CASE STUDY

# Weed management in onions: winter cover crop trials

The efficacy of winter cover crop varieties as a weed management practice for onion growers has been evaluated through a series of trials conducted in Western Australia.

As part of Hort Innovation levy-funded project *'A strategic approach to weed management for the Australian vegetable industry'* (VG15070), University of New England teamed up with West Australian (WA) based Ivankovich Farms in Myalup and David Grays Aglink in Perth, to run a trial across winter seasons in both 2018 and 2019.

Ivankovich Farms is a family-owned operation, growing carrots and onions. With a focus on physical, economic and environmental sustainability, the business got involved in the trials to better understand the development of weed management strategies to ensure maximum use of resources.

David Grays Aglink is a locally-owned wholesale distributer, offering a wide range of agricultural products across both the broadacre and horticultural sectors in WA. The research and development component of the business focuses on improving production methods and optimising on-farm productivity.

Commencing in 2016, the four-year project looked to identify alternative approaches to weed management that reduced reliance on the use of herbicides and also minimised the impact of chemical resistance.

The trial run in Myalup in the south west region of WA, investigated the performance of several different winter cover crop species and their capacity to supress weeds during the non-crop period.

## Main problem weeds:

- **Wireweed** (*Polygonum aviculare*)
- **Sedges** (*Cyperus* spp.)
- **Wild Radish** (*Raphanus raphanistrum*)
- **Crab grass** (*Digitaria* spp.)

The main problem weeds the trial was looking to address included wireweed, sedges, wild radish and crab grass, all known to impact onion crops in WA.

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This project has been funded by Hort Innovation using the onion research and development levy and funds from the Australian Government. For more information on the fund and strategic levy investment visit horticulture.com.au

Peter Ivankovich said it was important that Ivankovich Farms supported the trials.

“We wanted to reduce the seed bank of weeds on our farms. Our main problem weeds are wireweed, umbrella sedge, wild radish and crab grass and as a result of the trial it was clear that by planting these cover crops there was effective suppression of weeds that are problematic in our area.”

Involved in the trial, agronomist Grant Swan of David Grays Aglink believes that introducing cover crops into onion production is a worthwhile approach to be considered by growers and supports the practice as an area that industry should continue investing resources in, to build its efficacy.

“Weed control and the use of cover crops is topical in the industry. Through this trial, we wanted to be able to identify the most suitable crops for the south west region and bring some light to how cover crops can be best managed to maximise weed suppression,” Mr Swan said.

The trial revealed that planting a cover crop where land would otherwise be left fallow, does effectively control weed-growth, dependant on the species of cover crop planted and how it’s managed.

A range of cereal, grass, brassica and legume winter cover crops species were planted, with each monitored and measured for above-ground weed biomass (including the number and species of weeds present), the weed seed bank and cover crop biomass and ground cover.

“We utilised six different crops in the trial, including Field Pea, Ryecorn, Italian Ryegrass, Caliente, BQ Mulch and a biofumigant mix comprising White mustard, Rocket and Turnip,” Mr Swan said.

“Results showed cereal rye to be extremely effective for our area. It had early vigour which made for quick-growing ground coverage. It was able to out-compete the weeds and stunt their germination, which was consistent across the cereal rye blocks’ lower weed plant density and weed biomass.

“On the other hand, in the blocks of Field Pea and brassica, achieving solid ground coverage was a lot slower, giving weeds a better chance of establishment.”

Whilst cover crops are an effective tool in managing weeds, there are also plenty of benefits to be had in terms of soil health.

Mr Swan said that using a brassica species will help with the suppression of pathogens, and that the use of a pea or legume crop will improve the soil’s levels of nitrogen.

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"Particularly in our area, we are dealing with a lot of light, sandy soils. Having nothing planted sees you lose a lot of topsoil from wind. Cover crops are beneficial in keeping the soil down and protecting it from the wind, which reduces wash and erosion damage. Having material in the ground in turn improves the structure of the soil, benefitting its biology," he said.

One drawback recognised and considered as a potential barrier by Mr Swan is the level of commitment needed by growers to plant cover crops.

"Cover crops need to be treated as a commercial crop with the likes of water usage, fertilisation and pests to be considered," Mr Swan said.

"Water availability is considered a potential setback in this weed management practice. A grower hosting one of our trials noted that if he had the capacity to allocate water to cover crops, it would be a management approach that he'd practice full-time."

Mr Swan does however maintain that cover crops are a valuable approach that should be considered by growers, as the short- and long-term benefits will contribute to overall cash crop improvement.

To solidify these trials, the need for further research is acknowledged and will hope to identify more potential cover crop species and boost the value and efficacy of these weed management practices.

"We're seeing a lot more sorghum being used as a cover crop option which growers are then cutting for hay – offering benefits as both a cover crop and cash crop, which is an approach we need to explore further," Mr Swan said.

For more information about the project, visit: https://www.une.edu.au/about-une/faculty-of-science-agriculture-business-and-law/school-of-environmental-and-rural-science/research/plant-soil-and-environment-systems/weed-science/a-strategic-approach-to-weed-management-for-the-australian-vegetable-industry

Find updates from Hort Innovation here: https://www.horticulture.com.au/growers/help-your-business-grow/research-reports-publications-fact-sheets-and-more/vg15070/

Or watch a wrap-up of the trial:
https://www.youtube.com/watch?reload=9&v=Hseuw8JeIck&feature=youtu.be&fbclid=IwAR1MjkCgbVLcELOPukcV8tSqoi5pCYxBHClUdy0bi-4AUBF1nsDyPq4aap8

## MORE INFORMATION:

Michael Coleman | **Email:** michael.coleman@une.com.au
Paul Kristiansen | **Email:** pkristi@une.edu.au
Christine Fyfe | **Email:** cfyfe3@une.edu.au

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