North Island cover crop trials progressing apace

FAR's North Island team has another busy winter ahead with results of several cover crop trials to analyse as well as new trial plantings at the Northern Crop Research Site (NCRS).

Research and extension team leader Allister Holmes and field research officer Sam McDougall say five projects are helping shed light on ways in which cover crops can complement New Zealand maize/arable farm systems.

"The main benefits we are interested in include weed suppression, N fixation, provision of an addition animal feed source, nutrient management and environmental improvements," Sam explains.

AgResearch weed scientists Trevor James and Mike Trolove are currently analysing first year data from a large cover crop for weed suppression project which comprised 180 plots at NCRS in 2015/16.

Six species were planted late last autumn (faba bean, oats, red clover, alsike clover, Persian clover and annual ryegrass); grown over winter and either sprayed out or mechanically incorporated in spring.

A range of herbicide timings were used, including pre emergence and one or two post emergence applications.

Also, no herbicide treatments were included to isolate the weed suppressive ability of the various cover crops. The herbicide treatments offer comparison with industry standard practices "Preliminary results indicate faba bean, oats and annual ryegrass were the stronger performers in terms of maize grain yields. More details will be available soon," Sam says.

Given the preliminary results a further trial has been set up building on these findings and has just been sown.

Species selected include faba bean, oats, annual ryegrass and gland clover.

"Gland clover has been added as it has shown good cool season activity in previous trials and it could provide flexibility for some growers in their systems."

Research work on intercropping meantime began in November 2015 with a large replicated trial at NCRS.

Sam says it was designed to test some intuitive notions around how cover crops could work in a maize cropping system and introduce ideas that could be developed in the future.

A range of cover crops (lupin, annual ryegrass, Persian clover, red clover, faba bean and chicory) were broadcast or hand drilled at the V5 growth stage of maize, V8 and early March as the maize crop was dying down.

"Results so far suggest sowing cover crops at the maize V8 stage is too late and the seedlings were not large enough before the canopy closed over to withstand the summer - the summer was fairly dry for us at the site."

Sowings made as the maize dried down will be difficult for growers to implement, as the costs associated with broadcasting seed are high.

Results from this sowing looked promising before grain harvest, but it remains to be seen whether the plants will have the resources to punch through the surface maize trash and re-establish over winter and spring.

"Early results from the V5 sowing suggest several species were not able to cope with the lack of light under the maize canopy - faba bean, lupin, Persian clover and annual ryegrass all but died off.

"However the perennials fared much better, with red clover and chicory producing reasonable stands by the time the grain was harvested in early May."

Sam says plots intercropped with chicory and red clover had yields of up to 900 DM per ha, but it is yet to be seen whether they can withstand the stresses of a grain harvester running over them.

"At least they are someway ahead of the usual cover crop being sown after grain harvest."

The trial will be run through until spring.

A third trial designed to gather data on yields and agronomy of winter cover crops, primarily in maize systems, was established on a commercial Waiuku property in April.

Triticale, faba beans, sub clover, annual ryegrass, alsike clover and triticale mixed with legumes were drilled in strips of at least 25m in length. The species mixed with triticale include red clover, alsike clover, sub clover and faba bean.

"The plots with two species were seeded at 50 per cent of their monoculture rate – it will be interesting to see how the cover crops will interact when sown at these rates."

Sam says plant counts and dry matter cuts will be collected across the growing season, until the trial crops are terminated before maize is sown next spring.

Back at NCRS, 12 cover crops have been sown at two different times, mid April and mid May, with each planting replicated four times.

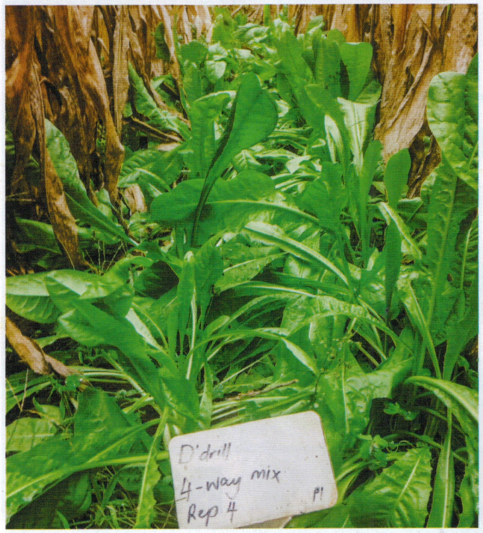
The aim here is to generate data on winter cover crop species growth and development rates, to help inform farmer decision making.

Again these are designed to fit in with a maize cropping/autumn harvested cropping system.

"My intention was to have another earlier sowing, but unfortunately this wasn't possible as seed arrival was delayed," Sam adds.

"This highlights the issue of seed access in NZ to some of these cover crop species. My advice would be to get orders in as early as possible and have a backup plan."

Two other smaller trials have also been sown recently, looking at the establishment of perennial clovers and annual clovers under maize.



Chicory and red clover at harvest.

Red clover at harvest.

Faba beans just before spray out.

Oats and faba - cover crop weed supression.

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