AQUAFIX
Wastewater Laboratories
University of Wisconsin Research Park

HOW SLUDGE RX INFLUENCES MICROBIAL COMMUNITIES, AND THE EFFECT ON ORGANIC CARBON AND NUTRIENT LEVELS.

Study Info

STUDY COMPLETED BY
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Lagoons, Sludge,
Ammonia, TSS, Algae

Abstract

This study consisted of primary research to further understand the relationship between sludge at the bottom of lagoons and nutrient levels and TSS within the water column and at the surface level. Additionally, the research shed further light on the relationship between bacterial populations within the sludge and water quality in lagoons.

Aquafix developed an experimental laboratory setup and methods to test sludge reduction. This setup was used to assess the efficacy of Aquafix's Sludge Rx to reduce sludge and discovered the following.

Results

In ongoing lab tank testing, the sediment depth of the tanks treated with Sludge Rx reduced much faster and ended at a lower soft sediment depth than the control tanks. Adding Sludge Rx to a system led to a decrease in the nutrient content of the sediments in the lab tanks. This was observed primarily in the early lab tank testing and also corresponded with sediment reduction. The level of nitrogen in the sediments of tanks treated with Sludge Rx tended to decrease compared to the control tanks. The levels of total phosphorus in the sediments also decreased below that of the control tank in the early lab tanks test.

- Our researchers found a statistically significant reduction of sludge levels in treated tanks as compared to control tanks
- Metagenomic DNA analysis showed greater populations of microorganisms associated with the breakdown of BOD in treated tanks
- The untreated tank consistently had harmful algae present

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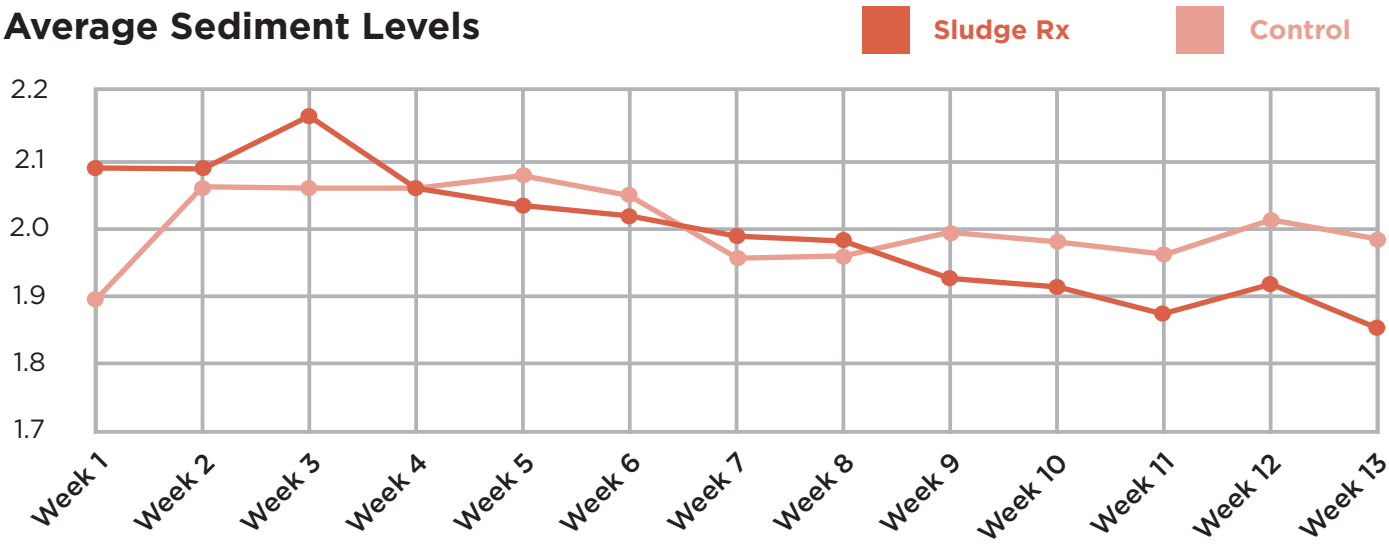
Conclusion

Sludge Rx promotes the digestion of organic compounds in the sediments that lead to reduction of soft sediment depth, decrease of available nutrients in the sediments that remain, and promote increased water clarity. Through the lab tank testing, it has been observed that Sludge Rx enhances degradation of easily usable, and some complex, carbon substrates and also may aid in complete digestion of such compounds.

Average Sediment Levels



Sediment Analysis		
Analyte	Control	Sludge Rx
Total Solids	44%	51%
Total Volatile Solids	6.7%	5.3%
Total Organic Carbon	13,000 mg/Kg	12,000 mg/Kg
Total Nitrogen	1,200 mg/Kg	980 mg/Kg
Nitrate	<0.89 mg/Kg	<0.76 mg/Kg
Total Phosphorus	400 mg/Kg	240 mg/Kg
Ratio TVS:TS	0.15	0.10