Which perennial ryegrass to sow?

An investigation into how dairy farmers make decisions about which perennial ryegrass variety to sow

Michaela Soper

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A project for Phase 2, Kellogg Rural Leadership Programme 2013

Michaela Soper

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EXECUTIVE SUMMARY

- This study stems from the common farmer complaint, that there are too many perennial ryegrass options on the market, this number conservatively estimated at over 50, with a few and limited tools available to farmers to aid them with variety choice for their pasture renewal programme.

- A survey is conducted of 16 Dairy Women's Network Regional Group Convenors in semi-structured, conversational format and previous industry surveys were reviewed to provide insight into how decisions are made based on the limited resources.

- Predictions that farmers largely rely on 'people' sources to assist their decision making processes were confirmed. While not hypothesized, the information shared at farmer discussion groups and 'over-the-fence' style conversations ranked highly as a valued information source.

- Information gathered and the 'Diffusion of Innovations' model of Rogers (5th Edition, 2003) was used to create a matrix of predicted response to methods of transferring information about perennial ryegrass variety by farmer segment to provide useful paths for a Seed Company to target the specific groups.

INTRODUCTION

PROJECT PURPOSE

The need for this study stems from the common farmer complaint, that there are too many perennial ryegrass options on the market with a lack of suitable information available to assist them in making an informed decision to suit their needs.

The complexity of choice is compounded by the multiple endophyte options now available and the lack of reliable, useful tools to help farmers choose which varieties to sow in their pastures. Furthermore, farmers are exhibiting a lack of confidence in recently bred varieties and whether correct or perceived, their observations are that their older pastures are persisting better than the new pastures.

This project seeks to identify the common tools that farmers currently use to select the perennial ryegrass variety to sow and provide paths to transfer specific information to the different categories of farmer, according to their attitudes towards innovation and change.

PERENNIAL RYEGRASS VARIETIES

Conservatively, there are currently over 50 different options available to farmers in New Zealand for selecting a perennial ryegrass/endophyte combination. Some varieties are sold with multiple endophyte options and it is now widely recognised that when these are trialled or studied, they must be viewed as separate entries. As Easton *et al.* recognised at the 2011 Pasture Persistence Symposium 'it is now understood that ryegrass genotype:endophyte strain differences exist, and can be large, adding complexity to the process.'

The majority of proprietary seed companies have multiple perennial ryegrass varieties on the market at any one time.

For example, the seed company Agricom currently sell 8 perennial ryegrass varieties, combine this with the endophyte options they are available in and the number becomes 19 perennial ryegrass variety/endophyte combinations:

One50 AR1	Commando AR37
One 50 AR37	Commando AR1
One50 LE	Commando LE
Samson AR37	Kingston LE
Samson AR1	Kingston SE
Samson LE	Halo AR37
Samson SE	Halo AR1
Request AR1	Prospect AR37
Request AR37	Prospect AR1
Hillary AR1	

Sub-Categories of perennial ryegrass

To help divide and classify the large number of perennial ryegrasses on the market, the seed companies frequently discuss their varieties in terms of endophyte type, flowering time and ploidy; these can be considered 'sub-categories of perennial ryegrass'. In the author's opinion, the

importance of these categories is extrapolated beyond their worth. For example, the difference between modern tetraploids and diploids is now much less than when the first tetraploids were introduced to the market, and nowadays many diploids test similar or higher in terms of nutritive value than the tetraploids. The sub-category of flowering time for the most part provides only days difference between the growth patterns of the varieties, yet is promoted as a major influencing factor when deciding which variety to sow. Furthermore, the author believes that the message delivered to farmers surrounding endophyte is in some ways oversimplified and not entirely based on definite research.

Seed companies also market grasses based on other traits; for example 'High Sugar Grasses', tiller density and low aftermath heading (AMH), though these are not quantitatively measured.

CURRENT DECISION MAKING TOOLS AVAILABLE TO FARMERS

There are few and limited tools available to farmers to aid them with variety choice when selecting a perennial ryegrass for their pasture renewal programme. No one source provides comparative information, nor is there a comprehensive, truly independent source of information accessible to farmers. The current tools available are listed, and the advantages and disadvantages of each listed:

National Forage Variety Trials (NFVT)

The NFVT system was set up by the New Zealand Plant Breeding and Research Association Inc. (NZPBRA), a society established to promote plant breeding and research in New Zealand. Trials commenced in 1991 and continue to the present day.

Pros	Cons
A forum for seed companies to discuss technical issues	Currently focussed on perennial ryegrass, italian ryegrass, whereas previously also included clovers, tall fescue, cocksfoot, etc
Data is subjected to heavy scrutiny prior to 'sign off'	Until recently have only measured yield
	Trials are conducted using pure swards only
	Only run for 3 years
	Run to 'best practise' management
	Data is not easily accessed by public
	Engagement from Seed Companies over the years has been sporadic and waning

DairyNZ Forage Value Index (FVI)

Launched in 2012 as a joint project between DairyNZ and the NZPBRA, the FVI is an online tool to select cultivars estimated to maximise profit for seasonal dry matter production. It claims to be 'the independent source of Forage Value Indices and seasonal dry matter performance values for perennial ryegrass cultivars in New Zealand'.

Pros	Cons
Makes use of data collected over many years from NFVT	Results are currently based on yield only
Is the first profit based index for comparing cultivars	The current structure indicates dollar values that grouped by number of entries rather than statistical reasoning
	Focus on perennial ryegrass

Seed Company Marketing Material - Brochures, flyers, Websites

Individual seed companies each produce different marketing material, some of which contains trial data or research from their own company run trials. For those companies in the NZPBRA, they are subject to a Code of Ethics and, if a breach of this occurs, a Conflict Resolution Process. Of course, all companies producing their own marketing material and claims are subject to New Zealand legislation surround advertising of products.

Pros	Cons
Those companies in the NZPBRA are subject to a Code of Ethics and a Conflict Resolution Process	Trial data may not be strongly scientific
Raises awareness of new varieties	Not all companies in the NZPBRA group
Share other farmers success stories	Only show 'good' results
	Conflicting results in different material

Industry Professionals

The range of industry professionals that a farmer may approach for advice of perennial ryegrass choice spans from the Store Front personal at a Rural Retailer to a consultant with experience from other clients to a dedicated Seed Specialist attached to a Retailer that has undergone training in the field and has contact with the seed companies.

Pros	Cons
Are the point of contact for farmers	Have varied level of technical knowledge
	Often opinions based on 'one-off' observations
	Influenced by retailer/seed company relationships

Books

There are limited printed resources on the varieties of a particular species. One example of this is the book published under the Grasslands Association titled 'Pasture and Forage Plants for New Zealand' (Stewart and Charlton, 2003) which gives a list of the varieties available at the time of printing. The retailer CRT Farmlands produces a booklet biannually with a consolidated list of all varieties of forage species available at the time of print.

Pros	Cons
Inclusive of all varieties (information provided by each of the Seed Companies)	Influenced by the company views of those selected industry participants/authors
	Not longer current once it goes to print

Scientific Papers

There have been several papers published to date comparing features and attributes of perennial ryegrasses. Kerr *et al*., (2012) produced a paper 'Evaluating perennial ryegrass cultivars: improving testing', similar to that of the paper by Easton *et al*., (2001), (including many of the same authors) where data from the NFVT trialling system was summarised. Edwards and Byrant (2010) produced a paper for the 2010 South Island Dairy Event titled 'What Perennial Ryegrass Should You Sow?' which discussed the categories of perennial ryegrass, but didn't attempt to make recommendations.

Pros	Cons
Peer reviewed	Not readily available to farmers
	Not always entirely independent

DECISION MAKING TOOLS USED INTERNATIONALLY

The problems farmers face with having so many perennial ryegrasses to choose from is not a problem unique to New Zealand. For example, in France the number of perennial ryegrasses available to farmers is over 150! More astounding is that endophyte is *not* commonly used in Europe and therefore does not multiply the number of varieties. Some of this number of varieties can be differentiated and categorised by the wider spread of heading dates that are suited to the environment in Europe. Prior to being sold, all varieties must undergo testing through an independent authority.

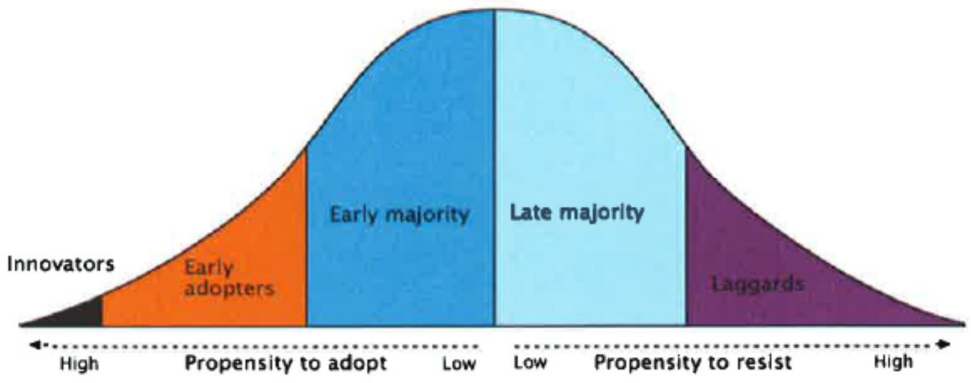
Registration and National Listing

The registration of new varieties is statutory under EU legislation. To gain 'Registration' (in Europe) and to be entered on the National List and be sold (in the UK) an entry must comply with two components, DUS (Distinctness, Uniformity and Stability) and VCU (Value Cultivation and Use). For DUS every aspect of ryegrass characterisation is taken, examples include growth habit, leaf colour, spikelet type and length and further detailed specifics such as basal glume length and internodal length. For VCU, varieties enter multiple field trials, so as to encompass differing climatic and soil types. Yield, quality, persistency and disease are all reviewed and a judgement is made whether the varieties have an economic benefit and then go forward to National Listing.

DIFFUSION OF INNOVATIONS

The 'Diffusion of Innovations' model (Rogers, 5th Edition, 2003) seeks to explain how innovations are taken up in a population. A professor of rural sociology, Rogers states that diffusion is the process by which an innovation is communicated through certain channels over time among the members of a social system. The categories of adopters that Rogers created are: innovators, early adopters, early majority, late majority, and laggards (Figure 1). The model is highly subject to the type of adopters and innovation-decision process.

Figure 1: Five Categories of a population, based on their propensity to adopt a specific innovation (Rogers, 5th Edition, 2003).



When considering how farmers make decisions around pasture renewal and species or variety choice, this model is a useful tool for segmenting farmers as to their attitudes and information sources. Furthermore, it could be developed into a tool used by the marketer of a product to 'tailor' marketing and sales strategies. The groups are further defined by Rogers (2003):

Table 1: Definition of Categories within the 'Diffusion of Innovations' model (Rogers, 5th Edition, 2003)

Adopter category	Definition
Innovators	Innovators are the first individuals to adopt an innovation. Innovators are willing to take risks, youngest in age, have the highest social class, have great financial liquidity, are very social and have closest contact to scientific sources and interaction with other innovators. Risk tolerance has them adopting technologies which may ultimately fail. Financial resources help absorb these failures.
Early adopters	This is the second fastest category of individuals who adopt an innovation. Early adopters are typically younger in age, have more financial lucidity, advanced education, and are more socially forward. More discrete in adoption choices than innovators. Realize that sensible choice of adoption will help them maintain central communication position.
Early Majority	Individuals in this category adopt an innovation after a varying degree of time. This time of adoption is significantly longer than the innovators and early adopters. Early Majority tend to be slower in the adoption process and have good contact with early adopters.
Late Majority	Individuals in this category will adopt an innovation after the average member of the society. These individuals approach an innovation with a high degree of scepticism and after the majority of society has adopted the innovation. Late Majority are typically sceptical about an innovation, very little financial lucidity, in contact with others in late majority and early majority.
Laggards	Individuals in this category are the last to adopt an innovation. Unlike some of the previous categories. These individuals typically have an aversion to change-agents and tend to be advanced in age. Laggards typically tend to be focused on "traditions", likely to have lowest social status, lowest financial fluidity, be oldest of all other adopters, in contact with only family and close friends.

Roger's (2003) even suggests notional percentages for each segment: 2.5% of any 'group' are likely to be Innovators, 13.5% are Early Adopters, 34% Early Majority, 34% Late Majority and 16% are of any group are predicted to be Laggards when it comes to adopting a new technology or innovation.

METHODS

A preliminary search for information using library and database searching techniques yielded little useful information on the subject of decision making around variety choice for pasture renewal. No previous work had been published for the public audience. To answer such specific questions, it was decided that a survey be conducted.

SURVEY OF DAIRY WOMEN'S NETWORK

The DWN Survey Group

The Dairy Women's Network (DWN) is a non-for-profit group operating in New Zealand whose central objectives are to develop and educate women and to add value to the business of dairying. The number of members are divided regionally and each group managed by a 'Regional Group Convenor'. There are 17 'regions' for the North Island, supported by a North Island Convenor Coordinator, and 13 South Island groups, supported by a South Island Convenor Coordinator. The contact details for these Regional Group Convenors (available on the DWN website) became the contact list for the survey for this project.

Survey Method

Sixteen telephone interviews were conducted with DWN Regional Group Convenors. Telephone interviews were chosen as the preferred method of data collection and the style of interview was semi-structured, in order to draw out the information in a more conversational form.

The survey was conducted between July and October of 2013, each participant would receive a preliminary phone call outlining the project and expectations of the survey participant, while checking that they were suitable to answer the types of questions, i.e. that they had the authority and experience in selecting pasture mixes or varieties for pasture renewal. During the preliminary phone call, an email address would be obtained and a further explanation of the project emailed, including 12 Questions, designed to categorise the farmer into Roger's Diffusion of Innovations (5th Edition, 2003) groups (see Appendix 1). Also, during this preliminary phone call, a time was agreed upon for the follow up phone call, and an intimation that the next phone call would be 5 to 10 minutes long and a discussion around the last time they renovated a pasture.

Follow up, conversational-style phone calls took an average of 12 minutes. For the most part, participants were very willing to help and rapport was easily formed, despite the survey occurring at a busy time of year for the group (calving, feed conservation). Interest in the project as a whole by the participants was high and several participants had questions about the nature of the Kellogg Rural Leadership programme.

The interviews were concluded with all participants receiving a commitment that any information provided would remain confidential and no names or farm details would be reported.

Geographical Region

The original aim of the survey was to gather information from 30 survey participants across all key dairying regions of the country (~15 from each island). After conducting 10 surveys it became apparent that there were some key themes arising and that it was not necessary to continue on to achieve 30 responses. The survey essentially became a survey of North Island DWN Regional Group Convenors' farming practises. The mean number of cows milked on these properties was 366 (with the exception of two farmers, one who milked 1900 cows, and the second who milked 1200 cows across two farms).

INDUSTRY INFORMATION

In preparing to conduct the DWN survey, it was discovered that there have been other survey's carried out to answer similar questions on broader scale topic of pasture renewal. Access was gained to The Perplexed Pasture Renewal Practitioners: The Perennial Problem (2011) report prepared by Sue Peoples of AgResearch, on behalf of FRST and DairyNZ. The project uses the findings from both qualitative and quantitative surveys to explore the adoption characteristics of pasture renewal technologies from the farmer's perspective and assesses if those adoption levels can be increased.

Further to this, a report prepared by Steven Kelly and Erin Smith on behalf of DairyNZ 'Pasture renewal in the Waikato and Bay of Plenty Regions (2010)' was obtained. This report was designed to identify barriers to adoption of pasture renewal in a specific dairying region of New Zealand.

The third survey was commissioned by the Pasture Renewal Charitable Trust to collate data on the financial benefits of renewing pasture regularly and to conduct market research on the benefits and barriers to adoption. While this report contains useful information, it is moderated by the age of the document, it now being over 5 years since the survey was carried out. When considering perennial ryegrass variety choice as an aspect of pasture renewal, it is an area of high turnover (new varieties being released continually), which may render some of the information in this report unusable.

HYPOTHESIS & ASSUMPTIONS

Survey of Dairy Women's Network

It is predicted that the majority of the group surveyed will likely fall into the Early Adopter or Early Majority segments of the 'Diffusion of Innovations' Model. I believe it is more likely that those involved in a group such as the Dairy Women's Network are likely to be more motivated and willing to learn than those in the Laggard or Late Majority segments. My prediction is that few if any of the survey group will fall into the Innovator segment, as these people are likely to be heavily time constrained and less likely to be part of a group.

It is predicted that the group surveyed (Early Adopters) are likely to be disappointed with the range of decision making tools available to them. It is likely that this group are going to be open to new ideas and change and the most vocal group about their successes.

It is not expected that any regional differences in how the survey participants make their decisions about which perennial ryegrass to sow will arise.

Decision Making Tools

It is predicted that previous surveys and literature produced on the subject of pasture renewal will highlight the confusion and at times contradictory information available around variety choice for perennial ryegrasses and endophytes.

For the most part, it is expected that farmers, even in the DWN Early Adopter or Early Majority groups will still largely depend on an industry 'professional' (retailer or consultant) to assist with variety choice of which perennial ryegrass to sow as the major component of a pasture mix. While it is predicted that the Early or Late Majority would accept this recommendation without question, it is expected that the Early Adopter group is likely to conduct their own research on the recommendation before going ahead with it, or challenging it. It is predicted that web sources are going to be strongly favoured by this group, over printed media as the method for carrying out 'follow up' research on a recommended variety.

It is expected that field days or events are likely to draw a crowd, mostly of the Early Adopter/ Early Majority/ Late Majority groups and that these are recognised as a source of information to assist choices around variety choice.

It is predicted that those sources of information highlighted as not of particular use to the decision-making farmer will be brochures, scientific papers, the National Forage Variety Trialling system and the DairyNZ Forage Value Index. It is not expected to find that social media is emphasised as a likely tool for supporting decision making processes now or in the near future.

RESULTS

SURVEY RESULTS BY DIFFUSION OF INNOVATIONS GROUP

Of those 16 farmers surveyed as part of the DWN survey, almost all fell into the category of Early Adopter (following analysis of answers to the standard set of questions asked of participants, see Appendix 1). Two participants (12.5%) were categorised as being in the Late Majority group, but for the most part, this group are considered to be progressive farmers willing to try new ideas or innovations.

When considering other survey results, it is likely that these larger survey groups contain a spread across the segments, similar to the bell-shaped curve presented in Figure 1.

IS THE PROBLEM REAL OR PERCEIVED?

The DWN phone survey highlighted that farmers believe there to be almost too much information available, and that the quality of this information is generally poor. Their exact understanding of endophytes and what they do in terms of making choices about endophytes was unclear. A common theme of mis-trust of information came through.

> Farmer comment:
>
> 'There are so many products that we get marketed at us. It's impossible to understand all that stuff, especially the endophyte stuff. It's all getting too complicated... '
>
> Farmer comment:
>
> 'The trouble is they've all got brand names and names that are all familiar or similar and you've actually got to sit down and really think about it before you actually do it.'

The DairyNZ and FRST funded project, 'Perplexed Pasture Renewal Practitioners: The Perennial Problem (2011), asked the participants to rate their level of confidence in selecting a suitable cultivar and endophyte for their property. The results varied, with 61% of participants being confident to varying degrees with their ability to select the most suitable endophyte (14% of those being very confident). Similarly, the survey found 59% of farmers to be confident to some degree to make the right decision in selecting the right cultivar (with 8% being very confident).

A common comment from participants in the DWN phone survey was around modern varieties being disappointing, especially in the realm of persistence.

> Farmer comment:
>
> 'As cockies we spend all this money but we just don't know what the seed is going to produce!'

This could be linked to expectations, as the 2011 DairyNZ and FRST project found, that 34% of participants expect their new pastures to perform between 5 – 9 years; 42% expect them to perform between 10 – 14 years and 8% expect them to last over 15 years.

The DairyNZ survey of Pasture Renewal in the Waikato and Bay of Plenty Regions (2010) highlighted that there is a level of confusion as to what the word 'cultivar' means. Specifically, close to 10% of survey recipients (776 participants) nominated an endophyte when they were asked which 'cultivar' they were least satisfied with.

Similarly, the survey commissioned for the Pasture Renewal Charitable Trust 'Understanding Pasture Renewal in New Zealand' (2008) indicated that farmers were generally confused about cultivars and endophytes. The survey found that farmers didn't know how to choose cultivars and they considered the printed information they received to be both confusing and at times contradictory.

> Farmer comment:
> 'I know when we were using Banquet we were getting good results out of that but then they changed to Banquet II and what the difference in the seed is I don't know but we haven't had any better results since!'.

INFORMATION SOURCES

In the survey conducted on behalf of the Pasture Renewal Charitable Trust ('Understanding Pasture Renewal in New Zealand, 2008), phone survey respondents were asked to identify their pasture renewal information sources and to rate the value of that information on a scale of 1 to 5, where 1 was poor and 5 was excellent (Table 2).

Table 2: Sources of information on pasture renewal and their value (on a scale of 1 – 5, where 1 = poor and 5 = excellent)
SOURCE: Understanding Pasture Renewal in New Zealand (2008)

Information Source	**n**	**%**	**Mean value score**
Reseller/Local merchant rep	337	35	4
Farming Magazines	256	27	3.8
Mail (pamphlets, brochures)	237	25	3.6
Seed company	186	19	3.9
Local farmers	126	13	3.8
Consultant	122	13	4
Local fertiliser company rep	97	10	4
Research Institute	43	5	4.2
Discussion Group	24	3	4
Internet	21	2	3.6
Monitor farm	19	2	4.2
Contractors	13	1	3.8
Other	79	8	3.7
TOTAL	**962**		

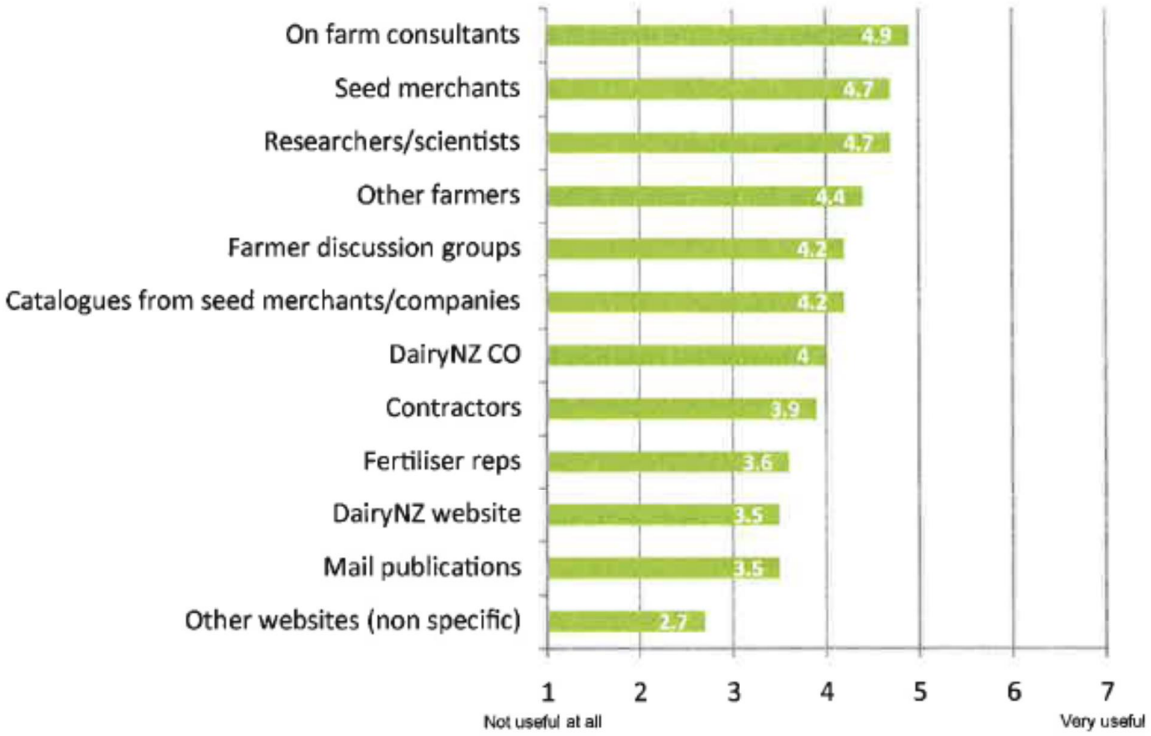
Resellers/local merchant company reps were a popular source of information and had a good rating. Farming magazines and pamphlets and brochures received through the mail were also popular

information sources, however these sources had slightly less value. Research institutes and monitor farms were rated well.

Although this survey covered all types of farming, there was little variation in information source across different farm types. Dairy farmers tended to value research institutes, local fertiliser company representatives and monitor farmers higher than other sources of information.

The survey conducted of Waikato and Bay of Plenty farmers (Pasture Renewal in the Waikato and Bay of Plenty Regions, 2010) asked respondents to rank the information sources they found useful, using a scale of 1 to 7, where 1 is not useful at all, to 7 being very useful (Figure 2).

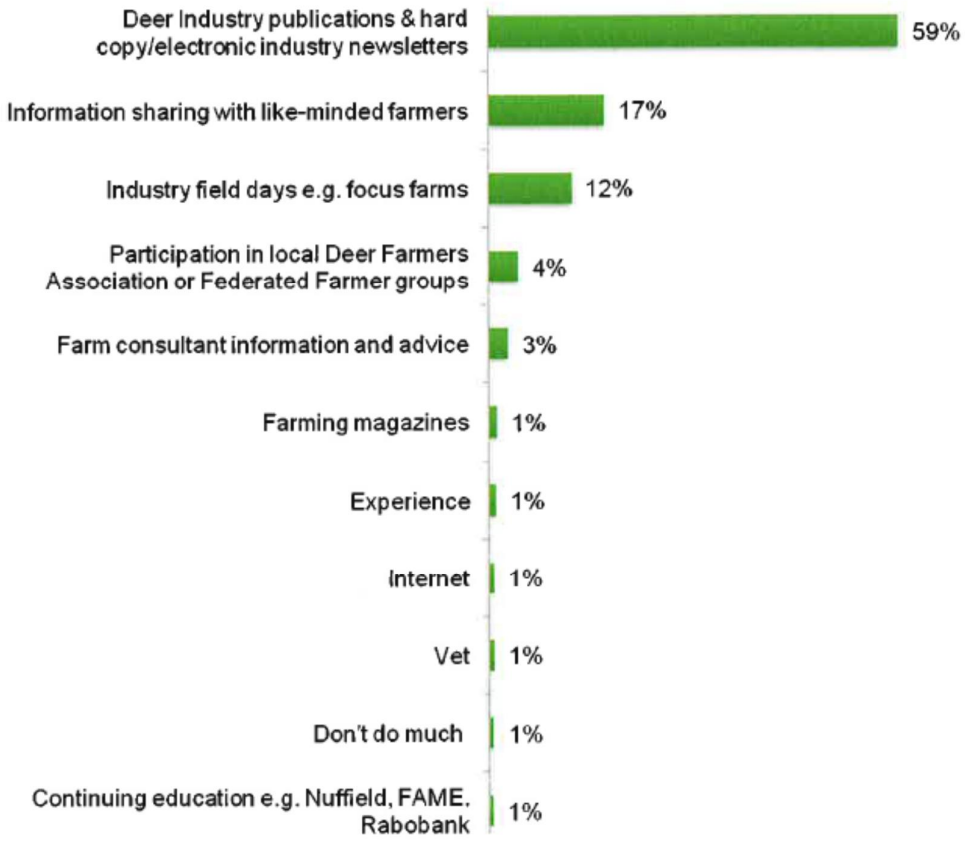
Figure 2: Usefulness of information sources related to pasture renewal
SOURCE: Pasture Renewal in the Waikato and Bay of Plenty Regions (2010)



The average scores for the given information suggest that no information sources were seen as particularly useful, with almost all of them falling between 3 and 5. The information source rated the most useful on average was on-farm consultants (4.9), followed by seed merchants and researchers/scientists (both 4.7). The sources rated least useful were Other websites (non-specific) (2.7) and mail publications (3.5).

Research conducted in 2012 for the Deer Industry New Zealand by Cinta Research (Deer Industry New Zealand Achieving Practice Change, 2012) showed that for the deer industry, the majority of producers (59%) keep their knowledge up to date via industry publications (Figure 3).

FIGURE 3: Ways in which Producers keep their Farming Knowledge and Skills up to date
SOURCE: Deer Industry New Zealand: Achieving Practice Change (2012)



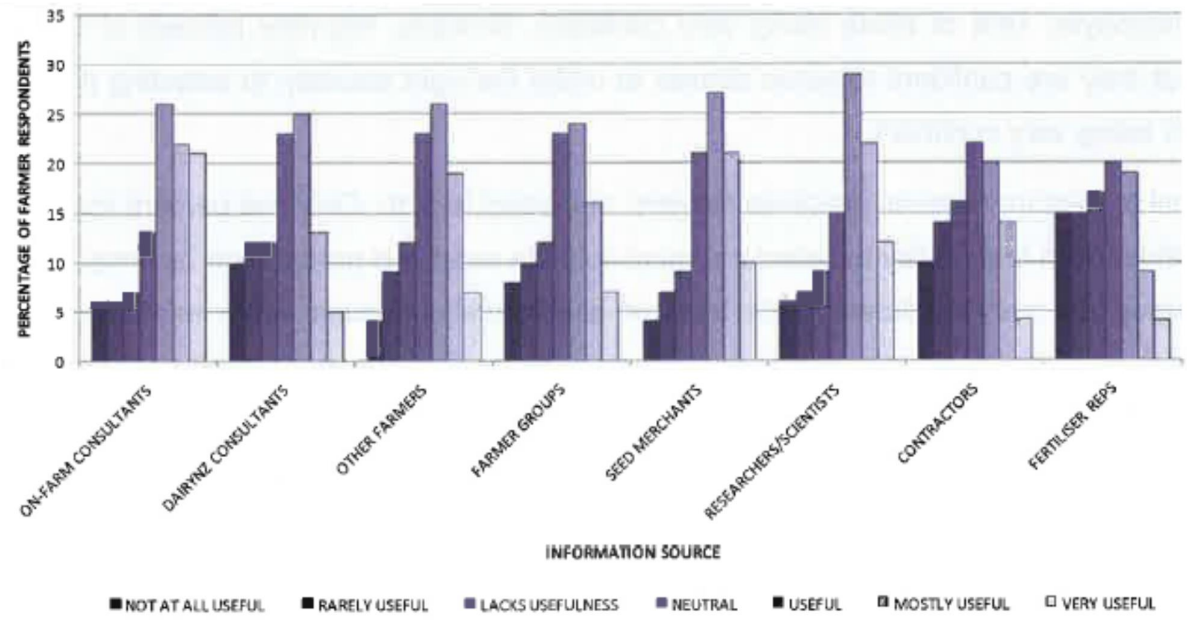
The Deer Industry survey suggests that deer farmers value industry professionals much less than other farming groups, although all surveys suggest that gaining knowledge from other farmers is a valuable source of information.

PEOPLE

The survey conducted of DWN co-ordinators showed that farmer prefer to deal with people rather than printed material or web-based sources and highlighted farm consultants and retailers as being the most important people for advice around variety choice.

The 2011 DairyNZ and FRST survey attempted to rank the usefulness of people within the industry (See Figure 4). The survey found that farmers see the most useful people as on-farm consultants, 21% of participants viewed paying for their services as very useful and 69% of the total viewing them as useful to varying degrees.

Figure 4: Utilisation of information sources and its usefulness
SOURCE: Perplexed Pasture Renewal Practitioners: The Perennial Problem (Feb 2011)



Interestingly, 12% viewed researchers/scientists as very useful, ranking higher than Seed Merchants as a useful information source. At the other end of the very useful spectrum were the DNZ consulting officer (4.7% very useful), contractors (4.2%) and the fertiliser representatives (4%).

While Seed Merchants did not rank highly as a useful source of information in the 2011 Dairy NZ and FRST survey, for those participants in the DWN survey, retailer advice was the basis for the decision around variety choice, 63% of those surveyed based their decision on retailer advice. In most cases, retailer advice was always followed up with a search for more information, the secondary information source varied widely from internet search, to brochures and flyers, dairy industry magazines and experience from neighbours or own previous experiences.

> Farmer comment:
> 'If my RD1 rep recommends it, I'll sow it. If RD1 doesn't have it, it's not going to get a look-in'.

> Farmer comment:
> 'My seed retailer really blew their credibility a couple of years ago with Revolution and so now, I wouldn't take a recommendation from them again'.

> Farmer comment:
> 'I asked this retailer if he had any experience and he said that he had a lifestyle block and he based his arguments on five cows! He lost my respect!'

Similarly, the retailer has a strong influence on advising farmers which endophyte to sow. Of the DWN survey participants, 75% said they used the endophyte type that was instructed to them by their retailer. While most participants blindly sow what is recommended to them when it comes to

endophyte, one farmer was unsure of the benefits, saying 'I don't know if it works, that's just what I'm told'.

Farm consultants were also highlighted as an important source of information for those in the DWN survey group, with 25% of participants taking the advice of their farm consultant when it came to variety choice for their pasture mix.

Separate to the advice received from retailers and consultants, there was a strong inference that discussion groups and over the fence type conversations had strong influence on decision making. While it is expected that the group surveyed would be involved in discussion groups, that these group were mentioned so often was surprising.

One farmer mentioned that they had someone come to a discussion group and told them that AR37 was the 'only thing to combat black beetle', the argument must have been convincing, because the farmer now won't sow anything but AR37.

> Farmer comment:
> 'We've got a good network of neighbours, we look and talk about what's happening. Farmer's are naturally nosey people and keen an eye on what their neighbours are doing'.

PRINTED MEDIA, WEBSITES

With the exception of the Deer Industry Survey (2012), all other surveys, including that of the DWN showed that printed media rank poorly as a valued source of information on pasture renewal and variety options.

The respondents of the DairyNZ/FRST survey (2011) indicated the only printed source of any use are seed merchant catalogues, 46% indicating that they are useful to varying degrees; 7% of those noting they are very useful.

Magazines

These two sources, while not considered particularly useful, the Pasture Renewal Survey of the Waikato and Bay of Plenty Regions (2010) did offer some interesting feedback into the various publications which farmers use (Table 3).

Out of 80 respondents 47 found the Dairy Exporter a useful source when accessing information concerning pasture renewal.

Table 3: Responses from farmers when asked to specify Magazines or Newspapers they find useful when accessing information concerning pasture renewal.
SOURCE: Pasture Renewal in the Waikato and Bay of Plenty Regions (2010)

Magazines/newspapers	Number of Occurrences
Countrywide	1
Dairy Insight	1
NZ Farmer	1
Farmers Weekly	4
Rural News	4
Straight Furrow	5
RD1 Enrich Magazine	5
Dairyman	6
Dairying Today	6
Dairy Exporter	47
TOTAL	80

Mail-Outs

The DairyNZ/FRST survey (2011) found publications received via the mail are of little use with 20% responding that they are not at all useful, 32% of farmers finding any use in them at all.

> Farmer comment:
>
> 'I'm always weary of what comes through the mailbox because they're trying to sell a product'.

When queried about the fate of printed media, the response from the DWN group was varied, with 38% of participants admitting to throwing out the pamphlets or brochures without looking at them. A further 25% briefly look at brochures, but if nothing catches their eye, they are thrown out. The remaining 38% of the group study the brochures, even studying any data, but with a level of scepticism.

> Farmer comment:
>
> 'Agriseeds puts out all their stuff and Wrightsons put out all theirs and you can't compare the two… there's no common basis, and they're all saying theirs is the best'.

Also, several farmers raised that data produced by seed companies is largely done in Canterbury in 'easy conditions'.

> Farmer comment:
>
> 'The trouble is a lot of the trials are done in conditions that aren't really applicable because they're done in irrigated Canterbury pastures and don't have a lot of insect pressure'.

Websites

Web information sources fare a little better. The DairyNZ/FRST survey found that the DairyNZ website was still not seen as useful with 46% finding it not useful to any degree, 19% suggesting it is not useful at all. Only 29% of farmers found that it was of use; 2% very useful. Other websites fared worse with 66% of participants indicating that they are of no use. Only 20% of farmers found them to be of any use; 2% very useful.

When questioned about the DairyNZ Forage Value Index and the adoption of it as a tool to help in decision making, farmers in the DWN group were reluctant and unlikely to use it as a tool. 100% of the survey group had heard of it, but hadn't sought it out too look at it. One farmer said they would likely use it in the near future. One farmer recognised that it is an incomplete tool and heavily dependant on the weighting put on types of performance, but that they may use it in time when it is more of a complete too.

Social Media

The survey of the DWN group showed that very few had adopted social media to aid decision making, with only one participant currently using Facebook as a media for viewing farming pages. Of the group only 20% remained open minded about the future, with the remaining participants having no plans to adopt social media as a tool for aiding decision making in the near future.

Radio

There was very little comment about radio advertising or radio segments as a successful marketing tool. Only one farmer mentioned that he listened to the radio whilst working in the tractor, but it did not help his decision making around variety choice.

Company Awareness

Interestingly, when asked to name some seed companies operating in New Zealand, participants of the DWN survey group all named Agriseeds. Close to 40% named PGG Wrightson and 25% named Cropmark. A quarter of the participants named RD1 as a seed company.
The following companies were named only once by a participant: Seed Force, Wesco, Pioneer, Ravensdown, Northland Seed and Supplies.

The recognition, or lack of, of individual seed companies is mirrored in the results of the Pasture Renewal Survey of the Waikato and Bay of Plenty Regions (2010) which found that (of the 33 respondents) 12 recognised the Agriseeds mail publication as being useful compared with 4 for PGG Wrightsons, 3 for Agricom, 5 for RD1, 2 for Farmlands, 1 for CRT and 1 for Cropmark.

TRANSLATING RESULTS FOR A SEED COMPANY

The 'Diffusion of Innovations' Model (Rogers, 5th Edition, 2003) outlined in the introduction can be adapted for the context of a seed company, and sales and marketing strategies targeted to reach specific groups, depending on the stage in the product life-cycle a variety or concept might be.

For example, when a seed company launches a new variety, it might first target the Innovators and Early Adopters groups, leverage from the Early Adopters to reach the Early Majority group (perhaps by way of Field Days or testimonials), before using mass marketing to reach the Late Majority and Laggards.

Innovators

Innovators are likely to be a very small number of farmers who have thought of an idea or process that, if successful, might have a wider application. For a Seed Company, this could be a good

opportunity to provide support and publicity for the idea, to help the new idea spread to the next level, the Early Adopters.
Or, it may be that the idea or innovation comes from within the Seed Company, then the idea could be shared with a group of key Innovators to try and, pending the success of the idea or innovation, the spread to the Early Adopters encouraged through publicity.

Early adopters

Once the benefits start to become apparent, Early Adopters are keen to try the new variety or concept. This group are likely to enjoy having an advantage over their peers.

This group is probably the most important group to a Seed Company because they become an independent test bed, ironing out the chinks and reinventing the innovation to suit the mainstream needs. This group are unlikely to need much convincing to try something new, as long as the probable benefits are perceivable in their farming situation.

How to work with early adopters:

- Offer strong face-to-face support for a limited number of early adopters to trial the new idea.
- Reward their egos e.g. with media coverage
- Maintain relationships with regular feedback

Early majority

They are followers who are influenced by mainstream trends, but are wary of fads. This group respond to terms like 'industry standard' and are encouraged by endorsements of 'normal, well-respected farmers'. This group is likely to dislike complexity and won't want to put in a lot of time into understanding the new product. Terms like 'user friendly' and 'value for money' are likely to spark their interest.

How to work with early majority:

- Offer giveaways or competitions to stimulate buzz.
- Use mainstream advertising and media stories featuring endorsements from credible, respected, similar farmers
- Design the support material to maximise ease and simplicity
- Provide strong support

Late majority

These are the conservative, practical thinkers. They are likely to be adverse to risk and are uncomfortable with trying a new idea.

How to work with the late majority:

- Focus on promoting the new product or innovation as the 'norm' or industry standard rather than just product benefits. This group will want to hear that other conservative farmers think this product is indispensable.
- Emphasise the risks of being left behind

Laggards

This group is likely to be small, and for the Seed Company can largely be disregarded, they are likely to make choices based on cost and should a new variety or idea become widespread, they will eventually adopt the new variety or innovation, albeit some years later.

What percentage are in each group?

The dairy industry has had a wave of steady growth over the past decade, with milk production increasing by almost 50%. In an industry experiencing such gains, it is likely that for the most part, farmers are embracing innovation and technologies. Where Roger's (2003) suggested that notional percentages for each segment could be 2.5%, 13.5%, 34%, 34% and 16% for Innovators, Early Adopters, Early Majority, Late Majority and Laggards (respectively), it is likely that for the dairy industry the percentages in the latter segments are smaller.

In the survey of the New Zealand Deer Industry (Deer Industry New Zealand, Achieving Practise Change, 2012), 600 participants were surveyed and the proportion in each segment found to be:

Innovators:	4%
Early Adopters:	21%
Majority:	71%
Laggard:	4%

The deer industry in New Zealand is still relatively young, with the first deer farming license issued just 40 years ago, this group of farmers are predicted to be largely weighted towards the top end, rather than the Laggard end of the scale.

Considering this, the dairy industry in New Zealand could be expected to have notional proportions along the lines of:

Innovators:	3%
Early Adopters:	25%
Early Majority:	30%
Late Majority:	30%
Laggards:	12%

Compared with Roger's (5th Edition, 2003) figures, the number of Early Adopters for the Dairy Industry are expected to be higher than a hypothetical 'normal' group and the number of Laggards slightly lower. By comparison with the Deer Industry figures, the number of Laggards could be much higher, because there are still some small, older, 'family' style operations running.

Stage of product lifecycle

The approach to marketing a product or idea may differ depending on the current stage in the full product lifecycle. For example, a product that has already had a number of years on the market, may have already been adopted by those in the Early Adopter category, but not necessarily by those in the Early or Late Majorities. Marketing and sales tactics may then be manipulated to target those groups (e.g. Testimonials rather than Research Trial data).

Conversely, a new product or innovation may be launched and specifically targeted at the Innovator and Early Adopters groups and some time after, depending on the rate of adoption, marketing may then switch to target Early Majority and then the Late Majority.

Targeting each group

Over the course of this project, farmer attitudes to information sources about pasture renewal and specifically information sources about perennial ryegrass choice have been examined. Roger's (2003) 'Diffusion of Innovations' theory has been examined in the context of a dairy farmer. Using this information it is possible to predict the best methods for targeting and tailoring information to each of these groups (Table 4).

Table 4: Predicted response matrix to methods of transferring information around perennial ryegrass variety reviewed by farmer segment.
Scale: Green has MOST INFLUENCE, Red has LEAST INFLUENCE

	Laggard	Early Majority	Late Majority	Early Adopter	Innovator
Discussion Groups					
Over-the-fence discussions					
Field Days - Seed Company					
Field Days - Guest Speaker e.g. Lincoln University, Researcher					
Industry specific Field Days e.g. Monitor Farms					
Retailer advice					
Consultant advice					
Seed Company Website					
Scientific Papers					
Brochures with product details					
Brochures with testimonials					
Farming Magazines					
Industry specific Publications					
Social Media					
Price-based					
Farmer experimentation					

For example, when attempting to attract an Early Adopter to a new idea, the Seed Company might invite them to an industry specific field day, as well as targeting industry specific publications (e.g. Dairy Exporter), or allowing some key farmers to compare the new product or innovation against what they currently do.

At the other end of the scale, few options for transferring information to the Laggard group exist, it is likely that they will respond to price first, but may accept a product or innovation once it has become the 'norm'

Opportunities to change the Perennial Ryegrass paradigm

Very strong messages from all survey groups around the confusion about perennial ryegrass varieties and endophytes offers an opportunity for a Seed Company to change the paradigm completely. Currently perennial ryegrasses are categorised by endophyte type, flowering date and ploidy first, before being further categorised into high tiller density/ high sugar grass, etc. While farmers are craving a simpler system, there remains an opportunity to re-design the system. For example, tiller density (and the implicit persistency) and After Math Heading (AMH) and the improved summer quality could be conceivably more important than flowering date, ploidy and

even endophyte. Categories created by other seed companies and adopted by farmers need not be the only way to approach the market. It is likely that farmers in the Early Adopter group, already restless with the information they are supplied coupled with poor results from new varieties, means this group are going to be receptive to a new message around perennial ryegrass.

A further theme arising from the combined surveys is that farmers would like a manual to accompany each variety they sow. Here lies an opportunity for a Seed Company to simplify the message for farmers, tailor marketing material towards being a step-by-step manual, where one of the steps in the process would be to purchase the seed required, with variety name specified and sowing rates recommended.

CONCLUSIONS

This project was successful in its attempt to identify the common tools that dairy farmers currently use to select the perennial ryegrass variety to sow in their pasture renewal process. Those tools that farmers rate as useful are largely 'people' sources rather than printed media or websites. Retailers and farm consultants play a large role in the process, their recommendations are often accepted without question, although it was found that Early Adopter farmers are likely to conduct secondary research before accepting the recommendation.

By comparison to the project hypothesis, discussion groups play a much larger role than expected, particularly in encouraging Early Adopters to share ideas and innovations. Compared with the hypothesis, field days are less valued by farmers as a useful source for information transfer.

A further objective of the project was to provide paths to transfer specific information to the different categories of farmer, according to their attitudes towards innovation and change. Direct information gathered throughout the course of this project and inferences based on findings from this report were used to create a 'Predicted Response Matrix' to methods of transferring information around perennial ryegrass variety by farmer segment (Table 4). This matrix would be of value to a Seed Company, with both the sales and marketing departments. To leverage sales, it would be important to be able to recognise which category a farmer would fall into and then specifically target the type of information to them.

Throughout the course of the project, there was a resounding inference that the messages getting to farmers around perennial ryegrass varieties was confusing and sometimes conflicting and that expectations with new pastures were often met with disappointment. While not investigated in this project, it is suggested that there could be some parameters imposed upon the seed industry to help minimise the confusion in the marketplace. Suggestions are that a truly independent organisation run registration-type trials to provide data to farmers, or that the number of ryegrasses sold by any one company be regulated. While there remains a high number of varieties available to farmers, there are opportunities for industry participants to change the paradigm and create a simpler system for farmers, based on 'real', not 'perceived' benefits.

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APPENDIX 1

EMAIL TO DWN SURVEY PARTICIPANTS

Dear survey participant,

Thank you for agreeing to help with my project for the Kellogg Rural Leadership Programme.

As part of the course requirements, I am expected to research a topic of interest to me and with relevance to the wider agri-business industry, and write a report and present my findings back to the Kellogg Group at the end of the year. I have elected to investigate the topic of 'pasture renewal', more specifically, 'how farmers choose which (of the many) perennial ryegrass varieties to sow'.

In an effort to make best use your time, I would be grateful if you could read and consider the questions on the attached page prior. I will then ring (at the most suitable time suggested by yourself) and ask for those responses and also ask questions about the processes you went through **the last time you renovated a paddock on your farm**.

I am grateful for your time and participation and guarantee that your identity will be protected in my report.

Kind regards,
Michaela.

On a scale of 1 to 5, where 1 means you are **Least like this** and 5 means you are **Most like this**, please mark where you fit within these statements. In my phone call, I will ask you to read your rankings for Question 1 to 12 to me.

	LEAST				MOST
I like to try out new methods and products rather than stick to traditional ways	1	2	3	4	5
I'm information hungry. I regularly keep up to date with the latest industry developments	1	2	3	4	5
I don't feel confident making changes to my farming methods if I'm not completely certain of the outcomes - even when the potential benefits are large	1	2	3	4	5
I will make changes to my farming methods if it's mandatory, but it's a nuisance to implement new practises and technologies	1	2	3	4	5
I understand and regularly monitor market demand and supply for the whole industry	1	2	3	4	5
I prefer to stick to tried and tested methods that I am familiar with	1	2	3	4	5
I like to exchange information about the latest agri-technologies and farming practices with other farmers	1	2	3	4	5
A lot of new practices and agri-technologies are complicated and I wouldn't know where to start with introducing them on the farm	1	2	3	4	5
I take calculated risks, carefully weighing up the costs and benefits before deciding to adopt a new practice or technology	1	2	3	4	5
It seems like a waste of time and money to seek out new methods and products if my existing ones are adequate	1	2	3	4	5
I proactively take measures to improve animal welfare and environmental sustainability on my farm	1	2	3	4	5
I prefer to base decisions on changes to my farming methods on the personal experience and recommendation of trusted colleagues and/or neighbouring farmers, rather than taking the word of industry experts at face value	1	2	3	4	5