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A wide variety of cover crop options are available on the market. In many settings, grasses and cereals have been used because they are quick to establish, easy to manage and are hardy across a wide range of field conditions. However, there are many other cover crops that provide additional soil conditioning benefits. Being clear on the purpose of a cover crop is therefore central to maximising the potential benefit resulting from their use.



In Levin, agronomist Karen Silva has been looking closely at a wide range of winter cover crops to better understand the benefits and challenges that are involved with integrating them profitably into vegetable rotations. “We’ve run two trials now to look at a selection of cover crops in our local fields. They’ve all been sown in the autumn, and then incorporated in the following spring. We’re looking for options that add life back into our soils and provide some structural benefits, but at the same time they have to be manageable. Where possible we want to move away from long fallow periods.”

Paul Johnstone of Plant & Food Research has worked alongside Karen on the trials. “In terms of biomass - oats, triticale, ryegrass and biofumigant mustards all grew very well over winter in the test paddocks”, he notes. “They produced between 5 and 10 t DM/ha, which is a good amount of plant material being added back to the soil. The crops with a fibrous root system like the cereals and grasses tended to have a clearer effect on aggregate condition than the tap-rooted options. We didn’t follow the incidence of soil-borne disease in the following crop where the biofumigant mustards had been planted, but this may provide an added benefit. The key to selecting the right cover crop is being clear on its purpose, and being realistic about the timeframe and amount of effort you’re willing to invest to make it happen.”



One of the main challenges Karen faced was around the timing of incorporation. “The crops grew big quickly in the spring, which meant we had a lot of biomass to work back into the soil. We tried to do that using a rotary hoe, which took a couple of passes. In the future mulching the crop first might be a better option, or spraying it out sooner. Ideally we want to end up with a

system that reduces the amount of cultivation necessary to work a cover crop back in, as we realise our hoe can quickly undo any improvements in soil structure.”

The trials also confirmed that the cover crops mopped up a lot of nitrogen, which can otherwise be prone to loss during the winter season. Paul notes some vegetable crops have quite shallow root systems, so keeping nutrients in a zone where they can be easily accessed helps to save money on fertilisers. “In both trials the cover crops reduced the amount of mobile nitrogen in the soil, whereas under fallow conditions that nitrogen had either moved below 60 cm or we couldn’t account for it at all. It was encouraging that the savings resulting from keeping the nitrogen close to the surface often offset some or all of the initial cost of the cover crop seed. It’s a good example of a win-win benefit that can make the use of cover crops more appealing.”



Both Karen and Paul are quick to note that cover crops form only one part an integrated approach to developing healthy soils. It’s not a silver bullet, but can provide real benefits in both the short and longer terms. The biggest gains come when such approaches are integrated with other practices like reduced cultivation, controlled traffic and well designed rotations.



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