



Case Study: EarthGuard and Compost

This case study was initiated through the request of Caltrans District 5 to ascertain the ability of **EarthGuard** to stabilize compost treated slopes. While compost provides nutrients to aid in revegetation, its erosion control performance during the time of seed germination and growth is uncertain.

Using a bench scale rain simulator, modeled after the Caltrans Soil Erosion Research Lab at SD State, the erosion control performance of **EarthGuard** was studied in three different applications. The first study consisted of applying **EarthGuard** directly to a bare soil plot and then applying a treatment of compost over the top. The second study consisted of applying a slurry mixture of **EarthGuard** and compost to a bare soil plot. The third study consisted of applying **EarthGuard Fiber Matrix**, recognized by Caltrans as a **Polymer Stabilized Fiber Matrix** (http://www.dot.ca.gov/hq/esc/oe/specifications/SSPs/99_04-SSPs/Sec_10/05-12/07-382_A03-21-08.doc) and http://www.dot.ca.gov/hq/esc/oe/specifications/SSPs/2006-SSPs/Updates/2009-03_updates/20-047_E_A03-13-09.doc) over a treatment of compost. The compost was purchased from Redi-Gro Corp in Sacramento, CA and meets Caltrans Specifications.

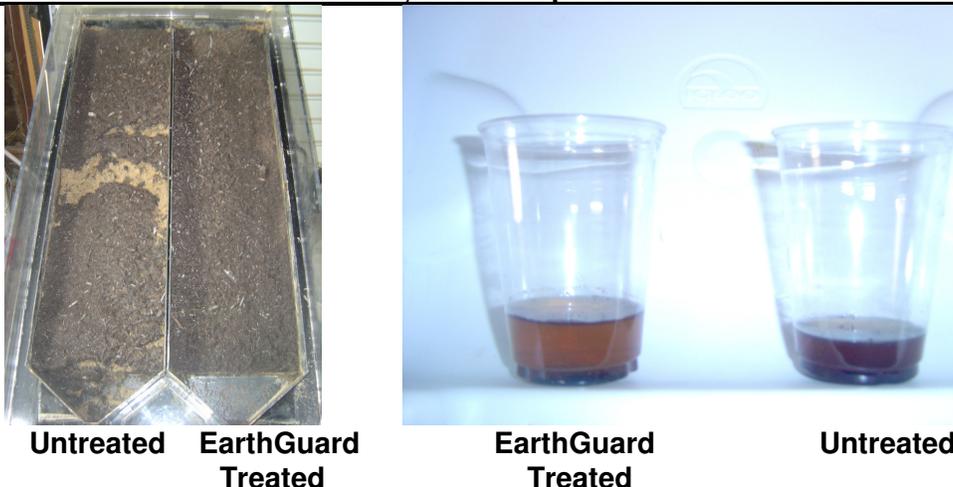
EarthGuard consists of a long chain molecule with negative charges that attaches itself to the positive charges of soil, mulch and compost. Once this reaction has occurred, this long molecular chain becomes heavy and weights itself down on the slope. Further, **EarthGuard** maintains soil structure that prevents a slope from losing its structural integrity and failing. Finally, **EarthGuard** works to flocculate dislodged sediment and compost.

Study 1: EarthGuard Applied Before Compost Application

This study consisted of applying a mixture of **EarthGuard** and water at a rate of 10 gallons of **EarthGuard** and 2000 gallons of water per acre and then spreading compost at a 1/2" thickness over the top of a sandy loam soil. This application method can be accomplished in the field by first applying **EarthGuard** with a water truck or sprayer and then blowing or spreading compost over the top. The estimated application cost of the **EarthGuard** would be approximately \$0.03 to \$0.035 sq ft.

For a reference plot, a 1/2" layer of compost was applied directly over the top of the same sandy loam soil.

The pictures below were taken after the reference plot (left plot) failed after receiving only 2 gallons of water, which equates to approximately 1.33" of precipitation in a few hours. **It is important to note that the main mode of failure was not rill erosion, but of slope failure due to a loss of soil structure.**





Effluent water clarity coming off each plot was also observed. The difference in clarity was significant representing what might be anticipated in the field.

Study 1 was terminated after the **EarthGuard** treated plot had received a total of 7 gallons of water which equates to approximately 4.67" of precipitation.

Study 2: EarthGuard Applied in a Compost Slurry

For the second study, **EarthGuard** was mixed with water and compost to form a slurry and then spread out on the test plot. This application method is similar to applying the slurry via a hydroseeder.

The results were almost identical to Study 1. Failure occurred on the reference/untreated plot immediately. The **EarthGuard** protected plot did not fail after 4.67" of precipitation, with similar results in terms of effluent water clarity. **Again, the main mode of failure was not rill erosion, but of slope failure due to a loss of soil structure.**

It is concluded that both application methods utilizing **EarthGuard** significantly improves the slope stability of a compost treated plot. No significant differences between the efficacy results of Study 1 and 2 were observed, therefore utilizing the application method of Study 1 would cost less.

Study 3: EarthGuard Fiber Matrix Applied After Compost Application

This study consisted of first applying a ½" thick layer of compost over the top of a sandy loam soil and then applying a mixture of **EarthGuard**, fiber/mulch and water at a rate of 8 gallons of **EarthGuard**, 2000 lb wood fiber mulch (combination recognized by Caltrans as a **Polymer Stabilized Fiber Matrix**) and 2000 gallons of water per acre. This application method can be accomplished in the field by first blowing or spreading on compost and then hydromulching or hydroseeding a **Polymer Stabilized Fiber Matrix** over the top. The estimated application cost of the **Polymer Stabilized Fiber Matrix** would be approximately \$0.045 to \$0.055 sq ft.

For this study, a larger spray nozzle was used to create a higher intensity precipitation event of 6.5" per hour. The study was terminated after the **Polymer Stabilized Fiber Matrix** plot did not fail after receiving 18 gallons of water, which equates to approximately 11.93" of precipitation.

This type of application could be utilized when re-vegetating a slope or for improved erosion control protection.

The picture below was taken after the termination of Study 3.



Polymer Stabilized Fiber Matrix Treated

For further information, please visit the following web sites:

Short 10 min. Video: <http://www.earthguard.com/video.php>

Product Brochure: <http://www.earthguard.com/pdf/SalesBrochure.pdf>

Web site: www.EarthGuard.com