

# PHOSPHATE REMOVAL FROM CANAL WATER IN THE EVERGLADES AGRICULTURAL AREA USING ACTIVATED ALUMINUM OXIDE

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The Everglades Agricultural Area (EAA) located South of Lake Okeechobee plays a crucial role in the water supply to the Everglades National Park in South Florida. Discharged water from the EAA has been identified to contain high levels of phosphorus (P). Therefore, Best Management Practices (BMP) have been implemented to reduce off-farm P loads. Although BMP's have been successful at reducing P-loads, current measures for P-removal could use the aid from other mechanisms to further achieve maximum P-adsorption capacity. Furthermore, new methodologies of P-removal are needed in this area. This study was conducted to determine the ability of aluminum oxide ( $\text{Al}_2\text{O}_3$ ) to act as an adsorbent for P with the goal to utilize it as a reactive barrier in the EAA farm canals. A granular media of activated  $\text{Al}_2\text{O}_3$  was tested using adsorption isotherms to determine its P-adsorption capacity under canal water with various adjusted pH levels. P-desorption from  $\text{Al}_2\text{O}_3$  was also measured to determine the recycling potential of the product. Canal water isotherms demonstrated a higher P-adsorption capacity at the highest pH levels used in this study, with pH 8 having the greatest P-adsorption capacity at  $33.0 \text{ mg g}^{-1}$  and pH 5 having the lowest P-adsorption at  $23.1 \text{ mg g}^{-1}$ . Other factors may have affected the full capacity of  $\text{Al}_2\text{O}_3$  to adsorb P at lower pH levels. These factors will most likely be the presence of other metals in the canal water. Despite the presence of other factors,  $\text{Al}_2\text{O}_3$  still showed to be very effective at pH 7 which falls in the pH range of the EAA canal water. Our results have shown that  $\text{Al}_2\text{O}_3$  has a high capacity adsorption for P-removal in canal water in the EAA, this mechanism could be useful to aid current methodologies in maximizing P-removal potential.

**PRESENTER BIO:** Maryory Orton is an M.S. graduate student under the mentorship of Dr. Samira Daroub in the Department of Soil and Water Sciences at the University of Florida-IFAS station located in Belle Glade, FL. She has worked with Dr. Daroub in different projects concerning the implementation of BMP's in the EAA.