

Effect of Cigarettes on Water Quality in the Wetlands

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Abstract

Cigarettes are filled with toxins that affect water quality. This research is about investigating the rate of effect of tobacco (found in all cigarettes) in correlation with pH levels. Moreover, research the impact of bulrushes (commonly found plant in the wetlands) on its possible influence to the toxins. By using closed containers filled with water from the wetlands, each were treated with low or high amounts (measured in grams) of tobacco and one control group for comparison. Another separate trial was done by repeating the same method but with the addition of bulrushes. After periods of time, pH measurements were taken. After observing the results, the rate appears to be decreasing to a more acidic level with increasing tobacco amounts.

Introduction

Studies have shown that plants are a good indicator of toxins in the environment (2). Carcinogens in cigarettes, especially tar, are known to have detrimental effects on humans and animals (4). The purposes of the research is to investigate the negative effects of cigarettes on plant life and the aquatic environment. The prediction was there would be no change in water quality with or without plants regardless of varying levels of tobacco.

Discussion/Conclusion

As soon as the water was treated with tobacco, the pH level decreased initially. According to the graph, a relationship exists between the factors of varying amount of tobacco and the levels of pH. By increasing the amount of tobacco put into the water, the rate appears to be declining to a more acidic level. The rate of pH with bulrushes decreased faster than the trials without bulrushes on the second day of measurements. The optimal pH in the wetlands is around 7. Since the rate decreases rapidly in such short time, the survival rate of living organisms drop significantly. Therefore, tobacco polluted into water sources would cause substantial damage to the aquatic environment and wildlife.

Fig. 1

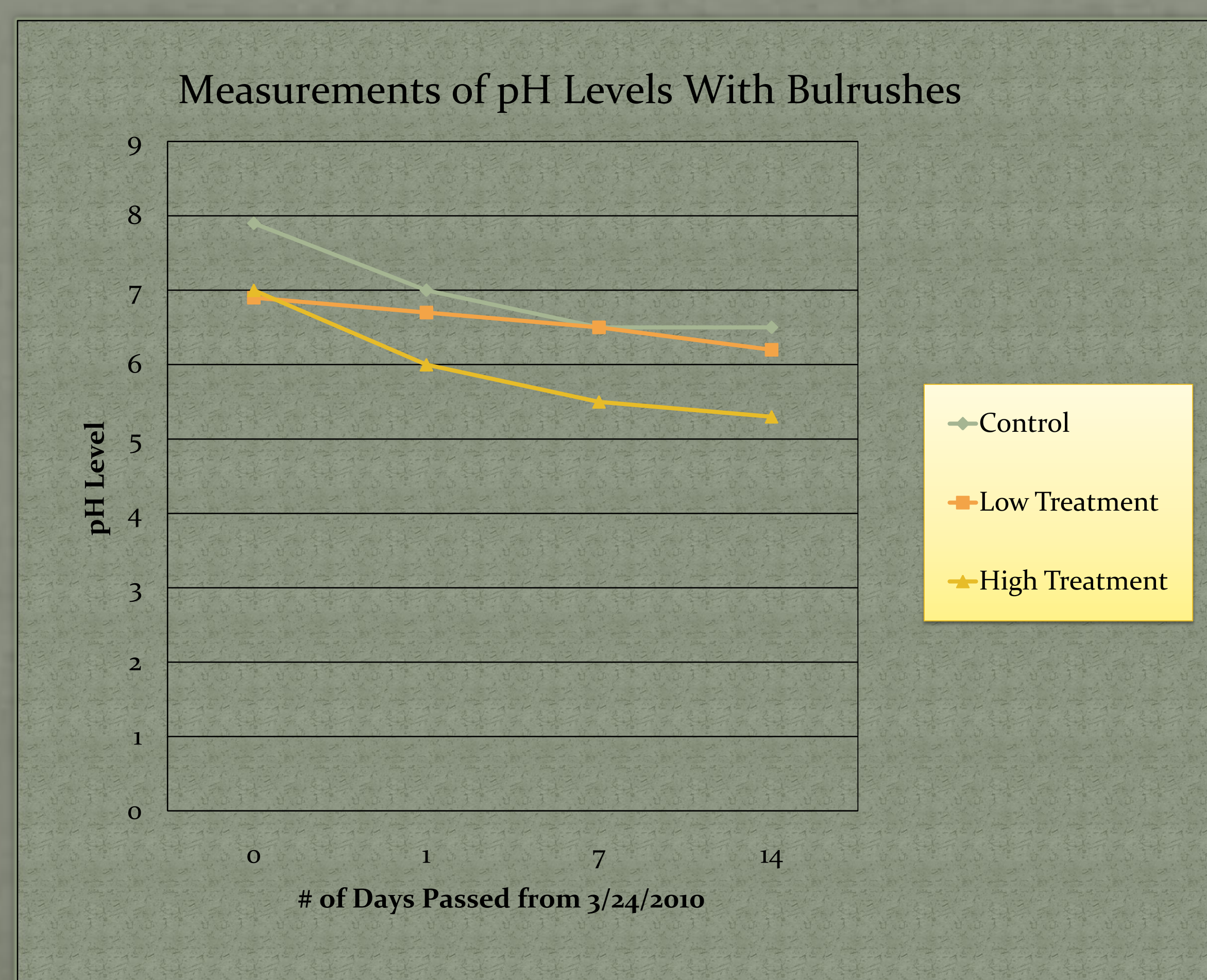
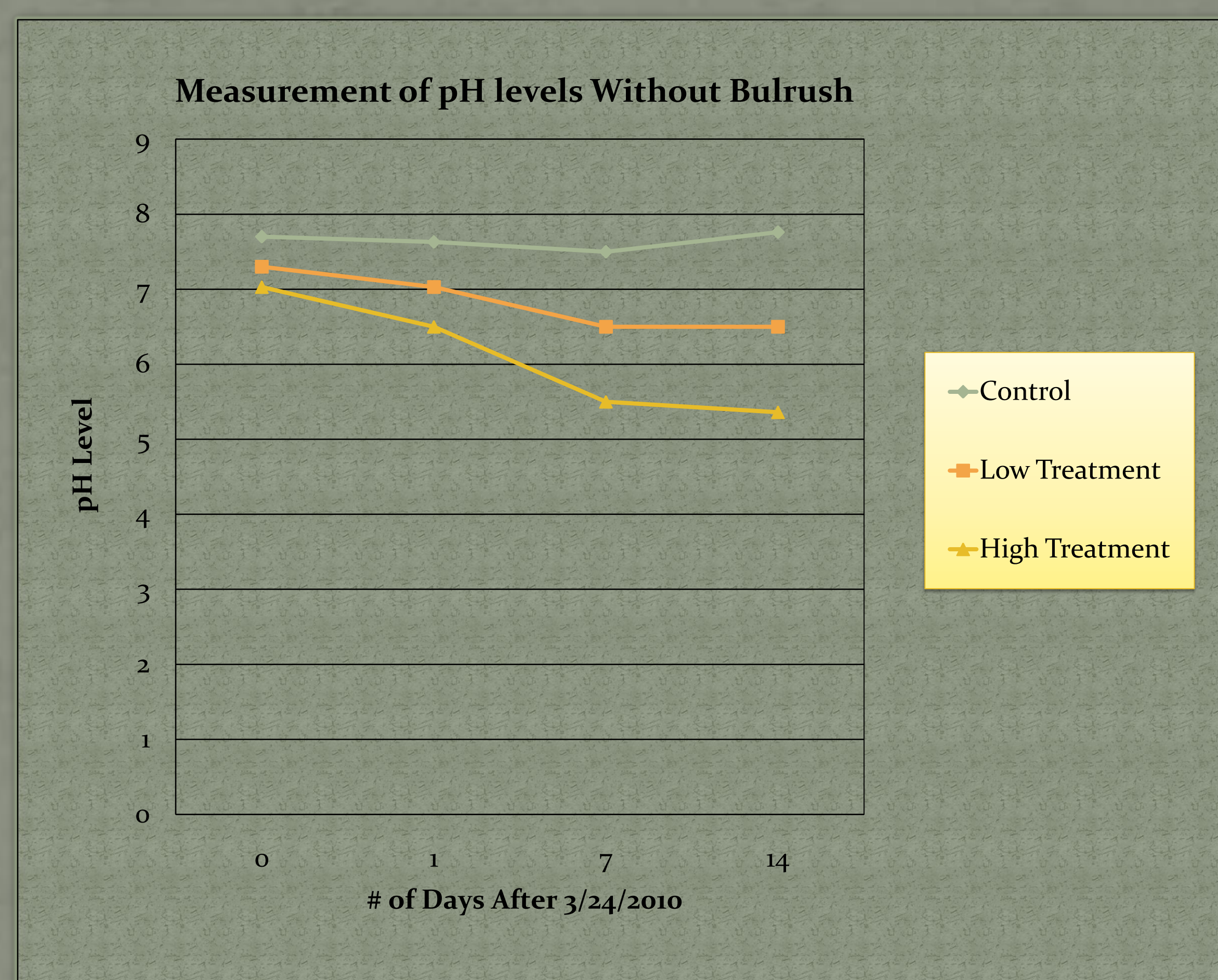


Fig. 2



Results

Both containers with and without bulrushes decreased in rate with increasing tobacco. It appears that containers without bulrushes declined at a slower rate throughout time, while as the containers with bulrushes declined to a more acidic level in less days.



Methods/Materials

Research was conducted at Lake Waco Wetlands.

Set up two groups (A and B) of containers, each filled with 2000 mL water from the wetlands. All containers are equal size of 1 gallon (Fig. 2)

Group A: lidded containers without bulrushes (fig. 2)

#1 Container will be the control group with no tobacco for comparison.

#2 Container will be treated with low amount of tobacco: 1.5 g.

#3 Container will be treated with high amount of tobacco: 11 g.

Group B: lidded containers with 90g of bulrushes in each (fig. 1)

#4 Container will be the control group with no tobacco for comparison.

#5 Container will be treated with low amount of tobacco: 1.5 g.

#6 Container will be treated with high amount of tobacco: 11 g.

For repetition, run 3 trials of group A simultaneously, for a total of 12 containers paired in 2 groups [A and B]. After each week, the pH will be measured. Set the control group as a baseline for measuring and compare with the data from the variables [treated containers].

Literature Cited

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