

Survey of potential nitrification inhibitors to replace DCD for targeted application to urine patches

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Following the withdrawal of the nitrification inhibitor DCD by Ravensdown in 2012 there has been a significant gap in the mitigation tool box for the treatment of greenhouse gas emissions of N₂O and nitrate leaching from pastoral urine patches. The development by Pastoral Robotics Limited (PRL) of a urine patch detection and treatment application system “Spiky”, has increased the potential for treating urine patches. The proposed treatment for use with “Spiky” are ORUN[®] and ORUN[®]Plus, combinations of growth hormone, urease inhibitor and soluble carbon, designed to increase pasture N uptake, urine-urea mobility and increase complete denitrification in the ground water. The ability to target urine patches shortly after deposition increases the potential range of inhibitor compounds, as higher rates of material can be applied compared to whole area treatments. Of the potential materials 20 were selected and assessed, including Biological Nitrification Inhibitor's (BNI) derived from Neen and unsaturated fatty acids; as well as synthetic aldehydes, phenol's and peroxides, using micro soil incubation's. This technique revealed a novel class of Hydroxylamine Oxidoreductase (HAO) inhibitors for use in treating urine affected soil.