



2019 PhD Proposal – China Scholarships Council and New Zealand – China Water Research Centre Joint PhD Programme Application

| Information to be published on NZ – China Water Centre website if proposal is selected | |
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| Project title | Environmental impacts of animal excrement application and mitigation options |
| Supervisors titles and names | Dr J Luo, Prof H Di, Prof L Ma |
| Department | Department of Soil and Physical Sciences |
| School / Centre | Faculty of Agriculture and Life Sciences |
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| Link to Supervisor's research page | |
| Project outline Please outline the PhD project in 300 words (approx) | <p>Background:</p> <p>Animal excrement input is regarded as an effective way to improve soil quality and forage yield. But its detrimental environmental impacts, such as greenhouse gas emissions and nutrient losses, could outweigh these merits. Nitrification inhibitors have been used to mitigate nitrate leaching and nitrous oxide emissions and slurry injection has been used to reduce ammonia volatilization. Different mitigation options can result in trade-offs among different greenhouse gases and nutrient losses. It may be possible that some mitigation strategies are able to reduce the overall detrimental impacts of animal excrement application without compromising the positive effects on soil quality and forage yield.</p> <p>Research questions:</p> <ul style="list-style-type: none"> • What are the environmental impacts of animal excrement application? • Can such environmental impacts be abated by appropriate mitigation options? • What are the trade-offs among environmental impacts caused by different mitigation options? <p>Hypothesis:</p> <p>Application of animal excrement can improve soil quality and enhance forage yield; however, it can also impact detrimentally on the environment. These environmental impacts can be abated by appropriate mitigation options.</p> <p>Objectives:</p> |

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| | <ul style="list-style-type: none"> • To quantify the greenhouse gas emissions and nutrient losses from animal excrement application • To explore appropriate mitigation options to abate the environmental impacts • To ascertain the trade-offs among these environmental impacts <p>Novelty aspect:</p> <p>By clarifying the potential trade-offs among different options when attempting to reduce the environmental impacts caused by animal excrement application to soil, this study would enable identification of optimal mitigation solutions.</p> |
| References for further reading (optional) | |
| Please indicate if research operational funding is available to support the project, and if so, the sources of funding. | <p>CAS would be able to provide research operational funding. This is from an internal funding source of the Institute of Genetics and Developmental Biology Chinese Academy of Sciences.</p> |