

Slope Security



Alabama transportation officials utilize a cotton fiber-reinforced matrix to prevent erosion on steep roadside slopes

By Tom Wedegaertner

After enduring public scrutiny for poor erosion and sediment control on a recent project, the Alabama Department of Transportation (ALDOT) began actively seeking new products that would offer reliable protection yet still prove cost-effective.

North American Green offered ALDOT a trial of its HydraCX² cotton fiber-reinforced matrix. Developed by Mulch and Seed Innovations LLC, the product is the industry's first cotton hydromulch that is rain-ready for soil erosion.

The department used the product alongside other best management practices (BMPs) it had been utilizing on a

test site comprised of a 2.5-mile section of roadside slopes along the I-22/I-65 project in Jefferson County, Ala.

Solution Application

Long, steep slopes—resulting from a lack of roadside right-of-ways—created erosion control challenges for I-22/I-65 project leaders and crew members. At the test site, the cotton hydromulch was placed on 1.5:1 (H:V) slopes with 80-ft vertical change, or about a 144-ft slope face.

ALDOT tested several products on the site, including a single net straw erosion control blanket, the cotton hydromulch, a blown straw with polyacrylamide and blown



Roadside slopes on which the cotton fiber-reinforced matrix was applied held up well during severe rain events.

straw alone. The site was seeded with a standard summer grass mix, and all products were applied in February 2007.

How It Works

The cotton hydromulch contours to the uneven surfaces of the earth; its combination of natural cotton, straw and a blend of performance-enhancing tackifiers and additives forms a protective web that holds soil in place on slopes as steep as 1:1.

“Cotton by nature is porous, absorbent and biodegradable—the perfect trio for controlling erosion and establishing seed,” said Wae Ellis, vice president of sales and marketing for Mulch and Seed Innovations, Centre, Ala. “It’s absorbent enough to take in and hold moisture for optimum seed-soil contact and strong enough to protect the seed and soil from wind and heavy rain. Meanwhile, its cross-hatching matrix provides just enough air space and porosity for seedlings to push through without barrier.”

The area in which it was applied germinated and established a greener grass more quickly than those over which other tested BMPs were applied. All products produced a stand of vegetation throughout the spring and summer, with the mulch and blanket sections filling in most prominently.

“The cotton hydromulch is a new sustainable option in an industry that has been heavily focused on virgin wood fiber and, to a lesser extent, recycled paper,” Ellis said.

Cotton Challenge

“We’ve developed a method to use natural fibers, instead of man-made ones, to create an all-natural product that establishes better grass growth,” Ellis added. “Those cotton fibers offer incredible strength and durability, and they prove themselves time and time again.”

In August 2007, a large rain event washed out a berm at the top of the slope, resulting in heavy water flows running over the test plot. The well-established vegetation was washed



ALDOT tested various products, including blown straw and a single net straw erosion control blanket, on the I-22/I-65 site.

off the entire site—that is, except the portion where the cotton hydromulch had been applied. The flows were so strong that some of the remaining vegetation was sheared, leaving only the roots intact.

The cotton hydromulch aided in the quick re-establishment and nourishment of the vegetation, resulting in taller grass with deeper roots, and it helped hold the vegetation in place during the severe rainfall event. The remainder of the site was reseeded, and workers reapplied erosion control blankets.

After another storm event, the non-

vegetated blankets washed off the site for a second time. By the fall of 2007, ALDOT had re-established a winter grass mix on the roadside site.

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