Fertigation Field Day

9th of June at Cameron Hendersons 'Summit' Dairy Farm

Graeme Pile – Fertigation NZ (graeme.pile@fertigation.co.nz); 027 624 6750

- Provided an overview of fertigation systems in NZ.
- Fertigation is the process of applying liquid or dissolved nutrients e.g. Nitrogen with irrigation water. Most commonly in Canterbury liquid Urea is pumped through an irrigation system via injection into the pump on either a single unit or a system. The liquid urea that is already dissolved to a concentration of 19% by either Ballance or Ravensdown (Molloy Agriculture) is then distributed via the irrigation system such as a pivot or a lateral most commonly in conjunction with irrigation water.
- Any irrigation system can be used for fertigation is all that is required is the ability to inject the liquid/nutrients at a point of pumping for distribution.
- 40+ systems throughout Canterbury currently which cater for a variety of crops and systems
- Ideology behind using fertigation is right source, right rate, right time, and right place in order for the farmer to increase their nitrogen efficiency and use less kg N/ha overall offsetting the cost they would have spent of transport/spreading solid fertilisers and allowing low application rates to meet plant demand.
- Ability to use more the Nitrogen as a nutrient, however the uptake of trace elements, micronutrients has been limited to the horticulture space as these nutrients are often expensive and at quite low levels BUT there is no reason why they can't be adapted into the pasture/crop situation on a widespread scale
- In terms of equipment requirements the importance of flushing the liquid urea out of your pivot/irrigation system was highlighted so it didn't lead to issues if it sat in your machine
- ECan also outlined that they are completing some work in the fertigation good management space but a key thing to remember is that backflow prevention needs to be considered to ensure no product can enter the environment due to equipment failure or other issues.

Jessica Hollever – Ballance Agri-nutrients (jessica.hollever@ballance.co.nz); 0275097458

- Spoke about the Science behind N and fertigation
- Discussion was had around the risk of volatilisation from fertigation compared to solid fertiliser, with the importance of fertigation occurring with irrigation rather than solid which to reduce the risk of volatilisation needs irrigation within 8 hours.
- Options to reduce volatilisation further were presented with Graham and Jess discussing the effect that adding a urease inhibitor to fertigation (the coating on products such as Sustain and N protect) → watch this space
- Spoke about the INZ SFF fertigation project
- Year 2 results have been collected but are yet to be finalised within project partners but should be released shortly.
- Year 1 looked at how fertigation can improve pasture quality and production.
- 1 Trial looked at the differences between fertigation N, Solid N + Immediate irrigation and Solid N + delayed irrigation influenced pasture. The treatments were: 25kg N applied as fertigation, compared to 25kgN as solid fertiliser + immediate irrigation and 25kgN as solid fertiliser and delayed irrigation. → Very little variation in DM production and quality between the treatments, but an increase in production when compared to the control. There was an abundance of clover found

on the trial plot due to the historic species that had been planted for the trial work prior.
- 2 Trial looked at the difference of applying fertigation as a once-a-month rate (25kgN/ha) or a lower more frequent weekly rate (6.25kgN/ha). Again there were no differences found in the year one data between the 2 application rates.
- Year 2 looks to decrease the rate of kg N/ha applied down to 16-24kgN/ha to look at the difference, and also looking at fertigation only during the shoulder seasons with the idea of clover sustaining production throughout the summer.

Cameron Henderson – Fertigation on farm

- Outlined the fertigation systems on farm. 2 Pivots at the moment have fertigation.
- 1 nearest the dairy shed has a supply via a 30,000l tank of liquid urea, the other has a 'tank' that goes with the pivot which can be refilled as required.
- Third pivot to get fertigation next season as well, has a corner arm to consider in the design and system.
- Utilises solid fertiliser and liquid fertiliser as part of the nitrogen strategy on farm as is often not irrigating in the early season months (August – October) or possibly not in the later part of the season (April-May)
- Maintenance fertiliser is still applied according to soil tests, so only liquid N via fertigation as a nutrient at the moment
- Cam outlined the potential ease of using phone and technology to manage and know the nutrients being applied.
- First full season in use will be next season on farm, but observations to date show no major difference in pasture production when compared to the normal nitrogen regime

Johan Joubert – Fertigation on farm and the SFF project

(joubertj@landcorp.co.nz)

- Outlined the SFF project on Pamu, which involves other industry partners. Key interest areas are loss rates (N leaching), utilisation and efficiency, reducing levels of N applied but maintaining pasture production/quality and considering the other on farm benefits
- Commercial viability is a key driver for ensuring that fertigation is successful
- Pivots have a liquid urea supplied to them via a trailer unit that gets towed out and hooked on to the pivot tower where it is then injected.
- Year 1 goals were ambitious to reduce N by 40%, which required careful management and hit some pitfalls
- Since the application rate has altered, but has been below what would be applied via solid fertiliser for the season and below the 190kgN/ha that regulation is bringing in.
- Johan commented that although not scientific the paddocks do appear to rebound quicker with the more frequent applications of N when compared to solid nitrogen.

Harry – Atlas Ag Tow and Fert (atlasag@xtra.co.nz)

- Discussed how the Tow and Fert unit is used within there business as it can be used to apply a range of nutrients providing the 'solid' form is water soluble or dissolvable.
- Different from carting the product in an already dissolved form, the tow and fert can create liquid N based on dissolving a quantity of urea in the tank and directly applying. Therefore not carting water around, and able to utilise the often-cheaper raw solid fertiliser product.
- Dissolving time depended on the product but considered relatively quick, and allows the addition of other nutrients to the mix such as humates, micronutrients and bio-stimulants (Progibb).

- 24m boom width with two wide fan nozzles on the larger unit which they have as part of their contracting business
- Another option available to look to reduce N on farm, by again using similar principles to fertigation which is applying little and often on pasture.

Questions Raised to follow up:

- How does fertigation/liquid fertiliser work in the Regenerative Agriculture space? Impact on soil structure etc
- What is the difference between Foliar Fertiliser and Fertigation? Is there a difference in growth rates? Does the plant utilise a different method of uptake? Leaf uptake vs. root uptake of product when and why would each method be utilised.
- Other nutrients how do they work in fertigation and foliar applications? Macro and micro nutrients
- How does fertigation work for other enterprises that are not solely pasture based? Forage crops and arable situations.

Suggested Next Steps

- Define fertigation, liquid fertiliser and foliar fertiliser to make sure the pod group is covering the correct information that they want to know. Is it all of these or just fertigation?
- Industry that attended the day have offered to help write up a FAQ for fertigation and liquid fertiliser to help answer some of the above questions
- Field day or investigate the wider use within other farming system than dairy or pastoral based
- Investigate how fertigation/liquid fertiliser works in the Regenerative Agriculture space using some of the key farming members that were attending – Allan Crowe, Harry Meijer, Andrew Mehrtens and other industry members to look at more innovative uses within the farming industry.