

Stormwater Harvesting, Irrigation and Plant Health

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Report Summary

Scarcity of water has become a serious problem in the world. Concerns over increasing pressure on good-quality urban tap water attracted the attention for rainwater harvesting (RWH) technology. In several advance countries including Canada, RWH is integrated in the so called “green technologies” for sustainable domestic water management. The City of Edmonton started integrating rainwater in its long-term environmental plan. The City installed an initial infrastructure for RWH at Muttart Conservatory greenhouse. The current experiment was conducted at this greenhouse.

The main objective of the experiment was to assess the effect of rainwater on crop production by comparing the effect with the control treatment, tap water. The quality of rainwater and tap water was tested by the Department of Natural Resources Analytical Laboratory at the University of Alberta. The pH of tap water was 8.3 while the pH of rainwater was 7.6. In addition, the dissolved salts in the tap water, measured in terms of electrical conductivity, was 533 $\mu\text{S}/\text{cm}$ while the electrical conductivity of rainwater was 195 $\mu\text{S}/\text{cm}$. To examine the effects of this water quality difference, the responses of four cultivars: Detroit Dark Red beets, Green Top Bunching beets (*Beta vulgaris*), marigold (*Tagetes patula* var.) and hypoestes (*Hypoestes phyllostachya*) flower plants to tap water and rainwater irrigation were assessed. The results revealed that rainwater irrigation yields a higher percentage of germination, longer plant length, thicker stem diameter, higher yield (dry weight), healthier flowers and shoots than tap water. The results suggested that using rainwater for crop production not just reduce the pressure on urban tap water but also results in better outcomes on crop production than tap water.