Quarterly Progress Summary: October – December 2016

A New Vision for Pastoral Agriculture through Seed and Nutritional Technology Development

Summary of progress during this quarter

- The nucleus seed multiplication of GPT12011 AR501 has progressed and is on track for harvest in late-January 2017. AR501 selections continue to perform well in the field trials, and in on-farm evaluations. GPT12011 AR501 pastures and GPT12011 LE pastures are established and ready for animal grazing studies in the first quarter of 2017.
- PGP-endophytes reduced facial eczema spore counts by >30% under field conditions in small plots. Larger field plots were established this quarter and will be monitored in 2017 for their ability to reduce facial eczema. Seed multiplication for larger scale trials is also on track for harvest in early 2017. Results from our first animal toxicology study have been favourable.
- We have continued to make excellent progress on traits that should improve feed conversion efficiency and reduce nitrogen emissions from ruminants. Furthermore the expression and inheritance of a key trait has been shown to be stable. Our first field trials of this trait will begin in mid-2017.
- A conditional release of our new brassica hybrid on ~1000 ha, split evenly between North and South Islands has occurred this quarter across farms in both the North and South Islands. Regular visits and monitoring is underway on 6 North Island and 7 South Island farms to determine agronomic and animal performance across environments. The adoption package for our new hybrid brassica was highlighted at the PGP Expo in November 2016.

Figure 1 Marlborough paddock under drought stress with Winfred rape (left) and Pallaton raphanobrassica (right)

- Herbicide tolerance of our HT kale has been excellent in replicated trials under worst case timing of herbicide application and at rates well above those recommended for commercial application. We have progressed our understanding of timing and application rate effects across regions. The initial seed multiplication is progressing well.

Key highlights and achievements

- The replacement nucleus seed crop of our perennial ryegrass with AR501 endophyte has been sown. This elite selection has improved bioactivity and has shown excellent agronomic performance, outperforming more than 100 other entries across 8 locations in New Zealand. Our first selection has been entered in National Forage Variety Trials. Pest resistance trials indicate better grass grub tolerance, Argentine stem weevil and root aphid resistance of perennial ryegrass plants containing AR501. The animal safety trials have continued to provide strong animal performance results without any adverse animal health problems.
- We have demonstrated improved water-use efficiency (+38%), aphid tolerance (+32%), clubroot resistance (100%), lower glucosinolate levels (-80%), excellent seed yield potential and improved agronomic performance (+14% DM yield) of our new hybrid brassica compared to Goliath rape across a range of regional sites. Furthermore our cattle grazing trial resulted in ~30% higher liveweight gain per hectare without any increase in brassica associated liver disease. Initial on-farm studies have also shown strong improvements in lamb finishing systems with >$2000/ha profitability gains compared with forage rape and grass pasture.
- A nucleus crop of our new brassica hybrid has been successfully harvested and a two further multiplications have been sown in Canterbury for harvest in 2017.
- HT-C Kale is tolerant to Telar herbicide under worst case scenarios and is now being increased for agronomic evaluation and on-farm trials.

Upcoming

- The forage quality attributes of our improved feed conversion efficiency project will be determined.
- Seed production results from several PGP products will be available in the first quarter of 2017
- Field results on facial eczema control will be collected

Investment

Investment period	Industry contribution	MPI contribution	Total investment
During this Quarter	$283,099	$203,163	$486,262
Programme To Date	$4,875,880	$4,421,869	$9,297,750