CALIFORNIA STATE SCIENCE FAIR
2014 PROJECT SUMMARY

Name(s)
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Project Number
34858

Project Title
Water Sources and the Growth of Lolium multiflorum (Annual Ryegrass) Year 3

Abstract

Objectives/Goals
In the Coachella Valley, the golf industry consumes an enormous amount of water; they frequently use aquifer water to achieve this. However, this resource is limited. The other two water sources are Colorado River water which is fed through a canal system and Reclaimed water which is treated waste water. My goal was to mix different percentages of Reclaimed, Aquifer, and Colorado River water to find a solution that will help the golf courses: maintain lakes with a low amount of algae; save aquifer water and using more reclaimed water; and help golf courses use less fertilizer.

Methods/Materials
I used Aquifer, Reclaimed, and Colorado River water, hereafter referred to as (A)quifer, (C)olorado, and (R)eclaimed; I prepared mixtures with varying concentrations of these water sources. I placed water absorbent beads in 200 ml glass vials to hydrate the 10 Ryegrass seeds. I observed the germination and measured the subsequent growth of the samples.

Results
At Day 4, I observed:

# of Seeds Germinated in mixture:			Sample with maximum length of growth:		
Mixture Composition	S1	S2	Mixture Composition	S1	S2
33% (A)/33% (C)/33% (R)	4	4	33% (A)/33% (C)/33% (R)	4	3
50% (A)/30% (C)/20% (R)	5	4	50% (A)/30% (C)/20% (R)	4	3
30% (A)/20% (C)/50% (R)	3	3	30% (A)/20% (C)/50% (R)	2	2
20% (A)/50% (C)/30% (R)	8	7	20% (A)/50% (C)/30% (R)	5	4
60% (A)/20% (C)/20% (R)	5	5	60% (A)/20% (C)/20% (R)	3	4
20% (A)/60% (C)/20% (R)	9	9	20% (A)/60% (C)/20% (R)	6	5

As I repeated these tests, my results were materially the same.

Conclusions/Discussion
The mixtures containing Colorado River water, demonstrated the most amount of growth in the seeds. Over the space of 4 days, the 50% Colorado, 30% Reclaimed, and 20% Aquifer demonstrated the best qualities for interested Golf Courses. It uses more abundant resources, such as Colorado and Reclaimed water, and less of our vital drinking water.

Summary Statement
My goal is to find a mixture of aquifer, reclaimed, and/or Colorado River water that reduces dependence on aquifer water while increasing reclaimed or Colorado River water usage by golf courses in their maintenance of their landscape.

Help Received
Coachella Valley Water District provided water samples and technical guidance and my mother prepared my data charts.