THE Tow and Fert TIMES

TOW AND FARM BY METALFORM
VOLUME 1. July 2018

FERTILISER MYTHS BUSTED | NUTRIENT BUDGETING: NUTRIENT MANAGEMENT WITH OVERSEER
ANDREW'S ANGLE ULTRA FINE PARTICLE FERTILISER – SOIL PH | TOW AND FERT CASE STUDIES

ENVIRONMENTAL REGULATION!
IS IT SOON TO BE A REALITY FOR FARMERS?

Change is coming. Like it or not, better environmental controls will change the way we farm for good. So how do farmers make that change?

John Barnes from Fertilizer New Zealand has been at the forefront of the fertiliser industry for many years. He is an advocate for the environment and believes that the way we farm must change to be in sync with the environment. BUT, and it's a big BUT, he says "looking after the environment, or working with it, does not have to come at the expense of your business."

For a long time the perception has been that having to change the way we farm is going to cost businesses and that that cost is simply not worth bearing. However, with increased media focus on the environment and the impacts of dairy farming, in particular, being in the headlines it is becoming increasingly clear that change is coming. And so says John...

> **"Farmers face a choice. Change their farming practices on their own or face the very real prospect that they will have change forced on them by national and local Government."**
>
> *John Barnes, Director. www.fertnz.co.nz*

Citing the new Labour Government's recent ban of future offshore oil and gas exploration, John believes the time may be coming when the Government simply announces changes to the environmental laws without consultation or notice, "that's when farmers who have not made the changes themselves will face increasing costs to change and have no choice but to do things differently."

In fact, those signals have already come to the fore with Environment Minister David Parker recently saying in the media "in some areas, the number of cows per hectare is higher than the environment can sustain". Mr Parker told TVNZ's Q&A that the degradation of the country's waterways needed to stop and we all had to be responsible for improving water quality.

Whilst the focus in the media seems to be on "dirty dairying", the real issue is being overlooked. This from David Parker, "[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's not just a dairy cow issue." And this, nutrient limits, is where the most significant gains in looking after the environment can be made.

When asked how farmers can change their practice now John Barnes says, "it's actually relatively simple. Yes, there is cost involved, but changing from the granular application of fertiliser, Nitrogen specifically, to applying fertiliser to the leaf of the grass, is the obvious thing to do."

Is there a better way? Foliar application explained.

Foliar application of fertiliser is not a new method of getting nutrients into pasture says John, but it is one that is misunderstood. "We are all taught about photosynthesis in school biology. We understand how the plant uses light and CO2 in the air to then produce oxygen. What we are not taught is that plants also absorb and process nutrients through their leaves."

Looking under a microscope at the leaf of grass it is clearly identifiable that there are holes. It is these holes John says, that absorb the liquid applied to the grass sword, "to give you an example, we know that RoundUp is a liquid and it is applied to the leaf of the plant. What happens? The grass or plant dies. That is foliar application working. So the reverse is true. If we apply the nutrient a plant needs to the leaf then it will absorb those nutrients and put them to work."

In fact, the leaf of the grass will only absorb the nutrients it needs, and it absorbs it in a matter of hours making the efficiency of what it uses much greater. This means the plant needs less of those nutrients for the same or better results. The end result is that farmers can use less of a fertiliser like Nitrogen for the same, or better results in grass growth.

Granular application of fertiliser has served farmers well, but the environment has suffered and New Zealand's waterways are testament to that. With the level of loss of Nitrogen into the environment through granular application, up to 75% into the atmosphere and down into the soil that the plant cannot access, reducing the application levels of Nitrogen simply makes sense.

"Foliar application is proven, it works and in fact it often works better than traditional granular methods. Not only that, farmers can save significantly in cost by applying their Nitrogen in liquid form."

And that, says John, is why looking after the environment by reducing the amount of Nitrogen applied actually makes good business sense. "Farmers can apply less Nitrogen, reducing their cost of fertiliser yet still get the same or better results. It's actually a really simple decision. Make the change to foliar application of fertiliser and the environment wins and your business wins. Why wouldn't farmers change?"

And on the prospect of a heavy-handed Government intervention in the near future? Here is what Minister for the Environment Minister David Parker also had to say about those who do not voluntarily change the way they do things....

> **"Now, those people will have to be regulated to do the right thing, because they may not be willing to do it voluntarily. That's the purpose of environmental regulation."**
>
> *David Parker, Environment Minister. May 2018.*

Like it or not, change is coming. It's up to individual farmers to do things better or have their hand forced.

5 WAYS TO IMPROVE YOUR Environmental Footprint.

01 Get soil AND herbage tests done by an independent laboratory. This is to identify a full picture of macro and micro nutrients across your pasture and soil ensuring you don't over-fertilise.

02 Apply fertiliser only when you need it applied for best efficiency to minimise losses and maximise growth period. Do it when it suits your stock rotation and when the weather is favourable.

03 Combine capital fertiliser, gibb, small seeds, humates, fulvic acid and fine lime with dairy effluent to your grass and pasture's needs in one application.

04 Apply multiple products (macro and micro nutrients) at once to minimise repeated runs across your pasture by you or a contractor. Reduce multiple passes to one pass.

05 Improve Nitrogen response efficiency by dissolving and applying Nitrogen using a Tow and Fert and applying it directly to the leaf.

For more ways to improve your environmental footprint call

0800 337 747

www.towandfarm.co.nz

ANDREW'S ANGLE

Andrew de Lautour

ULTRA FINE PARTICLE FERTILISER, SUSPENDED IN LIQUID, will improve your soil pH

Improving your soil pH will mean better, healthier feed for your herd.

Andrew de Lautour, Soil Scientist and founder of PFP Fertilisers, producers of Ultra Fine Particle Fertilisers, gives us his insight into the importance of soil pH.

In the past, nutrients have been applied to the ground in an agricultural grade particle size. These are large in comparison to the more recent innovation of Ultra Fine Particle application. Ultra Fine Particle fertilisers represent nutrient products that are ground down to a size of less than 20 micron. This Ultra Fine Particle massively increases the surface area of the product being applied making it more efficient and generates a higher response in your soil and plants.

If you picture a piece of steak, cooked to perfection, you will often season it with ground pepper. However, if you were to try to season it with four WHOLE peppercorns placed on top of the steak you will get only four mouthfuls of steak with your pepper. Each of those mouthfuls will be overridden with the pepper taste and spice. Ground pepper will give you a more even spread and a far better tasting piece of well-seasoned steak. The exact same principle applies with Ultra Fine Particle Fertiliser.

When it comes to soil, optimum nutrient availability falls between soil pH 6.0 and 6.5. To understand the chart shown to the right, note that the coloured bars relate to the various nutrients, the wider the bar, the more available that nutrient is. You will see that Potassium is about 30% available at pH 5.0 and by pH 6.1 it's 100% available.

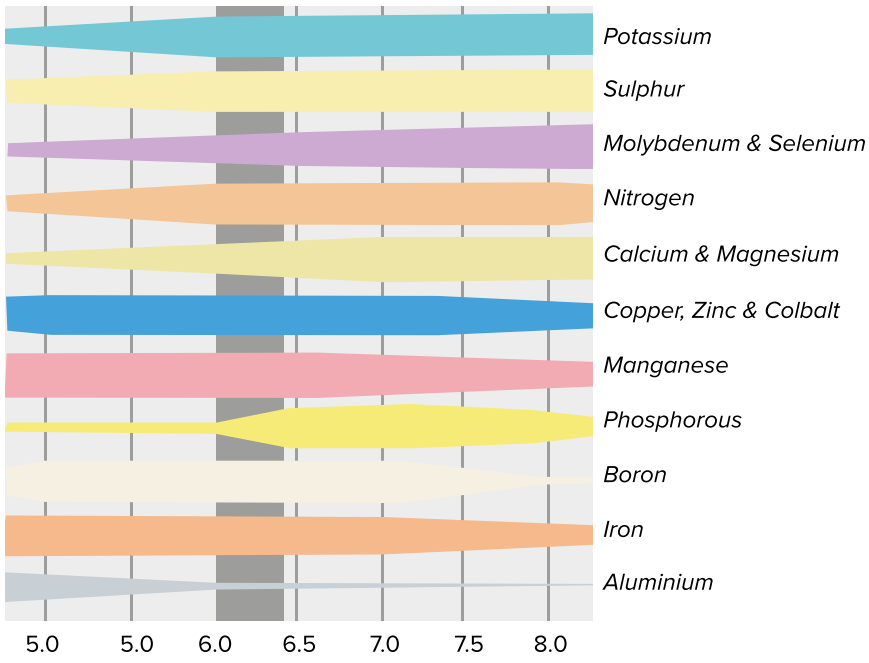
PFP Fertilisers Ultra Fine Particle Fertilisers are all ground to less than 20 microns, meaning that your soil receives a far greater spread of the nutrients it needs. There is far less chance of concentrated areas of one particular nutrient, you will use far less of the products you require and as a result, far better nutrition value is achieved for your soil and the grass your animals eventually eat.

The Tow and Fert range offers farmers the opportunity to apply our Ultra Fine Particle Lime products and other fertiliser products whilst suspended in liquid. This is an effective and efficient way of applying the nutrients your soil, your pasture and your animals need.

FERT SIZE MATTERS
UFP Fert means less is used

Description	Particle Size	pH Maintenance
Ultra Fine Particle	<20 micron average	75-100 kg/ha
Lime Flour	<50 micron average	100-150 kg/ha
Fine Particle Lime sieved	250 micron	250-300 kg/ha
Cropfine Lime sieved	250 micron	250-300 kg/ha
Ag-Lime	95% <2.000	1 ton/ha

Nutrient availability and soil pH graph



KEY

Bar widths show nutrient availability

pH Range 5.0 - 8.0

Optimum range

For more see www.pfpfert.co.nz

Quick reference THE TOW AND FERT CALENDER OF USES

	SPRING: Calving until *mating*	SUMMER: Mid lactation	AUTUMN: Late lactation dry off	WINTER: Dry off to calving
FERTILISER	Foliar Applied Urea Foliar Applied DAP Foliar Applied S.O.A Effluent Soluble Potash Gibberellic Acid	Foliar Applied Urea Foliar Applied DAP Foliar Applied S.O.A Effluent Soluble Potash Gibberellic Acid	Foliar Applied Urea Foliar Applied DAP Foliar Applied S.O.A Effluent Soluble Potash Gibberellic Acid Elemental Sulphur	
ANIMAL HEALTH	Mag Oxide Mag Sulphate Fine Lime Flour Cobalt Selenium Iodine	Zinc Oxide Zinc Sulphate	Copper Zinc Oxide Zinc Sulphate	Iodine Selenium
WEED CONTROL	Thistle Spray Spraying out	Spraying out	Porina Grass Grub Thistle Spray	
SOIL AMENDMENT	Over-sow turnips or brassicas Fine Lime Gypsum Humates/Carbon	Fine Lime Gypsum Humates/Carbon Over-sow chicory, plantain or clover	Fine Lime Gypsum Humates/Carbon	Fine Lime Gypsum Humates/Carbon

Visit www.towandfert.co.nz for more products that are compatible with Tow and Fert.

TOP TIPS FOR LIQUID FOLIAR FERTILISER APPLICATION
with Dean Lawrence

01 Applying fertiliser in rotation following stock allows you to apply your fertiliser little and often, to maximise response and minimise environmental impact.

02 Foliar application of fertiliser improves uptake and response per unit of nutrient applied while greatly decreasing losses to the environment, and increases profit to the farmer due to using less fertiliser.

03 The Tow and Fert provides the flexibility of having the option to be able to add or remove products, sprays, seeds etc. in every mix, custom making the mix to suit the individual paddock.

Dean Lawrence is a Southland Dairy Farmer and Tow and Fert Multi 4000 Contractor.
Contact Dean on 021 284 2200.

For more fertiliser TIPS from Dean CALL Tow and Farm on 0800 337 747

NUTRIENT BUDGETING WITH OVERSEER. Can farmers reduce fertiliser input, grow the same amount of grass and reduce nutrient loading?

As farmers, we all know of the increasing focus on the environmental impacts of our livelihood. We have seen this focus on the environment with talk of taxes and Government enquiries, articles in the media, Council working groups and the Dairy Industry Clean Streams Accord.

Nutrient budgeting is now an accepted part of farming practice with the Overseer programme providing the platform for calculating a farms nutrient loading. Farmers across the country are faced with having to meet new, lower allowable nutrient loading numbers. In many cases, the process of budgeting is simply taking from Peter to pay Paul, in other words, shuffling the inputs and outputs around in order to somehow reduce the nutrient loading value spat out the other end.

This juggling act is going on across the country as farmers realise the regulations are coming and compliance is required.

Fertiliser: The easy target for Government and Councils

On the input side of nutrient budgeting, fertiliser is where farmers can have the biggest impact on their nutrient loading. Government and Councils are targeting fertiliser because it is the only figure you can alter on the input side which has a direct result in lowering the figure at the bottom that is a farms nutrient loading.

However, as farmers, reducing our fertiliser inputs can have a direct impact on the quality and quantity of grass we grow. This in turn may reduce our outputs that we earn our incomes from. It is a delicate balance and something that many farmers are working through presently.

Is this the silver bullet farmers have been waiting for?

Reducing your farm's use of fertiliser is the obvious thing to do, but the trade off can mean reduced quality and quantity of grass grown. The Tow and Fert System offers farmers the opportunity to reduce their fertiliser input by up to 50%, yet grow the same amount of high quality grass.

As Overseer treats the application of fertiliser the same, whether it is applied in solid form or in liquid form, the reduction of fertiliser input by up to 50% will have a dramatic effect on nutrient loading figures. Tow and Fert will enable farmers to apply their fertiliser in liquid form direct to the leaf of the grass. Given the right conditions, the grass will use what it needs within three to four hours meaning greater efficiency is achieved, less fertiliser is required and fertiliser is not left on the ground to leach or run off.

> **"LIQUID FOLIAR APPLICATION of fertiliser is the only way you can reduce costs, improve profitability, look after the environment and grow better grass."**

Not only is a farm's fertiliser requirement drastically reduced (up to 50%) by applying less and allowing it to be taken up by the plant more efficiently, there is the added benefit of much lower environmental losses. Whilst this is not yet taken into account by Overseer, the benefit of lower environmental losses is obvious.

In short, a farms move to the application of fertiliser with a Tow and Fert is a WIN – WIN whichever way you look at it.

NUTRIENT LOADING IMPACTS

Conventional vs Tow and Fert fertiliser application methods

The table to the right illustrates in a simple manner the potential impact of changing to the Tow and Fert System on nutrient loading.*

		Convertional		Tow and Fert
Input	Fertiliser	200 Kg/Ha	Fertiliser	100 Kg/Ha
	Silage/feed	2000 Kg/Ha	Silage/feed	2000 Kg/Ha
Output	Milk	300 Kg/Ha	Milk	300 Kg/Ha
	Meat	400 Kg/Ha	Meat	400 Kg/Ha
	Supplement	1300 Kg/Ha	Supplement	1300 Kg/Ha
Nutrient loading		200 Kg/Ha		100 Kg/Ha
Environmental		70 Kg/Ha		35 Kg/Ha
Total loading		270 Kg/Ha		135 Kg/Ha

*Example only. Individual results may vary.

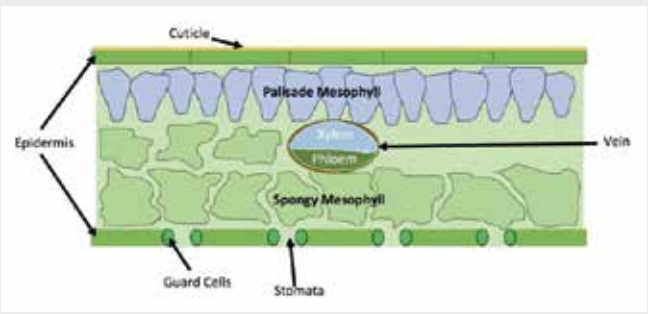
Fertiliser MYTHS BUSTED.

#01 MORE IS BETTER

The simple fact of the matter is that more is NOT better. In fact plants, in our case grass, can only utilise so much fertiliser. It's a bit like us sitting down for dinner, there comes a point where we are full and can simply not eat anything more. It's the same for plants. They will only use what they need, the rest is left on the ground and in the soil adding to the environmental problems we have today.

#02 PLANTS DON'T HAVE TEETH, THEY CAN'T TAKE UP FERTILISER THROUGH THE LEAF

Yes, we've actually heard this one thrown around the traps. Of course plants don't have teeth. But what they do have are cells that have space around them allowing them to absorb and take nutrients from products that hit the leaf. The grass sword will then use only what it needs to grow. So yes, plants can and do take up fertiliser through the leaf.



Above: The absorption of nutrients takes place through the grass stomata and epidermis.

#03 SOLID FERTILISER IS THE ONLY OPTION

False! Liquid fertilisers have been around for years and offer farmers better results in plant uptake and nutrition for animals, thus saving money and decreasing the amount of fertiliser needed.

"THIS YEAR I HAVE SAVED $18,000 AND 36 TONNE OF NITROGEN BECAUSE OF MY TOW AND FERT"

Read Ian Maxwell's story...

On the West Coast of New Zealand it rains a lot. Ian Maxwell's herd of 300 cows had suffered through season after season of high rain fall, wet ground, high water content pasture and mud. On any average year, up to 100 of his herd would suffer from sore feet. It was a constant battle and one that Ian could not figure out.

"I could not get on top of the sore feet issue. We have beautiful lanes, we walk the animals slowly, don't have dogs or anything like that, but we just could not combat the lameness."

Ian first came across the Tow and Fert machine reading the paper but it was not until he spoke to his rep from Fertilizer NZ about the merits of spraying Liquid Nitrogen on his pasture that he decided to give it a go.

"The advantages to the herd have been absolutely huge. With all the rain we get here on the West Coast, coupled with solid Nitrogen, it just left us with a lot of 'soup' in the grass [high water content] which just runs out the other end of the cow."

By changing to the Tow and Fert system Ian has greatly reduced the amount of water in the grass. Ian says he has saved around 36 tonne of Nitrogen this year alone by using the Tow and Fert, which equates to around an $18,000 saving.

From an environmental perspective, Ian is quick to point out the importance of working within the regulations, "once upon a time, Environmental concerns never really had a part to play in our farming practice. Now it must be environmentally friendly."

But with such a decrease in the amount of Nitrogen being applied there must be compromises made to the grass the cows are feeding on? Ian explains "the 36 tonne we have saved has not been saved from the cow side of things, we have actually saved from the environmental side of things because it hasn't simply gone down the drain."

From the animal health perspective, the change has been dramatic, "since we bought our Tow and Fert there has been a huge reduction in lame cows. We have only had 20 all year and it's just because of the dryer feed we are feeding our cows with not so much water in the grass." With drier grass, the feed moves through the cows system slower allowing for better digestion and a healthier gut, more solid poos, resulting in better hoof condition and better cow condition.

Ian now says he simply cannot imagine life without his Tow and Fert Multi 1000, "I was running myself silly putting fertiliser on in dry form, now the Tow and Fert means I can do four things in one pass, my Nitrogen, Pro Gib, weed killers and sow brassica seeds, all with the one machine at the same time. I go once around the paddock now".

"I just can't think of life without my Tow and Fert."

Ian Maxwell,
Dairy Farmer,
Hokitika,
New Zealand

Key Stats: 300 cows | Saving $18,000 p/a | Tow and Fert 1000
N use before Tow and Fert: 32 units/ha
N use after Tow and Fert: 20 units/ha

EMPTY RATES DOWN, PRODUCTIVITY UP, COSTS UNDER CONTROL

after changing to the Tow and Fert

Ben Black returned home from overseas to his family's sheep and beef farm in Culverden in early 2010. With a family history stretching back to the early 1930s, on the flat plains surrounding the small South Island town Ben was proud to be back on the land he knew so well.

Having converted their sheep and beef farm to dairy, and almost through their first year as dairy farmers, Ben's father Bruce had learnt about the Tow and Fert and the potential benefits it could bring to the farm and their animals. Ben says "in our second year, my father Bruce, credit to him, was sold on a Tow and Fert Machine".

Bruce was a great believer in good animal health. Ben however, was sceptical. "I wasn't as great a believer in the animal health side of things and I resisted at the start." Agreeing to the purchase of the Tow and Fert Multi 4000 was a big step.

Ben now says, "despite being a sceptic, within three weeks the temperament of our cows and how calm they were on the platform was starting to show and I started to sit up and become aware of what the machine could do to our [fertiliser] system."

Ben explains that applying the fertiliser to the leaf of the grass meant "the uptake of the fert we were applying was going through the leaf and was readily available, instead of being applied to the ground and coming up through the roots, which can be quite slow, and meaning our cows were getting the benefit of that product immediately."

For Ben, his animals and his farm, the foliar fertiliser system has meant he now has cows that are relaxed and productive, with one of the telltale signs the system is working well, being their low empty rate.

> **"Our empty rate, credit to the machine and what we are applying, for the last two years has been 5.9% and 6.9% when the industry average sits around the 15% mark."**

Further, the Black's farm is returning an average of 1500kg of milk solids per hectare (industry average is below 1100kg/ha) with a cost of under $3.50 per kg of milk solids produced.

Ben Black, Dairy Farmer, Culverden, New Zealand

Key Stats: 800 cows | 1500Kg milk solids p/ha
Tow and Fert 4000
Empty Rate before Tow and Fert: 15%
Empty Rate after Tow and Fert: 5.9% – 6.9%

So what would he say to those considering moving from traditional fertiliser application methods to a foliar application system using the Tow and Fert?

"People looking to get that last inch out of their business, this machine will do it. It is well built, it lasts, and it can used for other things as well. The benefits to our farm have been significant and I thoroughly recommend the Tow and Fert."

A REVOLUTION IN FERTILISER APPLICATION TECHNOLOGY. The birth of Tow and Fert.

In the early 2000s, Tow and Farm, from Dannevirke in the central North Island of New Zealand, was heavily involved in developing a system for handling and applying thick suspension fertiliser mixes from the air. A bucket was developed that revolutionised how suspensions and FPA were applied from the air, as it was designed for the versatile helicopter rather than a fixed wing aircraft. It was a first for helicopters as it came with the benefit of not requiring CAA approval due to it not being fixed to the aircraft like hopper boxes or belly-tanks. The real benefit to the farmer was being able to apply this 'powerful' fertiliser at a 35 metre swath and at a rate of one hectare in around 15 seconds.

> **"As Tow and Farm watched this industry grow, they noticed the agronomic benefits, savings being made on fertiliser and production efficiencies that were obvious on the client's farms, from venturing into the 'new' suspension and fine particle application methods."**

In the mid-2000s, Tow and Farm realised the potential to help the agricultural industry further by providing a versatile tool, originally developed for pilots, to be within reach of all farmers across the nation.

The Tow and Fert, a ground based foliar/liquid application method for dissolving fertiliser and handling suspensions was born!

The original design brief was to design a machine to tow on the ground, dissolve soluble fertiliser quickly without the need for another tank, hold fine particle fertiliser in suspension without blockages, have a tool-less design philosophy for operation/cleaning, remove the barriers for the 'hard-to-apply fertilisers' and offer the ability to mix multiple fertiliser products together for a one pass application, saving farmers time and money.

Tow and Farm then pioneered and commercialised a system that harnessed the energy produced by pumps and agitation, combined with specifically designed recirculating booms and tank shapes. The result was the development of numerous innovative technologies and flow management systems that eliminate blocking potential and are now patented around the world.

Tow and Farm pride themselves in the robust engineering and the technology they have developed, but the real passion they have is helping farmers save money on fertiliser, improve their animal health and the opportunities it is currently providing to our sustainable farming initiatives.

The Tow and Fert A MACHINE FOR ALL FARMS

A one pass solution.

Load solid Nitrogen and quickly dissolve in liquid.

There is one for all farm sizes.

The Tow and Fert range LIQUID FOLIAR SPRAY MACHINES

THERE IS ONE FOR YOUR FARM

Multi 1000

Multi 1200

Multi 2800

Multi 4000

THE BENEFITS OF OWNING A TOW AND FERT:

- Save on fertiliser costs
- Reduce nutrient loading
- Improve grass quality
- Improved soil health
- Better animal health
- Better milk productivity

For more information or to BOOK A FREE on-farm DEMONSTRATION CALL 0800 337 747 or email dairy@towandfarm.co.nz

TOW AND FARM BY METALFORM

www.towandfarm.co.nz