

Project Progress Report

Contract Number: ICP 032-2007
Agency Name(s): Fytogreen Pacific, Inc.

Contact Person: Murray Hawkins
Contact Phone No.: (909) 234-3850
Contact Email: Murray@verdigro.com

Reporting Period: October 2007 – June 2008
Report Due Date: July 31, 2008

Narrative

Activities Performed:

In the fall of 2007 the experimental plots were laid out on two different established turfgrasses (hybrid bermudagrass and tall fescue). The soil was prepared and the Hydrocell™ was incorporated into the soil. There were two treatments, one with Hydrocell™ and the other without Hydrocell™. The soil was leveled and the cool season turf plots (tall fescue) were seeded. The warm season turfgrass (bermudagrass) plots were not seeded or sprigged in order to observe the difference in growth of bermudagrass in the spring. Data on turf health, growth and development was monitored using an instrument called the Greenseeker. The Greenseeker sends light from a source and records the reflectance from the turf canopy. Monitoring the reflectance in the near infrared (NIR) and red (R) wavelengths allows in the determination of turfgrass quality, detection of early water stress, and reduction of irrigation needs in maintaining turfgrass quality. The characteristics of healthy, live, green vegetation is that it has a low reflectance of light from the visual spectrum R as a result of the leaf pigments and has a high reflectance of NIR from the scattering of light in the leaf mesophyll cells. On the other hand, dead, brown vegetation and the soil have the reflectance that increases monotonically from the visible spectrum to the NIR. The normalized difference vegetative index (NDVI) is strongly correlated with plant biomass, leaf area index, canopy photosynthetic capacity and chlorophyll production. Hence healthy dense turf stand has a higher NDVI value and the ratio of R/NIR is lower than the values observed in thin unhealthy stand of turf.

Deliverables Produced:

The following deliverables have been produced;

1. Plots have been laid out
2. Data on turf health, growth and development with cool season turf collected
3. Difference in spring greenup for bermudagrass observed and recorded
4. Difference in establishment of tall fescue observed and recorded

5. Difference in bermudagrass re-establishment in spring and early summer observed



Figure 1. Plots without Hydrocell™ show very slow recovery of bermudagrass.



Figure 2. Hydrocell™ incorporated plots showed fast spring greening up and recover of bermudagrass

The Hydrocell™ incorporated plots showed faster spring greening up and recover of bermudagrass compared to the untreated plots. The Hydrocell™ helped in increasing moisture retention in the soil which was observed in the higher levels of volumetric moisture content in the soil compared to the untreated plots. The higher soil moisture helped the bermudagrass green up early and increased re-establishment and coverage.

The difference in normalized difference vegetative index (NDVI) which is correlated to turf biomass and chlorophyll content was higher in the Hydrocell™ incorporated plots compared to the untreated plots. A healthy dense turf stand has a higher NDVI value and the ratio of R/NIR is lower than the values observed in thin unhealthy stands of turf.

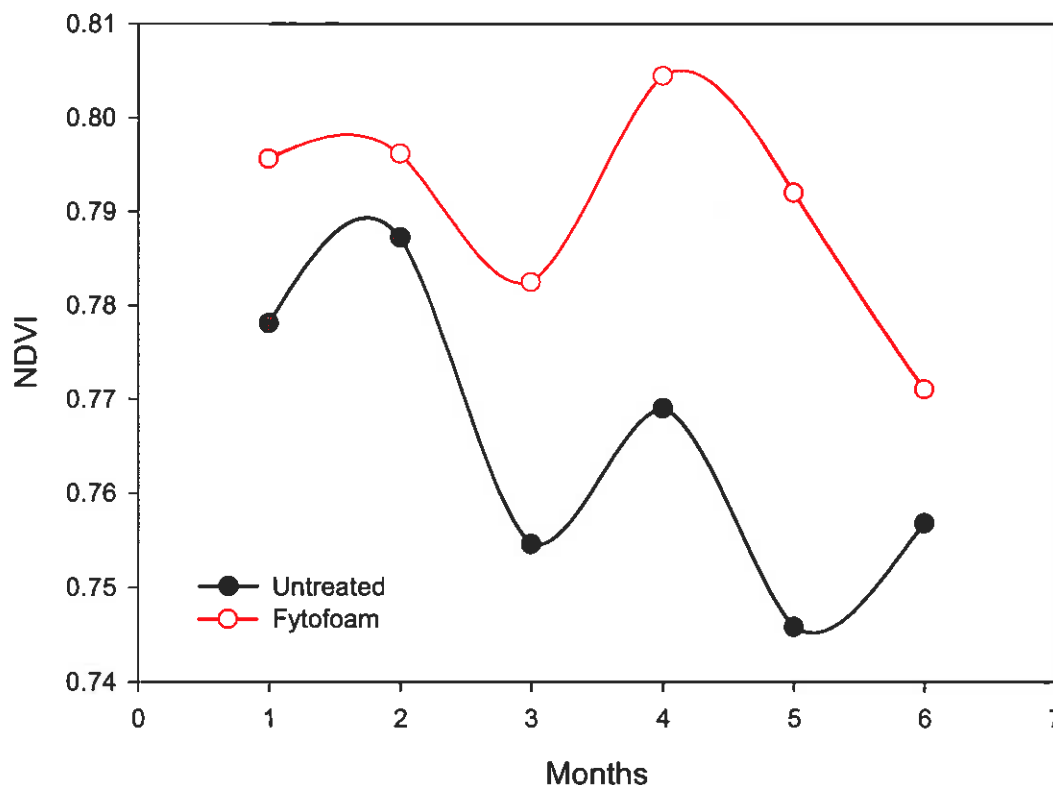


Figure 3. Normalized difference vegetative index (NDVI) between the Hydrocell™ and the untreated plots. The Hydrocell™ treated plots had higher NDVI values indicating higher turf quality compared to untreated plots.

The fyfoam treated plots had lower Red/Near Infra Red (R/NIR) values throughout the experiment. Lower R/NIR values indicate that the turf was healthier and had better growth and development compared to the untreated plots. The improved turf quality in the Hydrocell™ treated plots could be due to the higher moisture levels in the plots. The establishment of tall fescue was also quicker in the Hydrocell™ treated plots compared to the untreated plots.

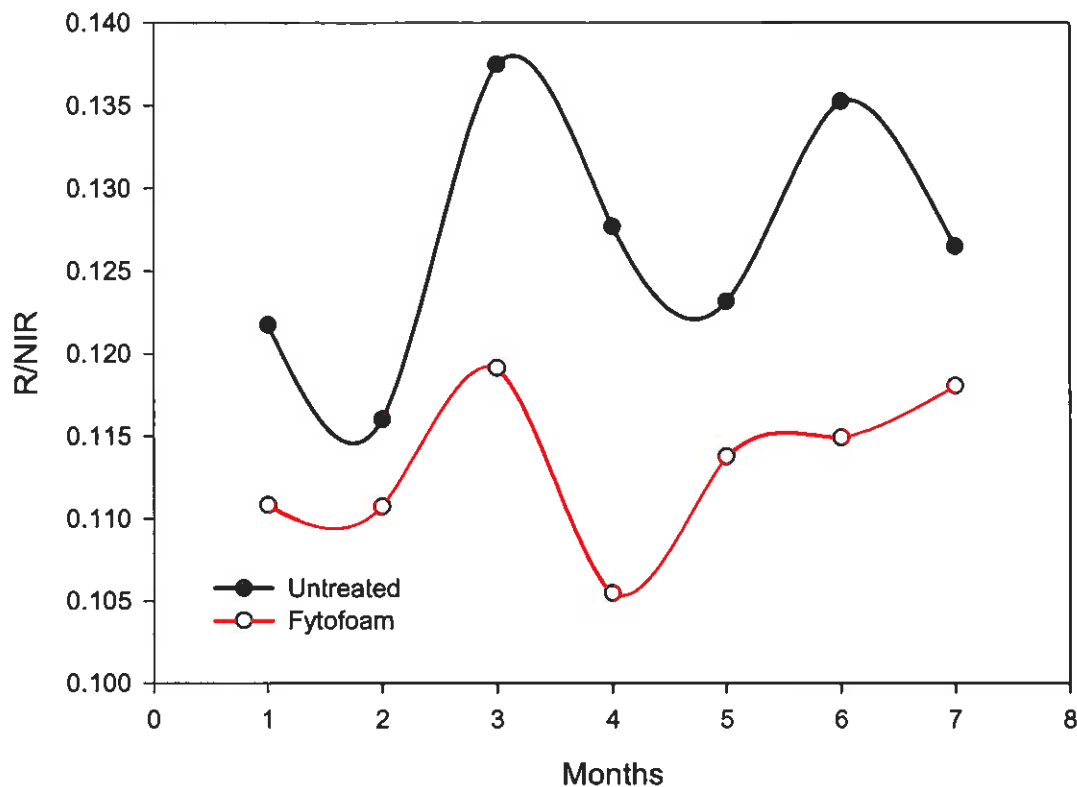


Figure 4. Red/near infra red (R/NIR) values of the Hydrocell™ and the untreated plots. The Hydrocell™ treated plots had lower R/NIR values indicating better turf growth and development compared to untreated plots.

Problems and Delays:

The establishment of the project took some time due to the logistics involved in preparing the soil and incorporating the Hydrocell™ but everything has been very smooth and without any major problems. It was difficult to level the soil mainly the heavy textured soil after the Hydrocell™ installation. The bermudagrass was slow to re-establish since it was cold in the fall and winter so a lot of effort had to put it to keep the plots wed free during the later fall, winter and early summer months.

Other Comments:

The incorporation of Hydrocell™ into the soil helped in retaining moisture in the soil and led to early establishment of cool season turf, faster spring green up and re-establishment of warm-season turf. The NDVI and R/NIR values indicated that the turf was more health and had better growth and development in the Hydrocell™ treated plots compared to the untreated plots.