



Photo by Martin van der Grinten

Figure 1 • Spreading medium on the coir fiber mats.

Vegetated Erosion Control Mats for Site Stabilization

MARTIN VAN DER GRINTEN
AND LINDA L GREGORY

Erosion control mats effectively stabilize erosion-prone slopes allowing seed mixes to establish. Over time, the mats decompose and the established vegetation stabilizes soil from erosion. The success of mats and seed mixes has some limitations on sites where disturbance is created by higher energy water flows or from concentrated foot traffic. At Acadia National Park, Bar Harbor, Maine, we had problems stabilizing and vegetating drainage ditches that experienced high water flows from concentrated rainstorms. We found that erosion control mats would stabilize the soil, but the seed mix was hard to establish because flowing water washed seeds away and late seeding dates and environmental limitations reduced seedling growth. We thought that if plants could be

grown directly on the mats in a nursery setting, and then placed where needed for erosion control, we might improve our success.

After testing several erosion control mats, thickness of media, and species of grasses and forbs, we found a combination that works well for our sites in Acadia National Park. We unroll 1.2 x 21 m (4 x 66 ft) Bon Terra HP90 (Bon Terra America, Moscow, Idaho); 100% biodegradable coir fiber mat (1.25 cm (1 in) thick) on top of weed barrier (allows water and air to pass through) or black plastic inside a wooden frame. The wooden frame rests on the ground.

We spread Metro-Mix 360 (horticultural vermiculite, Canadian sphagnum peat moss, processed bark ash, and white sand; The Scotts Company, Marysville, Ohio) about 2.5 cm (1 in) deep (Figure 1). To obtain

a uniform layer, we pull a wooden board, cut to the proper depth and resting on the frame, along the length of the frame. When watered, the medium settles to about 1.25 cm (0.5 in) thickness. We sow red fescue (*Festuca rubra* L. [Poaceae]) by

ABSTRACT

We grow grasses directly on erosion control mats in the nursery and then transport the sod to sites where establishing permanent vegetation is difficult due to adverse human or environmental factors. The vegetated erosion control mats system is a simple, viable method that can be effectively used to provide immediate erosion control and visual appeal.

KEYWORDS: nursery, coir fiber, red fescue, *Festuca rubra*, Poaceae

NOMENCLATURE: ITIS (1998)

Downloaded from by guest on April 18, 2024. Copyright 2000



Photo by Martin van der Grinten

Figure 2 • Cutting and rolling mats 3 mo after seeding.

hand at 20 kg/ha (18 lb/ac). A light covering of medium is hand spread and watered. During summer, mats should be kept moist. We make 2 applications of 15N:15P₂O₅:15K₂O fertilizer at 168 kg/ha (150 lb/ac) 3 and 6 wk after seeding.

After 3 mo, mats have a solid cover of grass that has an extensive root system into the coir fiber mat. We found that mats cut into 3-m-long (10-ft) lengths was the limit for 2 people to handle without mechanical equipment (Figure 2). In Acadia National Park, most of our sites were amended with a 5-cm (2-in) layer of topsoil, then the sod was unrolled and tacked down using the standard pins (Figure 3). When 2 or more mats were placed together, they were

overlapped and tacked securely to prevent any under-cutting from the flowing water.

The technique of growing vegetation on erosion control mats in a nursery setting, and then installing the vegetated mats on high erodible

sites, is a viable erosion control revegetation system. For less than US \$6.50 per linear m (\$2 per linear ft) for a 1.2-m-wide (4-ft) coir fiber mat (mat and medium costs), we can grow a vegetated mat that effectively stabilizes soil and provides instant erosion control vegetation. Our system has been implemented in Acadia National Park in a number of situations, including stabilizing water drainage and steep slopes, and revegetating critical areas and hiking trails. Mat installation provides immediate visual and site stabilization benefits. We need further studies to determine how forbs can be incorporated successfully into the seed mixes.

REFERENCE

[ITIS] Integrated Taxonomic Information System. 1998. Biological names. Version 4.0 [on-line database]. URL: <http://www.itis.usda.gov/plantproj/itis/itis-query.html> (accessed 16 Feb 2000).



Photo by Martin van der Grinten

Figure 3 • Above: Placing mats on a steep slope. Below: The slope 1 y later.

Author Information

Martin van der Grinten
 USDA Natural Resources
 Conservation Service
 Big Flats Plant Materials Center
 3266-A State Route 352
 Corning, NY 14830
martin.vandergrinten@ny.usda.gov

Linda I Gregory
 USDI National Park Service
 Acadia National Park
 PO Box 177
 Bar Harbor, ME 04609
gregory@nps.gov