

RMCG

Learn, Experience, Connect –
continuing to drive innovation in extension
in the Australian vegetable industry

CARL LARSEN, RMCG

APEN CONFERENCE, DARWIN NT

12 SEPTEMBER 2019



Take homes

1. Learn

2. Experience

3. Connect

Industry overview

In 2018:

- 3.7 million tonnes was produced (+6%)
- \$4.35 billion value of production (+1%), total horticulture \$9 billion
- \$4.62 billion wholesale value of fresh supply (<1%)
- 88.8 kg supply per capita (+2%)
- ~\$12 million spent on R&D

1. Learn

- **Problem:** how do you know if information on improved soil management and plant health is ‘the real deal’?
- **Solution:** we’ve got you covered through:
 - Training and events – workshops, farm walks, field days, webinars, Master Classes
 - Resources – ute guides, fact sheets, case studies, videos, podcasts
 - Global scan and reviews .

1. Learn

ahrc Erosion Control Benefits Of Strip Tillage Watch later Share



DR KELVIN MONTAGU
RESEARCH SCIENTIST

MORE VIDEOS

0:08 / 2:50

YouTube



Strip till
in Tasmanian vegetable crops

National Vegetable Extension Network
TASMANIA

Strip till is a system of cultivation that works strips of soil where the crop will be planted or sown and leaves most of the soil covered and undisturbed.

The strip till machine (see Figure 1) can, usually in a single pass, rake aside crop residue, work the soil around a ripper tine, accurately band fertiliser and plant or sow the crop.

Conventional cultivation involves multiple passes, often with more intensive use of tillage equipment to develop a fine tilth, eliminate or incorporate residues and till at depth for root penetration.



Figure 1. A component of a strip till machine, showing the rakes, ripper tine and press wheel. Image from slyfrance.com

Key messages

- Strip tillage is currently used in Tasmania for brassica seedlings, fodder beet and carrot seed
- Benefits include improved water infiltration and retention, healthier crops, fuel savings, fertiliser placement & efficiency
- Think of strip tillage as a farming system, not just a tillage practice

Benefits of strip till

- Compatibility with row crop planting equipment
- Reduced risk of soil erosion because more soil is covered and undisturbed
- Improved soil resilience to weather extremes
- Higher mineralisation in the row zone (for crop, not weeds)
- Fertiliser placement banded in row zone is not tied up on previous crop residues
- Better moisture infiltration and retention due to improved soil structure
- Water is stored more effectively and can be used by the emerging crop or young transplants, reducing stress and benefiting crop health
- Reduced fuel and labour costs because of fewer field operations to prepare the ground (reduced tillage)
- Reduced risk of soil compaction
- Soil health and biology may be improved through maintaining soil structure and soil carbon
- Less weed pressure due to residue cover and reduced soil disturbance
- Driving on firm ground gives a better GPS guidance performance
- For vegetable growers who have tried zero-till, strip till can overcome some of the known problems with poor establishment, cold soil and delayed maturity
- Reduced dirt splash onto some crops (cucurbits) which helps harvest efficiency
- Avoids side wall compaction problems associated with no-till
- Enables quicker access to marginally wet ground
- Efficiently handles large stubble trouble (crop residue) and doubles its benefit inter-row

This project has been funded by Hort Innovation, using the vegetable research and development levy and contributions from the Australian Government. Hort Innovation is the grower-owned, not-for-profit research and development corporation for Australian horticulture.


RMCG Soil Wealth Integrated Crop Protection Hort Innovation

ahrc Benefits of Combining Strip Tillage and ... Watch later Share



ED FAGAN
SUNSHINE HORT

ahrc Strip Tillage for vegetables and potatoes... Watch later Share



TILLAGE SOLUTIONS AUSTRALIA

Nurturing Crops, Protecting Crops

STRIP TILL
What have we learned?

Ben Poggioli & Steven Peterson
Tillage Solutions

Hort Innovation VEGETABLE FUND RMCG

MORE VIDEOS

0:07 / 1:01:54

YouTube

1. Learn



Cover crops are great tools for soil management. Their benefits can include improving soil structure and health, reducing erosion and weeds, adding nitrogen and contributing to weed and disease control.

Managing the transition from cover crop to cash crop is a key factor in determining the successful integration of cover crops into your farm. With cover crops able to produce more than 100 tonnes of fresh plant material per hectare, the transition needs to be well managed to prevent problems in the following cash crop.

The aim of this factsheet is to outline key factors and the management options for the successful transition from cover to cash crop.

What are your cover crop goals?

Be clear on what the purpose of your cover crop and how it fits into your production system. This will help determine the right cover crop, and the timing and method of termination to manage the cover crop residues. For example, if you are growing baby leaf crops then complete breakdown of your cover crop will be important to prevent contamination by cover crop residues at harvest. By contrast, if erosion and weed control is your goal retaining cover crop residues on the soil surface will require different management and cover crop choices.

Key factors in the management of cover crop residues

Managing the transition from cover to cash crop successfully requires the integration of the following aspects:

1. Cover crop chemistry (Carbon to nitrogen ratio),
2. How it is terminated, and
3. Tillage

Below, we discuss these three aspects and provide some rules of thumb to guide you in tailoring your cover crop to your farm.

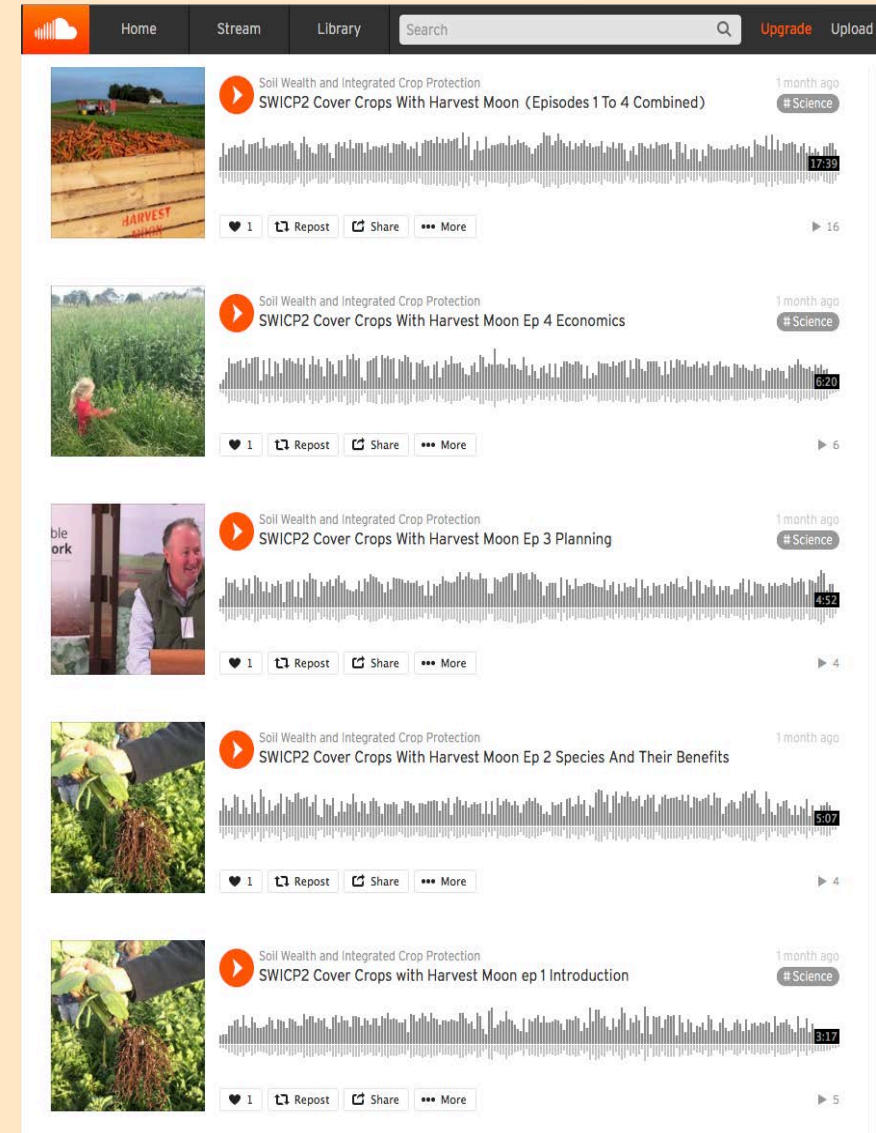
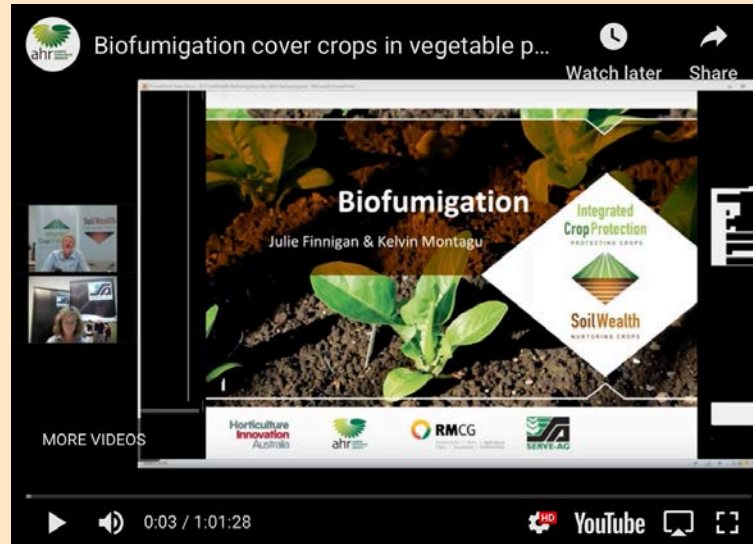
Potential cover crop residue issues include:

- Cover crop residue contamination of cash crops such as baby leaf
- Crop establishment issues due to high cover-crop residues
- Disease carry over – e.g. Sclerotinia surviving on decaying cover-crop residues
- Cover crop residues providing food and shelter for crop pests such as snails and slugs
- Nutrient draw down resulting in nitrogen deficiencies in the cash crop



A 150 t/ha fresh weight biofumigation cover crop immediately prior to mulching and incorporation

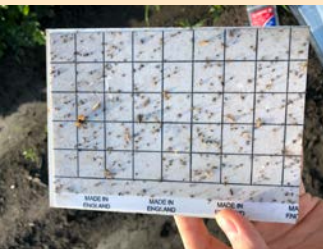
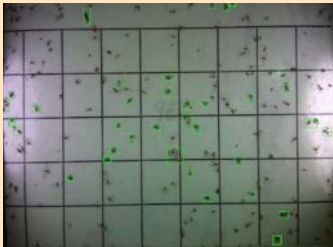
This project has been funded by Horticulture Innovation Australia Limited using the vegetable levy and funds from the Australian Government.



2. Experience

- **Problem:** will a new piece of equipment or change in management suit my production system in my area?
- **Solution:** see innovations first-hand in a practical setting through our national network of demonstration sites:
 - Showcase new equipment – strip-tillage, spot spray systems, roller crimper
 - Trial cutting edge technology – EM38, remote insect monitoring stations.

2. Experience



APRIL 2019




EXPLORING THE APPLICATION OF PRECISION AGRICULTURE IN CELERY, LEEK AND BABY LEAF PRODUCTION SYSTEMS

KOO WEE RUP DEMONSTRATION SITE CASE STUDY

Adam Schreurs, Schreurs & Sons; Stuart Grigg, Stuart Grigg Ag-Hort Consulting; Carl Larsen, RMCG

- KEY MESSAGES**
- ✓ Gridded and pre-plant soil testing allowed more detailed understanding of where nutrients are available to the plant
 - ✓ Development of a nutrition program and variable rate spreading enabled precise nutrition application across smaller areas
 - ✓ Drainage and crop health monitoring using drones meant problem areas could be identified and managed early before they impacted yield and the bottom line
 - ✓ Plant tissue testing provided a useful cross-check to see what nutrients the plant had taken up and whether this varied across a paddock
 - ✓ Installation and use of remote monitoring insect traps provided another 'safety net' cross-check for manual scouting. Placement lower in the crop is more effective
 - ✓ Yield assessment showed higher average celery heart weights and more uniformity across the trial block.

THE DEMO SITE

Schreurs & Sons and the Soil Wealth ICP team have partnered to explore the application of precision agriculture in celery, leek and baby leaf production systems. The demonstration site is located at Adam's Cera Lynn farm, about 80km south-east of Melbourne (Figure 1).

We're aiming to improve nutrition, irrigation and drainage management, and insect pest and beneficial monitoring as a basis for soil and crop health. To achieve this, we've used technology like EM38 mapping, gridded soil sampling, variable rate fertiliser spreading, remote monitoring insect pest and beneficial identification traps with cameras, as well as drones.

2. Experience



Report prepared for VG15010 A Multi-faceted approach to soilborne disease management
 Francis Tedesco, Center West Exports, Justin Wolfgang, C-Wise, Doris Blaesing, RMCg
 April 2018

SUMMARY

A large-scale compost trial was conducted with Center West Export (CWE) and C-Wise in the Gingin area of Western Australia (WA).

The focus was on disease suppression, mainly cavity spot, and maintaining organic carbon and structure in intensively cropped, sandy soils. Fresh organic matter such as manure cannot be used in the Gingin area due to stable fly issues; food safety requirements also mean that fresh manure should not be used just prior to a carrot crop. Any organic amendments must be well composted; they also need to be of a quality than can be repeatedly produced.

If that was not the case, i.e. compost quality would be variable from batch to batch, the information from this compost trial could not be relevant for other carrot crops on the farm.

Center West Exports provided a 10 ha trial area under solid set irrigation.

C-Wise provided two types of compost – "Humicarb Compost" and "Premium Compost". These were both used at 30 t/ha and 60 t/ha in 2 replicates of 0.5 ha each. Untreated control areas did not receive compost.

Both companies put in a considerable effort into setting the trial up and looking after it.

Data collection included:

- Soil analyses before and after planting (nutrients, pathogen DNA by SARDI)
- Pre-harvest assessment of roots against CWE grading criteria
- Carrot root analysis (nutrients)
- Commercial grading by CWE
- Field observations and photos.

Trial results can be summarised as follows:

- Compost appears to have reduced soil levels of some *Pythium* and *Rhizoctonia* species / groups that can attack carrots.
- Compost increased phosphorus availability in the soil.
- Compost had no effect on soil pH.
- Nitrogen (nitrate and ammonium) carrot roots were lower in composted areas while levels of available soil nitrogen (nitrate and ammonium N) was higher in composted areas than in the control but not above the desirable level of <50 kg N/ha.
- In composted areas, carrots had higher potassium levels, up to double that of those in the control.
- The total concentration of nutrients in the carrot roots increased with increasing compost rates and compost quality.
- The compost had no significant effect on carrot yields in its first year.
- The improved nutritional status of the carrots may have had a beneficial effect on shelf life; however, this was not investigated as part of the trial.

Recommendations

Continue to observe the trials site to assess longer term effects of compost applications on carrot crops and economic benefits.

Investigate the costs and benefits of using lower, affordable rates, and / or band placing compost to reduce initial costs.

VG15010/1/005/1805

This factsheet has been funded by Hort Innovation, using the vegetable industry research and development levy and contributions from the Australian Government as part of project VG15010/1 a multi-faceted approach to soilborne disease management. Hort Innovation is the grower owned, not-for-profit research and development corporation for Australian horticulture.

Hort Innovation **ahr** **RMCg**

Sample Information Intensive Samples have been double bagged (fill when completed)

Consultant Name: **AGVITA**

Company Name: **AGVITA**

Address: **20/11/18**

Phone: **0819 510 483**

Business to be visited: **AGVITA**

Postal Address: **PO BOX 100**

Sample No.	Plant Part	Plant Part	Plant Part	Plant Part	Plant Part	Plant Part	Plant Part	Plant Part	Plant Part
1	Carrot	Root	Leaf	Stem	Flower	Seed	Soil	Water	Air
2									
3									
4									
5									
6									
7									
8									
9									
10									

Notes: **GLAD SANDWICH**



3. Connect

- **Problem:** how can I keep up to date on the latest developments? Surely there are others out there that can help?
- **Solution:** gain the leading edge through our:
 - Website – ‘one-stop-shop’
 - Bulletin e-newsletter (monthly digest)
 - Twitter @SoilWealth and @ProtectingCrops
 - Facebook Community of Practice
 - Articles – industry magazines, print and radio
 - Partnership Network – advisors, suppliers and innovators.

3. Connect



MY AREA



Find out what's going on in your area

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MY TOPIC



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Bulletin June 2019

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Calcium cyanamide fertiliser: Economics

Calcium cyanamide Fertiliser, also known as nitrolime, has been used in Germany as a slow release nitrogen and calcium fertiliser with...

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Latest Events

Cover cropping: implications for weed management field day; Myalup, WA

Thursday, 20th June 2019
 The University of New England and vegetablesWA are hos

[Event Details »](#)

New technology forum as part of Hort Connections, VIC

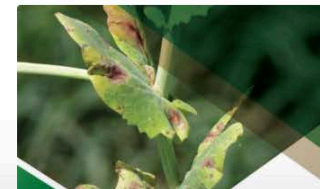
Tuesday, 25th June 2019
 How will tech change influence your vegetable business? Join the...

[Event Details »](#)

Tweets by @SoilWealth

SoilWealth
 @SoilWealth

Pick up your copy of the new guide to identifying and managing Soil Borne Disease in Vegetables Crops by Dr Len Tesoriero. Launching at Hort Connections. Visit the AHR stand 116/99. The Vegetable fund at work!. @Hort_Au @ProtectingCrops @AUSVEG



3. Connect



TUESDAY 11 JUNE 2019

READ | SOIL WEALTH AND ICP

Strip-till: what is it, and how can you benefit?

Strip-till in Tasmanian vegetable crops

Strip-till is a system of cultivation that works strips of soil where the crop will be planted or sown and leaves most of the soil covered and undisturbed. Strip tillage is currently used in Tasmania for brassica seedlings, fodder beet and carrot seeds. The main benefits being seen include improved water infiltration and retention, halftower crops, fuel savings, fertilizer placement and efficiency. It's important to think of strip tillage as a farming system, not just a tillage practice. The Soil Wealth ICP team in conjunction with WagRIE Tasmania have recently developed a fact sheet and complementary video about the benefits and challenges of strip-till, as well as practical considerations out in the paddock.



Figure 1. Aerial view of strip-till field showing the distinct rows of soil.



Figure 2. Close-up of strip-till field showing the soil surface and crop rows.

The Soil Wealth and Integrated Crop Protection (ICP) projects work with growers nationally to put soil management and plant health research into practice. This edition features the cultivation system of strip-till, with resources and demonstration site updates to keep you in the know. Soil Wealth ICP Phase 2 (VGL16078) is a strategic levy investment under the Hort Innovation Vegetable Fund.

Demonstration site: Sydney Basin, New South Wales

Strip-till is being used in a range of vegetable row crops such as sweet corn, beans, broccoli, cabbage, cauliflower, pumpkin, zucchini and beet. It is currently being showcased at the Sydney Basin demonstration site. The main suppliers of strip-till gear in Australia include Cottman, Nitty AG, SyFrance and Ruhn Krause. In selecting strip-till, look for sensor and cost, contribution and durability, weight, share, reset, strip width, ease of adjustment and fertilizer application options. The horsepower needed to pull strip-till gear is a minimum of 20 horsepower (hp) per row unit. This will vary upward if you have compact soils and/or place the ripper/shank deeper (up to 35hp per row unit). Therefore, for a three-bed system with six rows, a 120-150hp tractor is likely to be required. Your standard sowing or transplant gear can be used without modification – this is a big advantage of strip-till, where tillage is targeted to the zone where your crops are planted. Figure 1 shows a freshly strip-tilled soil following mulching of the previous brassica crop.

How does strip-till reduce establishment costs and save time?

- Transition from the previous crop to ready-to-plant in a single pass, saving 2-4 passes.
- The one pass is fast – ground speed of 8-10 kilometres an hour.
- Reduces fuel costs – tractor passes, no PTO, Take-Off load, fast ground speed.
- Wider range of soil conditions – able to get on the paddock sooner after rain.

Final full story

For more information on strip-till, visit our website at www.soilwealth.com.au. For more information on the Hort Innovation Vegetable Fund, visit www.hortinnovation.com.au. For more information on the Hort Innovation Vegetable Fund, visit www.hortinnovation.com.au.

Soil Wealth and ICP: Community of Practice
20 December 2018

Soil Wealth Cowra added 20 new photos from 20 December 2018 to the album Bik 11 – in Fairleigh Reserve Cowra NSW, 20 December 2018

ANL recycled green waste compost & soil conditioner on strip tilled popcorn

ProtectingCrops
@ProtectingCrops

READ: Soil Wealth and Integrated Crop Protection Bulletin - June 2019. In this edition new #tech forum at @HortCon_, strip #till recap from Sydney Basin #NSW #demo site, #cover #crops podcast series & much more. @SoilWealth @AUSVEG @Hort_Au #ICP

The Bulletin - June 2019
Find the latest on upcoming events, demonstration site news and resources on soil management and plant health in the Australian vegetable industry.
evsg.campaign-view.com

11:00 PM - 12 Jun 2019

1 Retweet

Shedding a practical light on challenging SOILBORNE DISEASES

Recap on the farm walk as part of the Soilborne Disease Master Class in Virginia, SA

BY CARL LARSEN RMCG

The Soil Wealth and Integrated Crop Protection (ICP) projects work with growers nationally to put soil management and plant health research into practice. This edition provides an update from the Virginia demonstration site in South Australia, as well as a number of resources that provide practical tips and tools on managing soilborne diseases in a range of vegetable crops.

Recap on the farm walk as part of the Soilborne Disease Master Class in Virginia, SA

In September, growers and industry service providers descended on Adelaide for the fourth Soil Wealth ICP Soilborne Disease Master Class.

The Master Class provided and discussed the core principles and cutting-edge knowledge for managing soilborne disease in different vegetable production systems.

As part of the Master Class, participants visited our demonstration site in Virginia, SA hosted by Braham Produce. Braham Produce grow capsicums in soil under greenhouse systems.

The key messages from the field visit were:

- Use soil fumigation strategically in a monoculture, actively manage soil biology via compost and biological products and be strict about hygiene and biosecurity
- Monitor all inputs and their effects via soil, plant and water testing for nutrients and diseases, and adjust management according to results – it pays
- Keep on top of new technology by working with suppliers and researchers through on-farm trials.

You can find out more about the demonstration site on the project website, www.soilwealth.com.au.

Clubroot management in brassica vegetables: fact sheet

Clubroot is one of the most potentially devastating soil borne diseases affecting brassica vegetables (e.g. cabbages, cauliflower, broccoli, kale and Brussels sprouts) in Australia. Once plants are infected there are no effective control measures.

A practical fact sheet has been developed that assists with identifying clubroot, clubroot management strategies including integrated approaches, as well as evaluating clubroot risk.

INDUSTRY UPDATES

Case study explores the application of precision agriculture technologies

A new case study from the Soil Wealth ICP team explores how precision ag has benefited Schreurs & Sons' celery, leek and baby leaf production systems.

The study focuses on the demonstration site based at the company's Cora Lynn property, with trials aiming to improve nutrition, irrigation and drainage management, and insect pest and beneficial monitoring as a basis for soil and crop health.

To download the case study, please visit the Soil Wealth ICP website.

Soil Wealth NURTURING CROPS Integrated Crop Protection PROTECTING CROPS

JUNE 2019

BULLETIN

Welcome to the June edition (Issue 501) of the Bulletin where you can find the latest on upcoming events, demonstration site news and resources on soil management and plant health in the Australian vegetable industry.

If you're attending Hort Connections in Melbourne in two weeks time, be sure to visit us at Trade Show stands 98/115 (RMCG) and 99/116 (AHR).

UPCOMING EVENTS

New technology forum as part of Hort Connections, VIC

Potato Industry R&D Forum - Managing pest and disease, VIC

NEW TECHNOLOGY FORUM

MANAGING PEST AND DISEASE WITHIN THE POTATO INDUSTRY

WHAT YOU'LL GET OUT OF THE DAY

DETAILS

Speakers: Dr Mike Bruns, JJ Pappasanto, Ben Peggitt

Details and register

DEMONSTRATION SITE NEWS

Strip-till on show in the chill, Srdnev Basin NSW

AHR's Dr Kelvin Montagu dug a soil pit and showed rooting depths, soil

Phase 1 achievements

- 2,000 growers and industry stakeholders directly engaged
- 30,000 hectares, or 25% of the total vegetable farming land
- 80% can now make better informed decisions as a direct result of project
- 47% changed practices
- 35% are considering change
- Phase 2: imbedded M&E, feedback from PRG and industry feedback

How to get involved

- Bulletin e-newsletter, sign-up at www.soilwealth.com.au/contact/
- Social media via @SoilWealth and @ProtectingCrops
- Training and events
- Demonstration sites
- Partnership Network, EOI at www.soilwealth.com.au/contact/
- Hort Connections – Trade Show booths 98/115 (RMCG) and 99/116 (AHR).



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Thank you