
WETLAND SEEDING

TECHNICAL GUIDANCE DOCUMENT



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INTRODUCTION

Broadcast seeding is the most common method of seeding wetlands as the seed of most wetland species requires light to germinate and should be planted on the soil surface. It is important while broadcast seeding wetlands to have an even distribution of seed to avoid bare areas that could establish with weedy species. Higher seeding rates are typically required with broadcast seeding but wetland seed mixes are usually designed with high seed counts to accommodate this need.

Broadcast seeding equipment



Broadcast seeding is conducted with Cyclone, Vicon or other types of mechanical broadcast seeders and by hand broadcasting. Drill seeders can also be used for wetlands but it is important that they are calibrated correctly to ensure that seed is not buried too deep. Brillion and Trillion type seeders that drop seed on the surface and use a roller for seed to soil contact can also be used for wetlands. Hydroseeding is sometime chosen as a seeding method when the terrain is inaccessible for other equipment.

APPLICATION

Generally, the smaller the wetland seed, the shallower it must be sown. Wetland plants have adapted to an environment that floods on occasion, so many species will float if flooded. Most wetland seed should be planted with broadcast seeders that spread seed on the soil surface or with Brillion or Trillion type seeders that drop and pack seed on the surface. Wetland grasses and other species with larger seeds may benefit from being harrowed into the soil 1/8-1/4 inches deep before smaller wetland seeds are broadcast. Wetland sedges, rushes, grasses, and forbs should be placed on the soil surface, as they require light to germinate. A firm seedbed is needed to ensure that seed is not buried too deep. When broadcast-seeding, carriers such as cracked corn, annual grains, vermiculite, or sand can be added to seed mixes to dilute the relatively small volume of wetland seed and to make it easier to see where seed has been spread. Carriers and seed can be combined in barrels that are closed and rolled over the ground surface for mixing or stirred in broadcast seeders.

It is beneficial to overlap wetland mixes a few feet with upland mixes as moisture conditions can be variable. The seed should be distributed evenly on the soil surface over the entire site. In windy areas with little thatch the site should be cultipacked after broadcasting seed to ensure good seed-to-soil contact and to prevent seed from being blown or washed away.

Gleason et.al. (2003) found that 0.5 cm (less than 0.25 inches) of sediment reduced wetland seedling emergence by 91.7 percent and total invertebrate emergence 99.7 percent. Unless the seed is of a species that floats, or is of relatively large size, this small amount of sediment has the potential of making a planting fail. It is very important that both the upland and wetland soils be stabilized to protect the seeding of wetland species.

Wetland seeding should be planned to coincide with the restoration of hydrology. It is common to conduct wetland seeding in the fall or winter before wetland hydrology will be restored the following spring. Planting the previous fall will allow for the use of larger equipment before soils become too wet. In areas where there will be flowing water or open water after snowmelt, it may be beneficial to conduct seeding in late spring or early summer after hydrology has stabilized. This is particularly true along the edge of open water where seed is easily displaced prior to it being established.



Hand broadcasting emergent wetland seed

Wetland seeding can be conducted in the spring, fall or winter. The following discussion covers the benefits and limitations of each season:

Spring Seeding

Spring seeding is beneficial when fall or winter seeding may lead to the loss of seed. Spring seeding should be conducted around mid-May after any germinating weeds are controlled and before July when moisture levels may decrease in wetlands. With spring seeding wetland grasses are often the first to establish along with some forbs. Other forbs, along with sedges and rushes require stratification of seed and will germinate after the first winter.

Fall Seeding

Projects that have been seeded in the Fall tend to develop differently than spring plantings because many forbs and sedges require a cold/moist period (over-wintering) before they will germinate. This is more often the case with mid-successional and late successional species than with early successional species. In wetlands, cool-season grasses, sedges, rushes, and bulrushes can germinate in early spring and will establish quickly if conditions are good. Seed of most native species will take three to four weeks to germinate under ideal conditions (moisture, temperature, night length, and dormancy break). They usually will not germinate under drought conditions. A limitation of fall seeding is that some seed can be lost due to rodents, birds, flowing water, and harsh conditions. Annual grain cover crops such as oats and winter wheat do not over-winter well if dormant seeded (late fall planting). Cover crops also do not perform well if it is seeded in late June or early July. Fall seeding should be conducted after November 1st in the southern half of the state and October 15th in the northern half of the state to ensure that seed does not germinate before winter. In some cases, forbs and sedges are seeded in the fall followed in the spring by the seeding of grasses that do not require stratification, to prevent the loss of grass seed over winter. If fall weather has been dry and warm it may be beneficial to delay seeding until shortly before snowfall.

Winter Seeding

Seeding can be conducted in wetland and uplands during late winter months over snow cover. The natural freezing and thawing action helps set the seed firmly in the soil (eliminating the need for further packing), preparing it for growth in the spring. This technique, often referred to as frost seeding, should be conducted on a previously prepared seedbed. Frost seeding has also been successful on sites where soybeans were recently harvested without additional site preparation. This technique is not recommended for areas that will have flowing water during the spring. The following are snow seeding guidelines from the Detroit Lakes Wetland Management District (Prairie Restoration Techniques/Tips, Hanson, L. Kahan, S.):

- Conduct a fall glyphosate herbicide application (1 Qt.) or do this application in early spring prior to native emergence (timing is important)
- Be ready to seed when conditions are right (have seed and equipment ready)
- Seed late in the winter when sun has a higher angle (late Feb./March/early April)
- Pick partly to mostly sunny days with temperatures between 20° to 40° F
- Seed when there is less than one foot of snow over most areas.
- Start work early so that seeding is done by 1:00 pm allowing time for sun to warm seed into the soil.
- Treat establishing weeds in the wetland as needed.

Hydroseeding wetlands can be an alternative to broadcast seeding. Hydroseeding may be a preferred option for situations where hydrology conditions do not allow for the use of broadcast seeding equipment and seed can be directed onto a site with a hydroseeder. There are many considerations when hydroseeding wetland seed to ensure that it is installed appropriately. Hydroseeding can be conducted in spring or fall. When hydroseeding is conducted, the seedbed must be loosened to allow spaces for seed to make good contact with the soil to prevent washing. A fan-type nozzle should be used with approximately 500 gallons of water for a visual tracer to ensure uniform coverage. Hydroseeding uses a slurry of seed, chopped mulch, and sometimes fertilizer. Seeds are often coated with absorbents to give them a better chance of survival during germination. A high-pressure pump is used to spray the slurry onto the prepared soil surface. One common problem with hydroseeding is ensuring good seed-to-soil contact. It is usually recommended to spray seed and water first followed by the slurry to aid seed to soil contact. In some cases the slurry may not be needed. Better contact can be accomplished by using a chain drag or harrow and roller after seeding to incorporate seed into the soil.



If trees and shrubs are also being planted, they should be installed before hydroseeding to prevent seedbed disturbance. Herbaceous species can be installed after hydroseeding as long as planting doesn't cause significant disturbance.

OTHER CONSIDERATIONS

In some cases species with larger seeds are broadcast first and then harrowed to ensure good seed-to-soil contact. Broadcast seeding of wetlands should ensure the successful establishment of wetland vegetation, decreasing future maintenance needs.

COSTS

The installation of wetland seed typically costs between \$30-120 per acre depending on the complexity of the project and type of equipment to be used. Wetland seed mixes can vary from \$200 to \$1000 per acre.

ADDITIONAL REFERENCES

Effects of sediment load on emergence of aquatic vertebrates and plants from wetland soil egg and seed banks, Gleason R.A., Euliss N.H., Hubbard D.E., Duffy W.G., *Wetlands*, Vol. 23, No. 1, pp. 26–34, March 2003

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