

## Addressing the Challenges of Restoration on Muck Soils

Muck soils are frequent in the glaciated Midwest where they were formed in saturated soil through the accumulation of plant material, particularly the roots and crowns of sedges and other graminoids. The saturation results in anoxic conditions, preventing the decomposition of this organic material. As a result, the accumulation of this material may be up to several feet thick, particularly in areas of upwelling groundwater.

Muck soils are a challenge to restore, particularly if complete restoration of the hydrology is not possible. In an unsaturated condition, the decomposition of this organic soil releases nutrients that support a luxuriant growth of annual weeds, particularly giant ragweed. I once knocked down an exceptionally tall giant ragweed growing on drained muck and measured its height at 16 feet. If forced to work with unsaturated muck, a seed mix containing both quick developing natives such as Canada and Virginia Wild Rye (*Elymus canadensis* and *virginicus*), and aggressive long-lived perennials like Prairie Cordgrass (*Spartina pectinata*) and Switchgrass (*Panicum virgatum*) is essential. Aggressive forbs such as New England Aster (*Aster novae-angliae*), Cupplant (*Silphium perfoliatum*), Wild Senna (*Cassia hebecarpa*), and Sawtooth Sunflower (*Helianthus grosseserratus*) are also recommended. It is critical that unsaturated muck planting be mowed several times during the first growing season to control annual weeds. In both saturated and unsaturated conditions, reed canary grass is a difficult weed on muck soils and should be eliminated through several herbicide applications prior to planting.

If muck soils can be restored to saturation, the sedge meadow vegetation native to this substrate may be established. Our [Sedge Meadow Seed Mix](#) will provide a good basis for this restoration. Additionally, plugs of some graminoids that are difficult to establish from seed such as Tussock Sedge (*Carex stricta*), Lake Sedge (*Carex lacustris*) and Blue Joint Grass (*Calamagrostis canadensis*) will help create a stable long term community resistant to invasion of weedy species such as reed canary grass.

### Plant Feature – Tussock Sedge (*Carex stricta*)

Typically the dominant graminoid of undisturbed sedge meadows, *Carex stricta* is an essential element in restoration of this habitat. Preferring saturated soils rich in organic matter, *Carex stricta* will grow in full sun to a half day of shade. The foliage reaches up to 2 feet high and an inconspicuous inflorescence is produced in spring. Over time the dense crowns build up a hummock that gives sedge meadows their characteristic difficult footing.

The seed is very expensive and has a short viability period in storage, so plugs are the most effective way to establish *Carex stricta*. The clumps produce long rhizomes that will increase their density over time. *Carex stricta* is an attractive plant in landscaping, where it may be used in water gardens, pond edge plantings, and storm water wetlands. In a restoration, it should be utilized with our [Sedge Meadow Mix](#) on soils that are saturated most of the time.

