

Stabiliser crops to reduce soil erosion

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Surface runoff can be a concern for growers, as quick moving water can scour out beds and cause significant soil losses. Associated with the erosion of soil is the loss of nutrient reserves and soil organic matter, components that are essential to profitable and sustainable cropping systems. Over time, erosion losses also expose less productive subsoil, which often requires more inputs to deliver target yield outcomes.

Pukekohe crop supervisor Andrew Luxmoore has to deal first hand with the effects of surface runoff. “It’s difficult for us to eliminate runoff from our cropping operations. We first look to prevent water from entering the field through the use of drains, contouring and banded headlands.”

“However, there’s still the issue of runoff generated within a paddock, which can be an issue over the winter months when we get heavy rains and our soils have been recently cultivated. Sediment traps and ponds help us to prevent losses beyond our farm gate, but there’s considerable effort and expense involved in maintaining these. We’re always on the lookout for practical options that can reduce our sediment losses before they make it to the traps.”



This is particularly important for their winter cropping operations, Andrew notes. “In Pukekohe we work our soils in the autumn when the conditions are right – otherwise we run the risk of damaging soil structure. But we don’t plant our crops until mid winter, which means the soil can remain fallow and exposed to the elements for 8-12 weeks depending on our planting schedules.”

One potential opportunity that Andrew has recently considered is planting a quick-growing crop of no economic value to stabilise the soil. The intent of this approach is to protect the soil during the period of highest risk, but not to complicate efforts to plant the main crop when that time arrives.

Nathan Arnold of Plant & Food Research was involved in the initial work in Pukekohe to test the potential of soil-stabilising crops. “We first looked at planting oats in the wheel tracks of a potato crop. In this initial trial, we didn’t see a big benefit from the oats on soil erosion as it was a pretty dry spring. Unfortunately, competition for nutrients, water or sunlight eventually occurred between the two crops, which ended up causing a yield loss in the potatoes. This clearly wasn’t going to be a viable option for growers.”

The following winter Andrew and his team revised the approach, deciding to plant some left-over wheat seed as a stabiliser. They wanted to see what would happen if the whole bed was covered rather than just the wheel tracks. To achieve this, he broadcast the seed using a fertiliser spreader before forming potato beds in April. “We set up two large strips in the paddock, and compared those against our typical fallow approach. The wheat established quickly and provided a protective layer across the soil surface. About 6 weeks after being sown, the wheat was sprayed off so that it had some time to break down before the potato crop. It was only about 15 cm tall at the time. We found that the residue broke down very quickly and was easy to plant into a couple of weeks later.”



As in the initial trial, Nathan measured sediment loss under the wheat and fallow areas over the winter months. “We had some heavy rainfall events under which to compare the two practices, and found that overall the areas that were planted in wheat lost much less sediment than the conventional fallow approach. In our best plots where we achieved good plant cover across the wheel track and beds, we reduced sediment loss by about 60%. It was very encouraging.”

It’s easy to see how this approach could make a big difference to winter soil losses, especially on sloping paddocks, and better yet, it is cheap and easy to accomplish with existing equipment. No additional herbicides are necessary, as most paddocks are already sprayed off ahead of planting. “We’re excited about the potential of these short-term stabiliser crops”, Andrew notes. “Next season we’d like to test the practice across a bigger area.”



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