NGN - Developing control strategies for key problem weeds in North West NSW ICN2404-002RTX & ICN2403-002RTX

GRDC
GRAINS RESEARCH & DEVELOPMENT CORPORATION

Focus of field activities 2024

External summary

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Authors note:

This report has been prepared for external communication with meeting participants and interested stakeholders.

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Proposed project direction for 2024/25

Following the Issues identification process run during spring 2024, a list of key high-ranking issues and suggested activities to address these activities have been captured below. It is unlikely that there will be sufficient project resources to address all these issues and activities, however these objectives can assist in guiding the project for the coming year.

Issue – Alternate herbicide and non-herbicide solutions to control of Group 1 & 2 resistant grasses. Phalaris in winter cereals was consistently rated highly (Narrabri, Pallamallawa (both top priority) and Burren Junction), although phalaris in broadleaf crops and wild oats/ryegrass in cereals was also commonly discussed.	
Activities	GRDC has another NGN investment (led by UQ Gatton) that is running field trials of herbicide solutions and other non-herbicide tactics (esp crop competition) for phalaris control in wheat and chickpea across northern NSW during 2024 and 2025 seasons. It is proposed that this project engages with the UQ project to assist in the extension of their results, rather than duplicate similar trials. It is likely that the 2024 trial results will be presented at the 2025 Goondiwindi GRDC updates.

Issue – Resistance to post-emergent herbicides used to control grass weed (phalaris, wild oats and ryegrass) in winter cereals is causing growers and agronomists to investigate at-planting applications of residual herbicides. Users are looking for confidence in maintaining efficacy and avoiding crop injury with available herbicide options (especially considering the price per hectare of several options). Of note, growers and agronomists towards the east reported a high desire to use these herbicides with disc seeders, while the meetings reported that many growers to the west were more likely to have tyne based planters. Almost all of these pre-emergent grass herbicides can be potentially toxic to winter cereals. Crop safety is increased by ensuring physical positional separation of the crop seed and the herbicide. This is best achieved by the Incorporation by sowing (IBS) system using knife points and press wheels. Disc seeders achieve varying degrees of physical separation. Some disc systems can be utilized with some herbicides, provided the operator understands what they are trying to achieve with planter set up.	
Activities	Autumn 2025. Demonstration sites and field walks with tyne and disc seeders to show the importance of achieving seed and herbicide separation for crop safety when using 'grass killing' pre-emergent herbicides in cereal crops. Videos and supporting information to be posted to the ICAN project web page.

Issue – Strategies for milk thistle control rated highly at Gunnedah (top priority), Narrabri and Pallamallawa. There is a lot of historical efficacy data already in existence (much generated by NGA) over many years targeting milk thistle and containing most herbicides of interest	
Activities	ICAN has plans to consolidate historical research conducted on milk thistle (and fleabane) into a package of grower focused extension advice, most probably incorporating data summaries and including the development of a management manual which will be delivered via associated extension workshops across northern NSW in 2025.
	A trial protocol will be conducted in the 2024/25 summer fallow to evaluate the effect of Group 14 mixing partners on the performance of glyphosate and glufosinate under summer conditions (small v large weeds; high Delta T v Low Delta T). Treatments will be measured as control/regrowth after a significant rainfall event (and not just speed of brownout). [It is also planned to undertake a similar protocol targeting feathertop Rhodes grass]
	A trial protocol will be conducted in the 2024/25 summer fallow to evaluate the effect of 2,4-D amine and glyphosate tank mixes under a range of summer conditions and with different water quality. Treatments will be measured as control/regrowth after a significant rainfall event (and not just speed of brownout). [It is also planned to undertake a similar protocol targeting feathertop Rhodes grass]

Issue – Paraquat regulatory defence. At the time of the issues identification meetings, the proposed regulatory changes to paraquat had only been recently announced, so there was high level concern regarding the ability to manage northern region weeds in the absence of paraquat (or limited to use of very low application rates). While discussed at all meetings, this was particularly important at Pallamallawa and Gunnedah.
Key questions raised included:

- The supported use patterns on the proposed paraquat label do not currently contain a use pattern relevant for use in northern no till fallow situations.
- Optical spot spray use patterns are not currently supported on the proposed paraquat label
- Is paraquat still effective as a double knock at the proposed use rate ceiling (231g ac/ha or approximately 800-900 mL/ha of a 250 g/L formulation)?
- What is the impact of water rate and application coverage on efficacy of low paraquat use rates?
- Are there mix partners that can be added to the proposed low rate of paraquat to enhance performance?
- What double knock alternatives are available (especially for grass weeds) if the permitted rate of paraquat is no longer effective?
- Haloxyfop labels for grass weed control in fallow recommend a sequential application of higher rates of paraquat. What happens to this label claim if that rate of paraquat is no longer supported?

Note: While this meeting was focused on 'weed control' issues, there was considerable concern over the loss of crop desiccation registrations, in particular the loss of diquat for desiccating mung beans.

Activities	There is considerable use rate and use pattern historical data for paraquat products residing in the NGA trial database. Some of these trials are likely to be able to assist in providing an understanding of paraquat performance raised here (e.g. > 20 historical data sets containing paraquat as a dose response with rates down to 200g ac/ha, many of these on 'large' weeds). It is proposed that this project summaries these data and presented this back to industry to demonstrate the technical performance to be expected from the proposed paraquat use rates and how this compares to known standard practice (i.e. application rates of 400 to 600g ac/ha).
	The APVMA have gone on public record indicating that changes to paraquat labels required under the review will have a 2 year 'phase in' periods, with paraquat likely to be able to still be used until this time according to the 'current' label on the drum. This should allow time for industry to develop potential new use strategies that align with ongoing supported use patterns and maximum application rates. **GRDC have requested that no project resources are utilised for paraquat field trials until the final determination of supported use patterns and rates are known** (expected early 2025). Once this is known, additional field trials may be supported.

Issue – Optical spot sprayer application parameters (nozzles, boom height, nozzle overlap, travel speed, water volume, weed size) does not appear to be well understood by some users. There is likely to be an opportunity to better refine application parameters and the resulting leaf coverage that can be achieved which may lead to more effective results.

Activities	ICAN in conjunction with Bill Gordon Consulting plan to provide new GRDC resources that outline important considerations for OSST set up and application.
	It is possible that OSST tank mixes can sit in the spray tank for extended periods (including potentially overnight) before they are applied to the field. Mixtures are extremely complex and it will be impossible to cover more than a few targeted mixtures, however we propose to measure the efficacy of selected tank mixes applied immediately after mixing as opposed to letting the tank mix sit for extended hours before application. Where possible, this will be done in conjunction with rainwater and poor quality bore water.

Issue – Residual herbicide use in summer fallow for grass weed control relies on rainfall for herbicide incorporation. It is known that some herbicides (e.g. s-metolachlor and triazines) can be degraded by UV light if rainfall does not fall after application, while others (e.g. isoxaflutole, imazapic, flumioxazin) are thought to be more stable on the soil surface. However there is no available information to understand the magnitude of losses where incorporating rainfall is delayed.

Activities	Replicated plot trial of the key summer fallow herbicides listed above to be applied in fallow in advance of an 'expected' period of dry weather. Soil samples taken approximately the day after application and then approximately each week until after a significant incorporating rainfall event (i.e. > 20mm) Soil samples analysed for actual soil residual levels. Budget limitations associated with extensive soil testing may prevent this protocol from being able to be conducted within this GRDC investment. Grass weed control measured following subsequent rainfall events

Issue – At the Burren Junction and Gunnedah meetings, some participants were interested in understanding the economic benefit of targeted mechanical weed control as a re-set for problem paddocks. For some, this is becoming increasingly of more interest as they are being exposed to the need for periodic deep placement of nutrients to sustain the farming system in the longer term. Questions raised included • What is the cost/ha and multi-year economic benefit of different treatments? • How long does the benefit from a single re-set last? • How do different treatments compare in terms of efficacy and cost? (Kelly chain v speed tiller v offsets v deep ripping v aggressive inversion tactics e.g. one-way plough or mouldboard) • Can these treatments be used successful as a single pass, or are multiple passes required to allow traffic back across the paddock? • Do multiple passes bring weed seed back to the surface? • Are residual herbicides also required to pick up any weed germinations from seed not adequately buried?	
Activities	Resourcing to fully answer the questions posed above is outside of the scope of this investment. However, if suitable demonstration site(s) can be identified, there may be the possibility to compare simple outcomes of various different tillage implements in a paddock with an established weed problem and a large seedbank. Most likely this would involve strips of different tillage options applied as a single operation, with part of the paddock then cross treated at 90° with a Kelly chain or speed tiller, so as to provide an area with a stand-alone mechanical treatment and an area with a multi-pass approach. If possible, it would be a useful extension message to include a deep rip treatment and a deep rip + deep placement of nutrient treatment. If possible, access to the optical spot chipper as an additional treatment would be highly beneficial.

Issue – Water quality for spraying did not rate highly during the prioritisation meeting or via the Update survey. However previous industry surveys indicate that the central and northern region of NSW has arguably some of the poorest quality bore water across Australia and this is likely to be negatively affecting performance of glyphosate, 2,4-D amine and clethodim in particular.	
Activities	Recommend running some demonstration trials with glyphosate in summer (milk thistle or feathertop Rhodes grass) and clethodim in winter (ryegrass) with rainwater versus poor quality bore water +/- water conditioning to highlight the importance of water quality and the use of water conditioning agents. These field demonstration sites will be supported with additional information on water quality and the impact on herbicide performance to be posted to the ICAN project web page.