Milk Production Study - Independently Conducted by University of Queensland

Aim: This extensive and scientifically robust study aimed to determine the effect of Great Land (GL) treated pastures on dairy cow's milk production, milk quality and animal health.

Study Outline: Randomized block, blind and controlled study in Harrisville, southeast Queensland. The study was performed on a commercially operated dairy farm with year-round calving. Eleven paddocks 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. The irrigation program and other agronomic practices were consistent across the entire study area.

A herd of 280 cows 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 for milk data collection and sampling while in mid-lactation (generally after 80 days in milk). Cows were milked twice a day for an experimental period of 176 days, from mid-June to early December 2016.

Treatments: Treatment group: data recorded on a total of 98 cows (replicates) grazed on pastures treated with Great Land at a rate of 40L/ha, three times over the season: early May; mid-July and October 2016. Control group: data recorded on a total of 114 cows (replicates) grazing untreated pasture.

Assessments: Enrolled cows were subject to weekly assessments on milk volume, milk solids content, somatic cell counts (SCC) and animal health incidence. Pasture and ration consumption were measured.

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 accounting for days in milk, cow lactation, dry matter intake and time in study:

- Milk production: treatment group cows milked 1.81 litres (7.3%) per cow per day more ($p<0.05$) than the cows grazed on untreated pasture. Milk protein was recorded at 0.06 kg (7.5%) per cow day higher ($p<0.05$) and milk fat recorded 0.03 kg (4.6%) per cow per day higher.

- Mastitis incidence: the treatment group recorded 14% lower incidence risk (incidence per 100 cows) compared to the control group. Notably, while this overall difference in incidence risk was not significant, the number of *repeat incidents* for effected cows was 33% lower in the treatment group compared to cows not exposed to GL treated pasture – further analysis finds this difference to be statistically significant ($p<0.05$).

- Initial baseline SCC for the study herd was low at approximately 50,000 cells/mL. Over the whole study period cows grazing on GL treated pastures still recorded a lower SCC comparted to the control group, albeit not statistically significant. This is consistent with other uncontrolled studies showing the impact of GL treated pastures is mainly prevalent when baseline SCC is high.

Conclusion: **The application of Great Land to pasture grazed by dairy cows produced a higher volume of milk and reduced risk of repeat mastitis incidence. This result is especially noteworthy given the cows were supplementary fed. The study helps to formalise anecdotal outcomes reported by other field applications and suggests further investigation into the role of Great Land in cow health is warranted.**

The full results of this study are being prepared for publication (Journal to be advised).