



# Farmnote

## Barley grass – a weed of pasture and cropping systems

Sally Peltzer, Senior Research Officer; Catherine Borger, Research Officer; Abul Hashem, Principal Research Officer

### Distribution and distinguishing features

There are two major species of barley grass across the winter rainfall areas of the Western Australian wheatbelt, barley grass (*Hordeum leporinum*) and northern barley grass (*H. glaucum*), which tends to be more prevalent in the drier areas. They are both annual grasses to 50 cm that germinate after the opening rains in autumn.

Both barley grass species are tufted annual grasses to 50 cm tall with erect or spreading stems covered with loose hairs (0.5-1 mm long) in the lower parts. The leaf blade is more than 2 mm wide and emerges rolled and overlapping at the base. The leaf and sheath are hairy. Both have large prominent auricles (ear-like outgrowths at the junction of the sheath and the blade) and a membranous ligule (the outgrowth on the inside of the leaf, at the junction of the sheath and the blade).

The inflorescence (seed head) of both species is a compact, much bristled, semi-flattened spike, 1.5-5 cm long, containing spikelets in groups of three. Each spikelet is composed of a single, central and awned floret and two bristles.

The two barley grass species are very difficult to differentiate. For assistance with correctly identifying weeds, see below in the 'Further information' section.

The two barley grasses can also be confused with other grasses such as brome grass and wild oats before flowering. Some features to distinguish barley grass from other grass weeds include:

- Barley grass seeds germinate rapidly after the autumn break.
- Seed remnants are often still attached to the roots after germination, frequently with the characteristic multiple awns clearly visible.

- Leaf colour tends to be a lighter green than other species such as great brome (*Bromus diandrus*), which tends to be a darker green with a dull purplish tinge.



Figure 1 Barley grass head (left) (photo: Andrew Storrie) and mature barley grass plant (right). Photo: John Moore

### A weed of pasture and cropping

Barley grass is a colonizer of disturbed low-lying situations and can be a problematic weed in pastures, especially when the pasture phase is more than 3 years. It is often associated with increasing soil fertility and can be seen in animal camp areas. Although useful as an early feed source in autumn, stock tend to avoid it once it flowers. The seeds may cause injury to stock and contaminate wool. Under good spring conditions barley grass can produce large amounts of seed. It is also a weed of cropping where cereal crops are sown dry without an effective knockdown. However, some growers are now finding barley grass in their crops as an increasing problem. This was supported by recent grower surveys where growers ranked their most problematic weeds currently, compared with 10

### Important disclaimer

The Chief Executive Officer of the Department of Agriculture and Food and the State of Western Australia accept no liability whatsoever by reason of negligence or otherwise arising from the use or release of this information or any part of it.

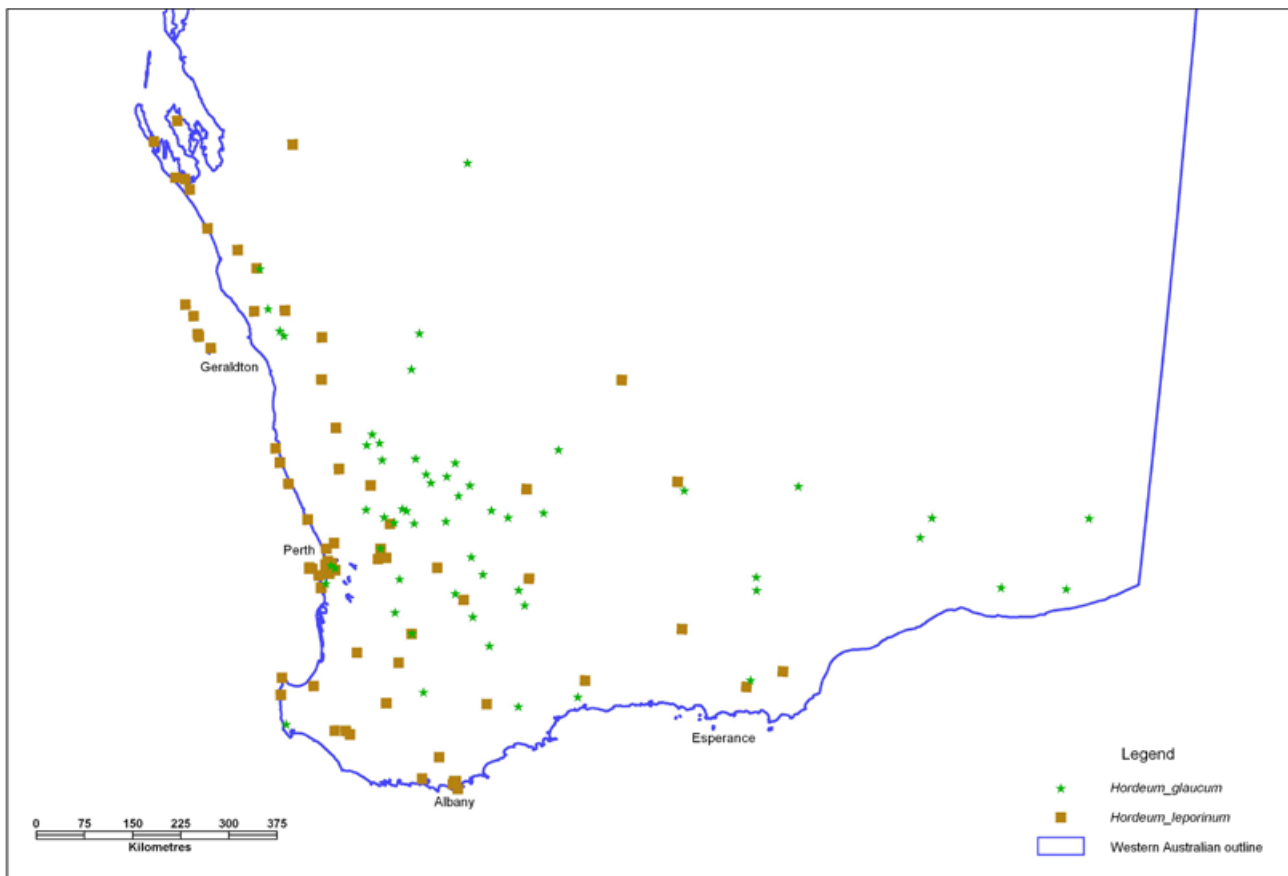


Figure 2 The distribution of *Hordeum leporinum* (squares) and *Hordeum glaucum* (stars). Source: Western Australian Herbarium (1998–), FloraBase—the Western Australian Flora. Department of Environment and Conservation. <http://florabase.dec.wa.gov.au>

years ago. The growers ranked barley grass as the fourth most important weed within WA wheat belt. It is not well understood as to why barley grass is increasing in the cropping areas in WA wheat belt, but this species is favoured by the minimum tillage system.

The seeds of both species of barley grass germinate rapidly on bare ground in response to autumn rain and can establish before the soil surface dries out. Both species prefer to germinate undisturbed on the soil surface which is why they become weeds of minimum tillage systems and/or long pasture phases.

The two species seem to differ in their seed dormancy. The common barley grass of the higher rainfall areas (*H. leporinum*) has low levels of hard seed and over 99% of seeds germinate in the first few weeks of the first year after seed-set (very little long-term dormancy). A very high proportion of barley grass will germinate on the autumn break.

However, recent research in South Australia showed that some barley grass populations had high levels of seed dormancy at maturity and the dormancy persisted for many months. All of these populations were northern barley grass (*H. glaucum*). These populations can avoid knockdown herbicides with their prolonged dormancy and then germinate in crop where

control options are far more limited. It is increasingly likely that the same thing is happening in WA and this species is becoming more widespread.

Barley grass is a major weed because the seed is readily dispersed and post-emergent herbicide control in crop is limited. It can also act as an alternate host for a number of cereal diseases and can develop resistance to herbicides. There have been reports of barley grass being resistant to paraquat and diquat and to several Group A ‘fop’ herbicides. Some populations have cross resistance to the Group A ‘dim’ herbicides. Slightly saline conditions favour its establishment mainly because barley grass has a greater tolerance to higher osmotic potentials at germination than most other pasture species.

### Controlling barley grass

An integrated approach to control is pertinent to both species of barley grass and should not rely entirely on post-emergent herbicides.

- A dry start to the season plus non-wetting soil can reduce the efficacy of herbicides. For example, the application of pre-emergent herbicides (metribuzin, trifluralin and Boxer Gold®) in a trial at Katanning in 2009 resulted in only 50-70 percent control of barley grass in

Eagle Rock® wheat. An additional post-emergent application of Monza® improved the barley grass control to 80 percent. Used alone, Monza® reduced the number of barley heads but only marginally improved the wheat yield compared to the herbicide free control plots.

- Break crops (e.g. lupins) in a rotation provide different herbicide options such as simazine and clethodim.
- In an ideal season break, many barley grass plants will emerge before sowing and can be controlled by knockdowns. If the barley grass population has a high level of seed dormancy at maturity and dormancy persists into the growing season, this population can avoid knockdown herbicides. Delaying the sowing of crops can reduce the proportion of dormant barley grass seeds, allowing a greater proportion of the seed bank to germinate and be controlled by knockdowns.
- Burning residues may result in 50% (0-75%) control of barley grass.
- Barley grass can be strategically managed in pasture phase prior to sowing cereals. If timed correctly, pasture spray-topping can control 60% (50-90%) of barley grass. Stock grazing can also reduce barley grass by 30% (0-50%).

#### Herbicide control options in cereals

- Metribuzin alone or metribuzin + trifluralin (tank-mix) in barley and metribuzin-tolerant wheat varieties such as Eagle Rock, IBS (incorporated by sowing).
- Diuron in barley, oats, triticale and wheat, pre-sowing or PSPE (post-sowing pre-emergent).
- Sulfosulfuron in wheat and triticale, PS (pre-sowing) or PO (post-emergence).
- Trifluralin and triallate in wheat, barley and triticale, IBS.
- Metolachlor in barley, oats, triticale and wheat, IPP (immediately after planting).
- Sulfosulfuron, imazapic + imazapyr + MCPA, imazapic + imazapyr or imazapic + imazamox in IT (imidazolinone tolerant) wheat, PO.

#### Herbicide options in canola

- Imazapic + imazapyr in IT canola, PO.
- Butroxydim, clethodim, fluazifop-p, haloxyfop, propaquizafop, quizalofop-p-methyl, sethoxydim, and tetraloxydim in conventional, TT (triazine tolerant) and IT canola, PO.

#### Herbicide options in pulses

- Simazine, atrazine, diuron, metribuzin, trifluralin, and pendimethalin in narrow leaf lupin, PS or PSPE.
- Cyanazine, metribuzin and simazine in chickpea, PS.

- Imazethapyr PSPE and imazamox PO in field peas and faba beans.
- Butroxydim, clethodim, fluazifop-p, haloxyfop, propaquizafop, quizalofop-p-methyl, sethoxydim, and tetraloxydim in narrow leaf lupin, chickpea, field peas and faba beans, PO.
- Recent research has shown that simazine followed by clethodim in lupins gave approximately 90% suppression of barley grass at Beverley (Figure 3). In contrast, trifluralin followed by sulfosulfuron or metribuzin followed by sulfosulfuron gave 40-50% suppression of barley grass in an Eagle Rock wheat crop (Figure 3).



Figure 3 At Beverley, simazine followed by clethodim in lupins gave approximately 90% suppression of barley grass in lupin (left) while metribuzin followed by sulfosulfuron gave approximately 50% suppression of barley grass in Eagle Rock wheat (right). Photo: Abul Hashem

#### Control in pasture

As the majority of barley grass seeds germinate in the first year after seed set, any activity to stop seed set will provide good control of this weed.

- Imazethapyr in lucerne and serredella PO.
- Imazamox in lucerne, medic, sub-cover and serradella PO.
- Fluazifop-p-butyl, haloxyfop, propaquizafop, quizalofop-p-methyl, and sethoxydim in lucerne, medic and sub-clover. Propaquizafop can also be applied in serradella, PO.
- Propyzamide in lucerne, medic and sub-clover, PO.
- Pasture spray-topping can control 60% (50-90%) of this weed.
- Grazing by stock can reduce barley grass by 30% (0-50%).



Figure 4 Barley grass in pasture at Katanning in spring.  
Photo: Alex Douglas



Figure 5 A strip of pasture (right) that has been spray-topped in spring. Photo: Alex Douglas

## Further information

- For accurate weed identification, samples can be forwarded to the Western Australian Herbarium (<http://www.dec.wa.gov.au/content/category/41/831/1821/>) or AGWEST Plant Laboratories ([http://www.agric.wa.gov.au/PC\\_90020.html](http://www.agric.wa.gov.au/PC_90020.html)).
- John Moore, Steve Sutherland and Birgitte Verbeek. Weed 2. Barley grass (*Hordeum* spp). In 'Integrated weed management in Australian cropping systems - a training resource for farm advisors.' (Eds T McGillion, A Storrie). (CRC for Australian Weed Management: Adelaide, South Australia, [http://www.agric.wa.gov.au/objtwr/imported\\_assets/content/pw/weed/major/silver%20grass.pdf](http://www.agric.wa.gov.au/objtwr/imported_assets/content/pw/weed/major/silver%20grass.pdf))
- B.M.J. Hussey, G.J. Keighery, R.D. Cousens, J. Dodd and S.G. Lloyd. 2007. Western weeds: a guide to the weeds of Western Australia - 2nd edition. Weed society of Western Australia.
- Ben Fleet & Gurjeet Gill. 2011. Emerging Weeds in a Changing Farming System: Barley. University Adelaide.