DE-RISKING EARLY SOWN CROPS – RESULTS FROM THE SOWING SPEED AND HERBICIDE EFFICACY DEMONSTRATION TRIALS AT RAND AND MURCHISON

KEY MESSAGES

- **A demonstration trial at Rand highlighted how natural paddock variability can cause moisture to depth to vary across a paddock, which can impact on the success of dry sowing.**
- **Using a slower speed at Rand caused clods to form, compared to a higher speed which generated more soil throw.**
- **A herbicide trial at Murchison highlighted the impact of rainfall on pre-emergent herbicide efficacy, as well as the importance of understanding the target species, moisture requirements and herbicide tie-up in stubble before selecting a herbicide.**
- **Discussions with farmers highlighted knowledge gaps and interest in long coleoptile wheats to better manage sowing depth in dry soils, cutoff dates for dry sowing and how small amounts of soil moisture can affect the success of dry-sowing.**

BACKGROUND

Dry and early sowing of cereal crops is a practice commonly used by farmers in southern Australia to combat erratic and late opening season rainfall, and to effectively manage the sowing program on increasingly large farms.

There has been a large amount of research and development on dry and early sowing by key research and development organisations such as the Grains Research and Development Corporation (GRDC), CSIRO, and state agencies into seeding strategies, nutritional requirements, and machinery setup for dry sown crops.

However, many growers have either not accessed the information or are seeking to develop a more strategic approach that is tailored to their specific district and property requirements. Additionally, there are opportunities to increase the success of early sowing by combining management approaches and strategies.

Two sites were established at Rand and Murchison during 2024 to demonstrate different strategies when managing a dry start to the season. The demonstration strategies were developed after conducting a survey with Riverine Plains members on what they'd like to see.

RAND, SITE 1

METHOD

The Rand site was established to look at the effects of the speed of sowing on establishment and yield. The trial evaluated three different speeds of sowing—6 km/hr, 8 km/hr and 10 km/hr—with all paddock treatments otherwise the same. The paddock was sown to canola (cv HyTTech Trophy® Hybrid TT) on 10 April 2024 at a rate of 3 kg/ha.

RESULTS & DISCUSSION

The Rand site was relatively dry when sown in mid April. While there had been some good summer rain at the end of January, by sowing there was large variability in soil moisture across the paddock and down the profile, as indicated by deep soil sampling (Table 1).

Table 1 Soil moisture measured down the profile at the Rand De-risking early sown crops trial site, 2024

	SPEED OF SOWING (KM/HR)		
Treatment	**6**	**8**	**10**
Depth (cm)	Soil moisture (%)		
0-10	11.7	12.1	10.8
10-30	14.9	16.8	14.8
30-60	15.6	19.3	12.4
60-90	13.6	15.1	10.7

Post sowing, the soil surface was noticeably different across the different sowing speed treatments, with the lowest speed leaving the surface with large clods of soil, while the highest speed had thrown the soil further.

Plant counts conducted on 15 May only showed a small difference in establishment between the sowing speed treatments, with the 8 km/hr treatment having the lowest emergence (34 plants/m^2) and the 10 km/hr treatment having the highest (39 plants/m^2).

Yield results for the different sowing speed treatments were inconclusive for this trial, due to the combination of severe frost damage and heavy rain at harvest time, which all negatively impacted grain yield. The yields in the paddock ranged from 0.1 - 1.0 t/ha.

MURCHISON, SITE 2

METHOD

The Murchison site evaluated different pre and post emergent herbicide options, applied as per Table 2. The paddock had a pasture history, with a high weed burden. A combination of herbicides and control strategies were used in the trial, including:

- Trifluralin incorporated by sowing (IBS), followed by Mateno® at the one leaf stage (GS11) – targeting annual grasses and broadleaf weeds both at sowing and early post emergence.
- Trifluralin + Terrain® Flow (IBS), followed by Mateno at the one leaf stage (GS11) – targeting annual grasses and broadleaf weeds, specifically wild radish using a knock down and residual control strategy at sowing, followed by grass and broadleaf control early post emergent.
- Trifluralin (IBS) – targeting annual ryegrass and wireweed.
- Trifluralin + Sakura® (IBS) – targeting annual ryegrass, barley grass, silver grass, toad rush, plus suppression of brome grass and wild oats.
- Trifluralin + Sakura + Voraxor® (IBS), as per previous treatment, with longer lasting pre-emergent residual plus suppression of capeweed and wild radish.

The entire site was sown on 3 May, 2024 to wheat (cv Scepter) at a rate of 75 kg/ha.

RESULTS & DISCUSSION

The trial was sown into dry soil, with the site receiving 18 mm one week after sowing, with a follow-up rain of 36 mm occurring at the end of the month. This was critical to the success of the application of the pre-emergents, which were applied within 24 hours of sowing and needed moisture for activation. Following crop emergence, Mateno® Complete was applied to two of the treatments at early tillering (GS13-21) on May 27, just before the rain event at the end of the month.

Weed species assessments were done at emergence (data not shown) and then again on 23 July. The weed species present included annual ryegrass, capeweed, erodium and onion grass. Table 2 shows the differences in population of weeds, with a trend to higher broadleaf weed populations in the Trifluralin and Trifluralin + Sakura treatments, compared to when Mateno, Terrain Flow or Voraxor was added to the mix. Grass weed populations were similar across treatments, although there was a trend to lower populations when Trifluralin and Mateno were used in combination.

Table 2 Herbicide treatments, applications details and weed counts conducted at the Murchison De-risking early sown crops trial, 2024

TREATMENT	APPLICATION RATE	APPLICATION DATE	GRASS WEEDS (PLANTS/M²)	BROADLEAF WEEDS (PLANTS/M²)
			23 July	
Trifluralin	1.5 L/ha	3 May	40	90
Trifluralin + Mateno	1.5 L/ha + 1 L/ha	3 May + 27 May	21	34
Trifluralin +Terrain Flow + Mateno	1.5 L/ha + 125 ml/ha + 1 L/ha	3 May + 27 May	40	17
Trifluralin + Sakura	1.5 L/ha +118 g/ha	3 May	29	74
Trifluralin + Sakura + Voraxor	1.5 L/ha +118 g/ha +200 ml/ha	3 May	32	28

LEARNINGS AND NEXT STEPS

It's recommended that farmers ensure the correct depth of seed placement and the spatial separation of crop seed and herbicide when dry sowing. It's also recommended that farmers avoid sowing into paddocks with high weed seedbanks until an effective knockdown strategy is implemented.

Field days and paddock walks held at the Rand and Murchison demonstration sites as part of the project also provided an opportunity for farmers to further discuss the above strategies, as well as other challenges and decisions they face when dry sowing. Feedback obtained at these events indicated a knowledge gap and further interest around dry sowing and:

- new varieties, including long coleoptile varieties
- understanding the cutoff date for dry sowing
- half germination – what percentage losses are occurring with small amounts of rain and does this contribute to poor germination?
- optimising pre-emergent chemistry efficacy, including the timing between herbicide application and sowing
- Rotation and how to adjust this in response to a late break (eg. lupins to field peas, or wheat to barley)

These topics will be used to inform future work in this area.

ACKNOWLEDGEMENTS:

The *De-risking the seeding program: Adoption of key management practices for the success of dry early sown crops* project is supported by Ag Excellence Alliance Inc, through funding from the Australian Government's Future Drought Fund. Thank you to our farmer cooperators, the Webster family (Rand) and the Brown family (Murchison)

Author:
Jane McInnes,
Riverine Plains
Email: jane@riverineplains.org.au

Australian Government
Department of Agriculture, Fisheries and Forestry
Future Drought Fund
AgExcellence ALLIANCE

This project received funding from the Australian Government's Future Drought Fund