Water Retaining Characteristics of Pomelo albedo to Combat Water Crisis

Chow, Raymond (School: Heng Ee High School)
Wong, Kai Wern (School: Heng Ee High School)
Ku, Yew Siang (School: Heng Ee High School)

Climate change has caused diminishing water resources, affecting food crop yield globally. Frequent irrigation is necessary when soil moisture decreases but becomes a problem due to limited water supply. In this project, pomelo (Citrus grandis) albedo's water holding property is investigated based on albedo size, albedo-soil mixture composition under two different conditions and its water retention characteristics over time. Fifty sets of different sized dried pomelo albedo were submerged in distilled water to find out the total volume of water absorbed respectively. The second experiment investigated how soil moisture was maintained when different percentages of albedo were added under normal sunlight and in the oven (simulating drought). The third experiment was conducted to find out when albedo decomposed over time affecting soil moisture. Our results showed that the big size pomelo albedo did not absorb as much water as the smaller size pieces. Statistical analysis rejected the null hypothesis that albedo size does not affect water absorbed ($p < .05$). However, the trend was reversed with our smallest size pieces. Next, it was significant that the higher the percentage of pomelo albedo, the higher the retention of soil moisture in both sunlight and oven conditions ($p < .01$). Lastly, our findings showed that the water holding ability of pomelo albedo was maintained until four months before it gradually degraded. Hence, pomelo albedo can be fully utilized as a bio-absorbent to improve water retention capacity in agriculture on a large scale. This is a viable solution to conserve water as well as ensure sufficient crop yield for consumption.

Awards Won:
Fourth Award of $500