Summit Ag
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Independent Agronomy Advice & Cutting-Edge Research

Whitefly IPM Management Trial

CRDC, Elders Rural Services and Summit Ag

July 2018

Whitefly IPM

Management Trial

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Silverleaf Whitefly is an emerging pest in the Southern Valleys with the last 2 out of 3 seasons having what was considered higher than normal populations. The aim of this is to demonstrate soft management options that can be employed on a commercial scale.

Key Points

A trial was established in Griffith NSW on the IREC research field station. The trial was undertaken to assess the use of soft insect control measures on key pets and their influences on the whitefly over the course of the season.

Coupled with this was thoroughly monitoring the crop for whitefly to add to the data set being collected at ACRI and other locations in the cotton growing regions.

No significant difference between soft management options with population trends similar. Whitefly overall population dynamics where attempted to be monitored but difficult to do follow but where persisted with.

Grower and advisors in the area have shown significant interest in the parasite releases that were done and wanted to continue in this direction.

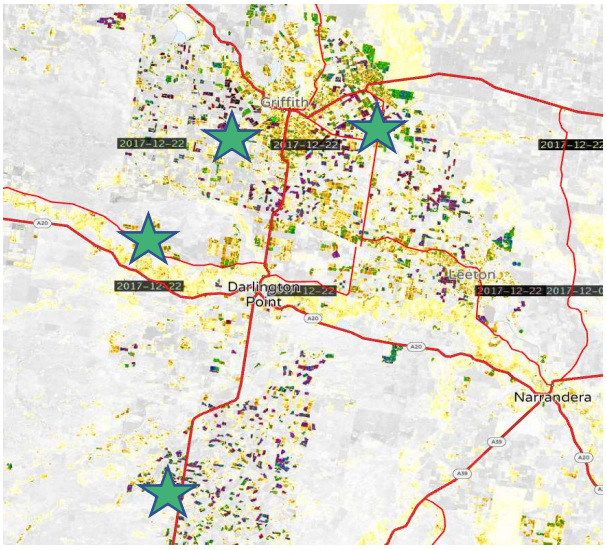
Background

The Southern Valleys are facing a new pest threat, one that many valleys up north have faced and are making great headway with, the silverleaf whitefly. The Southern Valleys are relatively young, with the longer-term growers been producing for about 8 years now. For a long time, we have been set with the old belief that whitefly won't be an issue for the south as the cool finish means that the 6-7th generation is never reached and therefore the blowout population never occurs, and there assumptions where wrong! The aim of the project is to demonstrate softer approach to pest management in the south including use of oils and soaps, introduce area wide management plan including the release of parasites, build relationship with horticulture to manage the pest between crops and over winter and ground truth monitoring/sampling techniques.

Trial Details

Population Monitoring

Monitoring the population of silverleaf whitefly was done by monitoring sticky traps across a range of sites around the area.



Above shows the locations of the main monitoring sites used across the valley that were used.

Soft Whitefly Management

Soft whitefly management options where explored at the IREC field station.

Treatment	Product	Rate
1	Control	NA
2	Water	200L/ha
3	Commercial Detergent	2% water volume
4	Biopest	3L/ha
5	Hitman	3L/ha

Layout is shown below.

The whole block had Biopest @ 2L/ha applied with the first roundup.
The above treatments where applied once whitefly detected in the crop in an increasing level, the first on the 24/01/2018 and second on the 13/02/2018.
Each plot was monitored weekly for whitefly population as well as immediately prior to and 4 days after application.

Whitefly Monitoring Data

Aim:
To collect data that was able to be fed to the ACRI Institute to help ground truth new sampling techniques.

Counts taken:
Node 5 Adults
Node 8 Adults
Node 8 Nymphs red eye vs younger with 15 leaves per treatment assessed under microscope.

Counts done weekly – 6.30am Thursday Mornings
Whole plot until whitefly detected then each plot individually
Started December – Completed March
Trigger 2.5% increase in nymphs on node 8 in 7 days for commercial chemical whitefly control.

Rep 1					Rep 2					Rep 3					Rep 4				
Control	Commercial Detergent	Biopest	Horticultural Soap	200L/ha water	Biopest	Horticultural Soap	Control	Water/Comercial Standard	Commercial Detergent	Horticultural Soap	Water/Comercial Standard	Control	Biopest	Commercial Detergent	Water/Comercial Standard	Control	Commercial Detergent	Horticultural Soap	Biopest
12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12

Figure One: Soft whitefly control trial layout

Trial Results

Population Monitoring

Sticky traps were placed out on the edge of cotton fields in locations as shown on the map, as well as 3 other locations for shorter terms. These were changed weekly and the removed stick traps visually assessed for whitefly.

Over the period we looked at both the blue and yellow sticky traps to see if there where any benefits from using one over the other, or in combination. The yellow sticky traps were the better option for whitefly, as expected, and the blue ones seemed to continuously get saturated with thrips and therefore the decision was made to no longer utilize them.
The first whitefly on a sticky trap was seen in September in a grape vine, as it was only a one off we are not really sure if there was a population or it was a one off that was just in the wrong place at the wrong time.

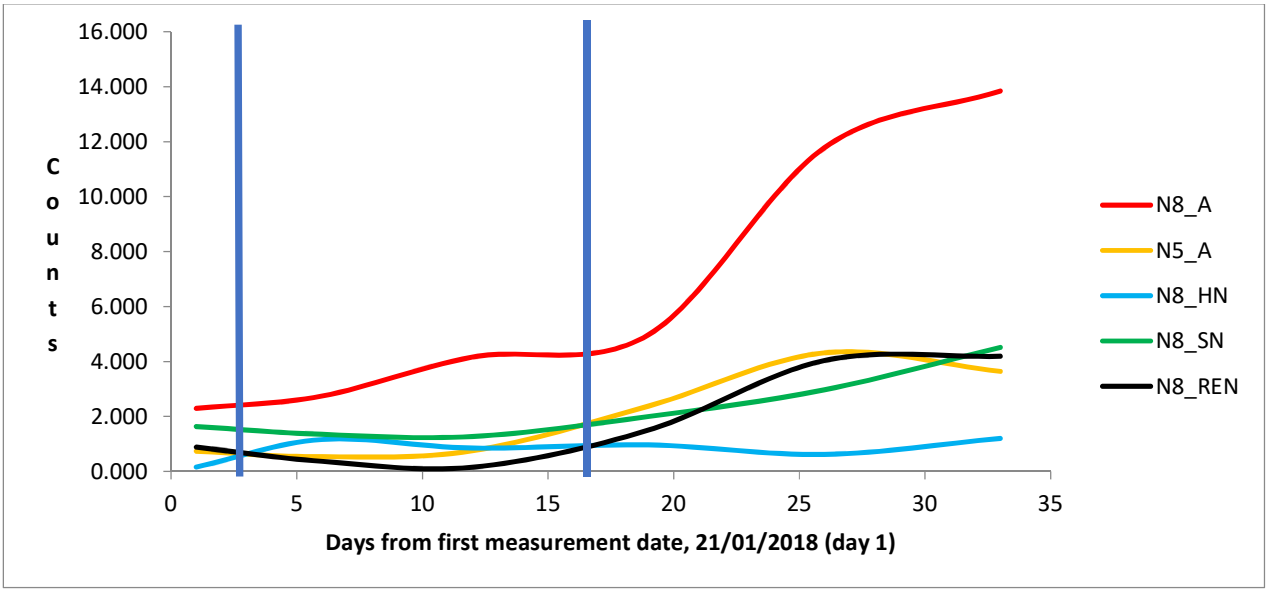
Over time the amount of time required to maintain the 7 locations (travel and reliability of people we asked to help) meant that we reduced this to 4 sites that we monitored more thoroughly. The first whitefly where detected in December, not long before they were first detectable in field. By mid-January the whitefly numbers on the cards became very high and therefore difficult to count.

One location was between a cotton and melon field. The visual population on cards increased here very quickly compared to the other sites. Due to staff changes and water prices we are likely not going to be able to source a melon grower as close this year but would like to try and look at vine monitoring a bit more closely.

Soft Whitefly Management

Spray and monitoring were done as indicated above. The data was then collated and compared both in terms of trend in the population based on the monitoring as well as per treatment.

Below are the trends that were seen at each sampling site by adult or nymph. The blue bars represent the spray timings. The red line is the number of adults detected at node 8 which is the population that increased the quickest. Node 5 adults are tracked on the yellow line which can be seen to have a much more gradual increase, but due to the location in the crop that was sampled would likely have been much more influenced by the climatic conditions at the time of sampling. The green line represents the number of small (non-red eyed nymphs) on node 8 which also produced a slowly increasing curve. The black line shows the red eyed nymphs which can be seen here to build up more slowly. The light blue lines are for the hatched nymphs on node 8 which can be seen to hold reasonably steady across the period.



Below is the whitefly population by treatment. The data was transformed in to a spline graph that allowed all of the data to be aggregated and compared. The scale on the x-axis is the days post the first counts. It can be seen here that the trends across all the treatments for the whitefly population are nearly identical with the difference at the end of the treatment period relative to the starting population, indicating there was no significant differences caused by the different treatments compared to the control.

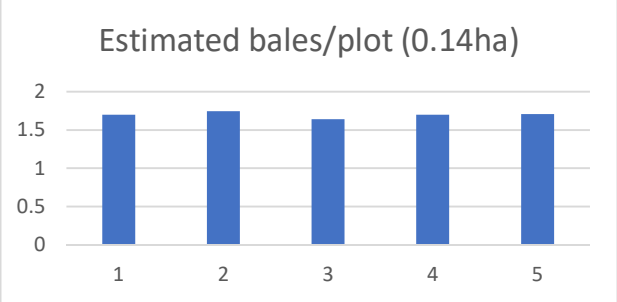
Talking to Richard Sequeira in regards to the results the process of application could possibly be changed to make the products work but this would involve changing the spray application method to droppers. There are two key limitations with this, one it is not practical in the middle of summer when planes are preference due to the soil moisture and two, it takes the practicality of application with other chemistries, especially roundup, and will make it difficult to implement easily on farm.

Commercial Chemical Whitefly Management

Using the commercial spray threshold of a 2.5% increase in nymphs on node 8 in 7 days. This threshold was met in mid-February and it was decided to take the opportunity to utilise the site to showcase the two whitefly control options in Receptor (Pegasus equivalent) and Lascar (Admiral equivalent) and run an informal get together with local interested agronomists to look at the population differences. These two treatments were monitored weekly also with no significant differences in population detected, although it is important to note that we did see a general drop off in whitefly towards the end of the season across the valley thought to be environmentally influenced.

Final Yield

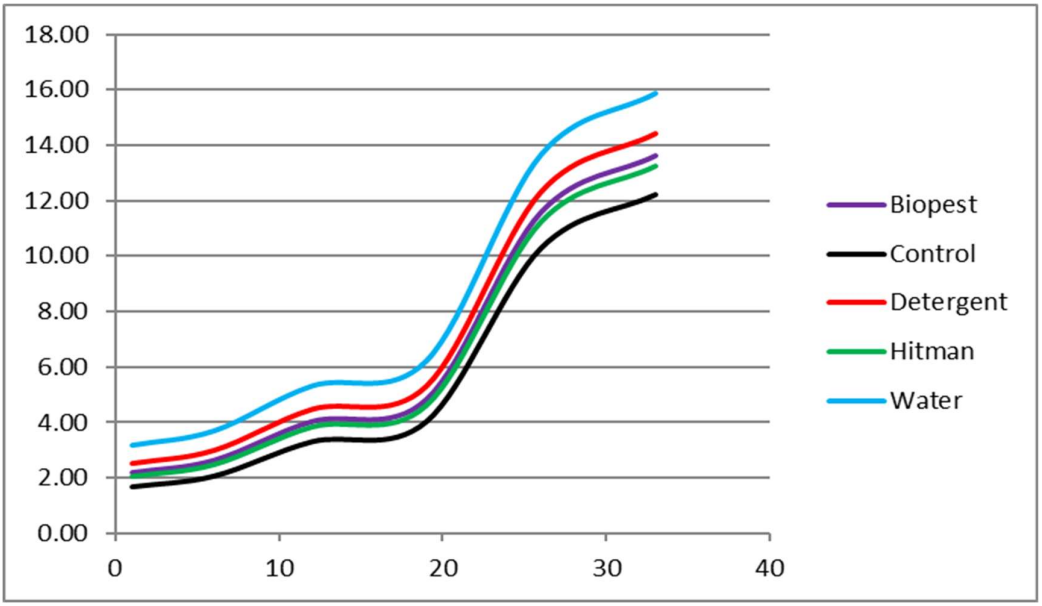
Each trial plot was picked individually and then the modules weighed to work out approximate yield per plot and then average per treatment. There was no significant difference between any of the treatments which is good as it means any of the techniques used didn't have a negative impact on the crops.



Above 1 = Biopest, 2 = Hitman, 3 = Control, 4 = Detergent, 5 = Water

Honeydew Assessments

There where no honeydew assessments undertaken this year as there where very low levels of whitefly at the site with not honeydew spotting visible on open cotton. It was decided that there would be no benefits from the assessments to the data sets.



Parasite Release

A population of Eretmocerus hayati where release on the 24/01/2018 with 350 vials hand placed across the IREC field station. The aim was to repeat this release over the summer 2-3 more times to try and build a background population. Unfortunately, we had issues sourcing enough Hayati for further releases due to the demand further north.

From samples of wasps sent to Jamie Hopkinson (QDAF) early indications where that as much as 70% of the whitefly nymph population was parasitised, which likely indicates some level of background population. There was also evidence of a native mite parasitising some nymphs which is exciting.

Year 2

2018.19 Plans

Population monitoring with sticky traps will commence in the second week of September at 4 sites, one in Coleambally, Murrami, Benerenbah and Lake Cargelligo to try and get some geographic range across the valley. These will be monitored weekly again.

Grower interests has primarily been around the utilisation of the parasites so the trial this year will look more into parasite release and monitoring infestations. The aim will be to create an area wide management group east of Griffith where we can run a similar management program and co-ordinate parasite releases of both the Eretmocerus hayati a mite for thrips and whitefly, Montdorensis. Working with Bugs for Bugs or QDAF (yet to be finalised) samples will be taken from the infested area as well as West of town and the levels of infestation determined to see if we are achieving higher levels from the areas of release.

There will also be a grower survey go out prior to planting, after growers and advisors have had time to reflect on the season, to try and gather some further opinions from the region as too the issues and where they feel we are lacking information

Thanks To

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CRDC
COTTON RESEARCH AND DEVELOPMENT CORPORATION

For the funding for running this work in the southern valleys.

Irrigation Research & Extension Committee

For the utilisation for the field station for running the trials and for allowing time to talk at the field day.

Elders

As partners in this project.

BUGS FOR BUGS

For guidance and advice as well as helping with beneficials.

CottonInfo

Kieran O'Keefe at CottonInfo for guidance, support and assistance.

Plus many many others who helped along the way.