

NORTHLAND'S DIVERSIFIED FORAGES PROJECT

2018/19

SUMMARY

The focus of the project was the establishment and then monitoring of a range of legumes, both annual and perennial. The project included both trial plots and paddock-scale sowings. To cover a range of soils, management practices and climate, farms and trial plots were located in Central Northland through to Northern Northland.

The full Technical Summary covers most of the field data, lab results and commentary for both the plot scale and whole-paddock scale work.

Paddock Sowings

Four farmers sowed whole paddocks of the following seed mixes in neighbouring paddocks, in April-May 2017.

Species	Kg/ha
Perennial Ryegrass AR37	5
or	
Italian Ryegrass AR37	5
Berseem uncertified - bare seed	8
Persian clover – bare	3
Balansa clover – bare	2
White clover – superstrike	2
Red clover – superstrike	5

While all these paddock sowings were successful, the results were extremely variable. Soil type differences between farms had a large impact on production achieved.

Summary – Paddock-Scale Sowings 2017/18					
Location	Ryegrass Type	Daily Growth Sept/Oct Kg DM/ha/day	Annual Clover Production from sowing Up to Early-Dec Kg DM/ha	Annual clover as % of pasture production up to Dec %	Total Yield for 12 months from sowing t DM/ha
Waiharara	Italian	66	3,715	21	18.2
	Perennial	74	6,146	29	20.9
Awanui	Perennial	77	10,472	68	15.4
	Italian	74	6,166	41	14.8
	Perennial mix	115	5,648	30	18.7
Moerewa	Perennial	84	4,487	31	14.2
	Italian	73	1,079	7	15.5
Kawakawa	Perennial	58	2,272	19	12.2
	Italian	73	1,197	9	13.8

Pasture growth from the same low-ryegrass and high-clover mixes were successful and variable. From a high of 20.9 tonne of dry matter per hectare for a perennial ryegrass mix down to 12.2 tonne of dry matter per hectare – this was for the same mix on all four farms!

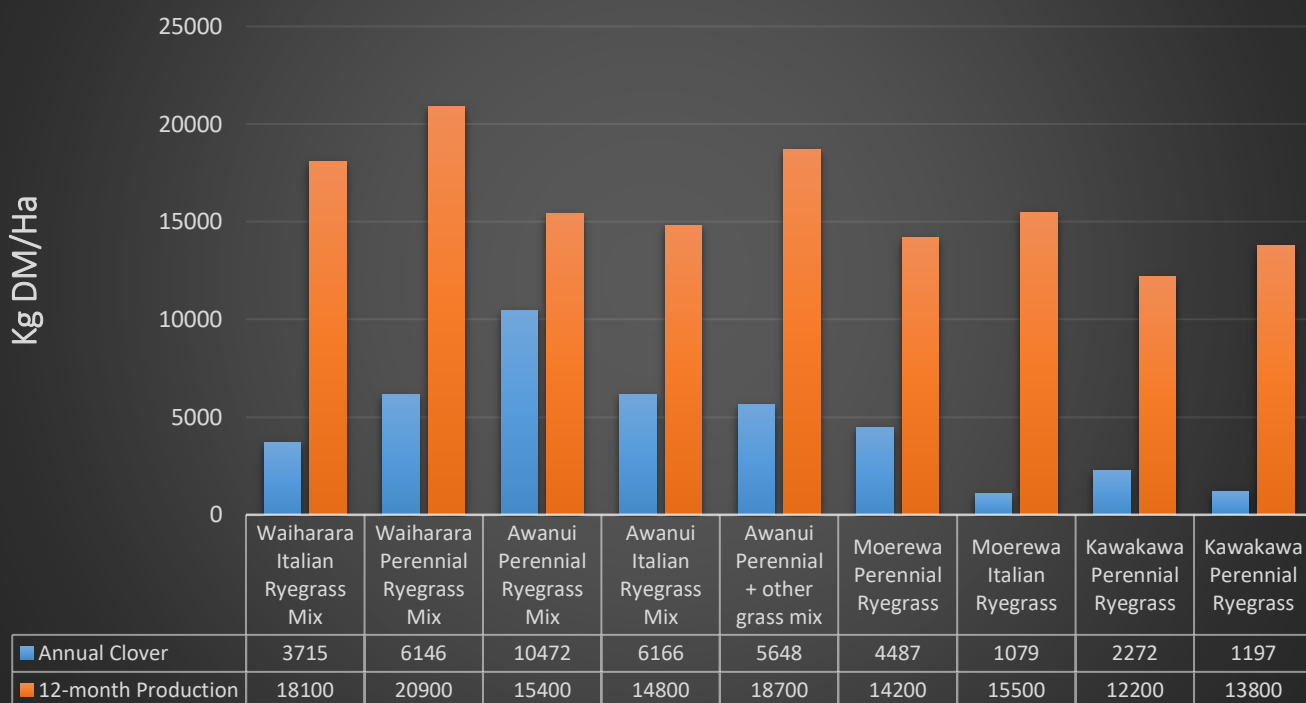
Annual clover production varied from a low of 1,079 kg DM/ha for the period from sowing up to and including December, to a high of 10,472 kg DM/ha. Across the nine sites, the average annual clover production was 4,576 kg DM/ha making up 28% of pasture production for the year and 36% of the pasture production from sowing up to December.

The above results for the annual clover includes one low-producing site which had flood issues during establishment, plus two sites with abnormally high legume content due to soil wetness issues and the ongoing impact of time of grazing. More typical figures showed that this annual legume production was 3,910 kg DM/ha from sowing and up to December at 36% of the overall pasture production for this same period.

Another project farm achieved 17.2 tonnes of dry matter for the year from a diversified pasture including tall fescue, cocksfoot, clovers and lucerne. It was the farm at Te Kopuru, which recorded moderate levels of white clover growth and high growth from red clover. The white clover production was 29% of the overall yield for the year.

The red clover production at this site was impressive, being 3,200 kg DM/ha and at 19% of the overall yearly production. One contributing factor was that the main grass seed sown at Te Kopuru was tall fescue as opposed to ryegrass at all other sites.

Summary: Annual Clover Growth compared to Total Pasture Growth (by farm) 2017/18



SEED QUALITY

Seed quality determined by germination percentage, was measured for most lines of seed sown within the legume plots. There was an issue with very low germination in one seed line: Sweet white clover – which achieved only 4% germination. This was probably very old seed. Other seed lines had “low to moderate” germination results which were below what they should be:

- Balansa clover @ 64%
- Sub clover @ 54%
- Spineless burr medic @ 65%
- Crimson clover @ 65%

Other seed lines had acceptable germination percentages with Persian clover @ 90%.

Field germination results at four trial plot sites was variable - measured by counting seedlings in June and July 2017. Persian annual clover was the only seed line to have an acceptable field plant population @ 266/m². All other annual legumes had low plant populations e.g. sub clover (94/m²), spineless burr medic (73/m²) and crimson clover (96/m²).

LEGUME GROWTH – PLOTS

Perennial clover yield for the full 12-month period was very high.

Perennial Legume Yield – Te Kopuru data from sowing Up to May 2018 and Composition		
Species	Kg DM/ha	Composition %
White clover	12,785	86
Red clover	14,464	89
Lotus	12,274	17

The composition percentage is the amount of the plant material present from the sown species In May 2018.

Annual legume growth from sowing up to early-mid December was variable.

Annual Legume Growth – Te Kopuru From sowing up to 12 December showing the highest production by species for the various harvesting frequencies		
Species	Harvest Frequency	Yield Kg DM/ha
Balansa	3	7,850
Persian	1	9,630
Arrowleaf	1	11,806
Berseem	4	2,817
Sub	1	551
Crimson	1	3,433
Sweet clover	1	860
Burr medic	3	6,173

This yield is solely for the legume species shown.

Grass, weed and white clover were deducted from the yield data.

FORAGE NUTRITIONAL VALUE

The table shows measured energy levels for some of the annual legumes at different times during spring.

Legume Forage Quality (megajoules of metabolisable energy) Per kilogram of dry matter					
Species	August	September	October	November	December
White clover					11.3
Red clover					10.5
Persian clover			11.7 – 12.0	11.3 – 12.0	
Lotus				10.1	
Arrowleaf				10.1	
Balansa clover			11.5 – 11.6	9.2 – 9.7	
Faba Bean	11.3	9.8 – 11.2	9.7		

In the preceding table, metabolisable energy is taken as the measure of forage quality.

- Early in the season or later in the season as long as they are in a vegetative state, annual legumes are of high quality.
- When in a flowering state, these annual legumes are of a low to medium-quality feed.

