

# The Great Cover-Up

The logo for Turf, featuring the word "Turf" in a bold, black, sans-serif font. A green grass blade is integrated into the letter 'T'.The logo for Tree Services, featuring the words "Tree Services" in a bold, black, sans-serif font. A small green leaf is above the 'i' in "Services". Below the main text is the tagline "Taking Tree Care to New Heights" in a smaller, italicized font.The logo for DesignBuild, featuring the word "Design" in a black, sans-serif font and "Build" in a bold, orange, sans-serif font. A small orange square is above the 'i' in "Design".The logo for PLOW, featuring the word "PLOW" in a bold, blue, sans-serif font.

Source: [www.TurfMagazine.com](http://www.TurfMagazine.com)

## Controlling erosion with blankets, mats and geosynthetics

The effects of erosion are all around us. Wind and water are the culprits, damaging plant life and the soil. Trees and plants combat the effects of erosion as roots help to keep the soil in place. Mechanically, vegetation increases the strength and competence of the soil by root reinforcement. A root-permeated soil behaves as a composite material in which fibers of relatively high tensile strength are embedded in a matrix of lower tensile strength.

How do you give the roots a head start in erosion-prone areas? Look no further than the solution that landscapers and site superintendents have used for the last 25 years: erosion blankets and turf reinforcement mats (TRMs).

"Some of the heavy-duty products can withstand velocity up to 20 feet of water per second once the rootzone is established," said Veronica Foster, P.E., senior engineer with Mt. Laurel, N.J.-based Golder Associates, Inc. "That's a lot of water cascading down the hill, and a lot of soil not going with it because of the mat."

Using blankets and mats has become essential in controlling erosion in many cases. Local governments across the country have ordinances in place that require contractors to control erosion, or pay the fine. Topeka, Kan., has a law on the books that fines violators \$1,500 a day for noncompliance.



Landlok Turf Reinforcement Mats (TRMs) are permanent, nondegradable mats that provide a solution for moderate-flow storm water channels that need erosion protection, vegetative reinforcement and water quality enhancement capabilities.

"There's a tremendous effort, even by the EPA, to use more and more vegetation," said Deron Austin, P.E., director of global market development for Propex, based in Chattanooga, Tenn. (Propex owns one of the most widely used brands of erosion control blankets and TRMs: Landlok.) Austin refers to a memo issued by the EPA in March 2007 that promotes "green" engineering, the use of vegetation in erosion control. By default, erosion control blankets and TRMs are high on the must-have list for most projects.

There's little wonder why agencies such as the EPA encourage the use of blankets and mats to control erosion. Soil erosion is one of the biggest contributors to nonpoint source pollution in the United States. Soil loss rates from construction sites are estimated to be 10 to 20 times that of agricultural lands.

The effect of a lack of vegetation on steep banks was seen in the case of the construction of Amity Community Park in Amity, Pa. Hot and arid conditions during the summer of 2005 played a part in scant growth of the grass on a steep stream bank. When heavy rain hit the site, the runoff severely damaged the bank and nearby tennis courts. Estimated costs for repairs reached \$200,000 at the \$3 million, 44-acre facility.

"It was difficult to grow anything (in 2005), so none of the grass stabilized like it should have with the steep banks around the courts," Township Manager Charles Lyon told the Reading Eagle. The lack of grass left the bank vulnerable to erosion, he said.

According to the paper, the township also faced censure from the Berks County Conservancy regarding potential water pollution the slope washout could have caused.

Construction and development projects where topsoil is disturbed or cleared of vegetation are particularly subject to erosion problems. These project zones often present a significant challenge in reestablishing vegetation to protect the soil due to reduced soil quality and fertility. In many cases, the existing topsoil has been totally removed, making the challenge even greater. In addition, heavy machinery and constant traffic compact the soil, creating a hard pan that decreases infiltration, increases runoff and prevents plant establishment and growth.

That's where erosion control blankets and TRMs come in.

"The typical erosion control blanket is used when you're starting from seed, when you've got your prepared soil substrate and whatever amendments already applied, as well as the seed already in the ground," Austin said. "The erosion control blanket is rolled over and anchored on top of the seed. These blankets are made of straw or coconut fiber, as well as degradable polypropylene fibers." The expected life of erosion control blankets is three to 36 months, and therefore a temporary help. The long-term erosion control becomes the vegetation itself. For that reason, these blankets should be used in a temperate environment where there's a good chance of developing vegetation from seed.

Erosion control blankets typically cost from \$1 to \$3 per square yard, installed. The variance in price depends on the fiber type. Coconut fibers, which last up to 36 months, are at the high end of the scale, and are used in areas where vegetative establishment can't be guaranteed in the first season of germination. On the lower end are blankets made of straw and degradable polypropylene, lasting only three to 12 months. Blended materials last in the 24-month range and also make up the middle of the cost range.

"TRMs are basically .25-inch-thick woven or blown polypropylene products that roll out and are put in place with staples or stakes," Foster said. "For grades of 10 to 15 percent, where erosion may be especially prevalent, you need a heavy-duty geosynthetic material. What kind depends on water velocity and sheer on the slope. Thinner, lighter-weight material can be used in areas where grades are not as steep; steeper slopes need a thicker material, on which you will need to coat with a layer of soil before seeding."

TRMs are also available as yarn or nylon. Costs range from approximately \$8 to \$20 per yard, depending on the material, composition and strength.

"There are the first-generation TRMs, manufactured with polypropylene fibers, but stitched between two polypropylene nets," Austin said. "Your second-generation TRMs—the ones that are out now and becoming more popular—are woven. These have greater durability and greater UV resistance."

Geosynthetics can provide stability in high-stress settings such as very steep slopes and the toe of streambanks. Initial protection of grass-root development against erosion is important because the period in which vegetation has not fully developed has been identified as vulnerable to failure. What's more, vegetation complements the geotextiles by masking their presence and, when planned and designed correctly, can provide wildlife habitat and water quality improvement. Furthermore, as the vegetation does develop, roots help stabilize the geotechnical materials.



Landlok erosion control blankets (ECBs), produced by Propex, are dimensionally stable blankets that degrade over specified periods of time as vegetation grows strong enough to control erosion by itself.

## Blanket protection

There's no question that erosion control blankets and TRMs work, no matter the scope of the job. After heavy runoff caused major washouts on Beartooth Highway in Montana and Wyoming in 2006, crews installed erosion control blankets to prevent the problem from recurring. In accordance with U.S. Forestry Service requirements to use biodegradable erosion control products in the region, the team specified BioNet, a natural-fiber product made by North American Green of Evansville, Ind. The work was recognized by the American Public Works Association as one of its 2006 Public Works Projects of the Year.

"Green" or ecological engineering approaches in general, and vegetative-based stabilization treatments in particular, are attracting attention because their perceived environmental and social benefits, including lower cost, water quality improvement, fish and wildlife habitat, recreation potential, acceptance by the public and easier permitting by regulatory agencies. Another important point that has led to a rise in popularity is aesthetics.

"Governments and other agencies are working to use TRMs more for erosion control instead of using other engineering methods," Foster said. "Using material like rocks looks obviously engineered, whereas TRMs don't look like the area has been engineered for erosion control. It's more aesthetically pleasing."

Austin agreed: "We all see the hardscapes that have been used—the concrete paving in ditches or in channels, for instance. TRMs are really designed to replace rock riprap and concrete paving in these ditches. Working together, between the TRM industry and the turf industry, we can promote the additional application of grass and turf in areas where people traditionally dump rock riprap or pour concrete."

If there is a downside to using blankets and mats, blame it on the wildlife. Burrowing animals can chew through the synthetic matting. Animals like squirrels, moles, even dogs, when they dig, can tear it up, and sometimes become entangled. If it's a problem, it's a small one. It does, however, remind users to not only choose an appropriate site for the geosynthetic installation, but to have routine inspections. Damage may warrant reseeding and possibly section replacement.

Austin said that woven geosynthetics pose a lesser risk of entangling burrowing animals due to smaller and more defined openings. "Even though it's a three-dimensional product, it doesn't have multiple layers; it's what we refer to as a monolithic structure." (This structural composition is explained on Propex's Web site, [www.propexinc.com](http://www.propexinc.com).)

Fortunately for the turf pro, blanket and mat manufactures make installation and upkeep easy. There's no guessing games when it comes time to rolling out the blanket staking it.

"Installation at the various types of sites—such as stream banks, highway overpasses, backyards, even water channels—should follow the manufacturer's instructions," Foster said. "Manufacturers have literature to help designers and site supervisors, much of which can be found online at the manufacturer's Web site. County conservation districts are another source, and some announce approved products as well as installation tips."

*The author is a Charlestown, Ind.-based freelance business writer and editor.*