

29/01/2024

To Graduate Women NZ,

I hope this letter finds you well. I am writing to express my sincere gratitude for the support provided by Graduate Women New Zealand through the fellowship. Your generosity is very appreciated.

I am pleased to report that my academic journey continues to be both challenging and rewarding. I am currently writing my thesis (by paper). I have two papers drafted to be submitted to journals.

The first paper presents the results from my three field trials, “Survival of 13 forage legumes in contrasting environments of Central Otago, New Zealand.” Our high-country grasslands limit the production of forage legumes due to soil acidity and associated aluminium toxicity. Legume species that tolerate soil acidity and aluminium toxicity can support sustainable grassland production through increased yields and nitrogen fixation. However, currently, there is a limited range of viable legumes for farmers to implement in such environments. My trial assessed the survival of 13 traditional and novel legume species at three field trial sites in Central Otago, located across the rainfall gradient of the district. Photos of my field trial follow:



*Planting legume seedlings at my Millers Flat field trial*



*My second field trial site near Hawea*



*My third field trial site near Ranfurly*

My second paper presents results from my glasshouse experiment, “Influence of soil acidity and exchangeable aluminium on the root morphology of forage legumes, *Lotus pedunculatus* and *Lupinus polyphyllus*.” *Lotus pedunculatus* and *Lupinus polyphyllus* were identified as key species of interest at my field trials due to their high survival under challenging environments and soil conditions. Therefore, I conducted a glasshouse experiment to investigate changes in root morphology due to differing pH in an acidic, high-country soil with varying rates of lime.



*My experiment set up in the glasshouse pre harvest*



*Scanning the roots*



*An example of the roots for scanning*

I am now working on my subsequent two papers, which will complete my thesis. These two papers investigate soil acidity and associated exchangeable aluminium following a soil survey and detailed chemical analysis. In addition, I have submitted an abstract to deliver an oral presentation at the International Soil Science Congress conference in Italy in May. This conference will provide an excellent opportunity to network and learn from other soil scientists and share my research.



*An example of one of my soil pits I have analysed*



*Sampling my soil pits for detailed chemical analysis*



*Sampling for my soil survey*

I have a big six months ahead of me as I work to complete my PhD. I am incredibly grateful for the support from GWNZ, which will allow me to focus on my studies and motivate me to strive for excellence in my research and academic pursuits.

Once again, thank you for your support.

Sincerely,

Lucy Bell