THE Tow and Fert TIMES

TOW AND FERT BY METALFORM

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FERTILISER, 'FARTS' AND FUMES.

Taxes and regulations continue to take their toll on the farming community. Yet change and innovation are continuing to transform farming profitability and environmental outcomes.

Most of us know the story of Chicken Little. It tells the tale of a young Chicken who, whilst sitting under an oak tree has an acorn drop on their head. Not realising the bump on their head is an acorn falling, Chicken Little decides that "the sky is falling!" and proceeds to tell all their friends that the end of the world is nigh!

This classic English fable has been told countless times and applied to countless situations over the years. And there are days when this fable seems to be true with what is happening in the agriculture sector. At nearly every turn, newspapers, websites, television channels et al. are reporting on the taxes and regulations being forced on farmers. It can feel like 'the sky is falling' in on one of the most important sectors of Australia's economy.

For the public at large it would seem that the agricultural sector is simply sitting idly by and doing nothing to improve their practices and businesses. Getting consumed in the headlines and subsequent public sentiment can lead many farmers to wonder why they are bothering to try and improve their farming practices and businesses at all. The media tend be quick to pick up on a sensationalised story letting the good stories, those that show progress, learning, changes, and positive business practices simply sink to the bottom of the pit, never to be seen in the wider media.

Some of the hot button issues facing farmers and covered more recently in the media are given plenty of airtime without any, or very little, telling of the 'other side of the story'. This side of the story is often one of innovation, positivity, and a willingness by farmers to grow and move with the times, all the while improving their businesses and production. Indeed, in our travels around New Zealand, Australia and further afield, we hear the 'other side of the story' regularly. It is a story of resilience, tenacity, passion, progress, and business acumen.

Fertiliser. In Australia we are not regulated. Yet!

If you have followed our articles in this tabloid over the last 3-4 years you will know that our neighbours across the Tasman have been facing regulation of fertiliser, specifically Nitrogen fertilisers, due to the impact they have had on their land and waterways. Over in New Zealand the Labour Government, through David Parker, Minister for the Environment made it quite clear that Dairy Farming was in the governments cross hairs when he said

> **"[improving waterways] won't be done through a raw cap on cow numbers; it will be done on nutrient limits, the amount of nutrient that can be lost from a farm to a waterway, because it is not just a dairy cow issue."**
>
> *(Q&A July 2018)*

Could it happen here? The New Zealand Diary industry is now regulated heavily in terms of the application of fertiliser. Specifically, 'N'.

Fast forward to today and fertiliser efficiency is very much at the forefront of New Zealand farmers minds. In Australia our environment, geology, soils, and methods of farming are different to those of our neighbours. In Australia an Environmental Protection Agency (EPA) is the responsibility of each state government. And whilst 'N' regulation is not yet a major focus of the EPA's there are moves afoot for the universal adoption of nutrient management plans under our Australian Dairy Industry Sustainability Framework.

Whilst specific regulation is someway off here, this is by no means a reason to not keep looking for improvements and advancements in the way we farm.

Machines such as the Tow and Fert range, offer farmers additional flexibility with the application of fertiliser enabling complex 'mixes' or 'slurries' made up of dissolvable solid fertilisers, ultra-fine particle (UFP) fertilisers, natural biological fertilisers, seaweeds, and other products to be applied to pasture and crops in a liquid form. This has significantly reduced the fertiliser burden on the environment on these farms and, in many cases, increased the amount of, and quality of, the grass and crops being grown. Further, the reduction in the need for fertiliser has led to significant cost savings.

For over 50 years farmers and growers have been sold the idea that to grow more grass you need to 'put more on'. An entire eco-system of business grew up around this idea. Disruptors are now proving that this 'more on' approach is not necessary. More grass is being grown with less fertiliser; healthier crops are being grown with less fertiliser. And more milk is being produced as well.

Overall, the impact on the environment has been reduced significantly, cost savings are made, and businesses have become more profitable.

Farts. Greenhouse gasses produced by ruminant animals such as cows, sheep, and deer.

Many readers will have no doubt seen and heard the chatter about the impact of methane as a Greenhouse gas. The emissions from ruminant animals are more appropriately from 'burps' and produce of lot of methane. In the atmosphere methane is a short-lived gas compared to carbon Greenhouse Gases. However, it is more than 80 times more potent in terms of warming power. Methane largely sets the speed at which the globe will warm in the short term.

Firstly, some data. Agricultural emissions in Australia represent approx. 13% of total carbon emissions from all sources. Agricultural emissions cannot be ignored in the greater scheme of reducing emissions to cap global temperature increases as agreed by the Australian Government in signing up to the Paris Agreement. Methane may be the most important gas for the human population to get control of if we are to reverse the impacts of global warming in the short term.

But what can farmers do to reduce the methane production from their ruminant animals?

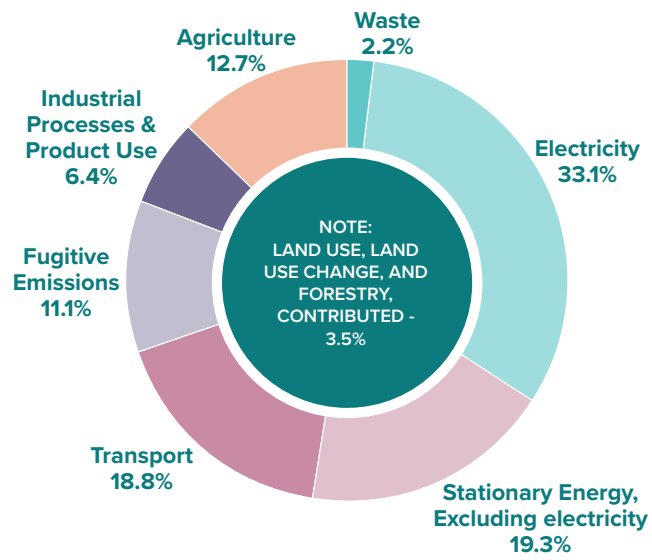
Throughout the Agricultural sector across the world, studies are being undertaken into methane reduction methods in ruminant animals. And the progress is positive and happening rather quickly.

Solutions include studies into allicin, a compound in garlic which has been found to interact with microbes inside the cow's stomach reducing the methane production, in some studies, up to 38%. Not only has methane production reduced but milk production increased possibly because of less energy being spent on the production of methane. And whilst the science is still early the results are promising.

Other potential solutions to the methane problem in cows are seaweed products. Indeed, Australian companies are conducting world leading research into the benefits of their products in methane production with some positive results. There are challenges with bringing these products to market, but the research, science and production is gaining ground every day, and solutions might just be around the corner.

Further and longer term are the possible production of vaccines against the methane producing bacteria.

AUSTRALIAN Greenhouse Gas Emissions



Source: Australian Department of Environment and Energy. Emission by Sector/Comparison Year to March 2019.

Whichever way you look at it many people are working hard knowing that methane reduction is essential to the environmental threat posed by this greenhouse gas and solutions would not seem to be too far away.

Fumes. Could emissions on the farm from diesel vehicles be targeted?

Back across the Tasman in New Zealand farmers have seen what has come to be known as the 'Ute tax' being implemented to cut emissions. The 'Ute tax' or the Clean Car Discount Scheme essentially takes from one - high emitting vehicles; to give to another – low emitting vehicles. By offering discounts or subsidies on electric vehicles those people who purchase vehicles such as diesel burning Utes and 4WDs will be 'taxed' to pay for the discounts on the EV's eligible under the scheme.

Could it happen here? The answer is yes. However, we need to consider a very different set of statistics when considering this question.

Article continues on page 2.

See inside for:

CASE STUDIES & FEATURED PRODUCTS:

In this edition we visit a farmer who has waited 10 years for his Tow and Fert and talk to two suppliers of fertiliser products to help get your operation growing better crops or pasture.

Scott Charmley

Dairy Farmer, Dannevirke.

Scott Charmley first saw the Tow and Fert Machine over 10 years ago. It was not until the release of the Tow and Fert Multi 500 that he finally took the plunge with some impressive results..

Contributor Articles

With a myriad of products available today we feature two company's whose products provide a different take on the traditional 'fertiliser' game. BioLink 4 Plants provide bio-stimulant products and Fertec micronise Gypsum, called Entra, for highly effective application to pasture and soil.

CASE STUDY

Scott Charmley, Dannevirke

AN EXTRA $11,000 IN MILK SOLIDS IN LESS THAN 3 MONTHS OF OWNERSHIP!

Scott Charmley

Owning the Tow and Fert Multi 500 has resulted in more grass and more milk for Scott Charmley. But wait.... there's more.... the application of animal health products in the Tow and Fert means "no dusting."

Scott Charmley remembers attending a discussion group over 10 years ago and seeing the Tow and Fert in action. At the time he was sharemilking, and he remembers that nitrates and environmental issues were just beginning to come to the forefront of farmers minds.

What piqued his interest, however, was the possibility of halving the amount of fert he applied. It was obvious to him that this meant savings on the environmental front and on the business front.

Fast forward 10 years and now Scott and his family farm 215 cows on 78 hectares of pristine dairy land beneath the Ruahine ranges near Dannevirke.

Over the past 10 years Scott had kept an eagle eye on the Tow and Fert range development, waiting for a machine that he felt was suitable for his farm. Enter the Tow and Fert Multi 500, released at the beginning of 2021. For Scott, this seemed the perfect size. With an average paddock size of 2ha the 500-litre tank could do two paddocks in one round. It was the perfect size for his farm.

Scott was the first farmer to purchase the Tow and Fert Multi 500 and he immediately started putting on Urea and Gibberillic Acid in one pass.

Scott says, "I had a good idea of what the machine should be able to do so I started with Urea and Gib Acid following the cows once they moved off a paddock."

Scott applying fertiliser to his pasture after the cows have been through the paddock using the Tow and Fert Multi 500 with electronic actuation.

"I started with 30kgs of Urea and 40mls of Gib Acid per hectare and it is working really well. We are getting a response that is equivalent to putting on 60kgs of solid urea."

Scott says that the ease of use is one of the key benefits to the Tow and Fert.

"I can put on what I want when the grass needs it. I do two paddocks in one round using the P30 nozzle travelling at approx. 16kms an hour. Each paddock takes less than 10 minutes following the cows."

Early on Scott decided to invest in the electronic actuation control upgrade which he says has been money well spent, "for me the electronic actuation upgrade just makes the machine that much easier to use."

Asked about his results and Scott is enthusiastic;

"We have had the Multi 500 since March this year (2021). We kept our cows on for a week longer than our neighbours and grew 70kgs/ha of dry matter through May. We've produced an extra 1500kgs of milk solids this season and have almost paid off our investment in the Tow and Fert."

He goes on to say that the farm is now producing more grass with only half the Urea, and he is well under the new environmental limitations.

During the late winter as Animal health became a priority Scott began to use his Multi 500 for applying Mag Oxide and Lime Flour. It was something he was looking forward to trying. Asked how it went, he says,

"It has been brilliant. I applied Mag Oxide the other day, seven days' worth in 20 minutes and the best part is, no dust. And what we have noticed now is that our cows are healthier, and we have had less issues with down cows this spring."

The Tow and Fert enables Scott to apply the Animal Health products directly to the leaf of the grass meaning that cows cannot avoid eating the products.

"Every animal is getting what they need now, there is no avoiding these products which are so critical to their health."

And on the dust front, "Wow. Just brilliant. Dusting is something most farmers loathe so not having to worry about that is awesome."

Scotts text to Tim Henman, Metalform Sales Manager, after completing his Animal health product application.

Continued from front page

In Australia the focus is on Road User Charges and distance charges being implemented to help curb the impact of the Transport industry. And therein lies the key to why vehicles such as 'Utes' are unlikely to be in the government cross-hairs any time soon. The transport industry is a far bigger polluter than Agriculture at just under 19%, the bulk of which is from those vehicles deemed 'heavy' such as Trucks, busses, etc.

The Rivian R1T, one of the first all electric 'Utes' available for purchase now with a range of just over 500kms.

And with the push to electric vehicles to help curb carbon outputs farmers and growers need not concern themselves with drives to have farm machinery electrified any time soon. Whilst it will undoubtably come our way, there are still many logistical hurdles to overcome before electrical vehicles replace the diesel-powered tractor or Ute in Australia.

Is the sky falling or are 'acorns' simply being tossed at farmers when they aren't looking?

It is fair to feel that farmers have had a bad run over many years as environmental concerns have risen to become one of the hot topics of conversations around the watercooler. Consistent droughts, highly changeable weather, wild fires etc have not made things any easier.

But like the watercooler, these conversations are often taking place in offices and homes well away from the coal face of farming: on the farm itself.

Fertiliser regulations are a possibility but not here yet and farmers and growers continue to innovate and improve their efficiency. Tools like the Tow and Fert are helping to significantly reduce the aftereffects of solid fertiliser application, whilst improving results and saving farmers money.

The 'fart' or 'burp' tax situation looks to have solutions around the corner and farmers would do well to take note of these and integrate new products into their systems for testing as soon as they can.

The 'fumes' argument is another area where innovation is happening, and it won't be long before realistic options are available for farmers and growers to reduce their use of carbon producing machinery.

To return to our fable from the introduction, Chicken Little can now turnaround and look at the sky and see that it is not falling, that, in fact it is simply changing colour with the odd 'acorn' falling from various places to test their metal.

The two constants in life are time and change. Change will always present challenges. How we approach and tackle the need to change is the test of our character. The sky is not falling in on farming, in fact the future is bright and its potential for environmental contribution to the world at large has never been greater.

The Tesla Semi, announced in 2017 to much fanfare is running 2 and ½ years late since first announced.

INCREASING YOUR YIELD AND YOUR FARM'S PROFITABILITY

WITHOUT COMPROMISING THE HEALTH OF YOUR COWS OR YOUR HIP POCKET?

Contributor article: Article supplied by BioLink 4 Plants www.biolink4plants.com.au

Australian farmers are an innovative lot. They're always looking for better ways to run their farm, take care of their land and livestock and deal with whatever comes their way, whether that's drought, floods or COVID-19.

Naturally derived products like microbial stimulants are not new. Organic fertilisers and bio-stimulants are starting to take off for farmers willing to embrace the power of microbials.

Breaking down the nutrients in compost faster, farm made Compost tea

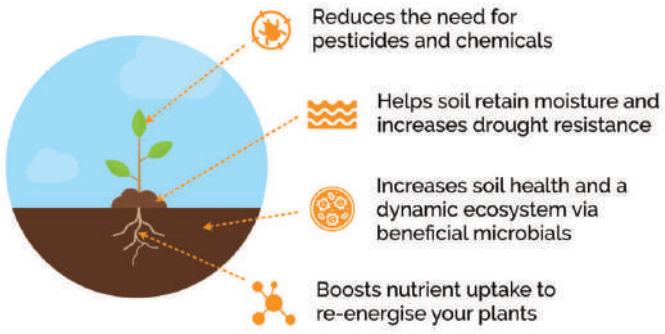
Organic fertilisers that are formulated to promote plant growth and help support the efficiency of your farm have increased in prominence as environmental issues have been brought into focus.

The blending of different microbes into pro-biotic growth booster products or 'tea's' has seen farmers improve their farming practices without the environmental impact and make more money.

An increase of microbes in the soil helps to make nutrients soluble and available, kick-starting plant growth and enriching the soil.

Through on farm trial work, scientists have also discovered that bio-stimulant products can be used as an ingredient in liquid fertiliser applications or as a stand-alone input to support the natural nitrogen and nutrient cycle of farm's manures and composts.

What Biolink 4 Plants does!



A more resilient, sustainable approach

Bio-stimulants help to promote healthy soil and an increase in corresponding plant growth. The result of using organic bio-stimulants is you'll grow enough dry matter to feed your stock throughout the year – and avoid buying-in too much supplementary grain. Farmers using these products are also seeing sustainable increases in nutrient dense home-grown dry matter. In turn, this is being converted into greater milk solid, crop and meat yields.

Reduction in soluble nitrogen use

With more oversight of nutrient use on farms, especially nitrogen, bio-stimulant products supplement and support reduced nitrogen applications. At BioLink we have seen clients reduce their nitrogen application by 50% and still get as good a yield result. The microbials compliment the reduced soluble nitrogen by stimulating the natural nitrogen cycle and converting atmospheric nitrogen to plant-useable forms.

Ready-to-use, easy to apply with a Tow & Fert

BioLink's specially formulated slow-release BioLink Ignition Tow and Fert Blend is an organic mix of nitrogen, potassium, and microbes. It is a product that is easy to use and apply to your pasture. Blend it with your general fertiliser application or through Tow and Fert machines. To use Biolink Ignition Tow and Fert Blend, the application rate is 4 kgs per hectare at a cost of A$32 plus GST per hectare is ideal.

Our belief in the efficacy of bio-stimulants and BioLink 4 Plants products has led to us purchasing a Tow and Fert Multi 2800 machine. We are using this machine to help our clients access the bio-stimulant programme we offer.

Kevin Beecroft, BioLink 4 Plants' co-director, "We've been pleased with the Tow and Fert Multi 2800's performance in applying our product. We're happy to see that all our clients have had good results."

An Australian company, run by Aussie farmers

Biolink was started by two Victorian dairy farming families who were looking for an alternative to standard fertilisers to support and enhance farm soils. Now, farmers all over Australia are seeing the results on their farm – and on their cashflow - using BioLink.

The Beecroft's and the Clay's, founders and directors of BioLink 4 Plants.

"Our soil is powered by Biolink 4 Plants biological products."

Woolvie Jerseys and Holsteins, Dairy Cow Stud Farm, Victoria

Ask for your copy of Biolink 4 Plants Organic fertiliser program for sustainable dairy farms guide at www.biolink4plants.com.au

GYPSUM MADE SIMPLE

MICRONISED GYPSUM PROVIDES A MORE EFFECTIVE GYPSUM SOLUTION.

Conventional, bulk gypsum has long been applied to pasture and forage crops to meet plant nutritional needs, as a soil amendment for treatment of soil crusting or for treatment of subsoil acidity.

A new and innovative approach has emerged where micronised gypsum can be applied using Tow and Fert machines or injected through centre-pivots. This makes gypsum application simple, while offering benefits such as lower application rates and more frequent application, if required.

Micronised gypsum, together with Tow and Fert application, vastly improves gypsum performance and operating efficiency.

Applying Entra Micronised Gypsum to pasture with a Tow and Fert Multi 1000 will help with plant nutrition.

Micronised Gypsum for Plant Nutrition

In a recent scientific publication entitled *Minerals in pastures – are we meeting the needs of livestock?* the authors concluded that in Australia "a significant proportion of pasture plants contain less calcium (Ca), P, magnesium (Mg), sodium (Na), sulfur, copper, iodine, zinc, selenium or cobalt than is required for growth and reproduction with significant genetic variation among and within legumes and grasses."

Amongst these nutrients, calcium can be supplied as lime or dolomite where topsoil pH of pastures needs to be increased while gypsum can be used to provide both calcium and sulphur where topsoil pH is satisfactory. Micronised gypsum improves calcium and sulphur availability to plants and directly to animals by ingestion.

Micronised Gypsum for Soil Crusting

Gypsum has long been used for treatment of soil crusting to improve water infiltration, reduce runoff and soil erosion and improve seedling emergence. However, the success with which this is done varies. The quality of gypsum used, particularly the particle-size, has a big impact on the effectiveness of this application. Finer, micronised gypsums work more effectively than traditional coarser gypsums due to increased solubility in the soil system.

Micronised Gypsum for Subsoil Acidity

Gypsum can also be used to treat subsoil acidity (Shainberg et al. 19892) if this is a problem as it dissolves more easily and is able to move deeper into the soil than lime or dolomite. Effectively the sulphate from gypsum can have a so called 'self-liming' effect which increases the pH and reduces acid cations, especially aluminium (Reeve & Sumner 19723). The use of micronised gypsum gives a better chance of accessing the subsoil.

Entra Micronised Gypsum

Gypsum that is ultra-fine or micronised *(by this we mean most particles are under 50 microns)* can be applied at lower rates to meet calcium and sulphur needs. It can also be used for the treatment of soil crusting because the smaller particle size allows for superior coverage of the soil surface after application and greater overall availability when compared to bulk gypsums.

Entra micronised gypsum can be readily applied as a slurry with Tow and Fert machines or applied through centre-pivots. It dissolves quickly and the calcium and sulphur become more rapidly available than coarser, bulk gypsum.

Using soil-columns, we have shown that low rates of Entra are highly effective at treating soil-crusting, because the product is rapidly available.

"We recently launched Entra micronised gypsum which is sourced and milled in Australia", said Durell Hammond, a Director of Fertec Pty Ltd. "When Entra is applied with Tow and Fert equipment, farmers can take full advantage of using micronised gypsum. In addition to lower rates and quicker results, farmers have the ability for precision and variable-rate application."

Applying Entra Micronised Gypsum

Entra is suited to application of a concentrated slurry using two parts Entra and one part water. Vigorous agitation by the Tow and Fert machine maintains the suspension while it is applied to the paddock. You can see in the pictures how the mix "paints the ground" where it has been sprayed, with an incredibly accurate application.

Entra can also be co-applied with other plant nutrients, such as nitrogen, potassium, zinc, boron, copper and molybdenum.

Entra micronised gypsum is available from warehouses nationwide. More information can be found on the Fertec website: www.fertec.com.au or call Rory on +61 409 804 297.

Entra Micronised Gypsum can be applied as a liquid ensuring all the gypsum is used where it is intended.

References

Minerals in pastures – are we meeting the needs of livestock? by David G. Masters, Hayley C. Norman and Dean T. Thomas, Crop & Pasture Science, CSIRO Publishing, 1 May 2019

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3 Reeve, N.G., and M.E. Sumner. 1972. Amelioration of subsoil acidity in Natal Oxisols by leaching surface applied amendments. Agrochemophysica 4: 1-6

www.fertec.com.au

entra

SPRAY NOZZLE ACCURACY:

ACHIEVING A COEFFICIENT OF VARIATION BELOW 15%.

The accuracy of fertiliser placement is becoming more and more critical for many reasons.
The design team at Tow and Fert undertook to achieve a benchmark accuracy test of below 15% Coefficient of Variation.

This is the story of how they did it...

Spray Nozzle accuracy is something we have had numerous discussions with customers over the last 18 months and in July last year the Tow and Fert Design team got a Nozzle design accuracy project underway.

This was a tricky project but one that was essential in the development of the Tow and Fert and proof of placement of fert as well as ensuring the environmental benefits of the Tow and Fert Machines into the future.

GAME OF CHESS ANYONE? 3D Printing of nozzles speeds up the design process.

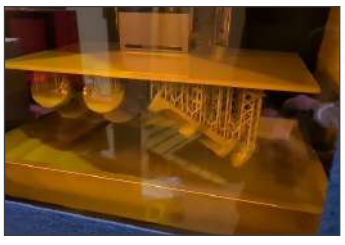
A lot of time, effort and creativity goes into the design of the Tow and Fert Machines. Whilst these images might look like we are designing chess pieces, they are nothing of the sort.

These pictures show just some of the different Nozzle designs the team went through in developing a more accurate nozzle. The accuracy of the placement of fertiliser is important to produce Dry Matter and the production of Milk. Additionally, fertiliser placement is important for environmental compliance.

The result of all the testing and design was the determination of seven key dimensions that can subtly be changed to tune the performance of the nozzle. Each of the nozzles shown here have slight changes to these dimensions to change the spray pattern.



Manufacturing stainless steel nozzles is a time consuming and expensive way of testing. The team decided a 3D Resin printer would enable them to design and test multiple nozzles at a time. They could now make a selection of nozzles in less than 12 hours. This was the beginning of making the stream from the nozzle consistent and even, without a pulsing effect.



One key element the team realised was the importance of consistent pressure at the Nozzle end of the booms.

Design Manager Liam explains the pressure importance as follows, “The pressure created by the Tow and Fert at the end of the booms is important to ensure the accuracy of the nozzles. A small drop in pressure can completely change the spray pattern obtained.”

With each change to the nozzle design there was a trade off in another part of the programme, be it spray pattern, spray width or sputtering that occurs as the liquid exits the nozzle. It was simply a case of trial and error, redesign and print and trial again.

TESTING, TESTING. Spray variance (Coefficient of Variation) under 15% achieved.

Using the B30 Nozzle the team started using blotting paper before shifting to clear plastic trays and measuring the combination of tray and liquid for the results. Initial results were looking positive.

A pass mark meant that the spray pattern variance across the range was under 15%, the percentage required. It was now time to set about testing the application in the field.


FIELD TESTING SUCCESS: On-farm testing replicates factory testing.

In mid-July the team headed to Canterbury for the official testing with clients’ machines.

With perfect weather on the day of testing the team needed to ensure that the area they were spraying on was flat. This would mean that each nozzle was at the same height ensuring even distribution of fertiliser across the spread width.

Wind was also something that needed to be considered. Wind can create a shift in the spray and whilst testing had shown that wind tended to shift the entire spray width it was important to be aware of the possibilities if the wind got up. On this particular day the sun shone, and the wind stayed away leaving perfect conditions for testing.

Recreating the test back at the factory using plastic trays, the Tow and Fert owners would drive through the testing area at a specific 16kms an hour using the B30 Nozzle. This would ensure a consistent spread was achieved and that each run was the same.




NOZZLE ACCURACY SUCCESS!!

Fertiliser Placement "Coefficient of Variation" of 13.9% was achieved, below our benchmark of 15%.

Liam, Tow and Fert Design Manager says

“This was a way more complex project than we ever imagined, and it is terrific to finally have achieved what we needed to achieve. For our clients both contractors and Tow and Fert owners this result gives them assurance of placement within industry standards of their fertiliser. The benefits to farmers from this result and to the environment are many not least of which is knowing how much and where their fertiliser has been placed.”