



Nitrogen, Sulphur and Potassium Responses

in Late Winter and Early Spring

July-October 2019

Background

Most Northland dairy farmers apply nitrogen to their pastures during winter and spring to increase pasture production. Many of these will include sulphur and/or potassium with that nitrogen to ensure these elements is not limiting. This is commonly applied as products such as Sustain Ammo or PhaSedN for sulphur or Sustain 20K for potassium. Some are convinced of the benefits of using these multi element products whilst others are convinced that nitrogen alone gives the best economic response.

It appears that very little research has been undertaken in Northland to determine responses to sulphur or potassium with nitrogen during winter and early spring. In a literature search only one paper was found that investigated nitrogen responses with and without sulphur (Rogers and Putt 1997). This showed that there was a good response to the addition of sulphur on a Wharekohe silt loam soil but no response on a marine clay. This was only investigated with one application time and appears there was only measure after application (not a harvest).

Research from other regions has less relevance due to Northland having a high incidence of poorly drained soils with low anion storage capacity, which is not common where the majority of research has been undertaken. Though many farmers will talk about anecdotal evidence supporting their approach of including or not including these elements, actual evidence is not available. Farmers may be adding these elements unnecessarily or missing out because they are not including these elements.

The N, S, K trial will help farmers and advisers make better decisions around product choice.

Trial Treatments

The trial is occurring on three different soils being a Wharekohe Silt Loam (Kokopu), a Marine Clay (Dargaville) and an Okaihau Gravelly Loam (Okaihau). Treatments include:

Treatment Number	Treatment Name	Early August Application	Mid September Application
1	Control	Nothing	Nothing
2	Urea Only	30 kg N/ha as Sustain	30 kg N/ha as Sustain
3	Urea & Ammo	30 kg N/ha as Sustain	Ammo 30N (30 kg N/ha)
4	Ammo & Urea	Ammo 30N (30 kg N/ha)	30 kg N/ha as Sustain
5	Ammo Twice	Ammo 30N (30 kg N/ha)	Ammo 30N (30 kg N/ha)
6	Urea & K	30 kg N/ha as Sustain	30 kg N/ha as Sustain & 22 kg K/ha
7	Urea & Ammo + K	30 kg N/ha as Sustain	Ammo 30N (30 kg N/ha) + 22 kg K/ha
8	Ammo Twice + K	Ammo 30N (30 kg N/ha)	Ammo 30N (30 kg N/ha) + 22 kg K/ha

At each site plots are replicated 5 times giving a total of 40 plots/site. Plots will be 2m x 5m on ryegrass dominant pastures. Plots will be mown twice prior to the first treatment.

The first harvest will be five weeks after the early August application followed by 4-weekly harvests until 3 harvests after the September application, giving a total of 4 harvests. At harvest times a section of each plot will be mown, weighed and subsampled for dry matter determination.

Sites will be soil sampled for nutrient analysis at the time of the mid July application. Soil moisture and soil temperature (at 10cm) will be determined at the time of each application and harvest.

Results will be published on www.nddt.nz and on the NDDT Facebook page