

## Recycling nutrients from depth

Adequate nutrient availability is an essential component of profitable vegetable cropping systems. Whether nutrients are released from reserves in the soil or applied as fertiliser, losses can be an ongoing concern for growers. For example, mobile nutrients like nitrogen can be leached following rainfall and irrigation events, while less mobile nutrients like phosphorus and potassium can be buried during deep cultivation.

Two seasons ago, Horowhenua agronomist Karen Silva wanted to find a way to recover those nutrients. “We’ve begun a programme to grow maize in some of our cropping paddocks. We picked maize because it can root down below a metre, retrieving nutrients along the way. When we incorporate the maize back into the soil, these nutrients are recycled and available for our next vegetable crop. This offers us the chance to save some money on fertiliser and increase our overall nutrient use efficiency.”



And it’s not just the nutrients they’re excited to have back in their soil – about 60 tonnes of fresh green crop return per hectare is also great for conditioning and driving the biology of the soil. “There’s plenty for the soil microbes to feed on when you incorporate the crop”, says Karen. “We’re thinking of the longer term sustainability of our soils and recognise that regular additions of organic matter will really help.”



The observations made in Horowhenua are no surprise. Recent studies in the arable industry have shown that maize can grow successfully without any fertiliser in soils that are already rich in nutrients. FAR maize project co-ordinator and Waikato vegetable grower Mike Parker has been closely involved in the work. “It’s been a revelation for farmers looking to cut the cost of maize production. They were saving up to \$400 per hectare on the cost of production, and in some cases didn’t need any fertiliser for two consecutive seasons of maize. It’s no surprise the good news is spreading to other cropping systems.”

Mike notes that an average yielding maize crop can recycle about 250 kg nitrogen, 40 kg phosphorus and 300 kg potassium per hectare – nutrients that might otherwise have to be applied as fertiliser for the next crop. With the rising cost of production, every gain in efficiency can help growers to remain in the black.

Better news for vegetable growers is that nutrient recycling systems don't require high inputs and there are plenty of deep-rooted recycling options that can be considered. Cereal crops like wheat and oats can also do a good job, as can some of the forage brassicas. Keep the costs low – you don't need the best quality seed or the highest plant populations. Extra fertilisers are not generally required, and in fact are likely to be counterproductive to the plants exploring for nutrients at depth. Instead, just let the roots find the nutrients in the soil and recycle them back to the surface.



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