TechLink Research Summary #3318

A Comparison of Filtrexx® Slope Protection vs. Hydroseed Applications

Summarized From: Faucette, L. Britt, Carl F. Jordan, L. Mark Risse, Miguel L. Cabrera, David C. Coleman, and Larry T. West. 2006. Vegetation and soil quality effects from hydroseed and compost blankets used for erosion control in construction activities. Journal of Soil and Water Conservation. 61:6:355-362.

The objective of this study was to compare the vegetation establishment and long term growth characteristics of Filtrexx® Slope protection and hydromulch used in erosion control and slope stabilization applications.

Vegetative grass and weed growth analysis for each field plot was performed at 3 months and 12 months. Analysis included the percentage of total vegetative (grass + weeds) cover, total number of weed plants and different species, and above ground biomass of the vegetation. Grass and weed biomass analysis was only conducted at the end of the study.

Percent vegetative cover was measured using a one meter (3.3 ft) wide by 4.8 m (16 ft) long grid with string lines set 10 cm (4 in) apart on all sides. Vegetation was counted only if it was found directly under each intersect. A total of 480 intersects per plot were used in the calculation to obtain the percent cover.

Weeds (defined as any species other than Bermuda grass) may help control soil erosion but they are also regarded as a nuisance and undesirable in field applications. The total number of different weed species and the total number of weed plants were counted for each plot at three months and twelve months. Total number of weed species and number of plants were low enough at three months to manually count and identify for the plot as a whole. At twelve months, a grid measuring 9.3 dm2 (1 ft2) was randomly placed once in each third of each field plot to sub-sample number of weed species, number of weeds and percent cover of weeds (i.e. excluding Bermuda grass). The sub-samples were averaged to obtain a composite for each plot. Composite samples for biomass analysis were harvested using a 9.3 dm2 (1 ft2) sampling area replicated three times, once in each third of each plot. Vegetation was clipped and harvested at the soil surface. Harvested biomass was sorted into weed biomass and Bermuda grass biomass, and then oven dried separately. Biomass was calculated as dry weight divided by the area. The addition of the weed biomass and Bermuda grass biomass were used to calculate the total biomass.

Percent cover

Although the control was not seeded, there was no statistical difference between the control and the hydroseed treatments; however, the Filtrexx® Slope protection treatments had significantly more vegetation cover than the hydroseed treatments. The compost treatments averaged 2.75 times more vegetation cover than the hydroseed treatments. Prior to plant establishment, it was likely that a greater proportion of seed washed down the slope during rain events in the hydroseed treatments, relative to the Filtrexx® Slope protection, as runoff volume and rate were higher in the hydroseed treated plots (Faucette et al., 2005). Percent cover results for all treatments at three months were lower than expected due to drought conditions over the 3-month time period (90.7 mm of rain). The greater percent cover observed on the compost treatments was likely due in part to their ability to hold more moisture (or restrict evaporation) than the hydroseed. This can be critical to plant growth during periods of drought, as experienced during the three months leading up to the first vegetation analysis.

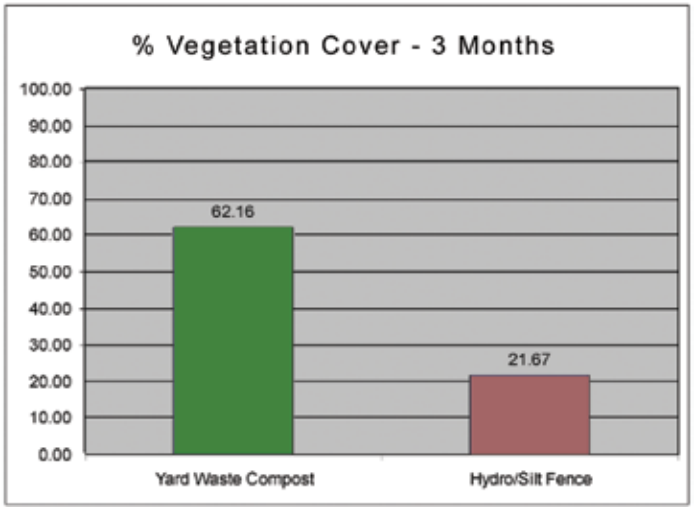
Above Ground Biomass

Above ground biomass samples were harvested in May of 2003, 12-months after the test plots were seeded. Although there were no differences between treatments for biomass of Bermuda grass, weed biomass was significantly higher in the hydroseed treatments relative to the compost treatments and the control. Similarly, Richard et al. (2002) reported that seeded Filtrexx® Slope protectionhad significantly less weed biomass than seeded topsoil or bare soil although the biomass of planted species was the same. The slow establishment of the bermuda grass on hydroseeded plots, relative to the compost plots, may have enabled more weeds to establish and proliferate. Additionally, the 1.5 in Slope protection acted as a mulch layer, physically suppressing and therefore preventing potential weed seeds in the soil from emerging through the compost. This provides evidence that Slope protection

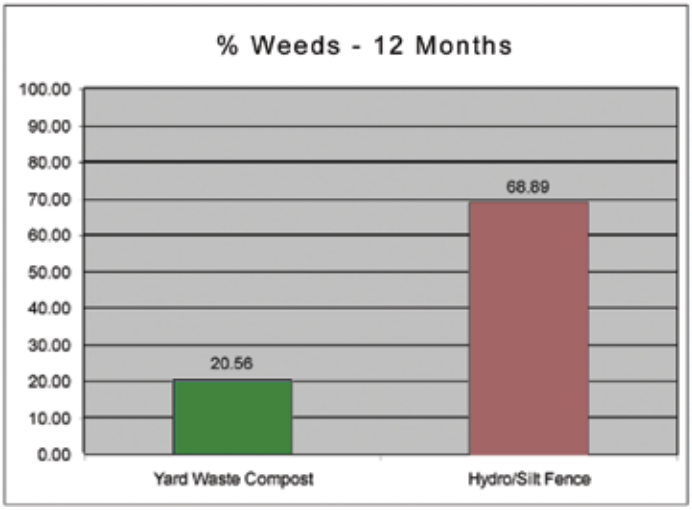
may suppress weed growth, relative to hydroseed.

Mineral N can have a positive affect on weed growth and proliferation, and although not directly tested in this study, it may partly explain why the hydroseed plots had significantly more weed growth than the bare soil.

On construction sites where disturbed soils are prone to erosion and vegetation establishment is required, compost applications will provide a greater vegetation cover and less invasive weed growth, relative to hydroseeding. These results indicate that Filtrexx® Slope protection may provide better erosion control in slope stabilization applications where vegetation establishment is required for post construction areas. Additionally, if exotic or invasive weeds are a concern, Slope protection should be considered instead hydroseeding.



After a period of 3 months, yard waste compost produced nearly 3 times the vegetation than hydroseeding and silt fence



After 12 months, Yard Waste Compost had 70% less weeds than hydroseed and silt fence.

References

Faucette, L.B., C.F. Jordan, L. M. Risse, M. Cabrera, D.C. Coleman, and L.T. West. 2005. Evaluation of storm water from compost and conventional erosion control practices in construction activities. Journal of Soil and Water Conservation, 60:6, 288-297.

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