View From a Wetland

News and Technology for Riparian and Wetland Management

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"Treat the Earth well. It was not given to you by your parents, it was loaned to you by your children. We do not inherit the Earth from our Ancestors, we borrow it from our children."
---Ancient Indian Proverb

Introduction

This newsletter is part of the Aberdeen Plant Materials Center's continuing effort to provide useable information to the public on wetland and riparian plants, plant establishment, and management. This newsletter is the tenth issue published since the Interagency Riparian/Wetland Plant Development Project was established.

A Big Welcome to Derek Tilley

The Plant Materials Center's newest employee is Derek Tilley. Derek's title is range conservationist, but his primary job is as a research scientist on upland, riparian, and wetland projects. He has a good background in plant taxonomy and plant research. Derek has taken over all of the wetland greenhouse research and the wetland direct seeding trials in the PMC ponds.

Riparian Ecology and Restoration Workshops

AZ workshop participants laying out a new organic soil filled sock that could either replace a willow fascine or added to it for more protection.

As part of the Project's technology transfer program a three-day Practical Streambank Bioengineering Workshop has been developed. The first day of the workshop is devoted to the classroom where basic riparian dynamics, riparian zone vegetation, plant acquisition, and bioengineering techniques are discussed. The second day is spent at a field location where participants classify the riparian site and install a series of bioengineering structures on an eroding section of streambank.

Each year the Project conducts several workshops in different parts of our service area. If you are interested in attending this course, contact Pat Blaker at the PMC for the next scheduled workshop. If you are interested in having a workshop in your area and you have about 30 people that would like to attend the training, contact Chris Hoag and we will try to schedule a course in your area.

Balled and Burlap Trees
Joe Scianna, Plant Materials Center, Bridger, MT

Follow the same rules for handling and transporting a dormant balled & burlapped plant as actively growing stock. Avoid wind desiccation on the trip home. Do not move the trunk and branches independently from the rootball or drop the rootball from any height. A properly acclimated conifer should be fully dormant when purchased. To avoid bud break and the initiation of active growth, limit the amount of time the tree spends in a warm environment (above ~37^{0}F) or is held under long photoperiods (extended day length caused by artificial lighting). This means storing the plant in a shaded outside location or an unheated garage prior to planting. Store the tree in a galvanized tub, keeping the rootball lightly moistened, but do not allow any water to pool in the tub.

Riparian Erosion and Vegetation
Riparian Notes, Steve Nelle, NRCS, San Angelo, TX

A certain amount of erosion and sediment deposition is normal and natural in river and creek bottom areas. However, when bank erosion becomes excessive, it is a sure sign that something is out of balance and the riparian vegetation has low vigor, is severely stressed, or inadequate.

Three broad types of riparian vegetation help provide needed stability:

- **Colonizer plants** establish very quickly and spread. They put down a quick mat of new roots by stolons or rhizomes (knotgrass, spikerush, some sedges, water hyssop, water primrose, slender wheatgrass, etc.).
- **Stabilizer plants** are usually taller upright plants with strong dense root masses (basin wildrye, Nebraska sedge, rushes, Mannagrass, etc.).
- **Riparian Woody plants** with larger diameter roots function as "riparian rebar" (willows, cottonwood, dogwood, alder, birch, etc.).

Keep this in mind the next time you are planning a riparian project. Determine which species to plant in and make sure to incorporate all three classes of plants for a better overall erosion control results.

Soaking Willow and Cottonwood Cuttings
Derek Tilley, PMC Range Conservationist

In 2004 the PMC began a series of experiments in the greenhouse investigating the pre-soaking of willow and cottonwood poles for transplanting. The rationale was, if we could get the poles primed with water, there would be less chance of drying out, the poles would be more likely to quickly produce roots, and therefore establish faster and with a higher success rate.

In the first experiment, two sets of 18" cuttings were soaked in 5 gallon buckets, one group outside (daily highs in the 30s) and one group in the greenhouse (constant 75º F). We then monitored the development of rooting nodules (small white lesions where roots emerge from the bark).

We found that the greenhouse materials, began forming nodules between two and seven days (depending on the species) and quickly produce roots. However, the poles outdoors remained dormant until the temperatures warmed up to around 50º F during the day, and only then did they begin producing nodules.

We also monitored and compared how quickly roots grew by species. Some species (peachleaf willow, whiplash willow and Geyer willow) grew roots very quickly, up to 5 cm after 12 days of soaking. Other species (Black cottonwood, Booth willow, Drummond willow and coyote willow) were very slow to produce roots. Even after 30 days of soaking we didn't see any roots on Booth, coyote and Drummond willow.

The final experiment involved soaking 6' poles either completely submerged, half-submerged, or 1/3 submerged. We measured the weight gain from water every seven days for four weeks. We found that all poles initially take up water at the same rate. In about seven to 14 days, the poles in 1/2 or 1/3 soak start to produce leaves and roots and lose weight due to water loss through the leaves. Then they start to gain weight again from leaf and root production. Poles that are completely submerged never produce leaves or roots, so they took up water at a steady rate and then leveled off.

Nodule and root formation on a willow cutting after soaking.

The question now is, "does any of this affect establishment success in a real-life planting?" Is it better to plant poles soaked with water? Should they already have nodules or roots? In 2005, we plan to conduct additional experiments by planting the poles outdoors after being subjected to different treatments to see which treatments have a higher rate of establishment.

Direct Seeding Wetland Plant Species
Derek Tilley, PMC Range Conservationist

In 2004, we began evaluating different possibilities for direct seeding wetland species. Most of our commonly used wetland plants need three things in order for the seed to germinate: light, heat and water. Direct seeding has proven to be very difficult, because seed drilled into the soil doesn't get enough light, and seed placed on the surface tends to float away when the water comes up.

An example of Submerseed™ which is a small rock with Juncus seed embedded in a coating around the rock.

We are currently evaluating two new possibilities for direct seeding. The first involves using a tackifier (a glue used in hydroseeding applications), which could potentially glue the seed to the soil without blocking the necessary light. The second involves binding seeds to small gravel-sized aggregates with clay and organic polymers. These pellets can be spread by hand or through use of a fertilizer spreader mounted behind an ATV. Both techniques have worked well in the greenhouse. In the spring of 2005 we will plant six different species into our constructed wetland ponds at the PMC to test the techniques described above under a real-life setting.

Practical Tips for Wetland Seed Collection from an Experienced Collector
Derek Tilley, PMC Range Conservationist

1. Wear rubber hip boots - these not only keep you dry, but also keep weed seeds like cocklebur and beggar's ticks from sticking to your clothes and shoes.
2. Avoid driving onto wetlands and meadows - they may appear to be dry, but there can still be wet pockets under the surface, and even though your vehicle comes equipped with a winch, good luck finding something to attach it to!
3. Collect a pressed voucher specimen for each seed collection – just a good practice.
4. Use bug spray, use bug spray, use bug spray!
5. Identify all the plants in the community where you'll be collecting first – this way you avoid collecting noxious weeds such as perennial sowthistle, and you keep from trampling over any TES species.

Revision of the *Streambank Soil Bioengineering Field Guide for Low Precipitation Areas*

Jon Fripp and Chris Hoag are planning on revising the S*treambank Soil Bioengineering Field Guide for Low Precipitation Areas* this winter. If you have any suggested revisions, additions, or deletions, please email them to Chris Hoag by March 1.

Bigger is not Always Better for Streambank Stabilization

Jon Fripp and Chris Hoag have looked at a number of streambank stabilization projects where the designer thought that if a certain sized rock was calculated to be right for stream velocities, that a little bigger rock was even better. As rocks get bigger there is less and less velocity reduction and more and more energy redirection. A good mixed run of rock with large and small rocks will do a better job than just a few large rocks.

Large rocks used to protect a streambank and to hold rootwads. The river flowed between the rocks, washed the soil out from around the rootwads, and wiped out the entire bank.

The same thing can be said for tree revetments. Do not select tree trunks based on their large diameters. The only purpose of the tree trunk is to hold the branches. The larger the diameter of the tree trunk, the less velocity reduction and the greater the energy redirection. This usually translates into more streambank erosion.

If the Hole is There, Plant it.

During construction of various structures such as rock riprap, spurs, refusals, etc, have willow cuttings available on site to place in the holes that are dug to install the structure. A good example is when a spur is being installed. The root or anchor of the spur needs to be dug back into the bank. Once the hole for the root has been dug and before the rock is placed in the hole, line the outside of the hole with cuttings then dump the rock into the hole. The sides of the hole provide good soil to stem contact, the hole is usually deep enough to ensure the cuttings are into the low watertable, and the rock will hold the cutting upright. This is a good way to establish tree species (cottonwoods, peachleaf willow, etc.) on the upper bank. Do not plant tree species on low banks.

Additional Information

All publications are now available on the Internet in Adobe Acrobat format. You can download each of the papers below by going to http://www.Plant-Materials.nrcs.usda.gov/idpmc/riparian.html. If you do not have access to the Internet or would like to receive a hard copy, please contact the PMC.

Bioengineering Information

1) *The Practical Streambank Bioengineering Guide*: A user's guide for natural streambank stabilization techniques in the arid and semi-arid Great Basin and Intermountain West
2) *Streambank Soil Bioengineering Field Guide for Low Precipitation Areas*

Individual Wetland Plant Fact Sheets – Description, ecology, collection, propagation, management, and uses of 6 different wetland species.

Riparian/Wetland Project Information Series

No. 2 - Selection and Acquisition of Woody Plant Species and Materials for Riparian Corridors and Shorelines

No. 3 - Use of Willow and Cottonwood Cuttings for Vegetating Shorelines and Riparian Areas

No. 6 - Seed and Live Transplant Collection Procedures for 7 Wetland Plant Species

No. 7 - Use of Greenhouse Propagated Wetland Plants Versus Live Transplants to Vegetate Constructed or Created Wetlands

No. 8 - Constructed Wetland System for Water Quality Improvement of Irrigation Wastewater

No. 9 - Design Criteria for Revegetation in Riparian Zones of the Intermountain Area

No. 10 - Perigynium removal and cold-moist stratification improve germination of *Carex nebrascensis* (Nebraska sedge)

No. 11 - Getting "Bang for your Buck" on your next Wetland Project

No. 12 - Guidelines for Planting, Establishment, Maintenance of Constructed Wetland Systems

No. 13 – A Reference Guide for the Collection and Use of Ten Common Wetland Plants of the Great Basin and Intermountain West

No. 14 - Harvesting, Propagating and Planting Wetland Plants

No. 15 - Costs and considerations of streambank bioengineering treatments

No. 16 – Riparian Planting Zones

No. 17 – Waterjet Stinger: A tool to plant dormant unrooted cuttings of willows, cottonwoods, dogwoods, and other species

Idaho NRCS PM Technical Notes

No. 6 - The Stinger, a tool to plant unrooted hardwood cuttings of willow and cottonwood species for riparian or shoreline erosion control or rehabilitation

No. 13 - Harvesting, Propagating and Planting Wetland Plants

No. 23 - How to Plant Willows and Cottonwoods for Riparian Rehabilitation

No. 32 – User's Guide to Description, Propagation and Establishment of Native Shrubs and Trees for Riparian Areas of the Intermountain West

No. 38 - User's Guide to Description, Propagation and Establishment of Wetland Plant Species and Grasses for Riparian Areas in the Intermountain West

No. 39 - Waterjet Stinger: A tool to plant dormant unrooted cuttings of willows, cottonwoods, dogwoods, and other species

No. 42 – Willow Clump Plantings

For a copy, write or call:

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