



## Making cover crops pay

Cover crops are used widely in the New Zealand vegetable industry. Some of the key benefits that can result from their use include higher soil organic matter content, improved nutrient cycling, less soil erosion, quicker drainage, disruption of pest and disease cycles, fewer weeds, reduced compaction, and greater biodiversity. Some of these benefits are realised quickly in a matter of months, whereas others take longer to develop.

Return of organic matter to the soil and improved soil structure were two benefits that encouraged Brownrigg Agriculture agronomist Guy Hamilton to focus on cover crops. “We crop widely across the Hawke’s Bay, and want our soils to remain productive and well structured for many years to come. Soils in good physical condition are easier to work and plant early.”

To decide on the best options for their business, Guy tested mustard, moata grass and oats against their typical winter fallow approach. “We selected a few paddocks and planted large areas of each cover crop. We wanted to see at a practical scale how these different crops grew, and learn more about what they did for our soils during the winter.”



Despite a late planting in several paddocks, Guy was pleased with the establishment and cover. “Moata and oats have really kept the weeds down by forming a dense mat across the soil surface. We sprayed them out in late July, as we didn’t want the crops to become too big or start seeding. Timing is critical, as we want the cover crop to melt down in the spring and release its goodness back into the soil.”



“We were encouraged by how quickly the soil benefits were showing. The moata and oats have very fibrous roots, so were forming better aggregates than the fallow approach which was exposed to the winter elements. We’ve also noticed more worm life under all the cover crops, including the mustards. Now we want to retain these improvements for our next squash crop, so the plough will stay in the shed and we’ll work the paddocks up using our strip tillage gear.”



Dirk Wallace of Plant & Food Research has been involved in the work, and notes that a key to making cover crops pay is to minimise heavy cultivation when working the residues back into the soil. “Timing is a key factor. If you let cover crops grow into the spring, they can accumulate a lot of biomass. If you have to make several passes to get the crop back into the soil, you might have actually reduced your soil quality instead of improving it. Mulching the crop first can enhance the breakdown of residues and make incorporation easier. Or spray out earlier as Guy has done and then let the crop break down naturally.”

An additional benefit Guy and Dirk looked at was nutrient cycling. Cover crops are also excellent at locking up nutrients, preventing them from moving below the shallow rooting zones of some vegetable crops. When the residues are returned to the soil, the nutrients are gradually released and made available to the next crop. This can reduce fertiliser use and save money.

“In Guy’s trials we found there wasn’t much difference in the total amount of nitrogen in the system between the cover crops and fallow areas. However, under fallow conditions more N was located in the soil between 30 and 90 cm, which meant that it would be less accessible to the next crop. In other trials we’ve found sizeable N losses under winter fallow approaches – the cost to replace this nitrogen as fertiliser in the spring can actually be higher than the cost of sowing the cover crop in the first place.”

Guy notes that being clear on the wider suite of benefits will really help them to pursue cover crops in the winters ahead. The next challenge he sees on the horizon is how to start getting the cumulative benefits of cover crops, controlled traffic strategies and reduced cultivation approaches.



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