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# Primary Growth Partnership Programme Review: Seed and nutritional technology development

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Report to the  
Ministry for Primary  
Industries and  
Industry Parties  
(PGG Wrightson  
Seeds and Grasslanz  
Technology)

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22 May 2015

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**Nimmo~Bell**  
& COMPANY LTD

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## ACKNOWLEDGEMENT

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## 1 Executive summary

1. In February 2013, the Ministry for Primary Industries (MPI) and industry partners PGG Wrightson Seeds Limited (PGWS) and Grasslanz Technology Limited (Grasslanz) agreed on a 6 year \$14.627 million investment programme, the Seed and Nutritional Technology Development Primary Growth Partnership (PGP) programme. MPI's share is up to \$7.145 million of PGP funds over 6 years.
2. As part of the agreement, MPI and the Industry Parties required an independent review of how the PGP programme is tracking towards its goals as set out in the original business plan (as modified from time to time).
3. The approach taken for the review involved a desk review of programme documents/reports, site visits in Palmerston North and Lincoln, face to face interviews with Programme Steering Group (PSG) members, project managers and key individuals, MPI PGP management, a member of the Investment Advisory Panel (IAP) and telephone interviews with a small number of key industry representatives. A workshop was conducted with the PSG on preliminary findings.
4. The programme states its aspirational vision as delivering the next generation of forage seeds and nutritional technologies that will assist in meeting consumer and environmental demands while also lifting on-farm productivity. Seed technology is the enabler to improve forage and pasture productivity, which will in turn lift the sustainability and productivity of highly productive farms and high performing animals which in turn will deliver higher value and quality milk, meat and fibre exports. The long term aspirational outcome is a competitive economy, particularly in the pastoral and seed sectors, with an additional \$200 million per annum in GDP by 2025.
5. Five projects make up the programme as follows:
  - i. Project1 – Biological Seed Additives: new microbial inoculants and seed coating methodologies that reduce pasture establishment failures, improve pasture yield and quality, reduce reliance on non-renewable sources and minimise impact on the environment.
  - ii. Project2 – New Endophytes Bioactivity: resistance against common ryegrass insect pests and no adverse impact on production and animal health.
  - iii. Project3 – Facial Eczema Control: a new technology for ryegrass pastures to overcome facial eczema leading to increased liveweight gains.
  - iv. Project4 – Feed Conversion efficiency: new cultivars with improved feed conversion efficiency; improved animal health and animal performance by 10% and nitrogen use efficiency by up to 60%.
  - v. Project5 – New Supplementary Feed Crops with much greater water-use efficiency and higher dry matter yield and plant persistence from multiple grazing in dry land conditions, increased palatability and insect/disease tolerance.
6. Our conclusions from the review are that overall the programme is on time and to budget, but it is too early to provide a high degree of certainty that the outputs and outcomes will be delivered as contracted within the six year contract period. High risks and significant challenges remain to be overcome, but no new risks are anticipated. After two years, the programme is beginning the transition phase from science discovery to commercialisation, and this transition will take

another two years before commercialisation will become the dominant focus of the programme. There is a high degree of excitement and optimism within the research and product development team and this should be translated into greater certainty that outputs can be delivered prior to the next review in 2017.

7. All five projects have made significant positive progress. Projects 2, 3 and 5 are on track and meeting milestones. There are concerns over Project 1 and a formal science review was carried out in March 2015, which resulted in a stop-go decision timed for late 2015. Project 4 has the brassica component put on hold to focus resources on white clover.
8. After initial teething issues in the first year, management of the programme is now bedded in and performing well. Feedback on all sides has been positive in regards to the current management of the programme. There are several minor issues that require management and the review team has confidence that these issues will be satisfactorily resolved leading to greater efficiency.
9. The only current governance issue of significance that needs resolution is related to the commercialisation terms. This needs to be formally addressed with MPI by the industry investors sooner rather than later to ensure the programme continues to move towards the contracted outcomes.
10. There is a strong divergence of views about the level and style of reporting, which needs to be managed to ensure the programme operates at an appropriate level of efficiency. In our view the number and breadth of reports could benefit from streamlining, however there are also a number of gaps identified that would contribute towards governance effectiveness.
11. There are nine recommendations related to reporting, namely recommendations 1, 5, 7, 8, 9, 10, 11, 12 below:

Recommendation 1: that quantified baseline indicators for the programme be agreed as a matter of priority (section 3.3).

Recommendation 5: That an Updated IP Register be expanded to provide a holistic picture of IP management to include (1) IP issues, (2) IP generated to-date, (3) IP expected to be generated and (4) exclusivity starting point status (section 5.3).

Recommendation 7: that project managers report quarterly to the PSG on associated commercialisation activities to ensure that critical factors for farmer adoption are pro-actively imbedded in the programme (section 6.1).

Recommendation 8: that the criteria for stop-go decisions be clearly defined in advance of decisions in the annual plan (i.e. Section 1.5 on stop-go decisions in the next year) and that consultation with independent experts (if any) be disclosed in the stop-go justification (section 6.2).

Recommendation 9: That capability planning should be consolidated and upgraded to a stand-alone section in reporting with the same status as the financial plan (section 6.3).

Recommendation 10: That the PSG gives consideration to streamlined reporting to reduce repetition while providing sufficient information on progress for MPI to monitor the performance of the programme (section 7.1).

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Recommendation 11: That a spillover benefits report be a new section in the annual plan that can potentially include benefits to-date, benefits expected over next 12 months, benefits forecast for the remainder of the programme and benefits beyond that (section 7.2).

Recommendation 12: That a financial snapshot be presented in the summary section of the annual plan that illustrates the financial impact of changes in project milestones and that the timeframe in the project milestone map be changed from a calendar year to a fiscal year i.e. ending 30 June (section 7.3).

12. Remaining recommendations unrelated to reporting are as follows:

Recommendation 2: that Management consider making the case to MPI for further funding to allow for broader discovery research under Project 3 (section 4.1)

Recommendation 3: that a stop-go decision of Project 1 is delayed until the results of the current laboratory trials are known (section 4.1)

Recommendation 4: that in addition to baseline data, information be collected so that a realistic Cost Benefit Analysis can be conducted prior to or as part of the 2017 independent review (section 5.1)

Recommendation 6: That the Industry Parties formally raise contractual issues relating to the commercialisation terms and resolve with MPI sooner rather than later (section 5.3).

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## 2 Introduction

### 2.1 Background and objectives

In February 2013, the Ministry for Primary Industries (MPI) and industry partners PGG Wrightson Seeds Limited (PGWS) and Grasslanz Technology Limited (Grasslanz) agreed on a 6 year \$14.627 million investment programme, the Seed and Nutritional Technology Development Primary Growth Partnership (PGP) programme. MPI's share is up to \$7.145 million of PGP funds over 6 years.

As part of the agreement, MPI and the Industry Parties require an independent assessment of how the PGP programme is tracking towards its goals as set out in the original business plan (and covered by contract variations through the PGP formal processes). The objectives of the independent assessment are to:

- i. Review progress made in each of the five projects and make any recommendations as to their future direction and funding priorities
- ii. Review project outputs to date within the time frames established in the business plan (and updated in the annual plan)
- iii. Assess progress made against the intended programme outcomes as set out in the Outcome Logic Model
- iv. Review internal and external factors affecting the programme including management, governance, reporting and the external environment.
- v. Make recommendations (if any) to improve the programme

### 2.2 Approach

The review involved a desk review of programme documents/reports, site visits in Palmerston North and Lincoln, interviews with internal/external interested parties and a workshop with key stakeholders on preliminary findings. The programme documents/reports reviewed include the business plan, contract, contract variation, annual report/plan, and Programme Steering Group (PSG) quarterly reports and meeting minutes. The people interviewed are listed in Appendix 1. The participants in the workshop, held on 26 February 2015, included MPI, the Industry Parties, and PSG members.

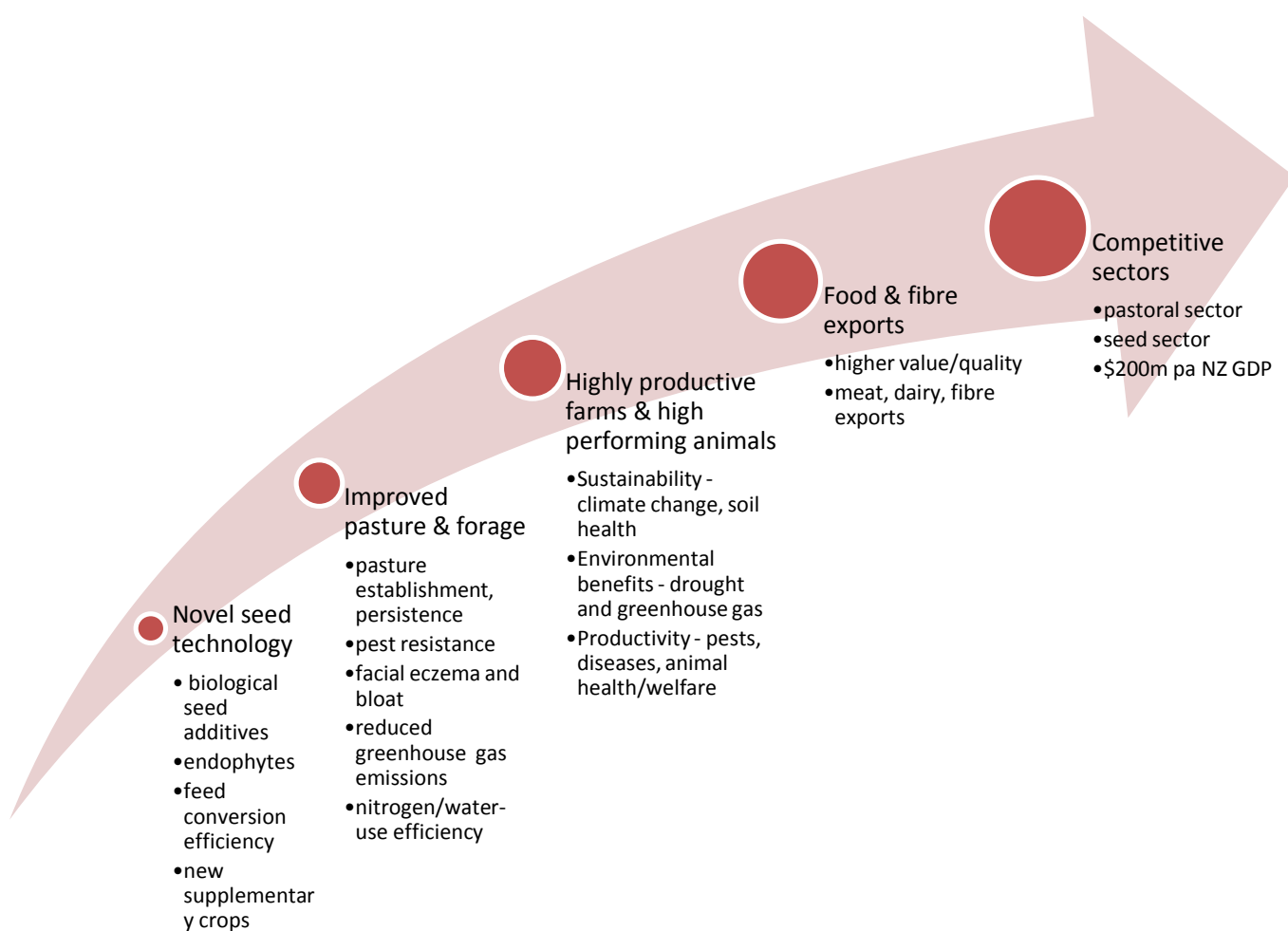
The review is based on information available to the review team as at 9 March 2015.

## 3 Overview of programme

### 3.1 Programme vision and rationale

The programme states its aspirational vision as delivering the next generation of forage seeds and nutritional technologies that will assist in meeting consumer and environmental demands while also lifting on-farm productivity. The programme responds to opportunity to lift pastoral and seed sector competitiveness and productivity in addressing consumer (growing global food demand rising 40% by 2030 from 2005 level) and environmental (climate change, soil health, animal welfare) demands. Seed technology is the enabler to improve forage and pasture productivity which will in turn lift the sustainability and productivity of highly productive farms and high performing animals which in turn will deliver higher value and quality milk, meat and fibre exports. The long term outcome is a competitive economy particularly the pastoral and seed sectors and \$200 million per annum in GDP by 2025. Figure 1 summarises the aspirational vision and programme impacts.

**Figure 1: Aspirational vision and programme impacts**



The current outcome logic model (OLM) for the Seeds and Nutritional Technology Development programme (Figure 2) outlines the path to achieving the aspirational vision. The activities and outputs produced in 2013-2019 will lead to short-term, medium-term and long-term outcomes from

2017 to 2040. Over time the OLM has been through a number of revisions with the aim to simplify and clarify it. The current 2014 version is due for a further update in April 2015.

The PGP investment in the seed sector comes in the context of low investment in research with only \$60 million pastoral R&D for \$24.5 billion industry equivalent to 0.24% of industry revenues. New Zealand depends on grazed pasture while higher input systems reduce profitability. Improved levels of cost effective feed are needed to ensure productivity/profitability that address environment constraints (drought, pests) and sustainability concerns (Nitrogen in waterways)<sup>1</sup>. While the drivers for R&D investment are strong, there is a lack of baseline and target metrics to quantify and qualify the state of the problems. For example, what are current levels of cost effective feed and what are the target levels of the programme?

### 3.2 Technology development projects

The five technology development projects (forage seeds and nutritional technologies) to address sustainability and productivity improvements which are the activities/outputs for the period 2013-2019 are:

**Project 1** – biological seed additives/coatings for pastoral/crop establishment; new microbial inoculants and seed coating methodologies that reduce pasture establishment failures, improve pasture yield and quality, reduce reliance on non-renewable sources and minimise impact on the environment.

**Project 2** – new pastoral (ryegrass) endophytes with resistance against common ryegrass insect pests and no adverse impact on production and animal health.

**Project 3** –novel control of facial eczema<sup>2</sup> leading to increased live weight gains.

**Project 4** – new cultivars to improve feed conversion efficiency in two pastoral species (brassica and white clover) for improved animal health (reduced methane/bloat, improved feed conversion efficiency/rumen health); improve animal performance by 10% and nitrogen use efficiency by up to 60%.

**Project 5** – new supplementary feed crops for better feed supply and summer productivity; development of new hybrid brassicas with much greater water-use efficiency; and transfer novel traits from Canola to forage brassicas to achieve higher dry matter yield and plant persistence from multiple grazing in dry land conditions, increased palatability and insect/disease tolerance. Feed crops will be targeted at lamb and beef finishing farms in New Zealand's dry and drought-prone regions.

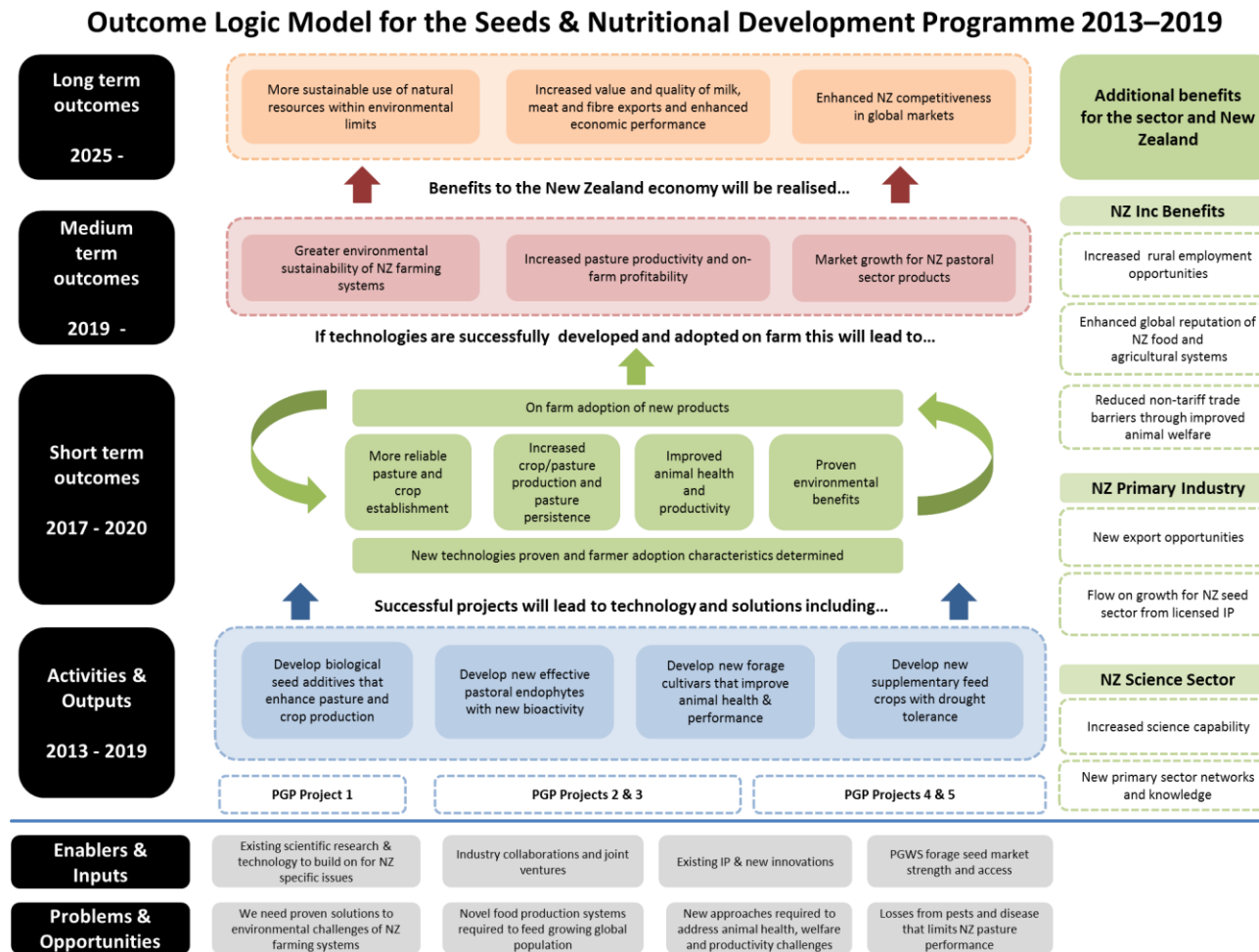
A summary of the targeted project impacts is provided below in Table 1.

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<sup>1</sup> Business Plan August 2012

<sup>2</sup> Annual plan 2014-15 and Contract Variation No 2

**Figure 2: Outcome logic model**



Source: Programme Management

**Table 1: Summary of targeted project impacts**

| Project/Impact                            | Pasture Establishment | Pasture Performance | Pasture persistence | Animal Productivity | Environmental | Supplementary feed | Animal Health |
|---|-----------------------|---------------------|---------------------|---------------------|---------------|--------------------|---------------|
| Project 1<br>Biological Seed Additives    | ✓                     |                     |                     |                     | ✓             |                    |               |
| Project 2<br>New Endophyte Bioactivity    |                       | ✓                   | ✓                   | ✓                   |               |                    |               |
| Project 3<br>Facial eczema control        |                       |                     |                     | ✓                   | ✓             |                    | ✓             |
| Project 4<br>Feed Conversion efficiency   |                       | ✓                   | ✓                   | ✓                   | ✓             | ✓                  | ✓             |
| Project 5<br>New supplementary feed crops |                       |                     |                     | ✓                   | ✓             | ✓                  | ✓             |

Source: Programme Management

Figure 3 sets out the R&D providers and project leaders for the five technology development projects. There have been two changes to project leaders since the start of the programme with Professor John Hampton being appointed soon after contract signing and Dr Chris Jones appointed midway through 2014.

**Figure 3: Technology development providers and project leaders**

| Project 1.<br>Biological Seed Additives | Project 2. New Endophyte Bioactivity | Project 3. Facial Eczema Control | Project 4. Feed Conversion Efficiency | Project 5. New Supplementary Feed Crops |
|---|--------------------------------------|----------------------------------|---------------------------------------|---|
| Lincoln University                      | AgResearch                           | AgResearch                       | AgResearch                            | Plant & Food Research                   |
| Prof John Hampton                       | David Hume                           | Christine Voisey                 | Chris Jones                           | Andy Dumbleton                          |

Source: Annual Plan 2014-15

### 3.3 Baseline data and targets

As ex post cost benefit analysts, we are frequently confronted with a lack of baseline data on which to judge programme success.

Improved baseline data on which to judge programme success is required. Aspirational targets and measures for each technology development project are provided in reporting. However, many indicators have either (a) no baseline data (e.g. yield increase in DM/ha but does not specify current DM/ha) or (b) no specific percentage change (e.g. reduction in spore counts but no specific target). Part D (baseline references) of schedule 5 remain unconfirmed in the most recent schedule 5 in Annual Plan 2014-15 and in the Metrics (section 13) of October to December 2014 quarterly report.

There are also some expected benefits from the projects where there are no indicators.

The responsibility for ensuring that baseline data is recorded lies with the programme. While joint MPI/ Industry Parties work has been undertaken no agreement has been reached on what baseline data should be recorded. Baseline data will enable further accountability by Industry Parties and ensure taxpayers know what they have paid for and the difference it will make.

While the difficulty of establishing baseline data is acknowledged particularly when different regions and seasonal weather variation can have significant impacts on base lines, the programme should be able to estimate them. When such factors are present, it is suggested that the key region(s) that is expected to have the greatest impact and weather associated with trigger point conditions be chosen as the base line e.g. for facial eczema control where the objective is to reduce FE to below sub-clinical levels, Waikato and possibly Manawatu should be chosen in a season with spore counts are above the critical level. The impact on other regions can then be estimated relative to this baseline. This type of information provides a peg in the ground to assist in quantifying net benefits and judging the effectiveness in achieving programme outcomes.

**Recommendation 1: that quantified baseline indicators for the programme be agreed as a matter of priority.**

## 4 Project outputs progress

### 4.1 Status and prospects

The research and trials for each project is divided among three phases: desk research, laboratory analysis and experiments, and farm field trials. Table 2 presents the current project status and prospects identifying the phase it is in and assesses timeliness and prospects towards commercial release.

Project 3 is an example of where extra PGP funding could be used to ensure the benefits from this project are delivered more quickly to industry. Management is moving ahead to commercialisation with the best candidate technology discovered so far. However, extra funding would allow broader discovery work to be done thus reducing the likelihood that superior technologies would be missed.

**Recommendation 2: that Management consider making the case to MPI for further funding to allow broader discovery research under Project 3**

An assessment of project milestones achievement compared with the timeline is presented in Table 3. 'Ahead of schedule' means positive or positives outweigh negatives, 'as expected' means neutral/as expected or positives offset negatives and 'behind schedule' means negative or negatives outweigh the positives. The assessment is based on actual achievement through 2014 and forecast achievement through 2018.

**Table 2: Project status and prospects**

| Project  | Results and quality assurance  | Phase  | Timeliness and prospects for commercial release   |
|--|--|--|---|
| <b>Project1 (Biological Seed Additives)</b>      | Variable results with lower response when BSA field trials conducted in non-challenging conditions. Development of a seed coating techniques for BSA successful  | Laboratory pot trials under controlled stressed soil conditions (finish November 2015)                             | Optimistic but formal science review March 2015<br><br>Revised workplan for 2015 submitted to PSG and approved. Stop/Go decision in November 2015 |
| <b>Project2 (New Endophyte Bioactivity)</b>      | On track, AR-X meets criteria with improved insect resistance. Technically there with tetraploid ryegrass, one of two lines to be chosen for production. Behind with diploid version   | Fast tracking best tetraploid lines for seed production in autumn 2015. Diploid may catch up but is challenging    | Tetraploid expected to achieve commercial production by year 5  |
| <b>Project3 (Facial Eczema Control)</b>          | A novel technology is showing promising effects on control of the facial eczema pathogen   | Scaling up to show technology is effective at whole plant and sward level and has no adverse animal health effects | On-time. Future prospects promising. Question over whether more agronomic trials will be needed thus delaying commercialisation                   |
| <b>Project4 (Feed Conversion Efficiency)</b>     | Technically challenging but all components are being finalized. Elite germplasm/parents have been identified with high genetic merit.  | Completed discovery phase for WC now entering product development phase  | On-time. High likelihood of commercial release by end of programme should regulatory requirements be met  |
|  | Conventional breeding approach was not feasible in brassica.   | Brassica component stopped until WC work proven  | Delayed until at least Year 5. Unlikely commercial release within programme timeframe.  |
| <b>Project5 (New Supplementary Forage Crops)</b> | Successful in integrating molecular and field techniques with milestones met on water use efficiency, new kale cultivars and new hybrid brassica for accumulated yield, insect/disease (clubroot) tolerance and plant persistence from multiple grazing. | Nucleus seed crop of new brassica hybrid on track for harvest in February 2015.                                    | Initial animal trials for new hybrid brassica complete. High chance of commercial releases within contracted timeframe                            |

Source: Programme Management

**Table 3: Project milestones achievement against timeline**

| Project  | Ahead of schedule | As expected | Behind schedule |
|--|-------------------|-------------|-----------------|
| 1. Biological seed additives   |                   |             | ✓               |
| 2. New endophyte bioactivity   |                   | ✓           |                 |
| 3. Facial eczema control   |                   | ✓           |                 |
| 4. Feed conversion efficiency <ul style="list-style-type: none"> <li>• Brassica</li> <li>• White clover</li> </ul> |                   | ✓           | ✓               |
| 5. New supplementary feed crops  | ✓                 |             |                 |

Besides Project 4 where research on brassicas has been put on hold, Project 1 is the only component with significant delays. Variable results in field trials have led the research team to conduct further laboratory trials in order to have more control over soil borne diseases. A science review of Project 1 was completed in March 2015, but as the laboratory trial results are not expected to be known until the end of 2015 it would seem logical to time a stop-go decision at that later time.

**Recommendation 3: that a stop-go decision on Project 1 is delayed until the results of the current laboratory trials are known**

Project 5 (new supplementary crops) is 'Ahead of schedule' as all components are either slightly ahead or on-track. 'As expected' projects are Project2 (new endophyte bioactivity), Project3 (facial eczema control) and the White Clover component of Project 4.

## 4.2 Technology adoption

The Industry Parties recognise the importance of technology adoption given the low rates of pastoral renewal and some scepticism among farmers on the benefits of new forage technologies. For successful adoption, seed companies need to engage with farmers and industry bodies to let them know of new products and pasture persistence issues, and to influence decision-makers in the adoption process. As the programme is at a pre-technology adoption stage, the building blocks for technology adoption are behind the scenes rather than highly public. The projects are largely driven by technology due to their novelty and high science component and the Industry Parties have shrouded them in confidentiality to protect intellectual property (IP). Thus the public linkages to farmers and industry organisations for this programme are at a low level at this stage.

We undertook discrete enquiries as to farmer linkages with key representatives of farmer groups (brief phone interviews were conducted with Beef+Lamb, DairyNZ, FarmIQ and Landcorp) which revealed that there was no knowledge of, or formal contact by, the Industry Parties or programme management about the programme. Industry representatives have not voiced undue concerns about the low level of contact with the programme considering that it is only at the end of the second year of a six year period.

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## 5 Programme management

### 5.1 Verifying outcomes

The medium term outcomes for the programme focuses on sector impacts and overall New Zealand economy benefits of \$200 million per annum in GDP (2020-2025). At the farm-gate, improved performance involves reduced on-farm costs, higher farm productivity, and better pasture/crop establishment, pasture persistence and pest control. For the pastoral sector, there will be improved profitability and resilience arising from environmental sustainability of farming systems, market growth for high tech products, and better animal health/productivity. For the seed sector, there will be increased sector capability, capacity and sophistication arising from growth from licensed IP, industry collaboration, wider added value products, and improved reputation of New Zealand as an innovative technology provider.

While this review does not focus on economic valuation or cost-benefit analysis, it is noted that there is insufficient information in Schedule 5 of the Contract and the Annual Plan 2014-15 on the derivation of the expected economic benefits of \$200 million per annum to verify this objective achievement measure. As the \$200 million is based on technology development reaching aspirational performance parameters there is a need to present a range of values with a focus on expected levels<sup>3</sup> grounded on quantified baseline information.

At the start of the programme outcomes are high risk with a high level of uncertainty. From the mid-point on of the programme there will be increasing clarity of likely outcomes. At this point, we consider there is a need for the programme to gather data required for a soundly based cost-benefit analysis (CBA) exercise. These should include quantitative estimates at the farm level on physical and financial impact distinguishing with and without scenarios (further discussed in Section 6 – governance and management). Besides the public relations aspect, providing more realistic estimates of outcomes is essential for better decisions around future resource allocation of both private and public funds. In a budget constrained environment with competing uses across sectors, the Government needs the best information it can get to maximise the future wellbeing of all New Zealanders. Such a CBA exercise should be undertaken prior to or as part of the second independent review to be undertaken in 2017.

**Recommendation 4: that in addition to baseline data, information be collected so that a realistic CBA can be conducted prior to or as part of the 2017 independent review**

### 5.2 Managing risks

Programme management identifies, monitors and mitigates risks to the programme. The risks relate to factors that influence project outcomes including financials, human resources and external environment.

The programme financials reveal underfunding by \$83,000 for research spending of PGWS and Grasslanz. To date, the Industry Parties have funded any overspend without requesting further PGP funding and we have been reassured that this will continue.

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<sup>3</sup> We note that the NZIER 2014 analysis of the “Economic Contribution of PGP” looked at more certain assumptions for the programme as a whole, but did not decompose it to the level of individual sub-programmes.

AgResearch (\$7.4m) accounts for 50% of total budget as the technology provider for Project 2, 3 & 4. With such significance, relationship and capability issues identified with AgResearch are concerning. The quality and stability of the R&D teams are critical to the success of technology development and the leadership gap left with the departure of AgResearch Project 4 leader (Dr Hancock) before her replacement by Dr Chris Jones has impacted on the programme.

In our view, overall risks are being managed effectively however we would like to see a separate risk register rather than the current IP and Risk Register. See section 5.4 below for further discussion.

### 5.3 Intellectual property

IP management is a sensitive issue. The Industry Parties take the issue of protecting IP very seriously and while MPI has been supportive of this, a point of tension arises in relation to MPI's need for periodic public disclosure of achievements.

IP management reporting is required both in Quarterly Reports (schedule 5 of the Contract under programme management) and in Annual Plans (schedule 3 of the Contract). The Q2 reports (Oct-Dec 2013 & 2014) reported on IP Update while the Annual Plan 2014-15 presents IP expected to be generated (see summary of year ahead), Updated IP Register (section 5) and a complete and detailed IP and Risk Register. While the IP Committee envisaged for the programme was relegated to an informal consultation with a PGWS IP expert up to late 2014, there is now formal recognition of the Committee in the governance structure (see Figure 4), but no report on IP as such has been identified. It would be beneficial to report on IP management annually with the following features for individual projects:

- i. Separate the IP Register from the Risk Register to become an Updated IP Register. In Appendix 3 of Annual Plan 2014-15, the IP and Risk Register is mainly a risk register.
- ii. The updated IP Register be expanded to include columns on (1) IP hurdles/issues (e.g. freedom to operate), (2) IP generated to-date (i.e. past), (3) IP expected to be generated (i.e. future), and (4) exclusivity starting point status.

The Exclusivity Starting Point, the commencement of the four-year Exclusivity Period (schedule 3 of Contract)<sup>4</sup> is an important aspect for IP management to update and assess. As the trigger for the Exclusivity Starting Point is different for each project, the PSG will benefit from knowing the updated timelines towards the start date of the exclusivity period.

**Recommendation 5: That an Updated IP Register be expanded to provide a holistic picture of IP management to include (1) IP issues, (2) IP generated to-date, (3) IP expected to be generated and (4) exclusivity starting point status.**

The Industry Parties have discussed at PSG meetings a desire to renegotiate the commercialisation terms, but the issue has not yet been formally raised with MPI. Any change will most likely require give and take on both sides to maintain the integrity of the contract. A change in conditions of mutual benefit to both the Industry Parties and MPI that maximises commercialisation and uptake by pastoral farmers is the desired outcome.

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<sup>4</sup> Exclusivity Period is for 4 years from Exclusivity Starting Point. See schedule 3 of Main Contract (p. 59)

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**Recommendation 6: That the Industry Parties formally raise contractual issues relating to commercialisation terms and resolve with MPI sooner rather than later.**

Reassurance was sought and provided on a sensitive issue in IP management: the potential leakage of the programme's IP and knowhow. It was confirmed that this issue was dealt with during contract negotiation. MPI is comfortable with the arrangements for IP retention in New Zealand with two primary reasons cited as: (1) the seeds resulting from the programme are designed for New Zealand conditions, and (2) new IP is owned by Grasslanz and the science providers rather than PGWS, with PGWS having exclusive rights to market the technologies.

A spillover benefit is the development of capability in science and commercialisation that keeps New Zealand at the forefront of the seed development sector.

## **6 Governance**

The terms of reference for the PSG are set out in PSG Supplementary Papers attached to each Quarterly Report.

The governance structure in the August 2012 programme business plan has been subsequently modified. Currently, the two members on the PSG representing the Industry Parties are John Caradus (CE of Grasslanz Technology) and John McKenzie (Chairman of PGWS) and the two members representing MPI are Jeremy Parsons and Tracy Voice. It is ably chaired by John Caradus and the diverse and complementary backgrounds and personalities of the remaining members makes for a well-functioning group. There is agreement that meetings are run efficiently with two quarterly face to face meetings of around 3-4 hours and two phone conference calls of a shorter duration for the other two quarters. In addition, face to face meetings provide an opportunity to meet project leaders and scientists in the field (once a year).

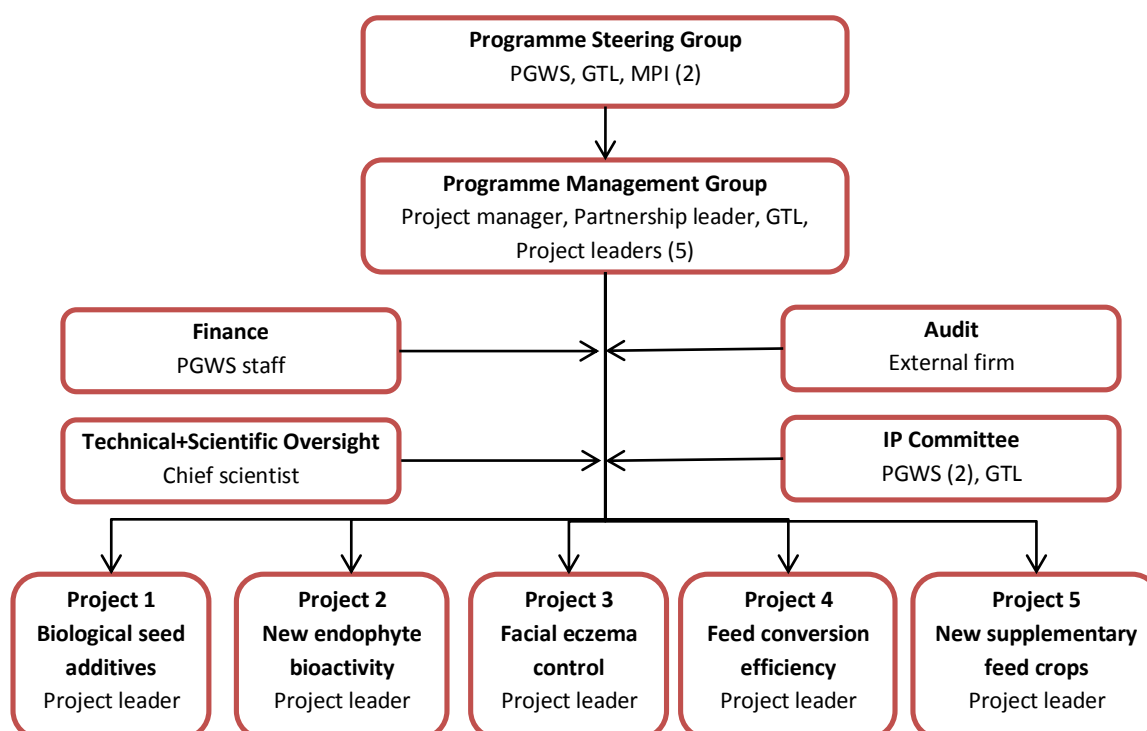
Initial teething issues have been overcome now that an understanding has been reached on the expectations and requirements of both MPI and the Industry Parties.

### **6.1 Governance structure**

Besides the lack of an IP Committee report, other committees and functions described in the Industry Parties business plan but missing from the August 2012 and February 2015 governance diagram (see Figure 4) are:

- i. Regulatory Committee responsible for the planning, management and compliance of regulatory issues
- ii. Commercialisation, Market and Regulatory Function responsible for linking commercial and distribution logistics and analysis into the project and implementing systems related to supply chain management, routes to market, licensing, pricing and promotion.

**Figure 4: Governance structure (February 2015)**



Source: Programme Management

As designed, the management and governance of the programme provides for oversight of cross-functional disciplines. Voice of customer with sales/marketing function is provided at the PSG level by the Industry Parties representatives. It is acknowledged that PGWS is a leading commercial seeds company with strong marketing capability and discipline that operates alongside the PGP programme. PGWS is the biggest seed company in New Zealand, ranks among the top three forage seed companies in the world and it has demonstrated successful channels to market in the past.

MPI has stated confidence in PGWS's ability to sell products if they prove commercial. The next two years mark the transition from pure science to commercialisation and thus we would expect to see increasing activity in the technology adoption sphere. Cooper's StageGate offers a model to address technology adoption issues (Cooper and Kleinschmidt, 2007).

Now that the transition phase from pure science to commercialisation is about to commence, PGWS needs to more clearly communicate at PSG meetings what commercialisation activities are in the programme. Of high importance will be drivers that facilitate farmer adoption, a lesson from previous seed product commercialisation. One driver is building the evidence base for farmer adoption. This may be in the form of metrics comparing performance of new products against current trends in farmer practices and alternatives provided by competitors and substitutes (the dynamic baseline). These will be the same metrics that will be used for conducting economic evaluation of the programme.

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**Recommendation 7: that project managers report quarterly to PSG on associated commercialisation activities to ensure that critical factors for farmer adoption are pro-actively imbedded in the programme.**

## 6.2 Stop-go decisions

The Programme Management Group is responsible for reporting stop-go recommendations for decision by the PSG.

Decision-making on major stop-go points are an important aspect of governance. There needs to be clear criteria on major stop-go decisions and input from independent expert/s at the decision table. While the risk register and project milestones identify stop-go decision points and timing, the decision criteria are not clearly outlined in advance of the decision, but rather once the decision is made. Instead, qualifiers are used such as capable, viable or acceptable. In making stop-go decisions, the Industry Parties disclosed that it has consulted independent experts. This practice is important and needs to be mentioned in the justification for stop-go decisions.

**Recommendation 8: that the criteria for stop-go decisions be clearly defined in advance of decisions in the annual plan (i.e. Section 1.5 on stop-go decisions in the next year) and that consultation with independent experts (if any) be disclosed in the stop-go justification.**

## 6.3 Human capability

Adequacy of resources for the programme is assessed through financial resources and research team capability. As a multi-year technology development programme, there is a need for stable project leadership and ownership and an R&D team that is stable, focussed and not distracted by other projects or priorities. As a programme largely implemented by external R&D providers, these capability issues become more critical. A capability report should shed light on this.

We cannot find a capability report as such. Capability is captured in the quarterly report in a number of places: Section 1.4 (Skills and Capability), Section 3 (Other Issues), Section (5-9).1.3 (Other Issues under each project) and Section 11 (Risk Register). In Section 3 and (5-9).1.3, Project Leaders detail any change in staff and changes that impact the project through loss/gain of capability. These are reported with recommendations to the Project Management Team along with any actions the Project Leaders have undertaken. However, it does not specify the role of staff.

As an ongoing part of capability planning, Management has also included key staff in the Risk Register (i.e. quarterly report Section 11 Risk Register). Management has recently added a sub-section in the quarterly report which gives an overview of skills and capability for each project (i.e. quarterly report section 1.4 Skills and Capability under Summary/Recommendations to PSG). This is like a balance sheet report that only tells status at point in time and is not future-oriented.

It is recommended that capability reporting be consolidated as one section under the annual plan and updates (if any) are provided in quarterly reports. Just like there is a 5 year financial forecast and project milestone Gantt chart, the capability plan should also cover 5 years. It should outline the staffing requirements (roles, expertise) for each project and indicate whether critical staff (e.g. project leader, key scientists) are committed for their required time for the duration of the project. This should be updated regularly in the quarterly report and used as a planning tool to identify potentials gaps, gains and losses. For example, it could say key scientist x will go on 1 year maternity leave or sabbatical, or project leader y will retire then outline contingency/succession action.

Human capability is the most important resource in research and development programmes. In our view, reporting on it should be upgraded to at least the same degree as that of the other major resource – finances.

**Recommendation 9: That capability planning should be consolidated and upgraded to a stand-alone section in reporting with the same status as the financial plan.**

## **7 Reporting efficiency and effectiveness**

The early days of the programme were excessively time intensive for the Industry Parties, and in particular PGWS, as MPI came up to speed with the Industry Parties systems and developed an understanding of the business and the way it operated. Initially there was a mismatch of expectations on both sides as to the reporting and monitoring requirements. Bedding down the unique PSG partnership systems took a year with a higher administrative requirement perceived by the Industry Parties than other government funding programmes such as the Ministry of Business, Innovation and Employment (MBIE), New Zealand Trade & Enterprise (NZTE) or Callaghan Innovation. All significant issues now appear to be resolved and the working relationship between MPI and the Industry Parties is a good one.

During interviews with key personnel we found a wide divergence of views around the level of reporting required by MPI to ensure the government's obligations are met. On the one hand, there was a high degree of frustration voiced by a number of scientists over the high level of information repeatedly required in quarterly reports and the necessity to account for time and processes rather than for outputs as is the stated focus of reporting in the commercial situation. On the other hand, other scientists considered the level of reporting appropriate and no different to that required under other public funded contracts. That this issue of reporting is a source of frustration to some scientists needs to be addressed by management so that the whole team has a positive attitude to the programme as this will have efficiency benefits.

### **7.1 Annual plan and quarterly report**

The annual plan and quarterly reports could benefit from rationalisation. The annual plan is comprehensive serving as the annual review and a plan for the year ahead.

There are timing issues that need to be addressed with all reporting based on the financial year ending 30 June. The annual plan is prepared in March and April and approved by PSG by the end of April for submission as a draft to MPI for their consideration. This means the annual plan for the year ahead is prepared before the end of the fourth quarter of the previous year. Confusion arises as often reports refer to the "latest quarterly report" rather than explicitly stating the specific dates e.g. Q4 ending June 2014.

Reporting serves two key functions - firstly to meet the governance responsibilities at the PSG level and secondly to communicate progress to the independent Investment Advisory Panel (IAP) which provides advice to the DG of MPI, who eventually makes the decisions on PGP investments. MPI has four major areas of interest: progress to date towards outputs and outcomes, key risks, key issues and financial overview. It requires comprehensive quarterly reports plus an annual review and report on the year ahead. To date, reporting has been heavily weighted to the science aspects of the programme and MPI would like to see greater emphasis on governance aspects.

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**Recommendation 10: That the PSG gives consideration to streamlined reporting to reduce repetition while providing sufficient information on progress for MPI to monitor the performance of the programme.**

## **7.2 Spillover benefits**

Spillover benefits are of particular interest to MPI to ensure the maximum leverage of direct programme funding. While schedule 5 requires reporting of spill-over benefits annually in every Q4 report (i.e. right hand side of Outcome Logic Model on additional benefits for the science sector, primary industry and New Zealand Inc.), no such discussion can be found in the two Q4 reports (April-June 2013 and 2014) but section 1 (i.e. Expected Programme Outcomes and Achievements to-date) of Annual Plan 2014-15 discussed benefits to the science sector. An explicit spillover benefits report could be a new section in the annual plan (amend schedule 5 of the Contract accordingly) and include spillover benefits to-date (past), benefits expected over next 12 months, benefits forecasted for the remainder of the project and benefits beyond that.

Industry Parties are able to influence spillover benefits to the NZ science sector and so reporting to date has focused on this aspect. While not able to directly influence NZ Inc. or NZ primary industry benefits, the programme is never the less in a good position to have a view on these benefits and should endeavour to report on them.

**Recommendation 11: That a spillover benefits report be a new section in the annual plan that can potentially include benefits to-date, benefits expected over next 12 months, benefits forecast for the remainder of the project and benefits beyond that.**

## **7.3 Annual budget and workplan**

The annual budget and workplan<sup>5</sup> could be better presented in order to communicate the funds flows and state of finances better. A big picture (graphical) snapshot in a single page could illustrate the financial impact of changes in project milestones.

There is also inconsistency in reporting timeframes that can cause confusion in year headings between the project milestone map or Gantt chart (calendar year) and the annual budget and workplan (fiscal year).

**Recommendation 12: That a financial snapshot be presented in the summary section of the annual plan that illustrates the financial impact of changes in project milestones and that the timeframe in the project milestone map be changed from a calendar year to a fiscal year i.e. ending 30 June.**

## **8 External environment**

While the programme does not work in isolation, external factors have not been on the agenda of the PSG to date. There was an initial push for industry statistics, but it was considered by Management that these were not a priority at this early science stage of the programme. Now the transition starts to take place from science to commercialisation (from year 3 on), external issues may become more relevant.

In such a field of innovative science that the programme operates, it is likely that some breakthroughs producing net benefits to NZ will be ahead of current public acceptability. This is a

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<sup>5</sup> Annual plan 2014-15 p. 25-27

sensitive issue and needs to be carefully handled to ensure that the industry's public license to operate is maintained. Programme management is acutely aware of this obligation and is well advanced in preparing for issues that may arise.

## 9 Conclusion and recommendations

Overall, the programme is on time and to budget, but it is too early to provide a high degree of certainty that the outputs and outcomes will be delivered as contracted within the six year contract period. High risks and significant challenges remain to be overcome, but no new risks are anticipated. Any high risks and significant challenges are being addressed in the research programme and reported on in the Programme Risk Register. After two years, the programme is beginning the transition phase from science discovery to commercialisation, and this transition will take another two years before commercialisation will become the dominant focus of the programme. There is a high degree of excitement and optimism within the research team and this should be translated into greater certainty that outputs can be delivered prior to the next review in 2017.

All five projects have made significant positive progress. Projects 2, 3 and 5 are on track and meeting milestones. There are concerns over Project 1 and a formal science review was undertaken in March 2015, which will lead to a stop-go decision in late 2015. Project 4, which relates to both white clover and brassicas, has the brassica component put on hold to focus on white clover.

After initial teething issues in the first year, management of the programme is now bedded in and performing well. Feedback on all sides has been positive in regards to the current management of the programme. There are several minor issues that require managing and the review team has confidence that these issues will be satisfactorily resolved leading to greater efficiency.

The only governance issue of significance is related to the commercialisation terms. This needs to be formally addressed by the Industry Parties and MPI sooner rather than later to ensure the programme continues to move towards the contracted outcomes.

While the number and breadth of reports could benefit from streamlining, there are also a number of gaps identified that would contribute towards governance effectiveness. The nine recommendations related to reporting (# 1, 5, 7, 8, 9, 10, 11, 12) are (summarised in Table 4):

Recommendation 1: that quantified baseline indicators for the programme be agreed as a matter of priority (section 3.3).

Recommendation 5: That an Updated IP Register be expanded to provide a holistic picture of IP management to include (1) IP issues, (2) IP generated to-date, (3) IP expected to be generated and (4) exclusivity starting point status (section 5.3).

Recommendation 7: that project managers report quarterly to PSG on associated commercialisation activities to ensure that critical factors for farmer adoption are pro-actively imbedded in the programme (section 6.1).

Recommendation 8: that the criteria for stop-go decisions be clearly defined in advance of decisions in the annual plan (i.e. Section 1.5 on stop-go decisions in the next year) and that consultation with independent experts (if any) be disclosed in the stop-go justification (section 6.2).

Recommendation 9: That capability planning should be consolidated and upgraded to a stand-alone section in reporting with the same status as the financial plan (section 6.3).

Recommendation 10: That the PSG gives consideration to streamlined reporting to reduce repetition while providing sufficient information on progress for MPI to monitor the performance of the programme (section 7.1).

Recommendation 11: That a spillover benefits report be a new section in the annual plan that can potentially include benefits to-date, benefits expected over next 12 months, benefits forecast for the remainder of the project and benefits beyond that (section 7.2).

Recommendation 12: That a financial snapshot be presented in the summary section of the annual plan that illustrates the financial impact of changes in project milestones and that the timeframe in the project milestone map be changed from a calendar year to a fiscal year i.e. ending 30 June (section 7.3).

**Table 4: Recommendations on reporting**

| Recommendation                               | Annual plan and report                        | Quarterly report     |
|--|---|----------------------|
| <b>1 Baseline indicators</b>                 | Schedule 5                                    | Section 13 (Metrics) |
| <b>5 Expanded/updated IP Register</b>        | Section 5                                     | Q2 reports (Oct-Dec) |
| <b>7 Commercialisation activities</b>        | New section                                   | New section          |
| <b>8 Criteria for stop-go decisions</b>      | Section 1.5 (stop-go decisions in year ahead) | -                    |
| <b>9 Capability plan</b>                     | Consolidate into new section                  | Updates (if any)     |
| <b>10 Streamlining</b>                       | Governance focus                              | Reduce repetition    |
| <b>11 Spillover benefits</b>                 | New section                                   | -                    |
| <b>12 Financial snapshot and fiscal year</b> | Summary section                               | -                    |

Remaining recommendations unrelated to reporting are brought together below:

Recommendation 2: that Management consider making the case to MPI for further funding to allow more similarly aligned discovery research under Project 3 (section 4.1)

Recommendation 3: that a stop-go decision of Project 1 is delayed until the results of the current laboratory trials are known (section 4.1)

Recommendation 4: that in addition to baseline data, information be collected so that a realistic CBA can be conducted prior to or as part of the 2017 independent review (section 5.1)

Recommendation 6: That the Industry Parties formally raise contractual issues relating to the commercialisation terms and resolve with MPI sooner rather than later (section 5.3).

## References

Cooper, R., and E. Kleinschmidt 2007. Winning businesses in product development: The critical success factors, Research Technology Management, May-June 2007, Industrial Research Institute Inc.

NZIER 2014. Economic contribution of PGP. A cost benefit analysis of potential impacts. A report to the Ministry for Primary Industries, May 2014.