ABSTRACT

USDA NRCS Cape May Plant Materials Center has successfully utilized an agricultural combine for cleaning seeds of smooth cordgrass (*Spartina alterniflora* Loisel. [Poaceae]). Large-scale conservation and restoration efforts will benefit when this technique can be cost effectively implemented.


KEY WORDS
seed cleaning, shoreline erosion control, tidal marsh restoration

NOMENCLATURE
USDA NRCS (2006)

Smooth cordgrass (*Spartina alterniflora* Loisel. [Poaceae]) Photos by Cape May Plant Materials Center
Smooth cordgrass (*Spartina alterniflora* Loisel. [Poaceae]), also known as smooth cordgrass and saltwater cordgrass, is a dominant warm-season species occupying the intertidal zone of estuarine plant communities. It is native on the US Atlantic and Gulf coasts but is considered to be a highly invasive species on the US Pacific coast. Although primarily used for erosion control on shorelines and canal banks, it is also used to reduce wetland losses and for restoring tidal marshes within its native range. It forms an extensive rhizomatous root system that is roughly 5X larger than its aboveground biomass. The rhizomes are a favorite food of snow geese (*Chen caerulescens* L. ssp. *atlantica* [Anatidae]).

In the past, large-scale harvesting, processing, and cleaning of smooth cordgrass seeds has been limited to hand processes to ensure high levels of viable seeds. The USDA NRCS Cape May Plant Materials Center used an agricultural combine as a form of large-scale seed-cleaning equipment. This resulted in hundreds of pounds of viable seeds. These results serve to advance the cost effectiveness of large-scale estuary conservation and restoration efforts.
HARVEST AND POSTHARVEST

Seeds are harvested by hand during September and early October with a variety of handheld tools. During postharvest handling, seeds are allowed to after-ripen in a wind- and weather-protected building for at least 14 d. Combined material is spread over an area no deeper than approximately 30 to 38 cm (12 to 15 in.). Materials are turned every day by hand with a pitchfork, to ensure even temperatures and ripening, and are lightly watered with a garden hose to ensure that seeds do not desiccate (Figure 1).

Traditionally, nurseries would then run materials through small-scale seed-cleaning equipment or clean it by hand; instead, the Cape May PMC used a Massey Ferguson 8XP plot combine (Massey Ferguson, Coventry, Great Britain; owned by AGCO Corporation). Staff used pitchforks to slowly but steadily feed materials into the head. The head was raised about 30 cm (1 ft) off the ground; the reel was raised upward away from the head and set on the slowest rotating speed (Figure 2).

Many combine settings were tested, and the following settings yielded the cleanest and least-damaged seeds.

- **Fan speed:** 9
- **Cylinder speed:** 7
- **Concave:** 12
- **Air inlet:** Full-Open
- **Adjustable sieves:** 15 mm

PROCESSING AND CLEANING SEEDS

Following combining, materials were transported to the seed-cleaning plant. Two primary pieces of equipment were used. Materials were first scalped using a Model 36-A seed scalper manufactured by the Hance Corporation (Westerville, Ohio). One 18/64th top screen was used with no bottom screen. Air was closed to avoid seed loss. Materials were then screened in a Model 62-D Clipper Seed Separator (Clipper Separation Technologies, AT Ferrell Company, Bluffton, Indiana). The 62-D three-screen separator performed best at the following settings.

- **Hopper roller opening:** 2/3rd open
- **Air deflector board:** 1/4 in open
- **Fan speed:** 900 RPM
- **Top screen:** #24
- **Middle screen:** Slotted 6/64th by 3/4 in
- **Bottom screen:** 1/25th covered with paper
- **Adjustable speed:** 1/2-turn open
- **Seed discharge door:** Closed
- **Top and bottom fan balancer:**
  - Air flow ribbon balanced
Once cleaned (Figure 3), cordgrass averages 385 000 seeds/kg (175 000 seeds/lb) (USDA NRCS 2006).

Cost-effective seed cleaning of the coastal halophyte smooth cordgrass can be accomplished. Because of the purchase costs associated with the machinery mentioned, a propagator will need to carefully examine available labor rates, quantity of seeds that will be processed, and the cost of equipping their operation with similar machinery.

REFERENCE


AUTHOR INFORMATION

William Skaradek
Plant Materials Center Manager
William.Skaradek@nj.usda.gov

Noel Murray
Biological Technician
Noel.Murray@nj.usda.gov

USDA-NRCS Cape May Plant Materials Center
1536 Route 9 North
Cape May Courthouse, NJ 08210

Melissa Alvarez
US Army Corps of Engineers
New York District
Jacob K Javits Federal Building
26 Federal Plaza, Room 2109
New York, NY 10278-0090
Melissa.D.Alvarez@usace.army.mil

Sunmark Seeds International, Inc.
Northwest's Largest Selection of Native Seeds

Bioregion Specific Seed Species
Native Wetland Seed Specialists
Water Quality Seed and Blends
Custom Seed Mixing
Streambank Restoration Specialist
Environmental Water Quality Consultant

Sunmark specializes in hard to fund Native Grass and Wildflower seeds. Including Erosion Control seed mixes in both Native and Non Native, Water Quality Swale seed blends, Wetland seeds and over 300 different wildflowers. Premium Blue Tag Certified Turf Grass Seed and Custom Blending. Forage seed and wildlife mixes for habitat improvement and site reclamation.

1-888-214-7333, 906 NW Corporate Dr. Troutdale, OR 97060