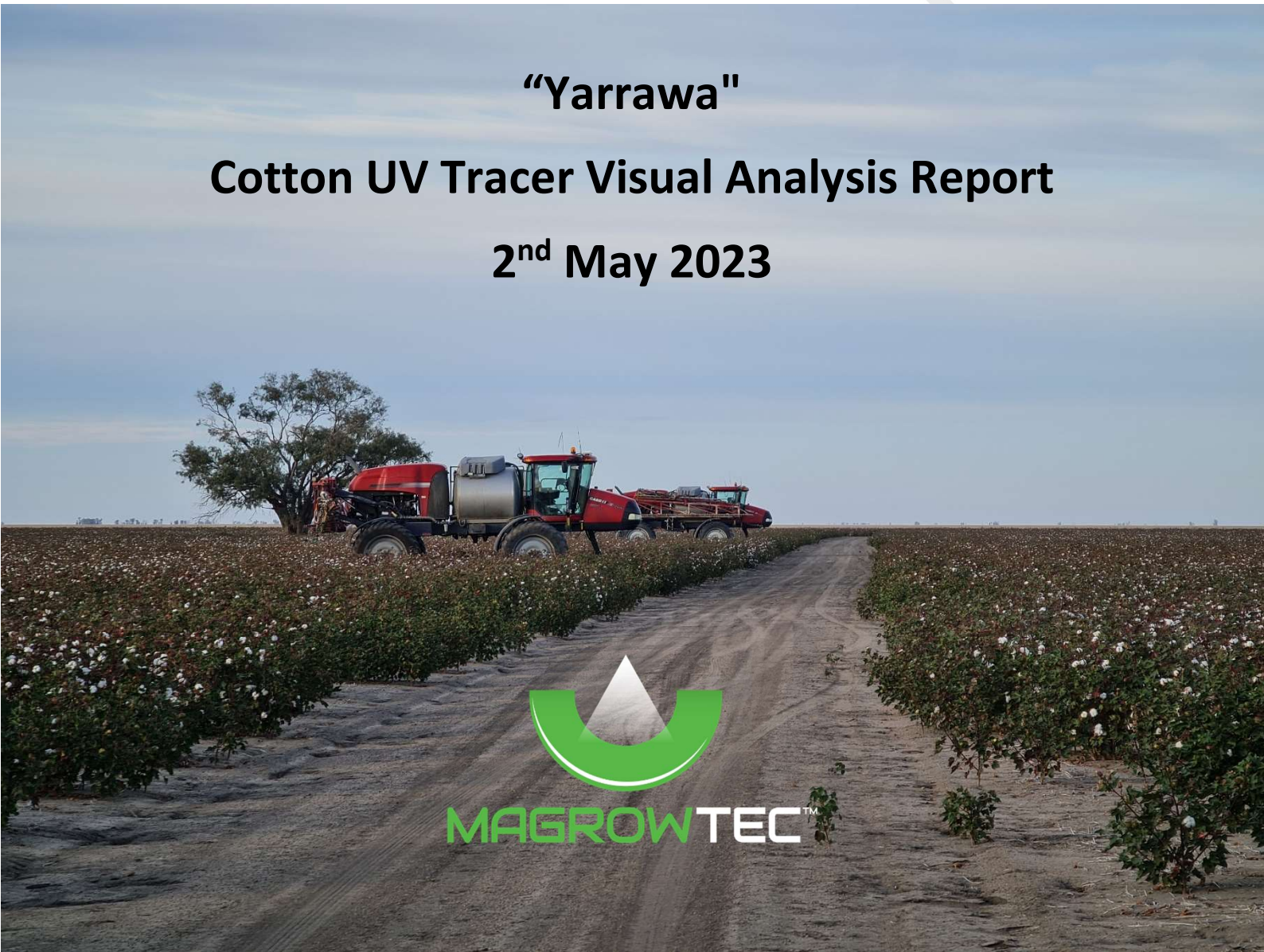


"Yarrawa"

Cotton UV Tracer Visual Analysis Report

2nd May 2023



Study Overview	
<p>Study Director: Dan Corfe – Crop Science Specialist, MagrowTec</p> <p>Study Monitor: James Dolman – Senior Crop Science Specialist, MagrowTec</p> <p>Date of Trial: 2nd May 2023</p> <p>Location: “Yarrawa”, Yarrawa Road, Mungindi, NSW, 2406</p> <p>Study Sponsor #1: MagrowTec</p> <p>Orchard House, Block 2 Clonskeagh Square, Road, Dublin 14, D14 CD72, Ireland</p> <p>Study Sponsor #2: Vantage-BMS LaserSat - Brisbane 1/22 Success Street, Acacia Ridge, QLD, 4110</p>	<p>Overview:</p> <p>A study was conducted at “Yarrawa” to demonstrate the effectiveness of a MagrowTec system in improving spray performance in skip-row dryland cotton.</p> <p>The study compared a sprayer fitted with a MagrowTec system to a conventional sprayer using their current spray parameters.</p> <p>Spray Coverage and Distribution quality were analysed via a night-time field trial method using an indicative qualitative UV tracer.</p> <p>The trial was attended by:</p> <p>David McGrath: <i>Regional Business Development Manager (Australia / New Zealand), MagrowTec</i> Dan Corfe: <i>Crop Science Specialist (Australia / New Zealand), MagrowTec</i> David Jackson: <i>Farm Manager, “Yarrawa” Avondale Ag.</i> Daniel Marchand: <i>Boom operator, Marchand Ag Services.</i></p> <p>Key Findings:</p> <p>Based on the trial results, the MagrowTec system outperformed the conventional boom in terms of coverage and distribution in like-for-like spray applications.</p> <p>Even when the MagrowTec system was used at a reduced rate, it still provided better performance than the full rate of the conventional system.</p> <p>These findings indicate that the MagrowTec system is a more efficient and effective solution for achieving optimal coverage and distribution in spray applications, with potential for improved crop yields via a cleaner cotton pick and potentially reduce the amount of chemicals needed for crop protection.</p> <p>Overall, this is promising news for farmers who are looking to maximize the effectiveness of their crop protection strategies.</p>

Qualitative Assessment Procedure:

Take a high-resolution picture in the middle of the plot, with the camera orientated horizontally, from hip height.

Then, make visual observation regarding:

1. **Spray coverage (SprCov) %** - What level of coverage % has been achieved at key targets (specific to the agronomy strategy) within the crop? For the category of chemistry being applied (systemic, contact, antifeedant etc.) is coverage % appropriate? How does this compare to the other treatments?
2. **Spray distribution (SprDistr)** – Where is the spray? If there is high/low distribution%. Is the spray fluid where it needs to be on the plant.
3. **Spray quality (SprQ)** – Make a visual observation for the average size of spray droplets at the key target areas; are there differences between treatments? Perhaps an opportunity to discuss the basic spray science principles around drop sizing (i.e., the drift/coverage relationship).
4. **Canopy penetration (CanoPen)** – Similar to spray distribution, but in specific relation to how well the spray fluid has been dispersed in mid and lower regions of the canopy.
5. **Endo drift / run off (ROff)** – Have spray droplets permeated the crop canopy straight onto the soil? Or is application volume high enough that spray fluid is reaching saturation point on the crop and running off onto the soil?
6. **Miscellaneous observations** – Any other noteworthy observations, such as coverage on the underside of leaves and how this compares to other treatments, pooling of spray fluid in stem axils or leaf rolls, and/or visual observations of drift at the boom line between treatments.

Deviation from Protocol:

Upon arrival to undertake the boom spray calibrations, it was discovered that alternative TT-110-03 nozzles (on droplegs) were installed across both the conventional and MagrowTec booms. Speed test, and nozzle calibrations were undertaken using the Treatment List below.

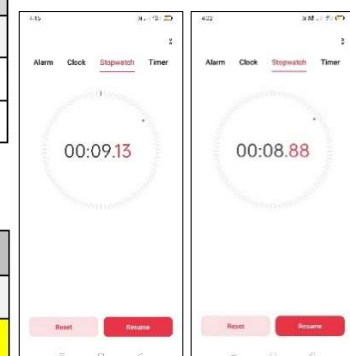
A selection of nozzles was selected across both booms, meeting the required 10% of the Expected Output (L/min) allowance.

Treatment List						
Treatment Number	Spraying Configuration	Nozzle	Pressure (bar)	Speed (KPH)	Application Rate (l/ha)	Rate (%)
1	Conventional	TeeJet TT-110-03	5.00	20.00	93.00	100.00
2	MagrowTec	TeeJet TT-110-03	5.00	20.00	93.00	100.00

Number of Treatments:	2	Repetitions per Treatment:	1
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Calibration			
Nozzle	Pressure (Bar)	Expected Output (L/min)	Spray Quality Classification
TeeJet TT-110-03	5.00	1.35	Medium

Speed test results:



*NOTE: the calculations in the Treatment List above, reflect the MagrowTec booms' pre-installation details. They do not affect the outcome of the qualitative results and pictures in this study.

Conventional (Figures 1 & 2)	Picture taken? YES
Treatment #: T1	Application: 100% Full Rate

Field observations from Farm Manager and boom operator:

SprCov: Good coverage at the top of the canopy. Good coverage also found on the open bolls. Poorer coverage at the lower canopy of crop.

SprDistr: Droplets are distributed at the top and the bottom of the plant.

SprQ: There seems to be larger droplets, along with some finer droplets...possibly at 20 – 30% splatting of larger droplets.

CanPen: There is a good amount of droplet penetration throughout the canopy.

ROff: There is minimal amount of run-off; most of the droplets are on the plant.

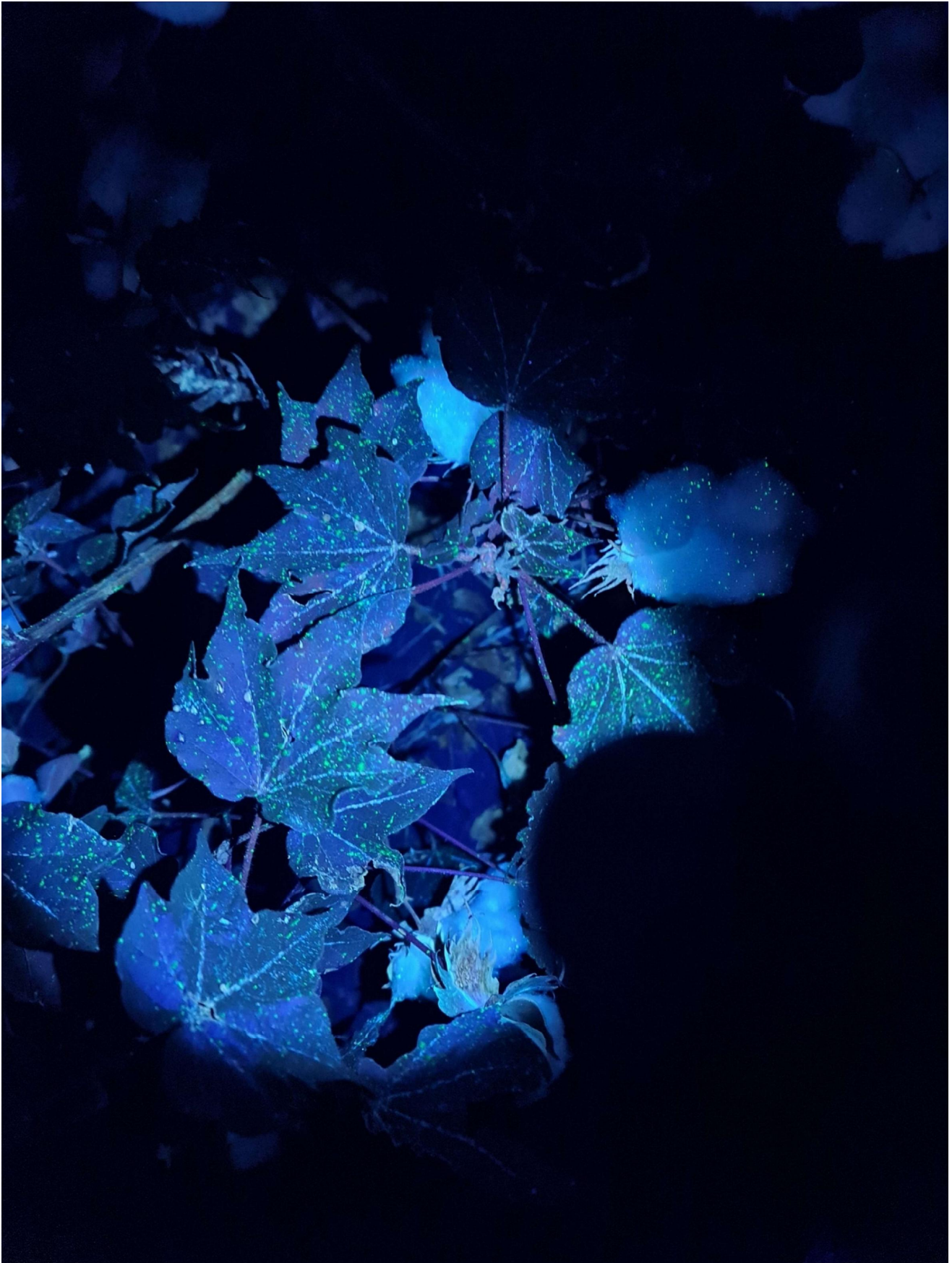
Other comments from Farm Manager & boom operator:

“Conventional [spray] was good. Happy with the spray job.”

Figure 1 - Conventional at 100% Full rate



Figure 2 - Conventional at 100% Full rate



MagrowTec (Figures 3 & 4)	Picture taken? YES
Treatment #: T2	Application: 100% Full Rate

Field observations from Farm Manager and boom operator:

SprCov: There is definitely a higher percentage of coverage [compared to the conventional].

SprDistr: The droplets are more evenly distributed through to the bottom of the plant.

SprQ: There are definitely more, finer [and medium] droplets which are more even [compared to the conventional].

CanoPen: There is much more of a spread of the medium and fine droplets at the bottom of the cotton plant [compared to the conventional boom].

ROff: No runoff of droplets was seen on the ground.

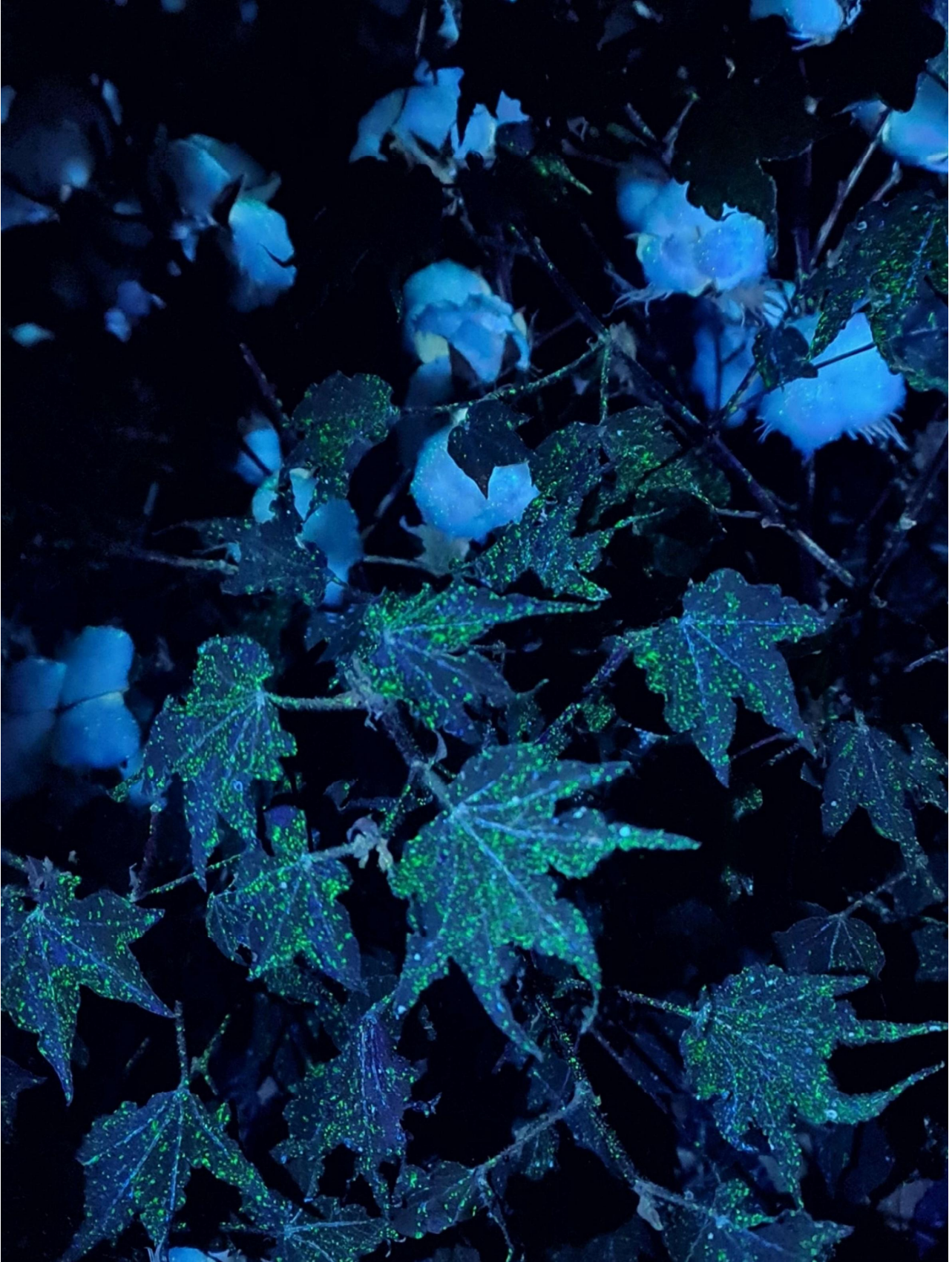
Other comments from Farm Manager & boom operator:

- “[Difference is] Chalk and cheese” / “Far more even [coverage] through the canopy” / “Even the shaded [areas] are better” / “Coverage improvement is everywhere you look on the MagrowTec”.

Figure 3 - MagrowTec at 100% Full rate



Figure 4 - MagrowTec at 100% Full rate



MagrowTec (Figures 5 & 6)	Picture taken? YES
Treatment #: Additional T2	Application: Reduced Rate (~20% reduced rate)

Other comments from Farm Manager & boom operator:

- *“Even with the reduced rate the coverage [with MagrowTec] still has a noticeable improvement”.*
- *“Pretty amazing [results]”.*

Figure 5 - MagrowTec - Reduced Rate



Figure 6 - MagrowTec - Reduced Rate



End of report.






Crop Science Research Study Report Acknowledgment Form

Study Code	2023-129-AU-AU
External Partner	Avondale Ag – Cotton UV Dye Research Study

By my signature, I agree to the sharing of the 'Avondale Ag – Cotton UV Dye Research Study' report document, with relevant contacts external to MagrowTec.

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Head of Crop Science	Nick Jessop		
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