



# Fertigation – a new tool for nutrient management?

## Year 1 Summary Report

*Fertigation is a new technology in New Zealand agriculture and has the potential to have environmental and production gains. This project aimed to determine if the use of liquid/dissolved urea through fertigation could increase N use efficiency and pasture production, quality and clover content over traditional solid urea.*



*Fertigation project assistant Tommy Ley applying urea dissolved in water to one of the field plots.*

## Method

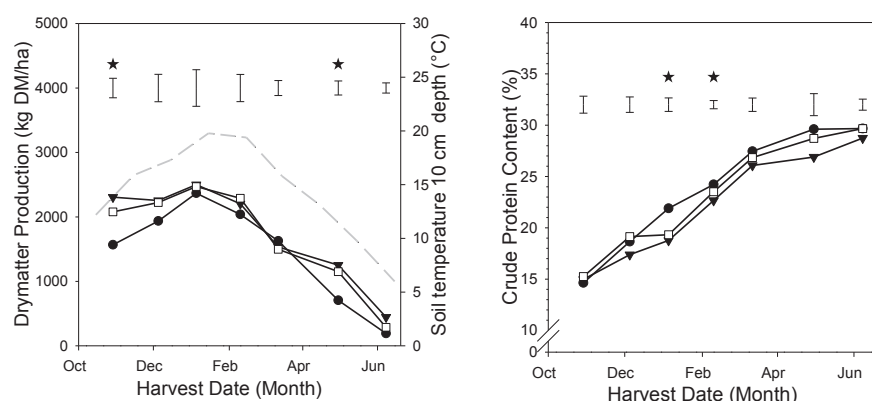
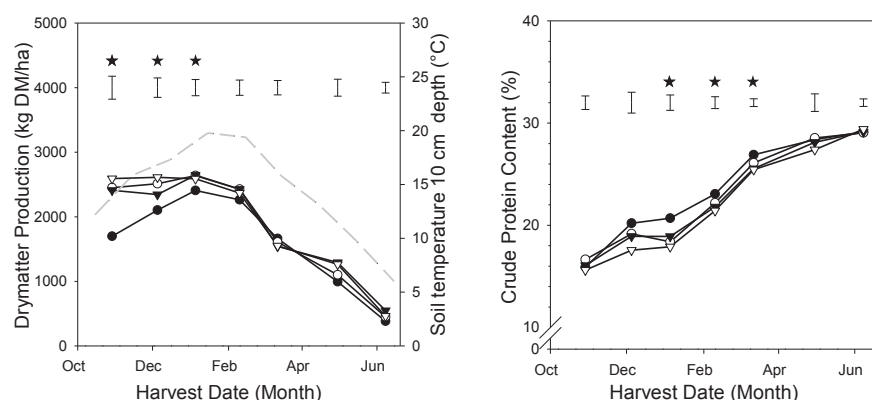
Two replicated field trials were established at Lincoln University during the 2019/2020 season to determine if fertigation could improve pasture production and quality.

	Treatments	Sites	Pasture
Experiment 1	Control 25kg N/ha fertigation 25kg N/ha solid urea + irrigated immediately 25kg N/ha solid urea + 2-day delay irrigation	A	Permanent ryegrass/white clover
		B	Autumn sown ryegrass/white clover
Experiment 2	Control 25kg N/ha fertigation applied once per month 6.25kg N/ha fertigation applied once per week	A	Permanent ryegrass/white clover
		B	Autumn sown ryegrass/white clover

- Soil tests were taken prior to the trial starting and any deficient tests were corrected with fertiliser addition.
- Soil moisture was monitored using a soil moisture probe and moisture maintained at field capacity.
- Monthly pasture cuts were taken from September–June to determine pasture production and quality (crude protein (CP), neutral detergent fibre content (NDF), dry matter digestibility and metabolisable energy (ME).
- Clover percentage was measured at four times during the season for the control and fertigation 25kg N/ha treatment only.



**Results** Results from only Site A are presented below. For all results see the SFF Fertigation Year 1 Report found at [www.iriigationnz.co.nz/PracticalResources/SpecialistEquipment/Fertigation](http://www.iriigationnz.co.nz/PracticalResources/SpecialistEquipment/Fertigation)



Total season DM production for trial 1 and 2 and both site A and B

		Total Season DM Production	
		Site A	Site B
Experiment 1	Control	<b>11.5</b>	<b>10.6</b>
	25kg N/ha fertigation	13.2	12.0
	25kg N/ha solid urea + irrigated immediately	13.4	12.4
	25kg N/ha solid urea + 2-day delay irrigation	13.2	12.0
Experiment 2	Control	<b>10.4</b>	<b>9.7</b>
	25kg N/ha fertigation applied once per month	12.5	11.4
	6.25kg N/ha fertigation applied once per week	12.0	11.1



## Conclusions

- No effect on pasture production from either application method (liquid/dissolved or solid) (experiment 1) or application rate and frequency (experiment 2).
- No difference between application method, frequency or rate on pasture quality measurements (CP, NDF, ME and DM digestibility).
- High clover content seen in the trial sites (65–90%) have reduced the treatment effect compared to the control for pasture production, particularly during summer months. The application of 25kg N as solid and liquid/dissolved urea decreased the clover content by 8–48% across all harvests and sites.
- No conclusions can be made around effect of N application method on clover content (this will be measured in the year 2 trial).

## Year 2 Trials

Trials looking at the following have been completed during the 2020/2021 season:

- Fertigation effect on N use efficiency at decreased rates of N (24kg N/month, 20kg N/month and 16kg N/month).
- Fertigation applied only in the shoulder months to determine if increased clover contents could carry production through the summer season.

Results are still being processed.