

Weeds: Are we losing our grip?

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AT A GLANCE...

- CCA surveys reveal 50 per cent of growers have confirmed herbicide resistance.
- A further 25 per cent believe they have resistance.
- Pre-emergent and residual herbicide treatments reduced weed numbers by 70 per cent compared to the nil control at Leeton in 2020.
- Bottom line; Start clean and remain clean, start weedy and stay weedy.

ANYONE who has tried to catch a wet football or stand on a Colourbond roof when wet knows how hard it is to get a grip on the situation. Are we faced with a similar scenario with weeds? As glyphosate resistance becomes more prevalent in our common weeds it can feel like we are losing our grip. There's no trainer with the magic spray for the hands or a harness and anchor points for the roof here. But, when dealing

with hard to control weeds we do have options. Diversity is the key! Doing the same thing each year is the quickest road to herbicide resistance.

A key component of the Herbicide Resistance Management Strategy (HRMS) is attacking weeds at all stages of their life cycle and with a range of different tactics. It should always be the goal to apply herbicides to small numbers of weeds, especially when using glyphosate. Across all agricultural industries we are seeing herbicide resistance (in particular, glyphosate resistance) develop in an increasing number of weeds.

A new CRDC funded project (*DAN2004: Improved management of weeds in cotton and grains farming systems*) is looking at residual herbicides and unpacking some of the perceived issues around their use, especially in southern NSW. The project encompasses a number of weed management strategies. A large farming systems trial will be established at ACRI at Narrabri, field experiments with dryland cotton on the Darling Downs and a focus on residual herbicides in southern NSW. In addition, an industry wide sampling program is in place to gain an understanding of the extent of herbicide resistance to not only glyphosate but also Group A and Group I herbicides.

Concerns have been raised around perceived issues with crop establishment, emergence and potential early vigour issues in southern NSW. Two field experiments were established (Leeton and Whitton) to investigate these issues. An early sowing



One of the zero herbicide treatments.

TABLE 1: Herbicide treatments, Leeton 2020

Pre/at plant	Post	Layby
1. Nil herbicide		
2. Glyphosate only	Gly	Gly
3. Pendimethalin + Gly	Bouncer + Gly	Gly
4. Glyphosate only	Pendimethalin + Gly	Diuron
5. Terbyne + Gly	Pendimethalin + Gly	
6. Terbyne + Pendi + Gly	Bouncer + Gly	Prometryn
7. Bouncer + Gly	Pendimethalin + Gly	Prometryn
8. Glufosinate FB Pendi	Bouncer + Gly	Valor

NOTE: Bouncer = metolachlor, Terbyne = terbutylazine.



Inter row sprayer.



ONE BALE OF COTTON
(227KG) CAN PRODUCE:



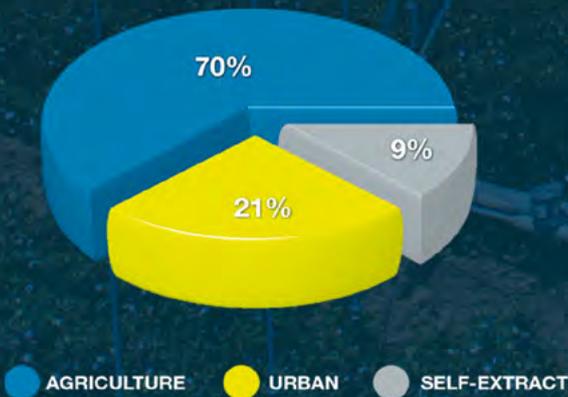
SOURCE: (COTTON AUSTRALIA, 2020)

IN AN AVERAGE YEAR, AUSTRALIA'S
COTTON GROWERS PRODUCE ENOUGH COTTON
TO CLOTHE 500 MILLION PEOPLE.



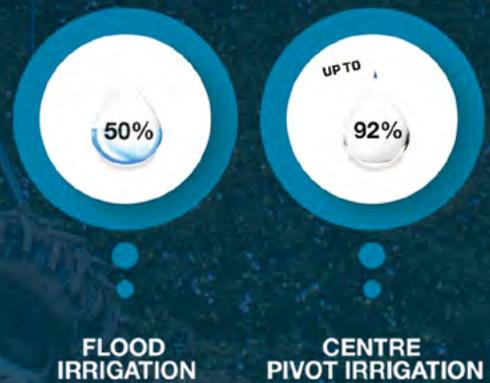
SOURCE: (COTTON AUSTRALIA, 2020)

WATER USAGE IN AUSTRALIA



SOURCE: (AUSTRALIAN BUREAU OF METEOROLOGY, 2015/16)

WATER EFFICIENCY IN AGRICULTURAL IRRIGATION



SOURCE: (USDA, 2001)

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THIS IS VALLEY.**



Clean interrow following pre-emergent and in-crop residual.

date (September 26) and a second sowing date (October 22) were chosen at Leeton to compare an early sowing date with potentially cooler soil temperatures and a warmer main season sowing date for the south. The site at Whitton on the IREC field station was planted with the commercial field on October 25.

Results

A list of herbicide treatments is in Table 1. Herbicides were chosen based on local best practice. Grass weeds were the

dominant issue at both sites and so cotton yields were highest in the treatments that included either pendimethalin or metolachlor (Bouncer) as either a pre-emergent or in-crop residual (Figure 1). Cotton yields in the herbicide treatments were above the district average for the season (9.5) averaging 10.3 bales per hectare on September 26 and 12 bales per hectare on October 22.

Weed numbers were measured based on a scoring system where each plot was rated on a scale of 1–10. The number 1 was <1 plant per square metre and 10 was >50 plants/m². As seen from Figure 2, weed pressure was very high in the nil treatment and the glyphosate alone treatment did not give satisfactory control due in part to the high numbers of weeds emerging with the cotton.

When comparing Figures 1 and 2 we can see that the high early weed numbers in the nil treatment has reduced cotton yield by 60 per cent compared to the pre-emergent treatments. The importance of starting with a clean field around crop emergence is a critical factor when growing cotton. Cotton is a poor competitor early and even low numbers of weeds early in the season can reduce crop yield (Charles et al 2019).

FIGURE 1: Cotton yield at Leeton in bales per hectare, 2020

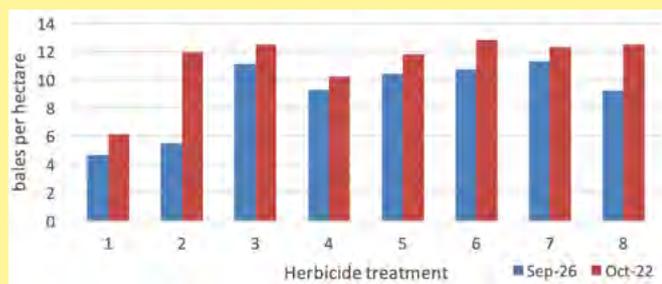
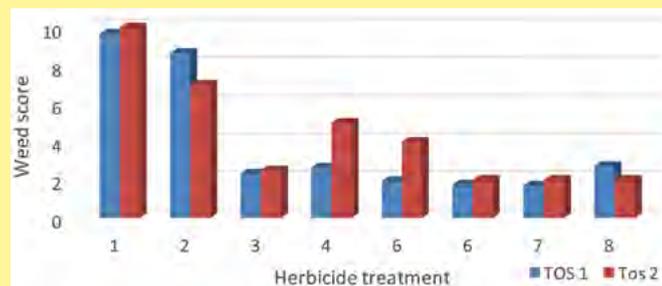


FIGURE 2: Weed concentration, Leeton 2020



Conclusion

Weed control is a numbers game, you need to apply control tactics throughout the lifecycle of the weed with overlapping modes of action from different residual herbicides.

Whilst this is the first year of a three-year project the early results give us some confidence around the use pattern and efficacy of pre-emergent and residual herbicides in southern cotton fields. The experiments will be repeated in the coming season and expanded to include cultural control such as inter-row cultivation.

References: Charles G, Sindel B, Cowie A, Knox O (2019) Determining the critical period for weed control in high yielding cotton using common sunflower as a mimic weed. *Weed Technology*.

This article originated as a student assignment for the UNE Cotton Production Course.