Photo: Andrew Storrie, Agronomo Consulting

Barley grass
(Hordeum leporinum)

Key facts

- Barley grass is becoming increasingly difficult to manage in low-rainfall cropping regions because of its change in dormancy pattern, limited in-crop herbicide control options in cereals, and increasing herbicide resistance.
- Germination of barley grass after autumn rains can now vary between 0–80 per cent, resulting in a knockdown before sowing being far less effective than in the past
- Herbicide-resistant group A populations of barley grass are becoming more prevalent and resistance to groups B and L also have been recorded.
- If seed set is prevented, barley grass seed reserves can almost be exhausted in 2–3 years.

Barley grass* (Hordeum leporinum) *is an annual weed, which can occur in high densities in crops and pastures. Barley grass grows on most soil types, is palatable to stock and can provide a valuable source of early winter feed, but seeds can damage the skins, carcases and eyes of sheep impacting liveweight gains and wool and skin quality.

Barley grass is highly competitive and a major host of the cereal root disease take-all (*Gaeumannomyces graminis* var, *tritici*) — yield losses in wheat due to barley grass infestation can be as high 80 per cent.

Historically 80–90 per cent of barley grass germinated during March and April after autumn rains across southern Australia. However, this now varies between 0–80 per cent because many barley grass populations have evolved to be highly dormant. An increase in cropping frequency combined with earlier sowing practices is likely to have contributed to this shift in the population dynamics of barley grass.

Recent research has identified that highly dormant populations of barley grass require cold stratification ('chilling') to trigger seed germination. It was found that barley grass seeds may require 1–5 weeks of 3–4°C to break seed dormancy. This means highly dormant barley grass populations can avoid knockdown, pre-emergent, and early post-emergent herbicide applications.

Herbicide-resistant populations of barley grass are increasing across low-rainfall regions. Resistance to groups A, B and L has been identified. Group A resistance is the most rapidly increasing area of barley grass herbicide resistance.

Control options for barley grass

There is a range of control options for barley grass, both chemical and non-chemical (Table 8).

Historically, a combination of a knockdown (e.g. glyphosate) with a low-cost pre-emergent (e.g. trisulfuron, trifluralin) controlled barley grass when 80–90 per cent of the population germinated during March–April after autumn rains. Highly-dormant barley grass populations can now avoid knockdown, pre-emergent and even early post-emergent herbicide applications. A change in the control strategies for barley grass is required to respond to this shift in dormancy patterns.

PREVIOUS PAGE: Herbicide-resistant populations of barley grass are on the rise.

LEFT: Barley grass seeds can cause significant damage to livestock and impact on carcase, skin and wool quality.
Photos: Andrew Storrie, Agronomo Consulting.

ABOVE: Highly-dormant populations of barley grass require chilling to trigger seed germination.
Photo: Emma Leonard, AgriKnowHow

Group B-tolerant varieties of both wheat and barley provide a herbicide option to control barley grass from early crop stages (3–4 leaf stage) up until later crop stages (first node–flag leaf emergence). Growing these varieties allows the application of imidazolinone (group B) herbicides in-crop, which can provide excellent control (up to 95 per cent). However, this technology does have some downsides. These herbicides are highly residual and can severely limit crop and pasture options in the following year, especially during low-rainfall seasons. In addition to this, Group B-tolerant cereal varieties often incur a 5–10 per cent yield penalty compared with the highest-yielding conventional cereal varieties.

Table 8. Expected results of various barley grass control strategies

Control strategy	Control of barley grass weed seeds or plants (%)	
	Most likely	Range
Non-chemical		
Stubble burning (>4t/ha stubble load)	50	0–75
Early hay production	50	30–80
Grazing	30	0–50
Seed collection at harvest	60	20–80
Chemical		
Knockdown before sowing	80	40–90
Double-knock before sowing	80	60–95
Pre-emergent herbicides	70	50–90
Selective post-emergent herbicides	90	60–95
Herbicide-tolerant crops — group B	85	70–95
Pasture spray-topping	60	50–90
Chemical fallow	85	75–95

Source: IWM Hub GRDC, expert opinion and grower experience

Non-chemical control options

Non-chemical control

Stubble burning

Burning stubble following harvest can reduce the overall weed seed burden in a paddock if the stubble load is >4t/ha. If the stubble load is <4t/ha, then narrow windrow burning is potentially a better option if enough seed can be captured at harvest.

Early hay production

Early hay cutting will prevent barley grass seed from setting seed and work towards depleting the seedbank.

Harvest weed seed management

Similar to brome grass, weed seed collection at harvest varies in its rate of success due to ability of barley grass to shed a portion of its seed early. However, recent on-farm monitoring has shown that collecting barley grass seed is worthwhile if crops are harvested early. Most captured seed can be destroyed by burning (narrow windrow, chaff pile) or a seed destruction device (e.g. Harrington Seed Destructor).

Resistance levels to post-emergent group A herbicides is increasing in barley grass. Therefore, break crops and legume pastures will become less effective in reducing barley grass populations over time. As well as group A herbicide resistance, populations resistant to groups B and L also have been recorded. Alternative chemistry is available for barley grass control (pyroxasulfone, prosulfocarb+S-metolachlor, propyzamide), but these products are more expensive and their effective life will be short-lived if growers rely on them as the sole control strategy.

Employing a combination of chemical and non-chemical methods can be a successful way to control barley grass and delay herbicide resistance. For example, grazing alone will not control barley grass, but it is an excellent tool for delaying the development and maturity of barley grass plants, which increases the effectiveness of pasture spray-topping.

Further information

- **Integrated Weed Management Hub barley grass profile:** http://www.grdc.com.au/Resources/IWMhub/Section-8-Profiles-of-common-weeds-of-cropping/Barley-grass