizing cover crops to provide soil armor and increase the number of months during the year when a living root is present in the soil.





The Olinger's

When it comes to taking steps to reduce erosion and increase soil health, Tom and Brenda Olinger have improved their farm in many ways over the years. The Olingers bought their farm in 1971 after Tom returned home from serving his country in the Navy during the Vietnam War. When Tom and Brenda took over the farm it was being managed as a typical crop and livestock enterprise with dairy, hogs, corn, small grain, and hay. Of the roughly 120 acres, 100 acres were under crop production. Since that time, the Olingers have transitioned the farm to a 100% grass/forage based grazing operation.

Neighbor and tenant, Mike McCormick, leases the pasture from the Olingers and nominated them for this year's "Conservationist of the Year" award through the Root River Soil and Water Conservation District. Mike grazes cow/calf pairs, makes hay on the farm and sees first-hand the results of Olinger's hard work to improve their farm. McCormick grazes cattle on several farms in the area and will attest to the quality of the grazing paddocks on the Olinger farm. Tom is a perfectionist when it comes to noxious weed (thistle, parsnip, multiflora rose, etc.) control and takes steps to reduce populations of weeds several times during the growing season. One would be hard-pressed to find a cleaner pasture anywhere in the county. Noxious weed control coupled with improving forage stand and growth are also important to note. Tom interseeds red clover and ryegrass as a way to improve forage species. The pasture is comprised of an excellent mix of forages including orchard grass, fescue, clovers, and ryegrass. In addition, the Olingers utilize managed rotational grazing to maintain forage quality and quantity while keeping a high plane of nutrition for the cattle.



In order to keep forages high in nutrition and utilize forage growth, a cutting of hay is taken off some of the paddocks in the spring and early summer. This allows good utilization of the fast-growing forage while providing a high quality feed for the cattle to graze during the balance of the summer. The principle idea behind managed grazing is to keep good quality feed available for livestock, but not allow continued access to the whole pasture. Instead, cattle are rotated through 15 individually-fenced paddocks on the Olinger farm and allowed to graze only the top, most nutritious part of the plant, in each paddock before being moved to the next paddock. This allows quick re-growth of the forage while providing very nutritious feed for the grazing livestock.



By operating a managed grazing system, the Olingers have all but eliminated soil erosion on their farm. On a typical crop farm, soil is exposed to the elements at times when no crops are being grown in early spring or late fall/winter following crop harvest. Uncovered soil is prone to soil erosion due to rain and/or wind. On a grazing system such as the Olinger's, the soil is covered by forage every day of the year. This keeps an armor on the soil and protects it from the harmful effects of erosion. In addition, organic matter levels in the soil increase over time thus creating a situation where rain water infiltrates into the soil profile at a higher rate. Increased water infiltration provides more available water for the forage and increased growth during the growing season, providing more forage for cattle to graze. This means that soil health and water quality benefits of managed grazing are compounded over time.

Lastly, the Olinger farm contains five grade stabilization structures that have been built in areas of gully erosion. These structures stabilize the gully and have a dual purpose of providing water for the grazing cattle. Houston County is in the Karst region where steep slopes are common and shallow soils over bedrock can be prone to erosion if not managed correctly. The Olinger farm is a prime example of one that is being managed to reduce the chances of erosion while increasing soil health. The Olinger grazing system is one that mimics nature. Before human settlement, Houston County was home to open prairies that were grazed by thousands of bison, deer, and other types of wildlife. The way the Olingers manage their farm is very similar to the way nature intended. That is why Root River SWCD is proud to announce that Tom and Brenda Olinger are this year's "Conservationists of the Year"!



Prairie Strips

An Exciting Opportunity

An exciting new opportunity for prairie strips is now available for area farmers. Prairie strips are a fairly new CRP practice. They reduce erosion, improve water quality, and create insect and bird habitat by establishing strips of native prairie vegetation on a field. They can be placed across a field in contour strips, along grassed waterways or terraces, or on field perimeters or headlands.

Planted as contour strips, they can give you the erosion-saving benefits of hay strips without the extra time and labor that comes with hay strips. As field perimeters they can act as a nice buffer between your crops and an adjacent woodland. On field headlands they can replace end rows that are running straight up and down the hill. By covering this



area in sod, it can eliminate the severe erosion that often occurs in these areas. It is a very flexible program and these prairie strips can be placed just about wherever you like within your cropping system.

Along with other criteria, these strips must have a seed mix containing at least 10 different wildflower species and be 30-120' wide. Width can vary, as long as it is within this range. Turning machinery around on these strips is allowed, but using them as field roads or to store bales upon is not.

Since prairie strips are a CRP practice, you will get a yearly payment from USDA-FSA for each acre enrolled, based on soil type. You will also receive cost-share for planting the strips, as well as a considerable incentive payment up-front. To make it even more appealing, local Soil and Water Conservation Districts are now offering an additional \$80/acre/year payment to stack on top of the CRP payments. We think this additional payment will make prairie strips a practical option for area

farmers. These strips have been shown to reduce the amount of sediment leaving a field by up to an incredible 95%! Talk about a win-win.

To learn more or to sign-up, contact Dan with Root River SWCD in Caledonia at 507-724-5261 extension 3.

Below is a sample Prairie Strips Mix. The seeding rate is 6.8 lb/acre (35.2 seed/square foot)

Common Name	Scientific Name	% of Mix	Seeds/ft ²	Total
Grasses				
Slender Wheat grass	Agropyron trachycaulum	12.50%	3.0	0.850 PLS lb
Big Bluestem	Andropogon geradii	14.71%	4.0	1.000 PLS lb
Sideoats Grama	Bouteloua curtipendula	17.65%	5.0	1.200 PLS lb
Blue Grama	Bouteloua gracilis	1.47%	1.7	0.100 PLS lb
Canada Wild Rye	Elymus Canadensis	14.71%	2.6	1.000 PLS lb
Switchgrass	Panicum virgatum	5.15%	3.1	0.350 PLS lb
Little Bluestem	Schizachyrium scoparium	18.38%	8.2	1.250 PLS lb
Indiangrass	Sorghastrum nutans	12.50%	3.8	0.850 PLS lb
Forbs				
Canada Milk Vetch	Astragalus Canadensis	0.15%	0.1	0.010 PLS lb
Partridge Pea	Chamaecrista fasciculata	0.44%	0.0	0.030 PLS lb
White Prairie Clover	Dalea candidum	0.44%	0.2	0.030 PLS lb
Purple Prairie Clover	Dalea purpurea	0.44%	0.2	0.030 PLS lb
Maximillian's Sunflower	Helianthus maximilliani	0.22%	0.1	0.015 PLS lb
Common Evening Primrose	Oenothera biennis	0.15%	0.3	0.010 PLS lb
Foxglove Beardtongue	Penstomon digitalis	0.07%	0.2	0.005 PLS lb
Prairie Cinquefoil	Potentilla argute	0.15%	0.8	0.010 PLS lb
Black-eyed Susan	Rudbeckia hirta	0.74%	1.7	0.050 PLS lb
Golden Alexanders	Zizia aurea	0.15%	0.0	0.010 PLS lb



Minnesota Buffer Program



The Minnesota Buffer Law requires perennial vegetative buffers of up to 50 feet along designated lakes, rivers, and streams. These buffers help filter out phosphorus, nitrogen and sediment. The deadline for implementation for buffers on public waters was November 1, 2017.

A buffer, also known as a riparian filter strip, is vegetated land adjacent to a stream, river, lake or wetland. Buffers are an important conservation practice for helping keep water clean. Studies by the Min-

nesota Pollution Control Agency show that buffers are critical to protecting and restoring water quality and healthy aquatic life, natural stream functions and aquatic habitat due to their immediate proximity to the water.

A wide range of vegetation can make a suitable buffer; to meet requirements the plants must be perennials. This includes hay and forage crops such as alfalfa and clover, woody vegetation, perennial grains that can be harvested later and prairie vegetation. When buying seed to plant buffers on your property the seed must be free of weed species considered "prohibited" in the state.

You can learn whether the buffer requirement applies to you by visiting the DNR Buffer map, <http://arcgis.dnr.state.mn.us/gis/bufferviewer/>, which will help you determine where buffers or alternative water quality practices are required and what buffer widths are required

Beginning in 2019, Soil and Water Conservation Districts (SWCDs) were mandated to check 1/3 of all public water buffers each year along with 25-50 random spot checks. The Monitoring Plan can be found on the Root River SWCD website, <http://www.co.houston.mn.us/departments/soil-and-water/>.

If you have questions regarding the Buffer Law please give Jean Meiners a call at the office, 507-724-5261 ext. 3.



HAVE YOU HEARD
Available to Rent
Kuhn 20.2 Broadcast Seeder
M1 Twin Discs will spread 33-59 ft.

on a trailer for quick access

\$5.00 per acre charge

Available on a first come first serve bases

Contact

Root River SWCD
(507) 724-5261 ext.





Tree Conservation

Can you imagine a world without trees? Without trees, the world would be a very different place. Unfortunately, due to overuse of this natural resource, some places are already facing this issue. Future generations may face a shortage of everything we rely on trees for. This is why tree conservation is so important.

The benefits of trees are saving the eco-system for current and future generations. Trees allow humans and animals to breathe fresh air. They create an eco-system to provide habitat for animals and birds. Trees absorb carbon dioxide and potentially harmful gasses, such as sulfur dioxide, carbon monoxide, from the air and release oxygen.

Trees are important as they increase property values, clean the air, slow water runoff, prevent soil erosion, help buffer noise pollution, cool our homes and save you money on energy costs.

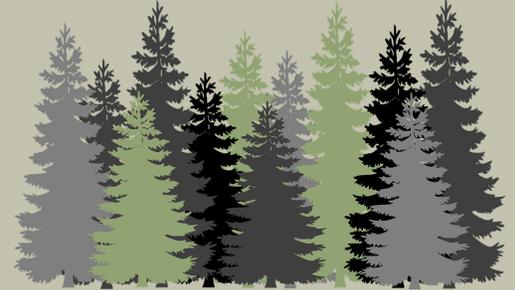
Root River SWCD would like to help, by offering conservation trees to you. The bare root trees are conservation grade and sold in bundles of 25. A variety of conifers and deciduous trees are offered as well as shrubs.

Order your conservation trees **TODAY**

Orders are first come first serve.

Some species have a limited supply available.

Special orders are welcome.



CALLING ALL AMATEUR PHOTOGRAPHERS

Excellent photography, as you know, can communicate volumes.

Each year the National Association of Conservation Districts (NACD), in partnership with the NACD Auxiliary, hold a contest for amateur photographers, both youth and adults, to showcase their passion for conservation.

Contestants can submit photos relating to four themes “Agriculture and Conservation Across America,” “Close Up Conservation,” “Conservation in Action” and “Conservation Practices.”

This past year’s National Photo Contest winners consisted of two local individuals, Karalee Christensen, age 17 Youth Division and Joni Mehus Adult Division.

Joni Mehus, of rural Spring Grove, has entered many award winning photos in the contest over the years. In 2021, her entry in the Adult Division of the “Conservation Practices” category is the 1st place winner. Joni has promoted this contest to many including her niece, Karalee Christensen.

Conservation Practices



Conservation in Action

Karalee Christensen, residing in rural Houston, MN, has placed each year since 2017. Her success started as an eighth grader in the youth division, where she placed 2nd in the “Conservation in Action” category. In 2018 she took 2nd place in the “Agriculture Conservation Across America” category. 2019 found her in 1st place in the “Agriculture Conservation Across America” category, 2020 – 2nd place in the “Conservation in Action” and “Close Up Conservation” categories and in 2021 – 1st place in the “Conservation in Action” category.

There is still time to enter the 2022 competition. Submissions are being accepted through December 1, 2022.

For contest information visit:

<https://www.nacdnet.org/general-resources/stewardship-and-education-materials/contests/>

Envirothon — Competitive Conservation for Youth

Envirothon is an outdoor, hands-on learning experience for high school and middle school students. It centers around five different learning stations (soils, wildlife, water resources, forestry, and a current environmental issue), which are staffed by professionals on that subject.

At each station, teams composed of five students answer questions on the subject. Since the event takes place outdoors, questions involve actual contact with natural resources, rather than a “paper and pencil” approach.

An oral presentation is also part of the competition for high

school teams. Students will be given a scenario prior to the event. The teams create a poster and develop a presentation, which they will give to a set of judges on the day of Envirothon. Students will have seven to 10 minutes to make the oral presentation. This oral presentation will be the same as the one used for the State Envirothon.

After all teams have completed the five stations, the points each team accumulates is tallied and the winner is declared. The highest scoring team will advance to the MN State Envirothon. The winner of the State Envirothon will advance to the National Envirothon representing Minnesota.

Get involved today in competitive conservation for youth, Envirothon!



**Root River Soil and Water Conservation District
TREE ORDER – SPRING 2023**

Name: _____ Home Phone _____

Address: _____ Work Phone _____

E-Mail: _____

CONIFERS – TRANSPLANTS (Tree information can be found on back side.)

Variety	Type	Min. Size	Price of 25	# of Bundles	Extended Price	Total # of Trees (# of bundles x 25)
Pine, Norway	3-0	8" – 15"	\$39.50			
Pine, White	Tran	7" – 15"	\$42.50			
Spruce, Colorado	Tran	7" – 15"	\$42.50			
Spruce, Norway	3-0	8" – 20"	\$39.50			
Spruce, White	3-0	8" – 15"	\$39.50			
Fir, Balsam	Tran	12" – 18"	\$55.00			
Arborvitae, Techny	TR 1-2	6" – 12"	\$45.00			

DECIDUOUS TREES (Tree information can be found on back side.)

Variety	Type	Min. Size	Price of 25	# of Bundles	Extended Price	Total # of Trees (# of bundles x 25)
Oak, Red (Northern)	Seedling	12" – 18"	\$ 35.50			
Oak, White	Seedling	12" – 16"	\$ 35.50			
Walnut, Black	Seedling	12" – 18"	\$ 35.50			
Maple, Sugar	Seedling	12" – 18"	\$39.50			

SMALL TREES & SHRUBS (Tree information can be found on back side.)

Variety	Type	Min. Size	Price of 25	# of Bundles	Extended Price	Total # of Trees (# of bundles x 25)
Cranberry Bush	Seedling	12" – 18"	\$ 39.50			
Crabapple, Red Splendor	Seedling	12" – 18"	\$ 39.50			
Ninebark, Common	Seedling	10" – 20"	\$ 39.50			
Dogwood, Red Osier	Seedling	12" – 18"	\$ 39.50			
Plum, American	Seedling	12" – 18"	\$ 39.50			
Lilac, Common Purple	Seedling	12" – 18"	\$ 39.50			

MISCELLANEOUS

Item	Price	Qty	Extended Price
Flags, Fluorescent Pink Bundle of 100	\$ 11.51		

Subtotal _____ Total # of Trees _____

MN State Sales Tax 6.875% _____

Total _____

- ✓ Trees will be sold on a first come first serve bases.
- ✓ Trees usually arrive mid-April. We will send out a post card or e-mail notifying you of pick-up dates.
- ✓ Call our office to check on tree availability. (507) 724-5261 ext. 3
- ✓ Special ordering available upon request.
- ✓ We purchase good stock, but make no survival guarantee.
- ✓ Payment is due in full with order. Make checks payable to: Houston County Treasurer

Mail to: Root River SWCD Phone: (507) 724-5261 Ext. 3
 805 N. Hwy. 44/76, Suite 1
 Caledonia, MN 55921



Conservation Tree Descriptions

CONIFERS - TRANSPLANTS

Variety	Size	Maturity Size	Description
Pine, Norway (Red Pine)	8" - 15"	75 - 100'	 Needles are 4 - 6" long, flexible, and a dark yellow-green color. Prefers well-drained, moist soils, but will tolerate dry conditions. Prefers full to partial sun. Growth spread ranges from 50-75'. Fast growth rate.
Pine, White Eastern	7" - 15"	50 - 75'	Needles are 3-5" long, very soft and flexible, bluish-green in color. Grows well in rich, moist soil, but does best in moist, sandy loams. Full sun to partial shade. Growth spread ranges from 20 - 40'. Medium growth rate (12 - 24" per year). Good lumber tree. Also, good for wildlife habitat. Used in windbreaks, to block farm odor, screens and shade. Soft, picturesque tree.
Spruce, Colorado	7" - 15"	70 - 100'	1" - 1 1/2" needle all shades of blue and green with very sharp tips. Prefers well-drained, moist soils but will tolerate dry conditions. Moderately tolerant of shade. Provides a 20-35' growth spread. Medium growth rate.
Spruce, Norway	8" - 20"	40 - 100'	Full sun and drought tolerant 20-50' growth spread. Does well in dry, moist or wet conditions. Fastest growing spruce. Dense draping branches. Needles are 1/2 to 1" long. Not native.
Spruce, White	8" - 15"	50 - 80'	 Needles are 1/3 - 3/4" long. Tolerant of shade. Does best in moist, well-drained, gravelly soils. Drought sensitive. Good wildlife cover and useful windbreak tree. Medium growth rate.
Fir, Balsam	12" - 18"	50 - 75'	Shade tolerant with 20-30' growth spread. Prefers moist, wet regime. Sensitive to drought. Bears small cones. Slow growth rate.
Arborvitae, Techny	6" - 12"	20'	 Maturity width 8 ft. Dark green in color year round. Medium growth rate. Very hardy.

DECIDUOUS TREES

Variety	Size	Maturity Size	Description
Oak, Red	12" - 18"	60 - 80'	Fastest growing Oak. Does best on moist or well-drained sites in full to partial sun. Valuable wood products tree. Acorns provide excellent wildlife food source. Fall color is red to a winter bronze.
Oak, White	12" - 16"	50 - 80'	Does best in slightly moist to well-drained sites and full sun. Acorns provide excellent wildlife food source. Brown, purple autumn foliage. May hold some leaves over winter. Excellent firewood & valuable wood products tree. Slow growth rate.
Walnut, Black	12" - 18"	70 - 100'	A large tree with medium green, compound leaves. Does best on rich, deep, fertile, well-drained soils. Requires full sun. Widely planted and highly regarded for top quality lumber. Excellent food source for wildlife. Yellow fall color. Rapid growth rate.
Maple, Sugar	12" - 18"	50 - 75'	Brilliant orange red fall color. Tolerates shade. Thrives on fertile moist and well drained soils. Collect sap in the spring for your own maple syrup. Valuable for wood products and excellent firewood. Slow growth rate.

SHRUBS

Variety	Size	Maturity Size	Description
Cranberry Bush Viburnum Trilobum	12" - 18"	8 - 12'	Soft maple-like leaves that turn purplish red in fall, and produce white lace cap flowers mid-May to mid-June, followed by bunches of shiny bright red berries by August, which can be harvested in autumn. To avoid poor fruit production plant more than one. Benefits birds, pollinators. Can serve as a screening hedge (plant 4' apart). Sun to part shade. Maturity width up to 10 ft. Soil type clay, loam, sand. Moderate growth rate.
Crabapple, Red Splendor	12" - 18"	20 - 25'	Full sun with sandy loam to clay loam soil texture. Should have moderate drainage with dry, moist or wet moisture regime. Growth width 20'. Pink spring flower precedes red fruit from spring through winter. High wildlife rating. Fast growth rate.
Ninebark Common	10" - 20"	6 - 10'	Sun to Part Shade. Growth width 6 - 12'. Features small pink or white five petal flowers appearing in dense flat rounded 1-2" dia. spirea like clusters in late spring. Flowers change to drooping clusters of reddish fruit (inflated seed capsules). Shallow lobed leaves up to 3" long that change to an undistinguished yellow in fall. Noted for its exfoliating bark which peels in strips to reveal layers of reddish to light brown inner bark providing winter interest. Valuable nectar source for pollinators.
Dogwood, Red Osier	12" - 18"	6 - 12'	Attractive red stems with white flowers followed by white berries. Growth spread of 6-12'. Red twigs create winter color. Tolerates almost any location, growing in moist soils and full sun. Effective bank cover holds soil well. Excellent wildlife food source and cover. Fast growth rate.
Plum, American	12" - 18"	10 - 30'	Small tree with an 8 - 25' spread that produces fragrant white flowers in early spring. Bears 1" red which can be used for jellies. Excellent for wildlife food and habitat. Requires well drained soil and a sunny location. Quite drought tolerant.
Lilac, Common Purple	12" - 18"	8 - 15'	Delicate, fragrant purple flowers in May. Perfect for border, screens or windbreaks. Hardy with 6 - 12' growth spread. Prefers rich, well-drained sites and requires full sun. Good for wildlife cover. Not native. Medium growth rate.

HOW MANY TREES DO I NEED & HOW FAR APART DO I NEED TO PLANT THEM?

Windbreaks/Shelterbelts - Shrubs: 6 ft. apart in rows, Trees: 15 ft. apart in rows (Rows should be 15 - 20 ft. apart). *Wildlife Planting* - Mixed plantings of shrubs & trees average 10 ft. apart in rows and between rows (about 500 seedlings per acre). *Fiber Production* - Average spacing of 8 ft. apart in rows and nine feet between rows (about 700 seedlings per acre).