Orchard Floor Management in The Riverland

Improving soil health and orchard resilience while reducing herbicide use.

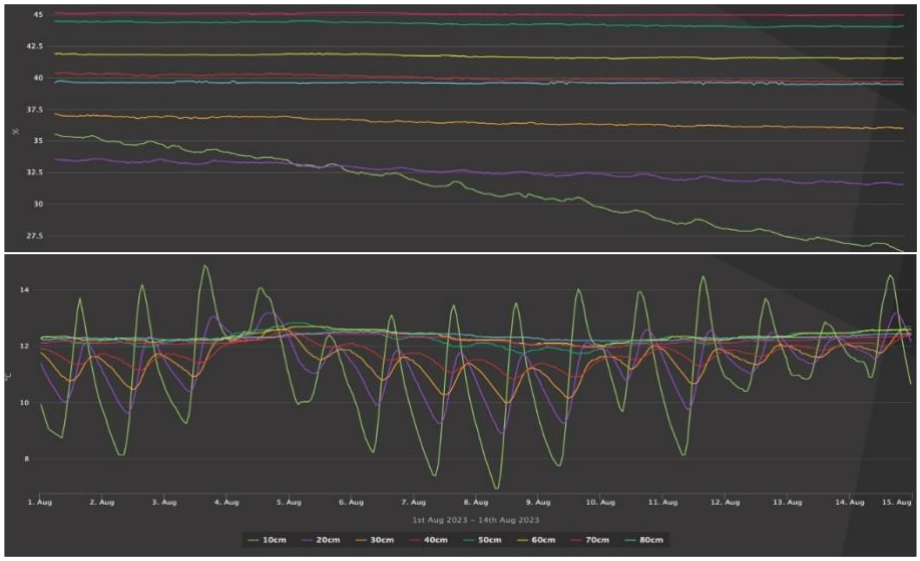
Treatments (ground cover trialled)	Potential influence on soil health
A: Herbicide tree-row, Volunteer Sward mid-row	Reduced competition *but* no benefit to soil health
B: Volunteer Sward – whole floor	No seeding cost *but* no specificity in selection
C: Pollinator Mix – whole floor	Increased pollinator abundance
D: Medicago and Rye – whole floor	Improved nitrogen fixation and soil carbon
E: Native species (Prostrate saltbush)	Native species adapted to climate
F: *Festuca arundinacea* (tall fescue) tree-row	Increased soil carbon *and* competition for water

How to: establishing tree line cover:

1. Sow cover crop mix as close the tree line and possible.
2. Plant seed mid-autumn, before the 'rain' arrives.
3. Allow cover to establish – avoid slashing for as long as possible! This maximised the benefits you get from the cover crop for as long as possible while establishing.
4. Once ground has died off, you can slash and side-throw to under the tree line – this will create a healthy mulch.

Example of established cover (medic & ryegrass):

Tools and techniques:



Technology makes life easier (usually)… The plots to the left depict recordings from *in-situ* soil moisture probes (top) and soil temperature probes (bottom). Having these probes in the soil year-round allows us to track moisture and temperature through the soil profile in real-time and, importantly, remotely.

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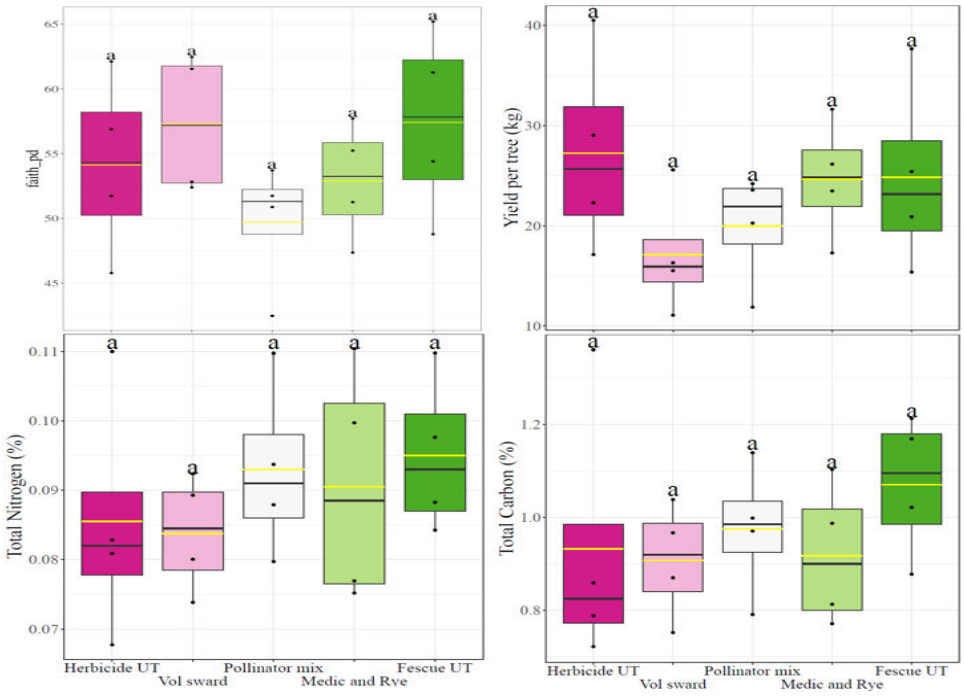
A of year of results: Trends emerging *but* more time required!

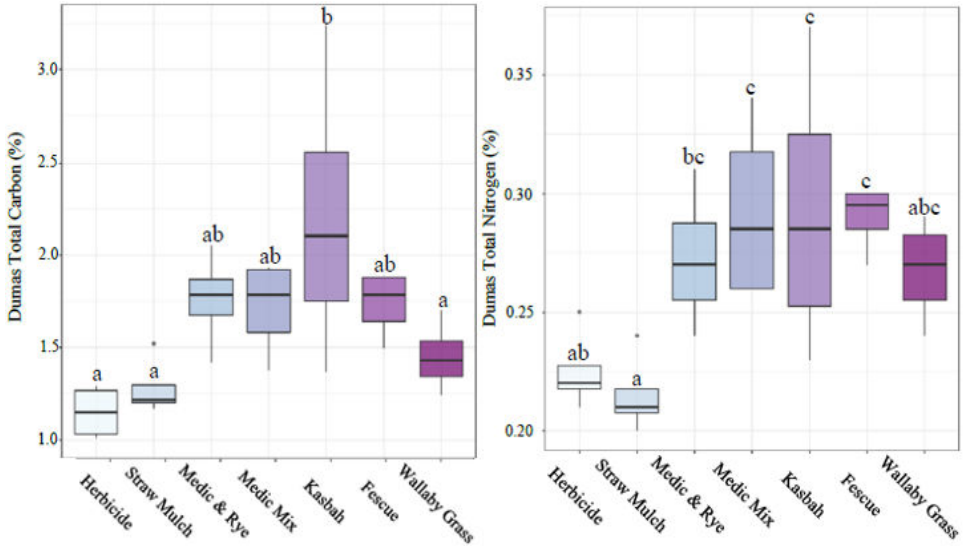


The four boxplots depicted left represent a year's worth of data collection. Set against the herbicide *control,* we don't see a great deal of difference…yet. Nitrogen (bottom left) shows a trend increasing with cover crops, as expected, so too with soil carbon (bottom right). It takes time to establish ecological equilibria. Over the coming seasons, we would expect to see treatments separate based on the soil and fruit properties that we sample and analyse.

Over the coming years, we expect to see differences emerge between treatments, such as:

Nutrient availability	Water holding capacity	Water infiltration
Soil organic carbon	Soil microbiome	Soil structure
Apple yield	Apple chemistry	Apple size

Field trials are marathon, not a sprint: Results from a six-year trial in grapevines…



The boxplots depicted left show data collected from a similar trial conducted in a Barossa vineyard. After six years of under-vine establishment, cover crop treatments had significantly greater nitrogen and soil carbon levels versus the herbicide control. Several other soil and grape properties showed similar differences.

Please scan the QR code to participate in a short five-minute survey.

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