

## QUARTERLY PROGRESS SUMMARY: April – June 2017

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

#### Summary of progress during this quarter

- The genetic control of transmission of AR501 endophyte has now been determined. This knowledge will be used to develop a new product that meets the commercial standards in both diploid and tetraploid perennial ryegrass. A fertiliser-fungicide trial within the 2016-17 seed crops has been completed and will guide seed production management protocols for future commercial seed growers. A further short-term animal grazing trial was completed confirming the animal performance and absence of any animal health issues.
- The effect of PGP-endophytes on facial eczema spore counts has been completed under field conditions in both plots and spaced plants in late-Summer and autumn 2017. Analysis of the *P. chatarum* spore counts is continuing. A new seed increase has been initiated at Lincoln to get effective seed quantities of our best PGP-endophyte for evaluation and animal safety.
- Our feed conversion efficiency project has continued to provide excellent results. Approximately 4,000 progeny have been screened this quarter for segregation and expression of our key trait. We are currently working to analyse this data to identify the elite parents with acceptable trait expression and herbage yield for crossing in 2017.
- We have prepared information for the release of Pallaton raphanobrassica, retail accreditation workshops, grower field days and recording performance data from last years on-farm proof of concept for the national grower survey. An app developed to get feedback from farmers who used Pallaton resulted in 81% confirming that they would use this product again. We had a launch of Pallaton at the Mystery Creek Fielddays in June 2017. In addition, two herds of dairy cows grazing Pallaton have performed well from an animal welfare and milk production perspective.
- A Plant Variety Right application has been submitted in New Zealand for 'Firefly' (HT-C) kale and the application has been accepted. Pre-commercial testing of Firefly across 1,000 ha is ready to begin.

#### Key highlights and achievements

- Our elite perennial ryegrass selection with AR501 endophyte 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 the official National Forage Variety Trials. The animal safety trials have continued to provide strong animal performance results without any adverse animal health problems demonstrating the animal safety of this endophyte. The nucleus seed crop harvested in 2017 had 88% endophyte transmission and will not be advanced. Knowledge on the genetic control of our AR501 endophyte has identified the optimal method for progressing to a commercial product in both diploid and tetraploid perennial ryegrass. A new tetraploid AR501 selection is being multiplied this year.
- The effect of PGP-endophytes on facial eczema spore counts have been assessed under field conditions with a 30% reduction in *P. chatarum* spore counts shown. The histology and haematology results from our first animal toxicology study have shown no adverse effects in small animal studies.
- 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 >\$2,000/ha profitability gains compared with forage rape and grass pasture.

- A nucleus crop of Pallaton raphanobrassica and two further crops grown in Canterbury this summer have been successfully harvested with yields exceeding the target of 1,500 kg/ha. Approximately 1,200 ha of Pallaton were sown across NZ in 2016/17 and DM yield and liveweight gains to date have been very encouraging. A stand at the national Fieldays at Mystery Creek highlighted the knowledge we have developed from on-farm use of this project over the past year. Pallaton is in its 2nd year of Plant Variety Rights examination.
- HT-C Kale is proving tolerant to Telar herbicide under worst case scenarios and has shown good agronomic performance at regional evaluation sites. A pre-nucleus seed increase has been harvested in Canterbury and pre-commercial testing across approximately 1,000 ha in 2017 is ready to begin. Several new interspecific brassica hybrids have been developed and are being evaluated for novel traits.

## Upcoming

- Screening and selection for improved grass grub resistance will continue in AR501 in the next quarter.
- Analysis of results from facial eczema control field trials will be finalized in the next quarter.
- A major field trial for our improved feed conversion efficiency project will run over the next two quarters and a major screening and selection project of approx. 300 crosses will continue.
- Wide-spread testing of Firefly (HT-C) kale across New Zealand will begin this year including two cattle grazing studies in Canterbury and Southland.

## Investment

<b>Investment period</b>	<b>Industry contribution</b>	<b>MPI contribution</b>	<b>Total investment</b>
During this Quarter	\$301,849	\$476,517	\$778,366
Programme To Date	\$5,328,814	\$5,129,565	\$10,458,380