CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY

Name(s)
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Project Number
S2018

Project Title
The Effects of Recycled Water on the Growth and Chemical Composition of Eleocharis palustris

Abstract

Objectives/Goals
With the growing demand on a limited water supply, the use of recycled water for irrigation offers both a possible long termm sustainable approach as well as a cost effective plan. However, the effects of recycled water on the growth and chemical composition of plant species are virtually unknown and may therefore pose a risk to the well being of plants. Because rush species are accustomes to growth in environments saturated with nutrients, it was expected that recycled water may potentially benefit plants treated with recycled water.

Methods/Materials
In this experiment, two water treatments were used to evaluate the responses of the rush E. palustris. These treatments included tap water and recycled water. The plants were irrigated regularly and stem counts and height measurements were taken. At the end of an approximately 90 day period, wet and dry masses were obtained. Several analyses were then taken, which included net water absorption and stem: root ratio. Plant tissue samples were sent to a lab and a conclusive plant tissue mineral analysis were conducted.

Results
It was concluded that though recycled water was expected to give the plants a boost with its extra nitrates and phosphates, the excess of heavy metals and salts ultimately proved detrimental to the plants' health, as seen by decreased overall plant growth. Recycled water caused the plants' shoot system to outgrow the roots system, hindering the plants' ability to absorb the necessary nutrients and to support itself. In addition, it was determined that the plants treated with recycled water retained more water than those treated with tap water. Plant tissue tests concluded that those plants treated with recycled water had an unusually high concentration of all minerals except iron and magnesium. This deficiency can be attributed to the excess of potassium, phosphorus, and zinc.

Conclusions/Discussion
The use of recycled water is an important first step in our fight against the world's growing water crisis. However, it is imperative that recycled water be thoroughly evaluated and designated to proper uses.

Summary Statement
This project aims to determine the effects of recycled water on the growth and chemical composition of the rush species, Eleocharis palustris.

Help Received
Mother drove me to greenhouse