

### Controlled Study - Independently Conducted by University of Queensland **DRAFT 8-Feb**

**Aim:** This extensive and scientifically robust study aimed to determine the effect of Great Land treated pastures on milk production, milk quality and animal health in a commercial dairy.

**Study Outline:** A controlled, randomised block design study was conducted on a commercial dairy farm at Harrisville, southeast Queensland. Eleven paddocks each of approximately 3 hectares with established ryegrass based pastures were each divided into two sub-paddocks. Half of the sub-paddocks were treated with GL and the other half were untreated. All other practices, for example fertiliser, irrigation and grazing practices were applied consistently across the treated and control study areas.

A herd of 280 cows with year-round calving were randomly selected into two equal-sized experimental herds and assigned to graze separately on either treated or untreated pasture, under a 12-hour rotation program. All cows were fully fed throughout the study period, supplemented with a mixed ration, and grazed at the same stocking rate.

Individual cows were enrolled in the study after reaching mid-lactation (after 80 days in milk). Cows were milked twice a day during the study period of 176 days, from mid-June to early December 2016.



**Treatments:** Treated sub-paddocks received boom spray applications of Great Land at 40 Litres per hectare, repeated three times in the following periods: early May; late-July and October 2016.

Treatment group: data was recorded on a total of 98 cows grazed on pastures treated with Great Land. Control group: data was recorded on a total of 114 cows grazing only untreated pastures.

**Assessments:** For the cows enrolled in the study, weekly recordings of milk volume, milk solids content and somatic cell counts (SCC) were collected. Pasture and ration consumption were controlled to stabilise total feed intake.

Health disorder incidents were also recorded as they were observed. Milk production and SCC data of affected cows during treatment were included for data analysis.



### Results:

Cows grazing Great Land treated pasture achieved improvement in milk production and health indicators compared to cows grazing untreated pastures. The following key results were found after controlling for the effect of days in milk, cow lactation and dry matter intake:

#### Milk Production:

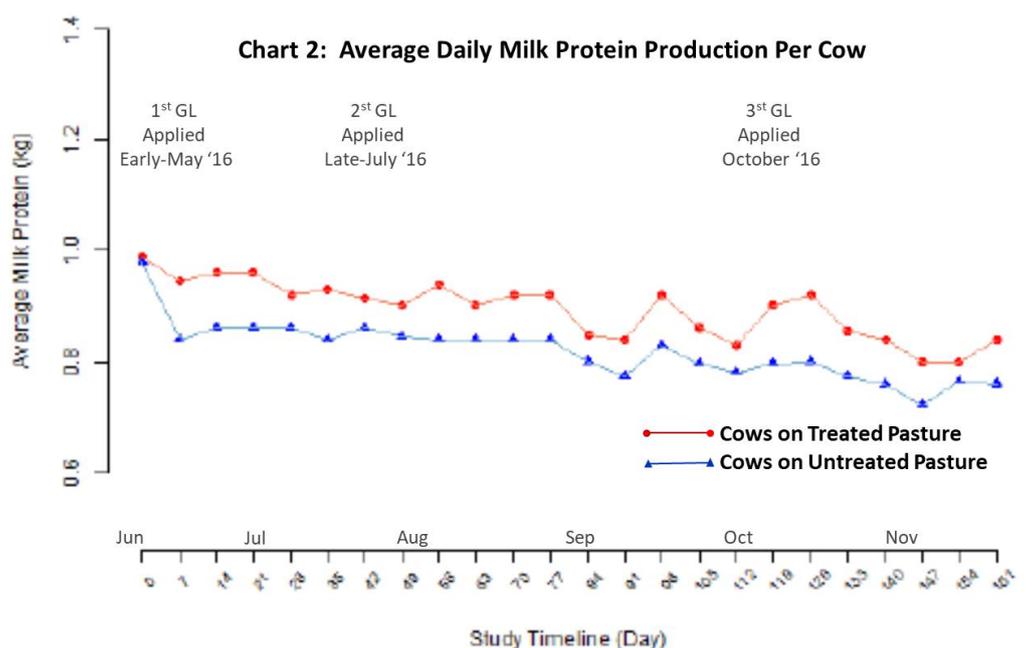
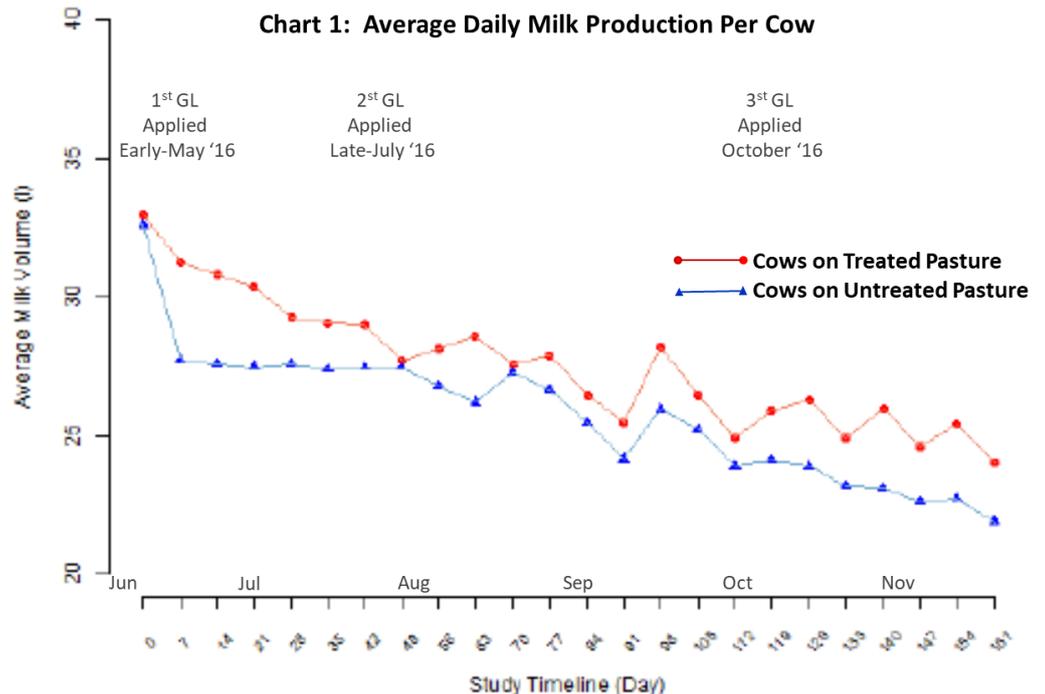
Treatment group cows produced an additional 1.81 litres (7.3%) of milk per cow per day ( $p < 0.05$ ) than cows grazed on untreated pasture (Chart 1). This gain equates to an extra return of more than \$200/cow/season.

Since milk data from mastitic cows was included for data analysis, this difference understates the difference in saleable milk. Refer to Mastitis results, page 3.

#### Milk Protein and Fat:

Treatment group cows produced an additional 0.06 kg (7.5%) protein per cow day ( $p < 0.05$ ) than cows grazing untreated pasture. (Chart 2)

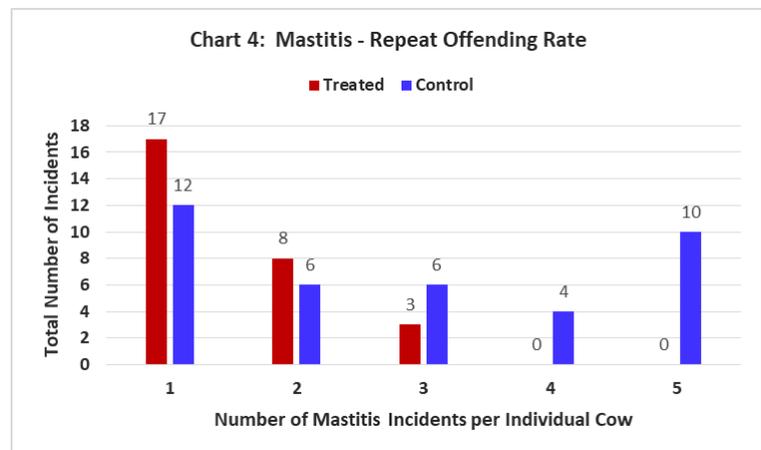
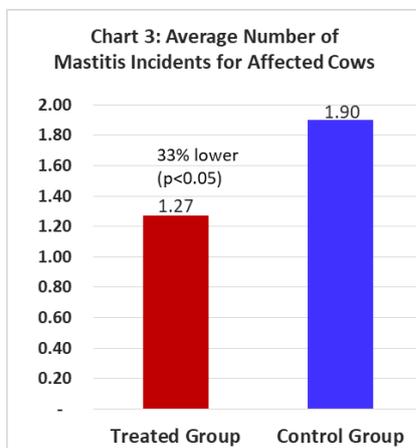
Milk fat for cows grazing on treated pasture was recorded at 0.03 kg (4.6%) per cow per day higher, however the difference was not statistically significant.



### Mastitis and Somatic Cell Count

The occurrence of mastitis was low. Over the whole 6 months study period a total of 66 mastitis incidents were recorded in the enrolled cows, a rate of 31 per 100 cows. Cows grazing on treated pasture had a mastitis incidence rate of 28.6 per 100 cows, 14% lower than the control herd at 33.3 per 100 cows.

Notably, of the cows observed with mastitis, the Great Land grazing group recorded a repeat offending rate 33% lower ( $p < 0.05$ ) than the control herd. The average number of mastitis incidents for cows with at least one mastitis occurrence was 1.27 and 1.90 for the Great Land grazing group and control group, respectively. Chart 3 and 4 demonstrate the significantly different pattern of repeat incidents between the two study groups.



This outcome supports evidence from other field work which indicates that extended exposure to Great Land treated pasture leads to improving cow's ability to withstand and recover from health ailments, including mastitis. Further strengthening this case is that all affected cows were treated in the conventional manner.

The low occurrence of mastitis is consistent with the low SCC recorded for the herd, with an initial baseline average SCC of 50,000 cells/mL, rising slowly over the period, largely due to the volume effect commonly evident in the last half of lactation. Differences in average SCC between the herds were not significant. Previous field comparisons have shown the influence of Great Land treated pastures is greater when baseline SCC levels are high.

### Conclusion:

The application of Great Land to pastures grazed by dairy cows produced a higher volume of milk and reduced risk of repeat mastitis incidence. The study suggests further investigation into the role of Great Land in cow health is warranted.

Results of this study are especially noteworthy given the cows were supplementarily fed. It adds further support to evidence from other commercial field applications where wide ranging benefits to productivity and herd health are best achieved when Great Land is applied to the whole farm – maximising the herd's exposure to the positive effects of the product.

Terragen is presently executing field trials to further investigate the role of its products in dairy mastitis as well as other animal health and welfare applications.

