Figure 1. Native button grass species Dactyloctenium radulans. Image: DPIRD

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The 2026 Grains Research and Development Corporation (GRDC) Grains Research Update event in Perth showcased the latest research and results from across the grains industry.

Several Crop Protection researchers from the Department of Primary Industries and Regional Development (DPIRD) were among the industry experts presenting on a variety of topical issues.

In this issue of Protecting WA Crops, we spotlight the presentation delivered by DPIRD Research Scientist, Arslan Peerzada.

Herbicide programs for button grass suppression in summer fallows

At a Glance:

- Button grass is becoming a major summer fallow weed in the northern wheatbelt of Western Australia. Its susceptibility to commonly used herbicides is strongly influenced by soil moisture, prevailing temperature, and weed growth stage.
- Under drought stress in screenhouse studies, the label rate of glyphosate and haloxyfop provided sublethal injury, indicating reduced efficacy under hot, dry summer conditions.
- Field trials showed double-knock programs, particularly glyphosate + 2,4-D amine followed by paraquat/amitrole, provided superior weed suppression versus single glyphosate applications on small, stressed plants. Even the robust double-knock strategies failed on large or environmentally stressed weeds due to impaired uptake and translocation. Targeting smaller, actively growing plants is critical to minimise survival and prevent seedbank replenishment.

Figure 2. Button grass in a paddock. Image: DPIRD.

The native button grass species *Dactyloctenium radulans* has long been common across the region, but in recent years it has become increasingly difficult to manage. It is now the second most damaging and the third most widespread summer fallow weed in the northern wheatbelt of Western Australia.

Managing button grass is difficult because its response to herbicides is highly variable, influenced by population differences, plant growth stage and environmental stress.

As part of a DPIRD project co-funded by GRDC, button grass populations were assessed through screenhouse and field trials to determine their response to widely used herbicides, and to develop effective management strategies in WA summer fallow conditions.

Screenhouse trials (rate-response study)

In 2023–2024, four button grass populations collected from Rossmore, Northam, Holmwood and Tenindewa were tested in a screenhouse (October 2024 to April 2025) for susceptibility to summer fallow herbicides under high temperatures and limited soil moisture.

At the pre-tillering stage, plants were sprayed with Roundup Ultra® MAX (570 g a.i./L glyphosate as potassium salt) at 0 to 2976 g a.i./ha and Verdict® 520 (520 g a.i./L haloxyfop as methyl ester) plus 0.5% v/v UpTake™ Spraying Oil at 0 to 78 g a.i./ha. Note that both rates are on the label for control of button grass in fallows or prior to planting a crop.

Herbicide injury was visually scored at 21 days after spraying using a 0–100% scale (0 = no visible injury,100 = complete plant death).

All the button grass populations showed a rate-response to glyphosate, with injury increasing significantly from lower rates to the maximum label rate. At the glyphosate rate of 741 g a.i./ha (1.3 L/ha), susceptibility remained low to moderate across populations, with the Rossmore population showing the greatest injury (40%). Higher glyphosate rates caused greater damage, with 92.5–

100% injury at 1482–2976 g a.i./ha. In contrast, haloxyfop performance was consistently poor at the maximum recommended label rate (78 g a.i./ha), producing only 30–47% injury across all populations. Overall, herbicide type, application rate and population differences all affected susceptibility, and low soil moisture reduced the effectiveness of recommended herbicide rates.

Field trials

Two field trials were carried out at Pindar and Wubin during the 2024–2025 summer fallow to assess button grass control. Both trials targeted plants from the vegetative stage through to seed set. Five treatments were tested to determine their effectiveness in controlling button grass:

- Single knock - Glyphosate (1364 g a.i./ha, Roundup Ultra® MAX) with AMS 1% (ammonium sulphate 980 g a.i./kg) + Li-700® 0.5% (soyal phospholipids 350 g a.i./L + propionic acid 350 g a.i./L)
- Double knock - Glyphosate (1364 g a.i./ha, Roundup Ultra® MAX) with AMS 1% + Li-700® 0.5% *fb* Paraquat + Amitrole (600 g a.i./ha + 24 g a.i./ha, Guerrilla®)
- Double knock - Glyphosate (912 g a.i./ha, Roundup Ultra® MAX) + 2,4-D amine (450 g a.i./ha, 2,4-D amine) with AMS 1% + Li-700® 0.5% *fb* Paraquat + Amitrole (600 g a.i./ha + 24 g a.i./ha, Guerrilla®)
- Simulated grazing
- Control.

Treatments were visually assessed 3-4 weeks after spraying for control and for plant survival compared with the untreated control. At the final assessment, seed production and seed viability was assessed on any surviving plants.

At the Wubin field site, the button grass plants experienced high environmental stress during weed establishment due to high temperatures and low rainfall. The resulting plants were mature and stressed, but very small (1-5 cm tall). Consequently, a single application of glyphosate at 2.4 L/ha with adjuvants was enough to achieve 100% control (0% plant survival). Untreated control plots only had 76% survival, due to natural senescence from environmental stress. The simulated grazing slightly reduced survival to 61% but dramatically increased seed retention (75% versus 23% under untreated control), likely due to delayed growth and seed head development caused by mowing.

Button grass plants at the Pindar site were larger than the Wubin site due to higher rainfall during the weed establishment period. However, after establishment, the plants became moisture stressed due to the high temperatures and very limited rainfall at the time of herbicide application.

Due to their larger size, complete control was not achieved, even with double-knock herbicide programs. The glyphosate + 2,4-D amine followed by paraquat/amitrole treatment provided the highest suppression (84%). A single glyphosate application with adjuvants achieved moderate control, with 35% survival. Notably, simulated grazing increased survival to 57% compared to 44% in untreated controls, presumably due to the removal of vegetation and a reduction in water loss via transpiration. Seed production remained very low across all the treatments.

Conclusion

The trials show that small, highly stressed plants, such as those at the Wubin site, respond very effectively to a single application of glyphosate, achieving complete control. In contrast, larger plants, like those at Pindar, are far more tolerant. Even targeted double-knock programs using glyphosate plus 2,4-D followed by paraquat or amitrole were unable to achieve full control of these large, mature plants.

These results demonstrate that sequential treatments, such as glyphosate + 2,4-D followed by paraquat/amitrole, are most effective when plants are small or stressed. Therefore, for summer fallow systems, effective management of button grass depends on well-timed applications (both biologically and environmentally) during optimal growth windows. In challenging seasons, double-knock programs offer the best chance to suppress button grass populations. Grazing did not provide reliable control or reduction of seed set.

For more information refer to DPIRD media release Grains Research Update 2026 – WA research targets suppression of button grass weed.

This article will be updated with the GRDC Research Update paper when it is released.

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Meet Crop Protection team member - Janette Pratt

Janette Pratt is the author and editor of the Protecting WA Crops newsletter. She is a research scientist based at DPIRD's Moora office and has been with the department for 26 years. Janette began her career in 2000 as a technical officer in wheat breeding at the Wongan Hills Research Station, before relocating to Moora in 2004.

Originally from regional Western Australia, Janette grew up on a mixed farm and station north of Northampton on the Murchison River. She later moved to Perth to complete a Bachelor of Science at Murdoch University, before returning to the regions where she has always preferred to live and work.

In 2004, Janette took on the role of a farming systems development officer in Moora, focusing on grazing cereals and grazing management. Over the past 10 years, she has worked with DPIRD's Crop Protection team and the Disease Epidemiology and Management Tools project, combining her research experience with communication and extension work.

Outside of her role at DPIRD, Janette farms with her husband and his family in Miling while raising their two children. She also enjoys off-grid camping, playing netball and hockey, and volunteers as an ambulance officer.