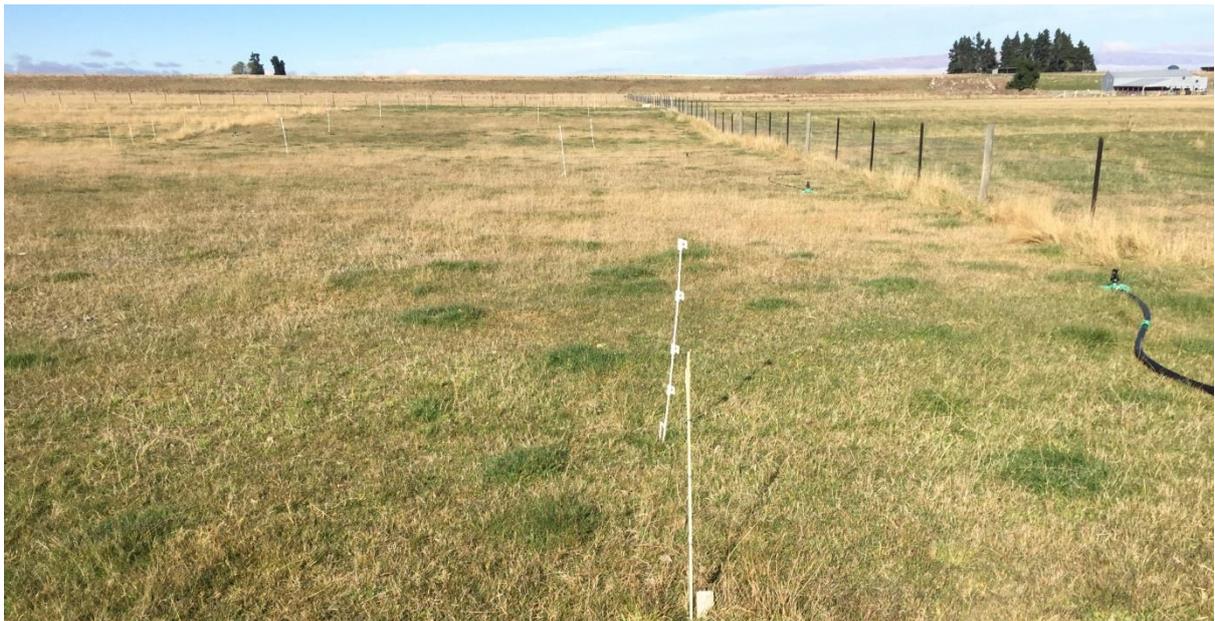


# Shortlands Energised Water Trial Autumn 2019



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## Executive Summary

The effect of energised water on semi-arid autumn pasture production at Shortlands Station, Kyeburn, Central Otago, was measured in April 2019, four months after pre-cutting in December 2018 and light grazing in 2019.

Soil phases significantly affected pasture growth ( $P < 0.01$ ).

Pasture production, adjusted for the effect of soil phases, was 19% higher under energised irrigation than with non-energised water, though this was statistically non-significant ( $P = 0.197$ ).

Previous effects of water energisation have been inconsistent at this site and this is the strongest response observed to date.

Further evaluation in the 2019 - 2020 season is recommended.

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## Introduction

The effect of energised and non-energised water on pasture production is being assessed at Shortlands Station, Kyeburn, Central Otago. Site information, trial description and initial growth responses are contained in previous reports<sup>1, 2,3,4,5</sup>. The irrigation trial consists of 24 plots, split between water treatments, which were located on the Bottom Stack research trial site. Plots were previously mown in mid-December 2018 and lightly grazed in early 2019 (Figure 1).



**Figure 1. Irrigated growth (white markers show sprinkler head locations) and pasture growth 25<sup>th</sup> April 2019.**

Autumn herbage production was measured on the 25 - 26<sup>th</sup> April 2019 in 4 x 4 m plots centred on each irrigation sprinkler. Herbage was cut by rotary mower to a height of 5 - 6 cm, weighed and sub samples collected for dry matter determination.

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<sup>1</sup> Espie P.R. 2011. Shortlands Station Fertiliser Trial Establishment Report. AgScience Contract Report, April 2011, 25 pp.

<sup>2</sup> Espie P.R. 2017 Shortlands Irrigation Trial Establishment. AgScience Contract Report, September 2017, 8 pp.

<sup>3</sup> Espie, P.R. 2018. Energised water effect on dryland pasture production. AgScience Contract Report, January 2018, 16 pp.

<sup>4</sup> Espie, P.R. 2018. Soil Phase effects on Shortlands Energised Water Trial. AgScience Contract Report, February 2018, 9 pp.

<sup>5</sup> Espie, P.R. 2018. Hydro-Boost Shortlands Station Trials. AgScience Contract Report, December 2018, 8 pp.

## Results

Differences in soil phases, as determined by previous precision soil mapping of electrical capacitance, affected pasture production, with a better curvilinear than linear fit (Figure 1). Statistically this effect is extremely unlikely to be due to chance ( $P < 0.01$ ).

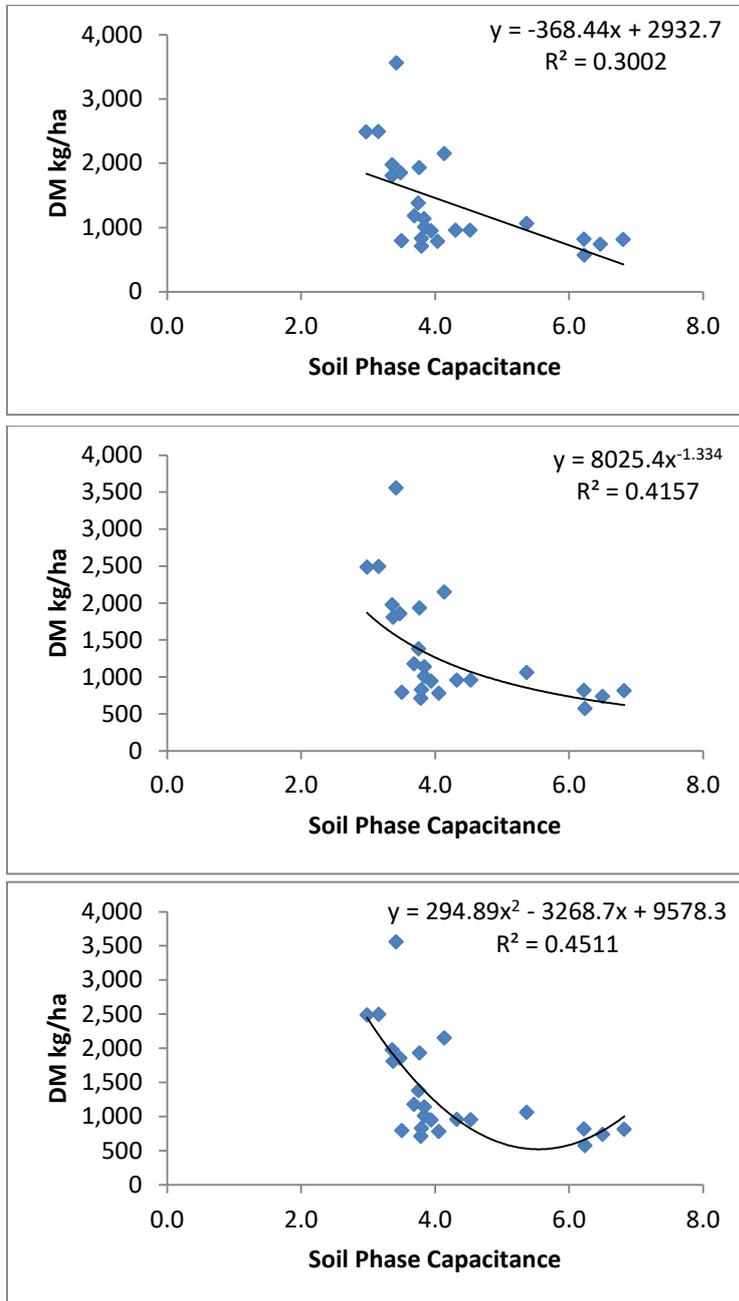
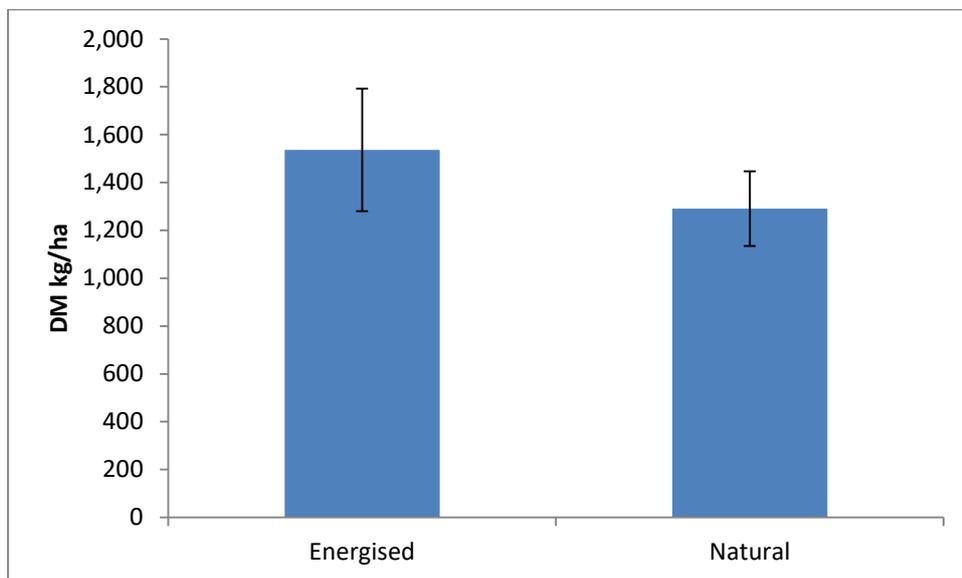


Figure 1. Effect of soil phase on autumn pasture yield. Upper: linear fit with  $R^2$  of 0.3; middle and lower curvilinear fits with  $R^2$  of 0.42 and 0.45 showing better relationships than with the linear model.

When adjusted for the effect of soil phase on production, energised water produced 19% more pasture than non-energised water (Figure 2) though this was statistically non-significant ( $P = 0.197$ ).



### 3. Discussion

This response to water energisation is similar to results from Hydro-Boost's initial Canterbury field trials and glasshouse wilting recovery experiments but differs from trial results with vehicle spraying at Shortlands and Canterbury.

Water energisation previously gave inconsistent responses in this trial in the 2017-2018 growing season and in conjoint Canterbury trials with mobile spray application. The reasons for these differences are not clear, possibly due to climatic interactions at Shortlands or from unknown factors affecting energiser unit operation on vehicle spraying.

Further evaluation in the 2019-20 season is recommended to examine the consistency of response to water energisation.

### 4. Acknowledgements

I thank Michael Richards and Brent Rodger for their field measurement for this assessment.