

Newsletter No. 4

June 2017



**NORTHLAND'S
DIVERSIFIED FORAGES**

What has occurred this last autumn?

A challenging autumn to establish either clover plots or whole paddock sowings with high clover content: this due to excessive rain and high to very high soil moisture. Pretty unusual conditions for March and April over the last 10-15 years!

We have sown a range of annual legumes (9 species) and perennial legumes (6 species) this autumn, with a few more to sow this spring, e.g. Lucerne. These sown at five sites for the plot trials and some of these same species in paddock-scale plantings.

Four farms have sown the same high clover, low ryegrass mixes and another farm has tick bean sown with oats. In addition, two of these farms have demonstration plots of pure legumes sown within their whole-paddock sowings: these two sites to see how critical a very bare seedbed is at sowing time.

Points of interest from all these plot and paddock sowings:

- We have had late sowing on most sites due to a wide range of issues
- Early sowing, e.g. April 4 and medium date sowing – April 20, have suffered the most from soil-borne fungus damage on a range of annual clovers. This damage is likely to cause a high death rate in damaged plants over this coming winter. Whether any/many of these affected plants will “grow through” this damage and survive to produce forage in the spring, only time will tell
- At this very early stage, the most successful of all the sowings is the latest sown, on 25th May. Free-draining sand, with good soil moisture, high soil temperature of 16.1°C for 0-10 cm depth and 18.7°C for 0-3 cm depth, a high seed sowing rate, trash-free site, has given very good germination. At this stage there is no root fungus damage showing on these clovers.



Young balansa plant

Photo by Mark Braithwaite (Plant Pathologist) showing root browning and rotting largely caused by root fungus

Buried Seed

One piece of our monitoring this autumn was the measuring of buried seed content of our soils from some of our monitoring farms and sites. This to measure how much seed was set during November-December last year for the annual clovers, plus some of our perennials.

The numbers shown below are expressed as number of seed on a per sample basis. While the calculations are yet to be completed, a close approximation is that the number of seed per sample will equal the kg of seed on a per hectare basis.

Buried Seed – Autumn 2017				
Species	Number of Sites	Seed Numbers per sample		Comment
		Target Sown Species	Volunteer White clover	
Balansa	5	135	5	Hard seeded clover
Persian	4	5	15	Influenced by 1 site @ 46
Berseem	3	2	3	
White clover	4	15?	-	Influenced by 1 site @ 44
Red clover	3	2	4	
Lotus major	4	<1	14	
New Plots for 2017	6	-	5	Range 0-11 seeds/sample

Comments:

Balansa is the only hard seed annual clover we had growing last year. With an average of 135 seeds/sample, the range was from zero to a high of 355! This high site had the shortest balansa plant height and lowest amount of foliage produced of all the balansa sites, by a huge margin.

It is impossible to say how much of the seed in the white clover plots was from the sown white clover or from volunteer clover. This volunteer white clover averaged 8 seeds/sample across six sites.

The red clover and lotus really set no seed during the late spring to early-autumn period – although their forage growth was very good. The six new sites are some of the sites that have received legume seed this autumn: a relatively low level of buried “old” white clover seed.

Perennial Legumes

Another aspect of our project has been the monitoring of a range of perennial legumes. While we have undertaken some forage production measurements another aspect has been to measure what the persistence is like for some of these perennial legumes. Shown below is the assessment for the presence of these legumes at 12 months for three of our plot sites:

Presence of Perennial Legume Species at end of First 12 months Clover Plot Data				
Species	Cultivar	Site		
		Awanui	NARF	Te Kopuru
White clover	Mainstay	80	83	75
Lotus major	Trojan	88	85	38
Control – Perennial ryegrass + white clover	Base rye + Kakariki white	85	92	32
Red clover	Relish	22	68	43
Lotus minor	Goldie	17	17	32
Strawberry clover	Upward	8	15	43
Lucerne	SF7	2	52	15
Lucerne	Breeding Line	3	25	5
Sulla	Wilpena	0	12	28
Sulla	Aokau	0	-	36
Talish clover	Permatas	0-ND	0-ND	0-ND
Kura hybrid clover	Aberlasting	ND	40	45

Note: ND = not determined. Control at the Te Kopuru site has been affected by an “invasion” of plantain.

As mentioned above, we have been monitoring some forage production aspects for these perennials.

Perennial Legume Harvest Data				
Site: NARF, Dargaville			Date Harvested: Mid-April 2017	
Species	Pasture Mass from Quadrat Kg DM/ha	Dry Matter %	Growth Total	Estimated growth from mid-March to mid-April Kg DM/ha/day
White clover	2804	12.1	1404	54
Red clover	3292	13.7	1898	73
Lucerne	4854	17.7	2002	77
Lotus Major	3979	9.8	2184	84
Control – rye + clover	3248	18.0	1742	67

March and April were very good growing months for all of Northland!

ENERGY PRODUCTION

Dry matter growth X metabolisable energy level (ME)

The ME figure used is data from 11 April harvest at NARF– assumption is that these ME levels were constant for the whole period.

Species	Total Growth Kg DM/ha	Metabolisable Energy Level MJME	Megajoules of Metabolisable Energy produced over the period mid-March – mid-April (26 days)
White clover	1404	11.5	16,146
Red clover	1898	10.5	19,925
Lucerne	2002	10.3	20,621
Lotus Major	2184	10.4	22,714
Control – ryegrass	1742	11.0	19,162

Comment

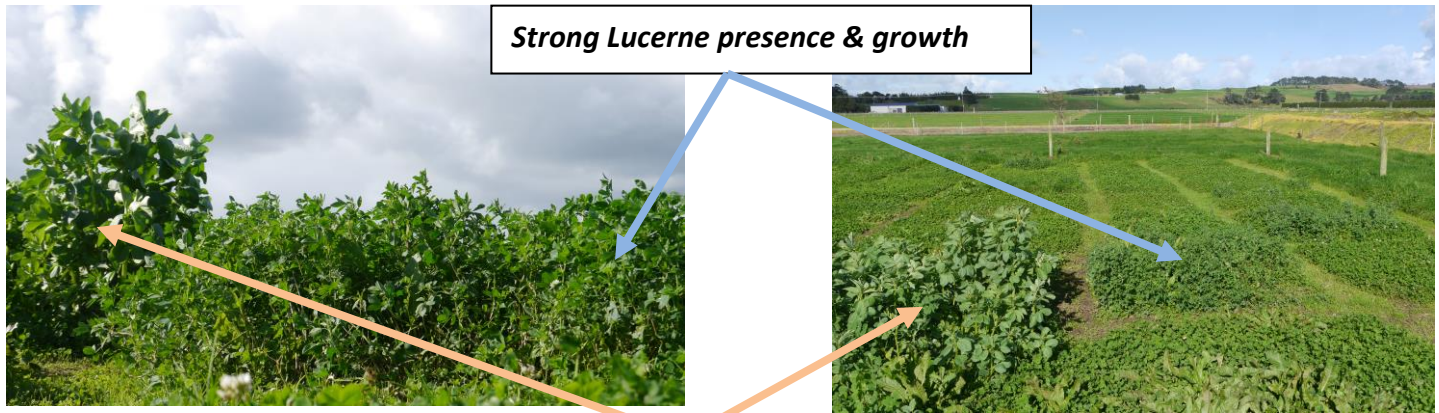
Although the Lotus major had almost the lowest ME test level, its energy production was the highest over the 26-day period due to its higher growth rate: giving 10% more energy produced over the period compared to the next highest producer, being lucerne.



May 2017:

Sulla presence @ 12 months in a plot at NARF – those few plants that have survived through to 12 months, growing very well were in April & May this year

Photos from NARF - 2017



Strong Lucerne presence & growth

Volunteer tick bean plants, germination this autumn from seed dropped in November last year



Volunteer berseem plants that also germinated from seed set and dropped Nov – Dec 2016: the red leaves are a symptom of stress, most likely from soil-borne fungus damage on the roots

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