

To: Paul Cook  
Sanibel Biosolutions

From: Edwin M. Everham III  
Inland Ecology Research Group



Re: Preliminary results of pilot study of Shore Sox

Date: November 9, 2007

I apologize that a final report of this pilot project has been delayed. As you know, we intended to run nutrient analyses through our auto analyzer on campus, but technical problems precluded that option and we had to depend on our community partners for running our samples. This preliminary report includes three samples run by the Lee County Environmental Laboratory. We sent additional samples to the Lee County Water Hyacinth Control Laboratory, as part of their Lake Watch Program. Both are state certified water quality analysis laboratories. The second set of samples will not be available until the end of the month, but I know you wanted preliminary results as soon as possible.

We established two pilot projects to determine water retention and nutrient sequestering. Both were initiated August 28. For the former, we placed a shore sox in a 500 gallon fiberglass tank with a drain hole. We added measured amounts of water and collected the flow effluent until the bag appeared to be saturated (i.e. additional added water rapidly drained). The bag held approximately 39 galloons (148 kg) initially. At the end of the sample period (63 days) the mass of water remaining in the bag was approximately 38 KG (10 galloons). The tank was covered during the study period, preventing rainwater from rewetting the sox, but also limiting airflow and evaporation from the sox. If this study is repeated, we would like to set up several during the dry season and measure the extent to which the sox will provide a moist growing environment during dry down.

To examine the nutrient sequestering capabilities of the shore sox, we set up a flow through water system and distributed nutrient-rich water (dosed with Vigora tree shrub fertilizer 16-4-8). Water was added to the upstream tray, flowed into the surf sox and the effluent was collected, sampled, and reentered into the system above. The system was open to both rainfall inputs and concentration of the nutrients through evaporation. The attached table reports the nutrient concentrations after 3, 7 and 12 days. Using the day 3 data as a baseline, we observed a 58% reduction in phosphorus (16 ppm to 6.7) and a 72% reduction in total nitrogen (170 ppm to 46). These reduction occurred during the nine day difference between sampling times. These preliminary results indicate a potential to significantly reduce nutrient loading. We are anxious to get the additional results and might prefer to repeat the experiment to confirm this sequestering ability. We would also like to examine the mechanisms for the color of the effluent water.

(239) 590-7150 • FAX: (239) 590-7200

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We hope to have a more complete, final report to you by December 15. It is important to disclose that we agreed to perform this pilot project at no charge, to provide a service to the community and as an opportunity for our students to participate in the study.

Table 1 – Nutrient concentrations of effluent in recycling flow system, days after initiation of the experiment. All concentrations are in ppm (mg/L). Minimum detection limits in parentheses

Day	Potassium (0.07)	Nitrite (0.002)	Nitrate (0.01)	TKN (0.05)	Total Nitrogen (0.06)	Phosphorus (0.01)
3	366	0.302	0.01	0.31	170	16
5	332	0.21	0.01	0.19	45	7.8
12	343	0.228	0.01	0.2	45	6.7
% reduction	6.3	24.5	0	93.5	73.5	58.1

