

# MEASURING SPATIAL DISTRIBUTION OF DICYANDIAMIDE MOVEMENT IN A WELL-DRAINED AND A POORLY-DRAINED SOIL

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Nitrogen (N) losses from urine patches can be significant contributors to greenhouse gas emissions and water quality issues. Nitrification inhibitors may reduce these losses by slowing down the transformation of urine-N to nitrate. Technologies exist that can detect urine patches and target inhibitor applications specifically to the patch area, thereby avoiding the need to apply the inhibitor over the entire paddock. However, the potential time delay between the grazing event and the inhibitor application, and the small volumes of inhibitor used could result in only partial interception of the urine by the inhibitor in the soil. This would limit the potential effectiveness of the inhibitor.

This study was undertaken to determine the movement and interception of the nitrification inhibitor dicyandiamide (DCD). Two volumes of DCD (the equivalent of 10 and 20kg DCD/ha) were sprayed using the Spikey<sup>®</sup> spray unit onto urine (2 L volume) patches created within 80 cm diameter chambers in two soils of contrasting drainage at two different moisture levels.

On average, 40 and 26% of the DCD applied at 10 and 20 kg/ha levels, respectively was recovered from the soil. Of this, on average 69% was present in the 0-2 cm, 8% in 2-5 cm and 24% in 5-10 cm soil depths. DCD concentrations in the top 2 cm varied greatly and average concentrations of 15.5 and 11.4 mg DCD/kg soil were measured for 10 and 20 kg/ha DCD application rates. There was little difference in DCD (1.45 mg DCD/kg soil) measured below 2 cm between application rates. More DCD was recovered from the poorly-drained soil (38%) compared to the well-drained soil (27%).

After five days, following 24 mm rainfall, DCD recovery remained the same but its distribution and concentrations among the soil depths changed indicating its downward movement. About half of the recovered DCD remained in the 0-2 cm soil, one-third accumulated in 2-5 cm depth and the remainder was in 5-10 cm depth. The findings will be presented and discussed at the workshop.

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***Editor's note:*** *An extended manuscript has not been submitted for this presentation.*

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