
PRESIDENTIAL ADDRESS – Advantages of on-farm research

A.N. CROFOOT
Castlepoint Station, RD 9, Masterton
anders@castlepoint.co.nz

On-farm research is something I have become quite passionate about, since attending my first New Zealand Grassland Association conference in Napier in 1999. Castlepoint Station has participated in three different projects over the past 8 years: Pasture Plan, which looked at pasture growth rates fortnightly over 4 years; Wise Use of Nitrogen, a 3 year project covered elsewhere at this conference; and ewe mortality over lambing, thesis research for a Veterinary Master's degree by a student at the Massey Epicentre.

On-farm research is costly and difficult. The environment can't be fully controlled and the working conditions are sometimes less than pleasant. However, despite the difficulties, there are some worthwhile benefits.

Farmers are always talking about the weather, not because it is a polite, safe topic of conversation, but because our livelihood depends on it. We are a finicky group. It always seems to be too hot or too cold, too wet or too dry. However, we are practical people working in a volatile environment. It should not be surprising that farmers can be a bit sceptical of research results. Good research protocol seeks to control the variables so the hypothesis can be tested. While the scientist needs a controlled environment to produce a significant result, the farmer wonders if that same result will be expressed in their uncontrolled environment. It is harder to produce statistically significant results from on-farm trials, given that there is usually less control of environmental factors at paddock versus plot scale, but they do give farmers greater confidence that they will be able to achieve similar results. This may seem somewhat paradoxical since for a scientist controlling variables is a key part of ensuring the desired effects are being measured, however, for a farmer it is a leap of faith that the results will apply on a paddock scale. Small plot trials may be statistically significant, but farmers want to know what will happen on their paddocks, not on their lawn. Seeing the results in another farmer's paddock is more reassuring than a plot trial.

Seeing is believing

Farmers live in a very physical world. One of the real satisfactions about farming is being able to see what has been accomplished at the end of the day: a new

fence built, sheep shorn, cows milked, crop harvested. However, since farmers are used to being able to see results, reading a scientific paper does not come naturally. Seeing results is much easier. When research is done on-farm, it has to have some accommodation of existing farm policies. So on-farm field days where farmers can actually see the land where the trial was conducted, allows them to make their own determination about the applicability of the research to their own situation.

Farmers seeing research in action has other benefits. Observing scientists and technicians at work on-farm gives the scientists exposure they don't receive if they stay in laboratories or research farms. It puts a human face on research and brings it down from the ivory tower. It is useful for farmers as levy-payers and therefore funders of research, to see activity that they are (indirectly) paying for. If farmers are involved early on they can help influence funding for projects with their levy organisations. The scientists benefit from seeing how their research might fit in to a larger picture and casual discussion on-farm can be fertile ground for new ideas.

Understanding results

Beyond general science through Year 11 (5th Form), further in depth study of science is no longer a required part of our core secondary school curriculum. That means we are sending people out from school with limited understanding of biology and chemistry, and critically, possibly with even less ability to evaluate competing marketing claims for agricultural products or farming systems. Seeing a trial being carried out, learning what is measured and why, can be a crash course in science, making up for laboratory classes that may have been missed in school.

One issue with on-farm research is when to release results. Scientists will want a very high degree of confidence in their results and may need to gather data for many years. Farmers need to make decisions now. If they don't have information, then the decision may not be much better than flipping a coin with a 50% chance for success. So they will be very keen for any information that will improve the odds of success. However, while the first year's data may look

promising, all too often subsequent years fail to provide replicable support. This means that farmers involved with research need to learn to be patient or to accept a lower level of confidence in the results.

Science structures and funding

Science in New Zealand has been through the ringer. Once it was funded by the Government through the Department of Scientific and Industrial Research, with research in Grasslands, Plant Diseases, Entomology, Soil Survey and Agronomy followed up with extension through the Farm Advisory Division. This gave a stable funding platform and a direct way of getting research out into the hands of farmers. This system did an amazing amount of good work and today's New Zealand's agriculture rests on the foundation laid by those scientists and extension experts. The split into Crown Research Institutes (CRI) in 1992, may have made sense from a fiscal point of view as Government departments did not have a great track record of efficiently spending money. However, requiring researchers to produce an economic return is a big ask. If Sir Isaac Newton was able to see a little further "by standing on the shoulders of Giants" then it is logical that less progress was being made when the CRIs were hoarding research results and trying to make a return rather than freely sharing.

With a focus on commercial return came a focus on commercial timeframes with quarterly and annual results. Commercial companies are often criticised for too much focus on quarterly results and missing the big picture. Have we been heading down the same track with research, being too focused on things that will produce a return in a short timeframe? Research on our biological systems does not lend itself to annual results, 3 or more years are often required for data collection. Some important questions may not be answered for 10 years or more.

Once research is done, how do we make effective use of it? The old Farm Advisory service was an excellent way of disseminating information to farmers. Now without that Government subsidised service there isn't a unified way to push information out to reach the widest possible audience. The CRIs are directed to work on extension, but is this really the best use of their limited resources? One can be a superb scientist, but that does not mean he or she will be effective at extension.

If research is done in labs or on research stations, who champions the result and who is the audience? The researcher might be keen. Perhaps the technicians will take an interest. The results will be published, preferably in the proceedings of a New Zealand Grassland Association conference. But if we are honest, how many people have been reached before

publication? In contrast, if research is being done on-farm, we get the same researchers, but the farmer and farm staff are pulled in. Depending on how the project is run, there may also be a community group involved, so rather than a dozen people being involved before publication there could easily be two or three dozen. In addition, the farm and community group are quite likely to tell their friends about what they have been involved with, since it is out of the ordinary and therefore of more interest. So there can be some quite effective guerrilla marketing going on for the project long before the results are published. Word of mouth is far more effective advertising than anything coming out of newsletters or paid advertisements.

Summary

So while on-farm research is more difficult and costly to run, there are a number of very good reasons to make the effort:

1. Paddock-scale trial results are more readily accepted by farmers
2. On-farm trials can also act as demonstrations on how the result can be integrated into a whole farm system
3. On-farm research can be fertile ground for new research ideas evolving from the interaction between farmers and scientists
4. On-farm research can be beneficial for funding, both gaining initial funding and ongoing support of research funding
5. On-farm trials can be the start of an effective guerrilla marketing campaign to get the results out and in use.