

The value of using digital technology for farm paddock record keeping



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Kellogg Rural Leadership Programme,
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1.0 Executive Summary

The use of paddock recording by farmers is still very much done by traditional methods. The popular method of paper recording ie. In a farm diary, has many limitations and although the benefits of using technology are clear, not many NZ farmers have been brave enough to take up the challenge and use paddock recording programmes such as Production Wise.

This report surveys four diverse farmers for their opinions about paddock recording and then uses a large Canterbury dairy operation as a case study to trial the use and benefits of using a cloud based computer programme to record paddock information.

Farmlands Co-Operative is a market leader in on farm service and farm advice. Using a case study from Canterbury Grasslands Limited, a proposal will be submitted to management to outline a system so that all TFOs are trained in the use of paddock recording technology to encourage the shareholder to maintain accurate records of all paddock inputs. The success of this study will be when a farmer can see how easy it is to use and how much more information can be retained on farm and available for use not only by the farm itself, but for other contractors such as seed supplier, fertiliser supplier or chemical supplier. If this programme is rolled out across all of Farmlands NZ, it gives the company major advantage in customer service.

2.0 Acknowledgements

I would like to thank the support of Farmlands for allowing me time and the resources to do this project. I have used a number of staff to help with their knowledge and expertise in the IT part of the business. Three of the Farmlands Technical Field Officers (TFO's) have been trialling the system with some of their clients and provided valuable feedback to me.

Canterbury Grasslands have been good to me letting me do a case study on their property and how it can help them in the future. They have provided maps and information.

The four farmers that I have surveyed to help me get feedback about what is happening on-farm and what they see would help them in the future.

I would also like to thank fellow Kellogg's who have challenged me and given me feedback.

3.0 Introduction

It is well known that in the farming industry paddock record keeping is very inconsistent and predominantly paper based. There are many software companies that offer an IT solution to assist in recording keeping, but farmers and advisors are cautious as how to integrate these into their daily workplace, due to limitations such as cost, time, perceived level of intelligence required, lack of digital tools (eg. Wifi, iPad etc).

This study is about what we can do to get away from the trusty notebook diary. It is about use of technology to help record this information in one place – but it still needs to be accessible as that book in your top pocket. These days with the phones and tablets available, why not save some time and upload this information as you are doing it? This saves trying to do it at home, when the news is on and it inevitably gets left to another day. Information need to be live-time, to make it more useful and easy to upload.

To achieve this, few of the options available are looked at and one chosen to run a case study with, as a working example for farmers and Farmlands TFO's.

The information gained will be used to create a proposal to present to the Farmlands Executive team, in order to promote and recommend the use of a modern technology based paddock recording system by the co-operative. Further work that will be recommended may include the creation of a user friendly teaching model, in the form of an interactive presentation for farmers, TFO's and other industry users (e.g. suppliers, contractors).

4.0 Method

A literature review was undertaken to help understand what the current views are and what information is available about the area of paddock recording management.

The current practice of on farm paddock recording was studied and used as point of comparison for the farmers who took part in the next step, a survey.

Four farms have been surveyed, to ascertain what their current methods of paddock record keeping are and if there are any barriers to the use of technology.

A short simple survey (see appendix 1) was done via telephone. This was to ascertain the respondents thoughts and feelings about paddock recording – their current practices and opportunity for change.

A large Canterbury dairy corporate, Grasslands Canterbury, will be used to demonstrate an online, cloud based recording system, which was chosen by careful consideration of a number of available and well regarded options.

I am using CGL for this case study because Farmlands is doing the crop monitoring and supplying the seed. There are a number of parties involved, from the Operations Manager to Pasture Manager to the Farm Manager looking after the farm. There are also “outside” people involved from Ravensdown, Molloy Agriculture Spraying, Ballagh Contracting and Farmlands.

Sam Lucas, Agronomist for Farmlands had a meeting on the 10th August with all stakeholders in this operation before we started, to set clear rules. It was good to have a roundtable discussion and know who was dealing with each area. It was at this meeting I brought up that I will be doing a case study on Paddock Recording Management.

4.1 Literature Review

RURAL NEWS

NATIONAL WORLD OPINION AGRIBUSINESS **MANAGEMENT** FARM HEALTH MACHINERY & PRODUCTS MOTU

Sunday, 11 October 2015 12:00

Paper records yield to online

By Admin

font size  | Print | Email

Online software and a mobile phone app are helping a sheep and beef farmer quickly and easily present data for farm assurance and compliance audits, says the supplier, Farm IQ.

Marcus Edge, South Wairarapa, this year changed his farm recording, using online farm management software and the mobile phone app.

Edge and his wife Vanessa lease 330ha at Pirinoa from a family member, the flat property suiting intensive finishing: chiefly they raise 2000 ewe lamb replacements for hill country breeders.



Wairarapa farmer Marcus Edge now uses online software and a mobile app for all farm management recordings.

Figure 1 Rural News 11/10/15

The main area that I wanted to see change from the current practices was the creation of a more efficient record for traceability for chemical residuals. This is important to know before new crops are planted, as well as when crops are sold that can quickly be audited so that there are no withholding issues around insecticides and fungicides.

Compliance is becoming an important consideration for everyone in the industry. This motivated me to look at what systems can make this process easier for farmers, when complemented by the support of their TFO.

The overall plan and outcome from this report is to recommend the use of paddock recording technology across the whole of Farmlands Co-operative and the further work of creating a demonstration teaching resource. If this was accepted by the Farmlands Executive, it would be rolled out to our 80 TFO's as a tool for them to use.

The current policies would need to be adapted to accommodate the digital recommendations made by TFO's, which would be via this system, with no more verbal or hand written recommendations. As the company would have control over off label recommendations and for trainee TFO's, the recommendation would have to be peer reviewed before being sent to the farmer.

This process is a lot more professional and with it being emailed directly to a number of people rather than just the contractor, I believe this will make it a lot more efficient for all parties.

"Andrew Currie has kept meticulous crop records ever since he started farming at Methven in 1987. The only difference now is that he does it on ProductionWise. He admits he's not the most computer literate person, and moving from a hand written paper based system to digital format last year was a big step Initially.

But it's definitely been worth the time and effort to set up." (Bates, 2014)

"Mid-Canterbury farmer Hamish Marr says the greatest benefit of the mobile app for him has been the time-saving and convenience of accessing records at any time - whether in be on the tractor or inside at the end of the day" (Bates, 2015)

"The information stored in Production Wise can also assist growers by providing maps and reports for farm environment plans, traceability and Nutrient reporting. Access to this information will also help with the development of Overseer® reports." (Bates, 2015)

"An advisor log-in is being streamlined for New Zealand to enable advisors and reps to enter observations and recommendations directly to individual growers' paddock diaries. When they do this, the grower will receive an instant message alert of the new entry." (Christian, 2015)

4.2 Current practices

The current practice for most recommendations is paper based, where the recommendations are written on to a Recommendation Form (Fig 2.0), while the TFO is out in the field inspecting the crops/pasture. This form is normally filled out in the car, or once back, at the office. Once this has been completed, it is delivered to the farm with the chemical or dropped off at the farmer's house. Limitations with this process include the chemical being dropped off up to two days later, or left in the shed where their one copy is. With only one copy, sometimes the TFO and the spray contractor have a copy but not the farmer. The other practice that can happen is the TFO rings either the farmer or the contractor and gives them a verbal recommendation, which is not ideal as there is no traceability.

Issues with this system –

- Documentation gets lost.
- No accountability if recommendations are done over the phone and very hard to look at paddock history. Process relies on memory – as sometimes it is too hard to go back through the books looking for the recommendation. (Some farmers keep a diary. This can be recorded by date or sometimes by paddock name – this is common for fertiliser and seed history).

Some people are using computer systems. These are normally Excel (spreadsheet) based or require time in the evenings to input the data and are not that user friendly.

These are the more common practices I have seen and used over the last 20 years, being a TFO myself for 12 years and then managing a number of TFO's over the past 8 years.

Another issue is deciding who owns the IP (intellectual property). I have seen a number of TFO's come and go from different companies and the information is retained in the TFO's head, or managers that are no longer employed. A large amount of time is spent sorting out records to make decisions going forward about seed and chemical.

The problems can happen if there is a crop failure, which is followed by spending some time tracking down all the information, rather than having one story of the truth. This can take hours of tracking down information. Most of it is paper based and it could be in a number of places. Sometimes this information is not available, as it was verbal or the person has left.

Compliance is becoming a bigger issue on farms – particularly about nutrients and water. In the future, people will want to know what is used across different crops, to make sure that they meet requirements around withholding periods.

Farmlands co-operative					Date: 25/10/2015 R 020501		Client Copy		
Chemical, Fertiliser and Seed Recommendation					Client: Mr A Brown		Farmlands Representative		
					Address: Smiths Road		Name: Wayne May		
					RD 5 Darfield		Cell: 0272424820		
					SH No: 12-345-789		Email: wayne.may@farmlands.co.nz		
Paddock or block name / GPS	Area (hectares)	Cultivar or variety	Growth stage	Weed / Pest / Disease problem	Recommended products and application rates (per hectare)	Water Rate (per hectare)	Application date	Withholding period	
Paddock A	10	Tabu Ryegrass		Fallen Hen Struck off	Pasture Kleen 200g/ha	200	27/10/15	14	
					All rates are per hectare				
					All rates are per hectare				
					All rates are per hectare				
					All rates are per hectare				
Critical comments:			Contractor name and comments:			Products required:			Office Use
Grazed before spraying to remove clover			Jim Smith			2 x 200g Pasture Kleen			
<input type="checkbox"/> OFF LABEL (tick box)									
This recommendation is valid for 7 days from the date of this Agreement									
A. Brown					Wayne May				
Client's signature					Farmlands Representative's signature				
This agreement is subject to our standard terms and conditions of trade overleaf. PLEASE READ									

Figure 2 Farmlands Chemical, Fertiliser and Seed Recommendation Sheet

Advantages and limitations of current procedures compared to using technology:

Paper Based System	Digital Based System
Easy to fill out in the paddock	Easy to access data and at anytime
Hard copy left and can be collected by the contractor or farmer and they have it in front of them	Can be emailed to a number of people and the information is retained in the system for the future
Better when there is limited cellphone coverage	If people leave, the information is retained
Can be scanned or faxed	Can be peer reviewed, by being emailed to a senior agent
Some people still like paper based system	Can be emailed to the contractor and loaded the job immediately.

Table 1 Advantages and Limitations

4.3 Technology and Paddock Recording Options

Technology alongside farming has slowly been taken up by a few organisations and a few farmers.

The biggest issue is collecting a large amount of data and deciding how to use that data in the most useful manner. I have had a look at a number of different systems that can help on-farm, from drones to help measure crops and diseases, to virtual fencing (ways of moving your fences from the comfort of your home). These will be a great help in the near future.

The ideal solution would be that we have one platform and everyone uploads to it – from the seed purchased, fertiliser, the spray and the spraying contractor – all inputs into that paddock or crop. This would be giving you a live-time cost of production, like a factory making products. This can be done at the moment but is through different systems. A lot of people only know what the margin is after the books come back from the accountant at the end of the year.

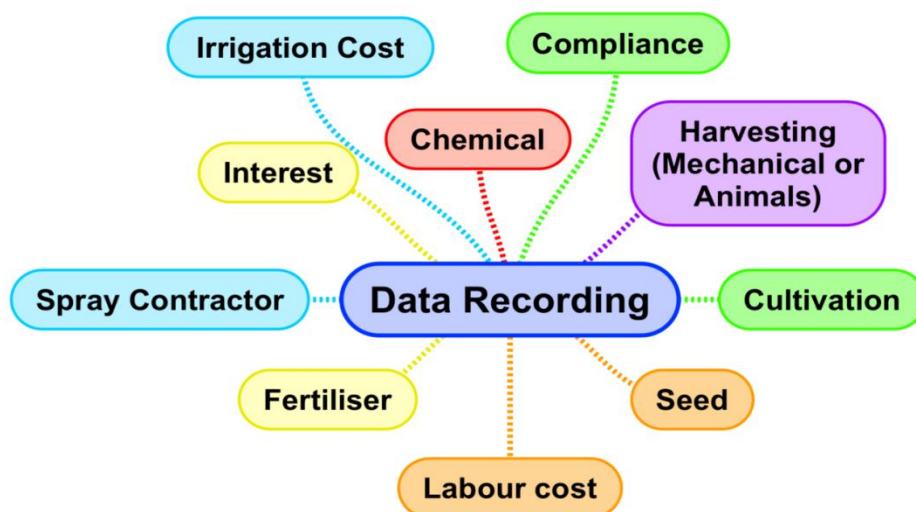


Figure 3 Technology Mind Map

There are currently a number of systems in the market that record paddock history and data that make life easier for access of historical data. Some are hard drive based, some are cloud based, some are web operated and some have easy to use apps. This project was designed to be more

about the recording of the information rather than any specific computer program recommendation. Thinking about the future, all of these systems need to integrate together, rather than operate on their own. I have listed a few but there are many more on the market.

Tool	Used by	Description	Website
Farm IQ	Farmer/Agronomist	Fert/Seed/Chemical	www.farmiq.co.nz
- The hub for Farm recording, with farm Analysis tools for you to compare and bench mark.			
Agworld	Farmer/Agronomist	Fert/Seed/Chemical	www.agworld.nz
- Farm Management for Farmers and Agronomist, manage your business via the web or your iPad.			
Aghub	Farmer/Agronomist	Fert/Seed/Chemical	www.aghub.co.nz
- Automatically gathers data and turns this in to useful information.			
Muddy Boots	Farmer/Agronomist	Fert/Seed/Chemical	www.muddyboots.com
- Supply chain insight, from grower to retailer.			
Agri 360	Farmer/Agronomist	Fert/Seed/Chemical	www.agrimap.com
- Farm record keeping, compliance, job managment and much more.			
IAGRI	Farmer/Agronomist	Fert/Seed/Chemical	www.lagri.com
- Manage your farm from one easy-to-use dashboard			
Production Wise	Farmer/Agronomist	Fert/Seed/Chemical	www.productionwise.co.nz
- Easily record your operation. Our comprehensive data list & Multi-paddock tools make operation recording quick and easy.			

Table 2. Paddock recording systems

5.0 Shareholder Survey

5.1 H & A Reid (Sheep and Cropping)

Hamish and Andrew Reid farm at Kirwee. They are currently farming 520ha, with 100ha under irrigation. They mix crop 120ha and they run 2,000 ewes, 600 hoggets and trade around 4,000-5,000 lambs.

1. How do you currently record paddock history?
 - All paper based
2. Where do you store chemical recommendations and seed history?
 - All paper based
3. When you refer back to your paddock history, e.g. residual chemical or seed history, do you have difficulty finding what you need?
 - Yes
4. What are the barriers you commonly have finding this information?
 - Incomplete history
5. If a cloud based, cost efficient system was easy accessible, would you consider using it in your farming practice?
 - Yes

Please list up to four barriers which you consider reasons why you don't currently use it ? (eg cost)
OR if you are currently using it, please list up to four limitations you may find with it.

- Clunky, hard to use
- Only PC based, it needs to be on phones and tablets
- Needs to work with other programmes
- TFO's/merchants need to be able to input

5.2 Matt and Sonia Collier (Foothill Sheep and Cattle)

Matt and Sonia Collier farm at Russell Flats, 40 minutes' west of Christchurch. They farm sheep and beef on 440ha. They also do some dairy support as well.

1. How do you currently record paddock history?
 - All paper based and some in his memory
2. Where do you store chemical recommendations and seed history?
 - All paper based
3. When you refer back to your paddock history, e.g. residual chemical or seed history, do you have difficulty finding what you need?
 - Yes
4. What are the barriers you commonly have finding this information?
 - Incomplete history
5. If a cloud based, cost efficient system was easy accessible, would you consider using it in your farming practice?
 - Yes

Please list up to four barriers which you consider reasons why you don't currently use it ? (eg cost)
OR if you are currently using it, please list up to four limitations you may find with it.

- Easy to access for the phone or tablet
- Easy to upload, during the day
- Has to produce reports that will be helpful with compliance
- Be good to have a system that you can review what you have done and change for the better

5.3 Rod May and Adrienne May

(Dairy support, Cropping and Sheep)

Rod and Adrienne May own a farm 5km south of the Darfield township. They are currently farming 176ha dryland but are looking at being part of the Central Plains Water Scheme. They mix crop, run 900 ewes and graze dairy cows in the winter.

1. How do you currently record paddock history?
 - All paper based
2. Where do you store chemical recommendations and seed history?
 - All paper based
3. When you refer back to your paddock history, e.g. residual chemical or seed history, do you have difficulty finding what you need?
 - Yes
4. What are the barriers you commonly have finding this information?
 - Incomplete history
5. If a cloud based, cost efficient system was easy accessible, would you consider using it in your farming practice?
 - Yes

Please list up to four barriers which you consider reasons why you don't currently use it ? (eg cost)
OR if you are currently using it, please list up to four limitations you may find with it.

- Outside input from fertiliser companies and seed companies
- Needs to be able to have access and input from your phone
- Needs to have access to chemical recommendation and labels in the field
- Need to have easy access to inputs that have gone on in the past

5.4 Chris Morrish (Cropping)

Morrlock Farms is owned and managed by Chris Morrish at Lincoln. This is a 200ha mix cropping farm, fully irrigated, running 500 ewes and trades 2,000 lambs. Chris is currently using Production Wise for recording his on-farm inputs. This covers the main inputs like fertiliser, seed and chemical and he is also using this for other costs like all tractor work, irrigation and grazing. He was another programme up until 8 months ago and has now changed over because it has more functions and is also cloud based.

1. How do you currently record paddock history?
 - All data stored in PW and also an paper copy
2. Where do you store chemical recommendations and seed history?
 - All paper based and now getting inputted into PW
3. When you refer back to your paddock history, e.g. residual chemical or seed history, do you have difficulty finding what you need?
 - No– if I need to go back, I use paper based copy at this stage
4. What are the barriers you commonly have finding this information?
 - None, Farmed property for 20 years, has all the information
5. If a cloud based, cost efficient system was easy accessible, would you consider using it in your farming practice?
 - Yes

Please list up to four barriers which you consider reasons why you don't currently use it ? (eg cost)
OR if you are currently using it, please list up to four limitations you may find with it.

- Wi-Fi is the biggest issue as it's slow and hard to connect – limited access around the farm
- App is slow and hard to use, need a bigger device rather than the phone like iPad
- Entering tank mixes can take longer but overall good.
- Spend approximately 10 minutes per day entering information from the daily activities

6.0 Results and Analysis

	Farm1 Reid	Farm2 Collier	Farm3 May	Farm4 Morrish
Q1: Current Recording system	Paper	Paper/memory	Paper	Paper and ProductionWise
Q2: Where info is stored	Paper	Paper	Paper	Paper and ProductionWise
Q3: Is history difficult to find	Yes	Yes	Yes	No
Q4: Barriers to finding info	Incomplete	Incomplete	Incomplete	None
Q5: Would you consider a digital system?	Yes	Yes	yes	Yes

Table 3. Analysis and comparison of survey results.

After collating the survey from 4 farmers, summary of the results was that the systems are mainly paper based (75%) and although the data is available, they have to go to a number of places to get this information and in some cases back to the TFO's and in 75% of the cases the data history is incomplete.

All four farmers surveyed agreed that if a cloud based, cost efficient system was easy accessible that they would consider using this in their farming practice.

They all had concerns which currently translate into barriers from using technology.

These concerns were:

- Clunky hard to use
- Only PC based needs to be on phones and tablets
- Needs to work with other programmes
- TFO's/Merchants need to be able to input.
- Easy to up load, during the day
- Has to produce reports that will helpful with compliance
- Be good to have a system that you can review what you have done and change for the better.
- Needs to have access to Chemical recommendation and Labels in the field
- Need to have easy access to inputs that have gone on in the past
- Wi-Fi is the biggest issue as it's slow and hard to connect. (Limited access around the farm)
- App is slow and hard to use need a bigger device rather than the phone like tablet
- Entering tank mixes can take longer, but over all good.

7.0 Production Wise (PW)

To demonstrate the benefits of this project I have chosen Production Wise (PW), which is a system that FAR (Foundation of Arable Research) are using for their levy payers. One of the main reasons that I have decided to use PW as an example is that the product is free, all the information on the latest crops have been loaded and they have also downloaded the Novachem manual into the system with the latest chemicals. Although this is an arable based system, it can be used by other sectors.

The system has a grower/farmer log in and an advisor app. The information should be owned by the farmer and not the merchant for a number of reasons – specifically if the farmer chooses to change company, they should retain the farm information. There are a number of reports that can be printed, like fertiliser, which can be printed and passed on to your fertiliser representative for overseeing. PW produces a report for when you are selling your crops, so the buyer knows what has been applied to the crop for traceability and chemical withholding periods. Recommendations can be emailed to a number of people, to keep everyone in touch with what is happening. It also has the ability to record observations, so even if there are no inputs required, the representative can make some notes.

Material Type	Product	Total
Herbicide	Norflon	45.00 L
Herbicide	Magister Cx	2.25 L
Herbicide	Synergy Glyphosate 360	30.00 L
Insecticide	Laniban 50EG	18.00 L

Inputs	Total
Laniban 50EG	\$1,620.75
1.2 L/ha at \$13.50/ha Chemical Group: T	16.50 L
Magister Cx	\$204.75
150 mL/ha at \$15.16/ha Chemical Group: F3	2,250.00 mL
Norflon	\$227.25
3 L/ha at \$71.25/ha Chemical Group: N	45.00 L
Synergy Glyphosate 360	\$1,080.75
2 L/ha at \$54.00/ha Chemical Group: G	30.00 L

Figure 5 Production Wise Home Screen



Figure 6 Production Wise Paddock Map

7.1 Case Study

Canterbury Grasslands Limited

Canterbury Grasslands Ltd (CGL) is a property that is located in the Hororata area, has nine dairy units and milks more than 5,000 cows. They also own a unit in the Mid West USA. This is a corporate farming operation with a number of shareholders. The current structure consists of an Operations Manager overseeing all farms with each unit (farm) having their own Dairy Manager.

Farmlands Co-Operative has secured the cropping and chemical contracts to supply CGL for the 2015 season. This is an ideal structure for running a case study, as there are a number of people involved from outside the corporate. This is something that CGL are looking at for the future, for record keeping and making sure that there is a system in place to keep regular control on what is happening on each of their units.

Communication is the main driver in making sure that we grow a successful crop for the CGL operation. After discussions with the Operations Manager, we are now keen to set a platform up for them that they can use in the future, regarding what grass/crops are in what paddocks. This will be visible to the larger group and a place that the data can be entered and retained by CGL.

All the CGL properties have had new maps drawn up of the property assisted by the use of a drone. This gives accurate paddock sizes and paddock numbers, so that the same maps and paddock numbers are viewed and used by all parties. Farm One has now been loaded into PW with high level of detail – this has taken 4.5 hours.

Ravensdown has soil tested all the paddocks that will be re-sown this spring. These results will be entered into PW for future usage. Sonja Perkins from Ravensdown has then given recommendations to CGL and the spreading transport of what has to be applied. CGL will load this information into PW.

Farmlands' Sam Lucas and Paul Cooper (TFO, Agronomist) have met with the CGL Pasture Manager at CGL on 22nd September, and have come up with a cropping and pasture plan. They have then placed the orders for the seed, timed for when they should be required. These will be entered into PW once this has been sown, when the quantity and rate application will be confirmed. On this day, the three of them have taken a drive around the farms and come up with a plan for each paddock – which is when these paddocks should be sprayed out and if they will be ploughed or directed drilled. This plan has then been supplied to Molloy Agri Services – so they know when the

paddocks will be sprayed out – and also to Ballagh Ag, so they can plough the paddocks. This information will then be entered into PW.

Planning and communication is key to a large operation like this and making sure that they get it right. Timing is imperative – the spraying needs to be done before the ploughing, followed by the fertiliser truck and then the drilling. All these operators are running large businesses and need to know well in advance, so they can look after their other clients as well. One of the good things about working with these operators is that they are decent sized businesses, that have high quality gear that can get across the ground easily.

I have set up CGL as a farmer on Production Wise, so that the information that we enter stays with them and at the end of the project they will own the data. I have shown the Operations Manager some of the information, including what will be stored and available. He was very excited that it will be all in one place and with staff changes it will stay with CGL.

Paul Cooper, TFO for Farmlands has had training on the program and will be entering the data from the field and any recommendations will flow to Molloy Agri and CGL.

CGL will continue to use the Production Wise method of paddock recording across all their farms, and I will encourage and assist them where and whenever needed.



Figure 7 Canterbury Grasslands and Contractors Team



Figure 8 Walking the paddocks and staff training

8.0 Discussion

The interaction I have had with the farmers that I have surveyed and with the case study have proven that there is a need for the increased use of technology in paddock recording. Farmers have incomplete paddock histories and have problems accessing what data they have. They have not taken up the opportunity to use technology due to preconceived barriers and an unawareness of the advantages especially for compliance and traceability.

These factors were all taken into account whilst undertaking the case study with Canterbury Grasslands. I ensured that clear communication and simplicity were foremost while explaining and teaching the concept to all members of the team.

The case study at Canterbury Grasslands has been about discovering what they have been doing in the past, which has been paper based recording and the limited details about what has happen to different paddocks. With a change in management some of the information was incomplete and took some time to track down. Keeping the information in one place has been hard with different companies been involved like Fertiliser companies, spraying contractors, drill contractors and merchants supplying the seed. Like a number of operations the information is there in different areas but takes time to pull together.

9.0 Summary

The rate of adoption of using technology to record paddock history has been very slow. This is due to a number of reasons, particularly with the decision as to what system they should run with and what will be compatible in the future. The biggest stress on the farmer is throwing away the trusted hand written notebook that never lets them down.

It has been shown in the case study that using technology is the way of the future and will save time and add more value long term. Most of this will be driven around traceability and compliance and the ease of getting the information.

The ongoing success of this relies on the farmers who own and update the data and also that everyone that works on the paddock (contractors and suppliers) also ensures that they input the data. The data needs to be entered as it happens - not days later. The online computer programmes available (eg. Production Wise) will ensure that the farmer has all the data they need to make timely and productive decisions on the ongoing future of their farms.

The management of inputs and history are going to be the way of the future to save money and time and also to have one source of the truth, not stored in a number of places.

10.0 Further work

The next step after this project is to formally present to the Farmlands Management, a proposal for a technology based paddock recording system that their TFO's can use in their day to day job. The first steps in this have been made by training three TFOs on the full usage of Production Wise. The decision on which software program to use will lie entirely with the co-operative, but the model that I have presented using Production Wise will definitely serve to prove that there is a place for the use of technology on farm, and by providing skilled and confident TFOs, that we can improve current farming practices.

11.0 Recommendations

From the data and information that comes from this report, I would like to propose the following recommendations:

1. To do further trial work, with more TFO's in the field working with farmers, then to be rolled out by Spring 2017 across the Farmlands field team.
2. This is the way we (Farmlands) will do our paddock and crop recommendations and observations in the future.
3. To work with the industry to make this a industry standard, and to ensure that information is stored in a central database.
4. This may be included with H&S requirements about being on farm, when and where.
5. Batch numbers and expiry dates where required can be easy uploaded into the programme, as this will be a compliance requirement in the future.
6. To look at other technology to complement this, like the use of drones and soil probes.

References

Production Wise website www.productionwise.co.nz

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Bates, M (2015) FAR Newsletter Summer “ProductionWise Online Crop Management”

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Christian, D (2015) Grain Grower Ltd, Australia - FAR Newsletter Summer “ProductionWise Online Crop Management”

Glossary

CGL - Canterbury Grasslands Limited

FAR – Foundation of Arable Research

PW – Production Wise

TFO – Technical Field Officer

Appendix:

Survey used for farmers:

1. How do you currently record paddock history?
 - a) All paper based
 - b) All Digital
 - c) Mix
 - d) Other ...Where?
2. Where do you store Chemical Recommendations and Seed history
 - a) All paper based
 - b) All Digital
 - c) Mix
 - d) Other ... Where?
3. When you refer back to your paddock history, eg Residual chemical, seed history, do you have difficulty finding what you need?
 - a) Yes (go to Q4)
 - b) No (go to Q6)
4. What are the barriers you commonly have finding this information?
 - a) No history
 - b) Incomplete history
 - c) Unable to find history due to employee movement
 - d) Other
5. If a cloud based, cost efficient system was easy accessible, would you consider using it in your farming practice?
 - a) Yes
 - b) No

Please list up to four barriers which you consider reasons why you don't currently use it ? (eg cost)
OR if you are currently using it, please list up to four limitations you may find with it.