

Applying and studying the effect of human urine nutrient solutions on plant growth

Abstract:

Human urine is a rich source of essential elements required for plant growth and biomass production. As such, it could be a suitable raw material for fertiliser production and nutrient solutions. Recently, urine to fertiliser conversion is becoming increasingly popular through different processes and technologies. Recovering nutrients from human urine is crucial in a circular economy for many reasons, mainly to create a green loop by growing ornamental plants and urban farming by reducing waste and environmental pollution. In this context, many successful agricultural and horticultural trials were performed to assess crop yields when fertilised with urine, and the one obtained with synthetic fertilisers. Urine contributes up to 80% of the $\text{NH}_3\text{-N}$ in wastewater, thus, its separation would reduce the aeration energy required for biological oxidation of ammonia to nitrate. Additionally, urine separation will reduce the discharge of pharmaceutical compounds into wastewater.

This research proposal will detail the experimental designs to answer a set of 4 hypotheses on the growth of plants in an experimental setup.

- How urine fertiliser affects plant growth compared to commercial fertilisers?
- Effect of urine fertiliser on the flowering and longevity of annual plants
- Urine fertiliser comparison in Hydroponic vs Fertigation
- Urine fertiliser assessment on Forb, Grass and Legume

The experiments will be carried out at the Royal Botanic Garden Sydney – Nursery to test our hypotheses on plant performance and growth.

