

Hardwood Reforestation in a Creek Valley Dominated by Reed Canary Grass



For details on this project, visit the Fillmore Soil and Water Conservation District website at www.fillmoreswcd.org and click on the "Hardwood Reforestation in a Creek Valley Dominated by Reed Canary Grass" link or email Tim Gossman at tgossman@northlc.com

The work in the Lost Creek Valley on our farm includes three goals in reclaiming this area from the widespread monoculture of Reed Canary Grass (RCG) that dominated the valley: Restoration of existing natural plant communities, Reforestation of a diverse hardwood forest by direct seeding, and Reforestation using Cottonwood and Willow poles.

Due to the persistence of RCG and its resistance to control by non-chemical practices, we were faced with an environmental decision: whether it was better to leave the creek valley and RCG untreated and allow the RCG to dominate and spread but not expose the area to herbicides or to explore several alternatives including treating an area with chemical herbicides for several years in an attempt to reforest the area. After much research and deliberation, we decided that the application of herbicides with a track record of low environmental impact at rates similar to those used in a field of soybeans for a period of only 3 or 4 years to reestablish a forest that should remain for over 100 years is the more sustainable, environmental decision. We think of this as a transition period that will provide long term environmental benefits to our farm and to the Lost Creek and Root River Watersheds.

As flooding introduced Reed Canary Grass to our creek valley and Dutch Elm disease reduced the bottomland forest cover, the RCG came to dominate much of the area. Our early efforts to reforest the area with tree seedlings and hand planted seeds and nuts were largely unsuccessful in the areas where RCG was established. We have now adopted techniques that utilize three vulnerabilities of RCG: It does not survive long term in shade, it spreads primarily by the roots and will not survive long term mowing. So, it will not grow well under established trees and it can be controlled from spreading into areas where it does not exist by a mowed barrier or a band of trees. Our strategy is to control RCG in the short term using Sethoxydim, a selective herbicide that kills grasses, but not sedges, reeds, broadleaf plants or trees. Sethoxydim can be used before trees are planted to prepare the area and also after trees have been established until there is adequate shade to control the RCG. Sethoxydim is quickly degraded by ultraviolet light and should be applied on a cloudy day, or in the evening when UV levels are lower.

RCG control takes 2 growing seasons before tree seed is planted. Areas of the creek valley that are accessible by machinery for spraying and tilling are planted using Direct Tree Seeding. We begin with a prescribed burn in April of year 1. This removes a layer of thatch to make the herbicide application more effective. The site is sprayed with Sethoxydim herbicide in late May to kill the grasses including RCG, but leaving the forbs. Using a selective grass herbicide gives the native sedges, reeds and forbs a chance to return in areas where they are still present but suppressed by the RCG. These areas remain in this native cover. The areas where native sedges and forbs are no longer present are designated as tree planting areas.

In April of the second year the area is burned again. The area is treated with a second Sethoxydim herbicide application in late May. Areas designated for direct tree seeding are mowed in early July of year 2 and treated with Glyphosate herbicide in early September to kill all the plants in the areas to be direct seeded. The site is mowed and tilled in mid September and direct seeded to a seed mixture of Black Walnut, Burr Oak, Swamp White Oak, White Oak, Butternut, Bitternut Hickory, Kentucky Coffee Tree, Ohio Buckeye, Ginkgo, Black Cherry, Wild Plum, Dogwood, Ninebark, Highbush Cranberry, Elderberry and False Indigo in early October. We seed 15 bushels of walnuts, 5 bushels of acorns and lesser amounts of the other species listed above. This is more walnuts than usually recommended for a direct seeding, but with our forest nearby, we lose a large amount of the walnuts to squirrels. The larger seeds are disked in followed by the smaller seeds and oats cover crop and finished with a culti-packer.

In June of year 3 Silver Maple seed is sown on the area when that seed is ripe. In April of year 4, Seedlings of Hackberry, Tamarack, Basswood, Cottonwood and Disease Resistant Elm are planted in gaps of the direct seeded area. Additional spot treatment of Sethoxydim may be needed in years 2,3 and 4 to control the RCG. Treatment with Oust herbicide is also an option if weeds other than grasses are a problem. If Box Elder or other undesirable trees are present in the planting area, they can be removed in year 1, or girdled or treated with Pathfinder herbicide in year 2 and left to rot and eventually fall. If the Box Elder trees are removed, spraying, tillage and planting is easier, however the Box Elders that fall as the young trees are beginning to grow offer some protection from browsing deer. The cost of this practice not including machinery and labor would be about \$125 for herbicides if collecting your own seed or \$675 if purchasing seed.

In areas where the Box Elders are dense enough to shade out weed completion, we use the above plan with no preplant herbicide application, beginning with tilling the area and planting the seeds and nuts. The cost of this practice not including machinery and labor would be about \$25 for chemicals if collecting your own seed or \$575 if purchasing seed.

If collecting your own seeds, prepare your seed storage early, as seed collection times can vary from year to year. We use a chest freezer modified with an override thermostat to convert it to a refrigerator and store the early collected seeds at 40 degrees. Oak, dogwood, Black Cherry, Wild Plum and other early maturing seeds may need to be collected up to 6 weeks before the later maturing seeds are ready. Since some of the larger seeds, including the walnuts, mature later but need to be planted first in a direct seeding, the earlier collected seeds will need proper storage. Scout out seed trees ahead of time. When the acorns and later walnuts begin to fall, you will be in a race with deer, squirrels, lawnmowers and desiccation to gather seeds. Seeds need to be kept moist and cool to maintain viability. Soak acorns in cold water prior to storing to chill and hydrate them. If using a freezer modified to work as a refrigerator, set the thermostat at 60 degrees (or 10 degrees less than the temperature of the acorns if lower than 60 degrees) and lower it 10 degrees each day until you reach 40 degrees. This will allow the cold to spread from the walls of the freezer to the middle where the thermostat sensor is located without freezing the acorns next to the freezer walls. Look for the freezer/refrigerator override thermostat where wine and beer making supplies are sold.

We use 2 tools to make nut collection more efficient. A Nut Wizard is used to collect hickory nuts, butternuts and walnuts. A Bag-A-Nut is used to collect acorns. Both nut collectors save considerable time and effort compared to picking by hand or raking and are available in several sizes for various sized nuts at the manufacturers' websites. They work best on mowed areas, and we have found a good supply of acorns and walnuts on lawns, golf courses and cemeteries. Most people are glad give you their acorns and nuts if you pick them up. 1 bushel equals 8 gallons in volume. Tree seed is also available commercially.

If your planting is near an existing forest, squirrels may view your direct seeding as an easy food source. To avoid the loss of planted seeds, provide an even easier food supply by making several piles of walnuts around the edge of the planting. Hopefully the squirrels will take these and leave your planted tree seeds in the ground.

Some woody plant species including willow, cottonwood and dogwood can reproduce from wood cut from the tree or shrub. This is commonly done using small cuttings of the first year growth. Using small cuttings does not work when planting in RCG due to competition for moisture and sunlight.

In areas that are not accessible to machinery, are too wet or that flood regularly, planting fence post sized poles of willow and cottonwood to eventually shade out the RCG is used instead of direct seeding. When the RCG is eventually controlled, additional tree species will be planted to increase diversity. Willow and cottonwood poles, 3 to 5 inch diameter and 8 feet long are gathered while still dormant in March and stored in a root cellar to keep them cool and moist. Holes are dug with a post hole digger at least 2 feet deep in a solid stand of RCG as soon as the frost is out in April. Tree poles are placed in the holes and tamped firm as when setting a fence post. The idea is to get the bottom of the pole to root below the RCG roots and the top to sprout above the height of the RCG and deer browsing. Willow and cottonwood poles will not grow if planted upside-down. You may want to mark the tops when harvesting. With excess cottonwood and willow trees available to be cut at no cost, the only cost to planting tree poles is labor.

In the summer of 2012, many of the tree poles planted before then were cut down by beavers building dams. We are now painting tree poles with a mixture of exterior latex paint and mason or sandbox sand at a ratio of 2 cups of sand per gallon of paint to deter the beavers. An average tree pole uses about 1 pint this paint/sand mixture.

In addition to small areas of restored sedges, reeds and forbs in each of the direct seeded areas, we are working to control the RCG in larger areas near 3 spring fed ponds. We have also killed Box Elder trees to restore a natural stand of Thornapple trees.

We have received financial and technical assistance for this project from the Minnesota Department of Agriculture Sustainable Agriculture and Integrated Pest Management Program, the Fillmore Soil and Water Conservation District, the Natural Resources Conservation Service through the Wildlife Habitat Incentive Program (WHIP) and the Department of Natural Resources Forestry Office in Preston, Minnesota. We would also like to thank Mitch Gilbert, private forestry consultant for his on going work and sound advice since before this project was started. — Thornapple Farm, Tim and Susan Gossman