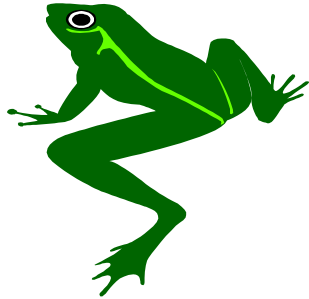


# ***View From a Wetland***

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## ***News and Technology for Riparian and Wetland Management***



**Interagency Riparian/Wetland Plant Development Project  
Natural Resources Conservation Service  
Plant Materials Center  
Aberdeen, ID**

**Number 1 (1994-1995)**

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### **Introduction**

This is the first in a series of annual newsletters that the Interagency Riparian/Wetland Plant Development Project plans to produce. The initial objectives of this newsletter are to: 1) explain what the Riparian/ Wetland Project is all about, 2) provide the reader with information about riparian and wetland plants, 3) provide the reader with planting techniques for riparian and wetland plants, and 4) to offer some recommendations for where and when to use riparian and wetland plants.

This newsletter is your newsletter. We see the newsletter objectives as being very dynamic. In other words, we plan on adjusting the type of information we provide in this newsletter to meet the wants and needs of you, the reader. In order to accomplish this goal, we need your input!! We would appreciate any comments on what we have written. We need requests for specific information we can supply that might help you in your conservation efforts. Our door is always open. Please feel free to call, write, or drop in at any time.

### **Riparian/Wetland Project**

The Interagency Riparian/Wetland Plant Development Project was established in 1991 when several federal, state, local, and private organizations decided that they needed more information on how to propagate and plant riparian and wetland plants, how to establish and maintain wetland and riparian vegetation

in an artificial situation, and other uses related to water quality improvement. Based on these needs, the following objectives were outlined for the Project:

- 1) Assemble, evaluate, and select performance-tested ecotypes of wetland and riparian species for commercial production.
- 2) Develop recommendations for establishing and maintaining wetland plant communities.
- 3) Develop design criteria for establishing and maintaining wetland plants to maximize their performance in constructed wetlands for water quality improvement.
- 4) Develop and manage a wetland plant attribute database.
- 5) Coordinate input into wetland restoration/development training courses.
- 6) Coordinate preparation of videos, slide shows, publications, and other means of information exchange.
- 7) Develop demonstration sites to show plant materials and techniques for the establishment of constructed wetlands.

We have an aggressive technology transfer program to convey our research results as possible to the professionals in the field. We have created a series of technical papers called the Riparian/ Wetland Project Information Series. We have also produced a couple NRCS Tech Notes. We have been featured on the PBS TV program Outdoor Idaho in a special called Wetlands: Between Land and Water that has been aired in at least 28 states. A list of the Information Series papers and Tech Notes can be found at the back of this newsletter. If you would like a copy of any of them, please contact us.

Wetland and Riparian plants we are currently researching include:

#### Herbaceous Plants

Nebraska Sedge (*Carex nebrascensis*)  
Creeping Spikerush (*Eleocharis palustris*)  
Baltic Rush (*Juncus balticus*)  
Threesquare Bulrush (*Scirpus pungens*)  
Alkali Bulrush (*Scirpus maritimus*)  
Hardstem Bulrush (*Scirpus acutus*)  
Water Smartweed (*Polygonum amphibium*)

#### Woody Plants

Coyote Willow (*Salix exigua*)  
Geyers Willow (*Salix geyeriana*)  
Booth Willow (*Salix boothii*)  
Drummond Willow (*Salix drummondiana*)  
Lemmon Willow (*Salix lemmonii*)  
Yellow Willow (*Salix lutea*)  
Pacific Willow (*Salix lucida ssp lasiandra*)  
Peachleaf Willow (*Salix amygdaloides*)  
Laurel Willow (*Salix pentandra*)  
Narrowleaf Cottonwood (*Populus angustifolia*)  
Black Cottonwood (*Populus balsamifera ssp trichocarpa*)

#### Constructed Wetland System for Water Quality Improvement

A Constructed Wetland System (CWS) for water quality improvement is designed to mimic a natural wetland's purification processes that remove a variety of nutrients, sediments, and other contaminants. For agricultural wastewater, the system is designed with five components. The actual size of each component of the system is based on contaminant levels in the water (e.g. nitrogen, phosphorous, total suspended solids, etc), hydraulic loading rates, and water retention time. A CWS is not meant to replace proper on-farm management, only improve it. Harvesting of the aboveground vegetation in the different components and occasional removal of sediment from the sediment basin and the deep-water pond are critical parts of the function and maintenance of the system. Existing Constructed Wetland Systems have produced removal efficiencies of 66 to 95 % for nitrogen, total phosphorous, and total suspended solids. Extensive application of this technology would result in significant improvements in water quality.

The Interagency Riparian/Wetland Plant Development Project is working on the construction and wetland plant establishment of three different Constructed Wetland Systems (CWS) for water quality improvement

in this area. These CWS are being installed in a semi-arid climate and will be used to treat irrigation wastewater. Each CWS is located in a different irrigated farming situation. One CWS is located at the end of two furrow-irrigated farms. It will treat about 2 CFS of water before the water returns to the Snake River. Another CWS is located at the end of a main canal. It will treat between 5 and 10 CFS of irrigation water before the water returns to the Snake River at the 1000 Springs Preserve near Hagerman, ID. The other CWS is located in an irrigation drainage ditch that picks up water from many surrounding farms near Paul, ID before the water is injected into the aquifer. Two of the systems have been constructed, planted with wetland and riparian plants, and baseline data collected in 1994. The remaining system will be constructed and planted in 1995. More detailed water quality and plant uptake data will be collected from 1995 on.

#### Wetland plant propagation tips

When growing wetland plants from seed, three things are required: 1) water, 2) heat, and 3) light. The need for water is fairly straight forward especially when one thinks about conditions in a natural wetland. Light, however, is not as obvious. We have found that covering wetland plant seeds with even a thin covering of soil will significantly decrease germination. Heat is also less obvious. Natural wetlands are generally very hot and humid. We have found that greenhouse temperatures in the range of 100°F or higher will increase germination and growth.

When we plant wetland plant seeds in the greenhouse, we use propagation tanks and Rootainers<sup>tm</sup> with a 1:1:1 soil mix of sand, vermiculite, and peat. The propagation tanks can be filled with enough water to completely cover the Rootainers<sup>tm</sup>. After the stratified seeds are planted on the soil surface, we fill the tanks with water to within about one inch of the soil surface. We illuminate the seeds 24 hours a day with 400-watt metal halide lamps. Covering the propagation tanks with clear plastic while the seeds are germinating helps keep the environment warm and humid. If you find that you have a problem with the seedlings damping off, try flooding the soil. Leave the soil completely submerged under about 1/4 to 1/2 inch of water for about two weeks. After this period lower the water level. This procedure will subdue the fungus and may also stimulate more stubborn seeds to germinate.

## Wetland planting tips

The real fun begins after you have grown the wetland plants you need for a given project. **PLANTING!** Before you begin planting, you need to figure out what and where to plant. This will save a lot of time and money if you plant each species into its appropriate niche. Remember that a natural wetland system has high species diversity. When selecting the plant species for your wetland, try to copy a nearby natural wetland. Where are the different plant species growing? How deep is the water? How long will the plants be inundated? Are the plants in flowing or in relatively stagnant water? Rarely will a natural wetland be totally stagnant through time. Generally, there is water flowing into the wetland from somewhere either above ground or from groundwater. Spring and Fall overturn, as well as wind mixing, also help to circulate the water.

Now that you have figured out what and where to plant, prepare the planting area. The easiest way to plant the plugs is by flooding your planting site. Standing water is much easier to plant in than dry soil (this also ensures that your watering system, whatever it may be, works before you plant). Make sure the soil is super saturated so that you can dig a hole with your hand. Take the plugs and place them in a Styrofoam cooler (you will not need the lid). Try to cover most of the roots with water while in transit. At the planting site, drain off most of the water so the cooler will float. Use the cooler to move the plugs around the wetland as you plant. This will definitely reduce the strain on your back. Select a spot in your wetland to put a plug, reach into the water with your hand and dig out a hole deep enough for the plug to fit all the way into. Push the plug into the hole and pack around it with your hand. Make sure all of the roots are covered with soil. Be careful where you step so you don't dislodge the plug and expose the roots. Start at one end of the planting site and work toward the opposite end.

The planting window for wetland plants is quite long. We have planted plugs from April through September. The main criteria are availability of water. Remember wetland plants like it hot and wet. They tend to spread faster with warmer temperatures. If you plant in the spring, it will take the plants a while to get going, but they will have a longer establishment period. Fall will have a lower establishment success. Fertilizer is not necessary. The plants can be successfully established in a wide variety of soil textures (e.g. clay with no organic matter to gravels).

## Collection Techniques for Dormant Riparian Cuttings

Before collecting woody riparian cuttings, determine the objectives of the project. Whether the objectives are streambank stabilization, riparian rehabilitation, wildlife habitat improvement, or water quality improvement, some of the factors you will need to consider include: soils, hydrology, herbaceous and woody species selection, planting method, cutting source, planting window, and storage potential. These factors will help determine what to plant and possible collection sites.

First, reconnoiter the proposed planting site. Look at aerial photos or maps to see what is upstream (e.g. dams, landuse, vegetation). Are woody plants there? Does spring runoff occur? The better reconnaissance job you do the better your chances for establishment success.

Next, based on your reconnaissance, decide what species should be planted and where can you find "mother plants." Cuttings can be harvested from existing native or naturalized stands near the planting site.

Now, you are ready to harvest the cuttings. The cuttings should be collected while they are dormant, generally from December to March or prior to bud break. Your climate and elevation will determine this time period. A general rule of thumb when harvesting cuttings is to get the largest diameter possible. Cutting diameters will vary depending on the species. The cutting length is determined by the depth to lowest seasonal water table and the height of the herbaceous vegetation around the hole (this information should be obtained during your reconnaissance). The cutting should be at least 2 feet in the ground (much deeper if the water table is low) and above the herbaceous vegetation so it won't be shaded out. The length may be from 3 feet to 10-12 feet or more. Chainsaws, loppers, or pruning shears can be used for harvesting dormant cuttings. Use sharp equipment and proper pruning techniques to decrease the risk of rot, infections, or physical damage to the mother plant.

The two principle causes of failure when planting dormant cuttings are: 1) the cuttings are not planted deep enough to withstand the water current, and 2) they are not planted into the lowest seasonal water table. Make sure that the cutting is planted at least 6-8 inches into the lowest seasonal water table. The stem then acts as a wick to move water up to the

primordia, stems, and roots even during the dry season.

Some general harvesting guidelines should be followed. You should take cuttings from the branches and stems that are more than one year old, but not more than 12-15 years old. Stay away from old, heavily furrowed bark, insect-infested or diseased growth, dead or broken branches, basal shoots, young suckers, or water sprouts with soft tissue.

Now the cuttings need to be treated before planting or storing. First, trim off all of the side branches and at least 2 feet of the top of the branch. Basically, you will be left with something that resembles a fence post. Paint the top cut with enamel or latex paint. This will help ensure the cutting is planted right side up and it also helps reduce desiccation of the cutting. Make sure the cuttings are kept out of the sun and wind during transportation and while they are waiting to be planted. If labor is not available or site conditions are not conducive to planting in the spring, the cuttings should be stored in a cool, dark area (e.g. a walk-in cooler, root cellar, basement, etc.) until you are ready to plant. Storage will help to extend the planting window. You can also harvest and plant immediately in the spring before bud break if this better meets your needs. However, be aware of when spring runoff occurs or periods of extremely high water. You may want to hold off planting until after these times so you have less chance of catastrophic damage to the planting site.

One last thing is to soak the cuttings in water for 5 to 7 days before planting whether you store them or not. Soak at least that portion of the cutting that will go in the ground. You can also soak the entire cutting without problems. Soaking initiates the root primordia and starts them swelling. Do not soak the cuttings long enough to cause the root tips to emerge from the bark.

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### **Additional Information**

The following is a list of available technical papers:

#### **Riparian/Wetland Project Information Series**

**No. 2** – Planning a Project: 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. 4** - How to Plant willows and Cottonwood for Riparian Rehabilitation.

**No. 5** - Collection, Establishment, and Evaluation of Unrooted Woody Cuttings to Obtain Performance Tested Ecotypes of Native Willows and Cottonwoods.

**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. 11** - Getting "Bang for your Buck" on your next Wetland Project.

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

#### **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. 23** - How to Plant Willows and Cottonwoods for Riparian Rehabilitation. (This Tech Note describes planting willows and cottonwoods in riparian revegetation in much greater detail and includes references from the scientific literature.)

For a copy, write or call:

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