

Successfully taking new products to market:

A case study – Grasslanz Technology Ltd

John Caradus and Jenn James

Grasslanz Technology Ltd, PB 11008, Palmerston North 4442

Grasslanz Technology Limited is a plant technology provider - its products are primarily proprietary plant varieties and other technologies delivered through seed to the end user - farmers. Grasslanz, a wholly owned subsidiary of AgResearch Ltd, invests in applied research and development (R&D), the outputs from which are licensed to production and marketing companies for sale. It employs neither science nor marketing capability. It establishes alliances with seed companies to co-invest and then most often exclusively licenses the resulting products for production and sale.

Grasslanz specialises in developing proprietary forage varieties and other forage technologies, such as novel fungal endophytes that can be inoculated into ryegrasses and fescues. Grasslanz's product portfolio is based around traditional temperate plant species, namely perennial, Italian and hybrid ryegrasses, tall fescues and white and red clovers, but also bents, bromes, herbs and many others.

Grasslanz, while owned by AgResearch, has the freedom to invest in both public and private research. Investment can be made wherever it expects to obtain the best return in terms of an innovative technology or product that is fit for purpose. However, AgResearch is the preferred R&D provider and receives more than 70% of total R&D investment made by Grasslanz Technology. The majority of Grasslanz plant varieties have been bred out of AgResearch.

Grasslanz develops strong commercial alliances to maintain a channel to market for its plant technologies. Delivery to the ultimate customer, the farmer, is achieved through production and sale of seed by head licensee companies. These companies are based primarily in New Zealand but do include businesses in Australia, USA and Europe. Ironically some companies that are a competitive threat in some technologies are valued customers for other innovations. Grasslanz also manages funding in joint R&D investment programmes on behalf of other R&D investment agencies and commercial companies.

Business model

The Grasslanz Technology business model (Figure 1) is a six step process leading from the identification of a product concept to the product's commercial launch by a seed company partner:

1. Identifying market opportunities, through either market 'pull' or research 'push'
 - Fact finding visit to the market
 - Desk top study/analysis
 - Contract consultants to assess the opportunity
2. Determining the market entry strategy and engage investors/alliances
 - Analyse market opportunities relative to market size and time to market
 - Analyse R&D capability and cost and compare with market opportunity
 - Identify, confirm and involve a commercial partner.
3. Contracting and managing R&D
 - Project managed by milestones and objectives; quarterly and annual reporting
 - Develop and manage the R&D budget
4. Protect intellectual property (IP) and brand

All or some of the following are used depending on product and market to ensure the exclusive use and protection of technologies for licensees in key forage markets. Our ability to secure this Intellectual Property protection makes it more attractive for companies to license our technologies.

 - Withholding publication by the R&D provider of the discovery until IP status is secure
 - Patents – of inventions that are unique, functional and commercially viable.
 -
 - Trade Marks – of brands that are then used by head licensees
 - Plant Variety Rights – protects plant cultivars for exclusive use by head licensees.
5. Deliver technology through nucleus seed to commercial partner

Grasslanz Technology undertakes the first high grade large scale nucleus seed production of varieties. This is then on sold to the head licensee company for commercial seed production.
6. Administer licenses and product stewardship in the market place
 - Execute licence agreement and agree on royalty returns to Grasslanz with the commercial partner
 - Support commercial partner in the market place with marketing information, industry training, and information to assist with product launch, and management of the new product/technology in the market place
 - Assist in the product launch.

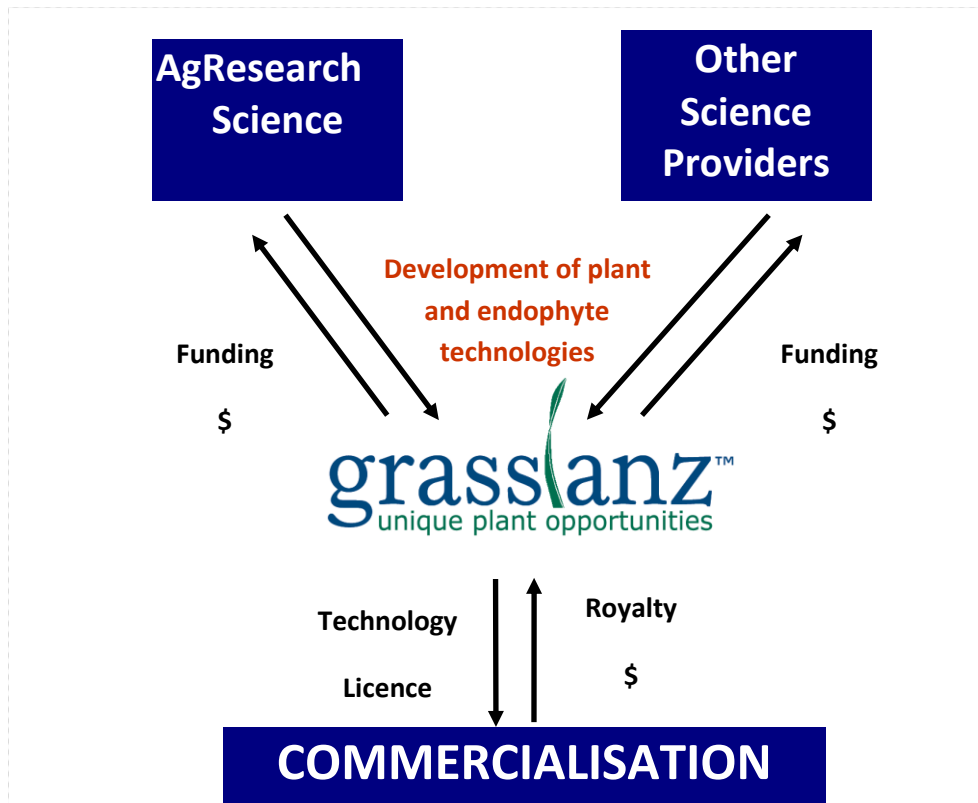


Figure1 - Grasslanz Technology Limited business model

Grasslanz effectively manages a range of national and international customers. Customer management is matched to the customer segment:

(i) Science customers (R&D providers we invest in)

- From project conception, a science plan is developed in consultation with the provider clearly identifying milestones and timeframes for stop/go decisions.
- Written milestone and quarterly reports are required to formally monitor progress.
- Quarterly face to face review meetings of larger R&D projects allows researchers and Grasslanz to contribute feedback and suggestions on direction, process and technical expertise.
- Open communication is encouraged with informal meetings conducted as required.

(ii) Commercial customers (we license to)

- Regular formal and informal interaction to discuss new opportunities for joint product development.

- Formal biannual Head Licensee (face to face) review meetings provide information on volume and royalty return against budgets and set sales projections for coming seasons.
- Additional meetings analyse what is known about the markets and discuss commercialisation strategies.
- Develop product life cycles with customer to better manage the introduction and exiting of products.
- Primarily we work with our customers to meet their customer's needs.

(iii) Co-investor customers (collaborators, funding agencies, industry organisations, commercial entities)

- R&D investment is focused to align with market potential and investor interest.
- When an industry need is identified a project concept sketch is developed in consultation with a potential co-investor and appropriate researchers identified.
- A project management team with members from all entities involved meet formally at least annually, and review the research programme with a presentation from the science provider.
- A free exchange of information is maintained through provision of milestone, quarterly reports, minutes and teleconference meetings.

Grasslanz Technology also has a significant 30:70 joint venture with PGG Wrightson Seeds Limited – Grasslands Innovation Ltd. Established in the 2006/07 season the objective of this long term strategic joint venture is to discover, develop and market forage innovations nationally and internationally exclusively for PGG Wrightson Seeds Limited.

Intellectual property (IP) protection

Intellectual property protection is at the core of the Grasslanz business success , A full time IP manager is employed to ensure appropriate protection of its commercially important IP occurs through Plant Variety Rights, patents and trademarks. This is managed through:

- Key liaisons between legal advisors and breeders/inventors in the development of new applications;
- Constant monitoring of new IP of interest from potential competitors and collaborators; and
- Interaction with plant breeding governing authorities (e.g. NZPVR office, IP Australia, EU, USA)

The key goals of Grasslanz IP strategy are to:

1. Protect and extend Grasslanz industry and commercial leadership in proprietary fungal endophytes and forage cultivars.
2. Generate revenue via licensing protected intellectual property rights.
3. Allow establishment of a gene trait business, and continued development of novel fungal endophytes and forage cultivars

4. Develop strategic alliances to expand ownership of a broad pipeline of plant technologies.
5. Enable Grasslanz to gain a royalty position in fields of use or geography outside core business.
6. Exploit our Intellectual Property rights.
7. Interact with commercial decision makers to ensure correct IP is utilised and maximised

Grasslanz IP strategy is based on:

- Establishing an Intellectual Property (IP) estate that can be used to leverage alliances with other companies
- Encouraging broad claims to IP rights that maximise utility in offering field-of-use licenses outside primary field of interest and helps attract alliances to share R&D costs and allows for cross licensing any improvements
- Identifying IP that can be commercialised and obtain access through ownership or license

To achieve this strategy Grasslanz follows 4 steps:

1. **Assess** the opportunity, potential financial and strategic benefits and value of the IP. Is it novel, can it be protected, will there be freedom to operate and is there an obvious path to market?
2. **Capture** the IP to ensure Grasslanz has freedom to operate and to prevent it unknowingly entering the public domain, and ensure confidentiality is maintained.
3. **Protect** the IP in a way that maximises its commercial potential. Most common types of protection include:
 - Patent
 - Trade Mark
 - Plant Variety Right
 - Trade Secret

If the patent option is plausible determine that exemplification of invention can be achieved 12 months from filing date.

4. **Exploit** the IP as quickly as possible to ensure a return on investment within the term of the protection period (e.g. 20 years for patents). Determine based on market data
 - the countries where protection needs to be been obtained
 - Is licensing or selling the technology to another party a sensible option?
 - Risks associated with sales into territories were we do not have IP protection

AgResearch has a long history of high quality plant variety research and development. Its PVR portfolio (now managed by Grasslanz) dates back to the first

PVR application filed in 1985 with the New Zealand Plant Variety Rights Office and since then have applied and been granted hundreds of PVRs, many which have exploited their full 20 year protection period. This security of IP protection has enabled Grasslanz to demand an appropriate royalty on proprietary seed sold to ensure 'adequate' returns on investment and into future R & D

AgResearch/Grasslanz's successful proprietary varieties enable higher monetary return to be invested in other projects – ones which serve farmers directly and generate an effective cycle of providing funding to develop highly innovative products for the agricultural industry which in turn help fund further projects.

Factors required for successful commercialisation

Grasslanz Technology when exploring new areas of business, that are for either an identified market opportunity or a solution for a problem in the market place, uses a number of methods to assess the viability of the project and product. These include desk-top studies/analysis, fact finding trips to the market place by senior staff, surveys, and use of consultants, especially for markets and/or technologies we have not been involved in previously. Information obtained using some or all of these methods are used to assess the following:

- Market opportunity (size and value)
- Grasslanz ability to fund and manage the delivery of the project (resources e.g. science capability, germplasm and appropriate technology)
- Cost of project compared with projected income from new product
- Do we have a commercial partner (i.e. path to market)
- Assess the potential life span of the new technology.

For successful commercialisation the following are required -

- Innovation – the invention of a novel technology or product
- Benefit to cost ratio – high return on investment
- Protection of the 'invention'
- Path to market – who will sell it, who will buy it?
- Time to market
- Size of potential market
- Market dynamics – acceptance of value added products

Case studies – successfully commercialised innovations

The novel endophyte story begins more than 20 years ago when Grasslanz primary R & D providers discovered the cause of ryegrass staggers and heat stress on animals grazing perennial ryegrass throughout New Zealand. They showed that the naturally occurring wild-type endophyte (also known as standard endophyte) in ryegrass pastures significantly improves persistence through protection from insect pests and from overgrazing by stock but also adversely affects stock health and performance.

This discovery resulted in the search for, and identification of new endophyte strains (e.g. AR1) that can be introduced into grasses to maintain pasture persistence and production without the problems associated with animal health.

These 'novel' endophytes were developed for a range of commercial ryegrass cultivars available to pastoral farmers.

Patents, trademarks and plant variety rights protect the intellectual property surrounding these proprietary endophytes, which strengthens confidence within our co-investors and provides licensees a solid platform in the market place.

As a result of this significant discovery, New Zealand pastoral scientists and farmers became world leaders in the development and uptake of endophyte technology. The leading edge knowledge and skills helped facilitate the establishment of our primary plant technology products overseas.

Surveys undertaken with farmers and in conjunction with agricultural research stations across USA, Europe and South America identified similar pastoral issues to New Zealand. These findings highlighted the need for a comparable product, particularly for tall fescue, the primary forage grass grown in USA. The necessity for non-toxic endophyte-containing tall fescue pastures were identified in USA through scientific research and contact with key industry stakeholders.

Field trials and extensive animal safety trials conducted to compare our products with the current situation clearly demonstrated the superiority of our novel strains not only in animal health but in pasture health and persistence.

Key factors for successfully commercialising products

For products aimed at the New Zealand and global market:

- Identify your commercialising partner carefully
- Understand the market into which you are selling
- Use the best R&D capability
- Secure intellectual property
- Keep focused on the product output
- Have good data to back your claims
- It may take longer than you think
- Remain intimately involved with the commercialising company
- It is possible and can be very successful