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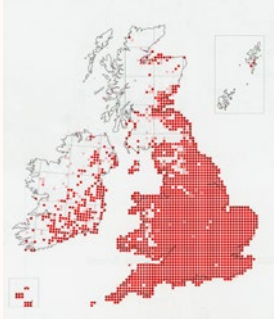
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Identification of Brome grasses

Dr Stephen Moss

In the UK, there are five main species which frequently occur as weeds of arable crops. Their relative frequencies, as reported in the Atlas of the British Flora (2002), are given as the (%) of the 2852 10 x 10 km grid squares surveyed in which the species was detected. See maps. Blue = Native species; Red = Introduced species.



***Bromus sterilis* – sterile or barren brome**

Very common throughout England and Wales, more scattered in Scotland. (65%). Very common in field margins and hedgerows as well as within arable fields.



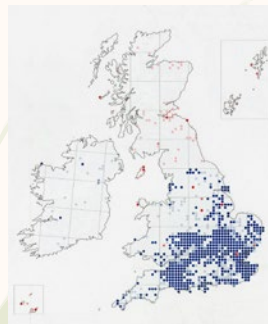
***Bromus hordeaceus* – soft brome**

Very common throughout the UK. (85%). Most commonly found in grassland, field margins, waste ground and roadside verges, but does occur in arable fields too.



***Bromus diandrus* – great brome**

Mainly recorded in East Anglia but scattered throughout the rest of England. (11%). Probably under-recorded due to confusion with *B. sterilis*.



***Bromus commutatus* – meadow brome**

Mainly recorded in the southern half of England. (27%). More commonly found in grassland situations, especially old pastures, but also occurs in arable fields.



***Bromus secalinus* – rye brome**

Mainly recorded at scattered locations in the southern half of England. (14%). Largely confined to arable fields, field margins and waste ground. Probably under-recorded due to confusion with *B. commutatus*.

Why does identification of species matter?

Different post-harvest control measures apply to *Bromus sterilis* & *B. diandrus* compared with *Bromus hordeaceus*, *B. commutatus* & *B. secalinus*. Early post-harvest cultivations are advisable for the first two species but not for the other three species.

Brome species differ in their sensitivity to herbicides and label claims for control vary. Knowing which species is present can help in herbicide decision-making.

Bromus diandrus and *Bromus secalinus* are generally considered more challenging species to control than the other brome species, requiring more robust strategies.

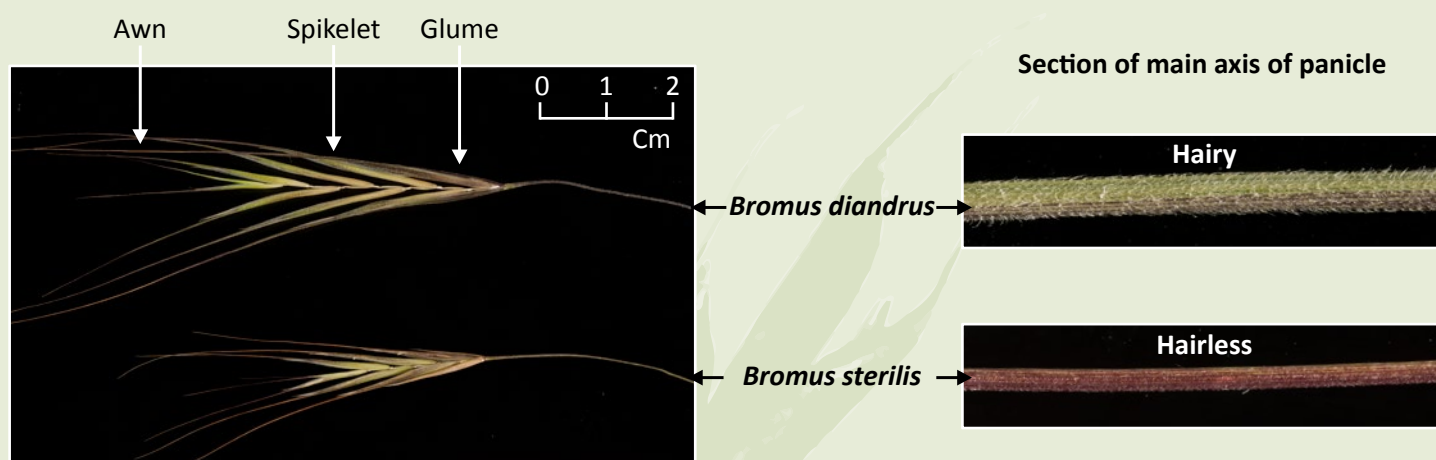


***Bromus sterilis* (sterile or barren brome) & *Bromus diandrus* (great brome)**
(sometimes referred to as 'Anisantha' species).



Both have wedge shaped spikelets with long, spreading awns, so are broader at the tips.
Flowering plants can be distinguished by the following characteristics:

	<i>Bromus sterilis</i> Sterile brome	<i>Bromus diandrus</i> Great brome
Length of spikelets, including the awns	40 – 60 mm	70 – 90 mm
Length of awns	15 – 35 mm	30 – 60 mm
Length of upper glume (longer of the two bracts at base of spikelet)	10 – 21 mm	20 – 32 mm
Main axis ('stem') of panicles (this characteristic is useful, but not wholly reliable)	Hairless or only minutely hairy	Distinctly hairy (visible with naked eye)



***Bromus hordeaceus* (soft brome), *B. commutatus* (meadow brome) & *B. secalinus* (rye brome)**
(sometimes referred to as 'Serrafalcus' species).



These have more oval shaped spikelets with shorter awns and are narrower at the tips.
Flowering plants can be distinguished by the following characteristics:

	<i>Bromus hordeaceus</i> Soft brome	<i>Bromus commutatus</i> Meadow brome	<i>Bromus secalinus</i> Rye brome
Lower leaf sheaths (see photos opposite)	Hairy	Hairy*	Hairless or hairy*
Panicles	Usually compact	Loose	Loose
Length of panicle branches (pedicels) relative to length of spikelets	Mainly shorter	Mainly longer	At least some longer
Spikelets (see photos opposite)	Softly hairy usually	Hairless usually	Hairless or hairy
Length of spikelets, including the awns	12 – 25 mm long	18 – 30 mm long	12 – 24 mm long
Mature spikelets viewed from side (see photos opposite)	No gaps	No, or small, gaps	Gaps visible
Cross section of mature seeds (see photos opposite)	Saucer shaped	Saucer shaped	Deep V or U shaped

* When assessed after panicle emergence, all 28 populations of *B. commutatus*, collected by ADAS Boxworth throughout England, had distinctly hairy lower leaf sheaths. In contrast, 16 out of 30 samples (53%) of *B. secalinus* had hairless lower leaf sheaths. Thus, hairless lower leaf sheaths is a useful, but not reliable, characteristic for identifying *B. secalinus*.

Bromus commutatus* & *Bromus hordeaceus

Hairy lower leaf sheaths



Bromus secalinus

Hairless lower leaf sheaths
(a useful indicator BUT about 50% of populations have hairy lower leaf sheaths)



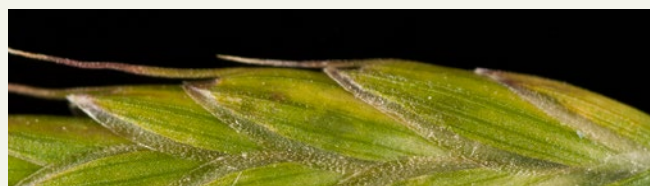
Bromus hordeaceus

Hairy spikelets



Bromus commutatus

Hairless spikelets



Spikelets viewed from the side, when seeds are fully mature and about to shed

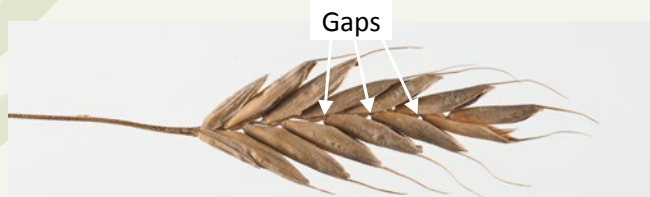
Bromus hordeaceus* & *Bromus commutatus

The seeds don't tend to become tightly in-rolled, so there are no, or only small, gaps between them.



Bromus secalinus

The seeds tend to become tightly in-rolled, leaving obvious gaps between them.



Cross section of mature seed

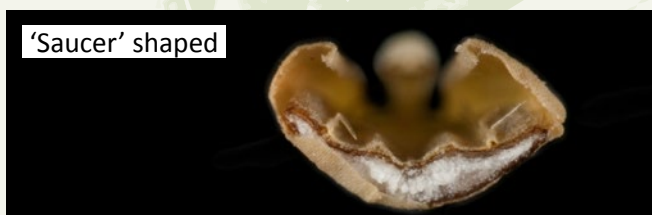
Best done by cutting dried, fully mature (at point of shedding), brown seeds in half crosswise with a sharp blade.

Seeds best collected by gently shaking panicles into a bag so that only fully mature seeds are collected.

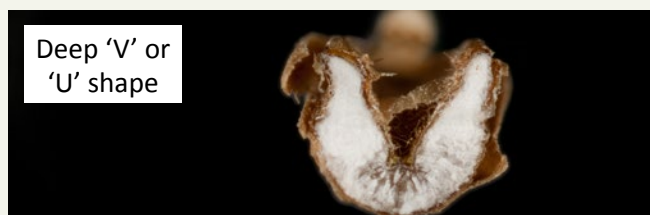
If necessary, let seeds air dry for a few days before assessing - this can improve the reliability of this assessment.

This diagnostic will not work reliably on green seeds, or on brown, maturing seeds which have not fully dried out.

Bromus hordeaceus* & *Bromus commutatus



Bromus secalinus



This is by far the most reliable test for identifying *Bromus secalinus*.

Note that this feature is not particularly obvious in intact seeds - cutting the seeds definitely helps.

Note that brome species are very variable and definitive identification will not always be possible. Also be aware that other brome species exist in the UK, although these are not commonly encountered in arable fields.

Information sources

New Atlas of the British and Irish Flora. (2002). By C D Preston, D A Pearman & T D Dines. Oxford University Press, Oxford, UK. 910 pp. (Online version: <https://www.brc.ac.uk/plantatlas/>)

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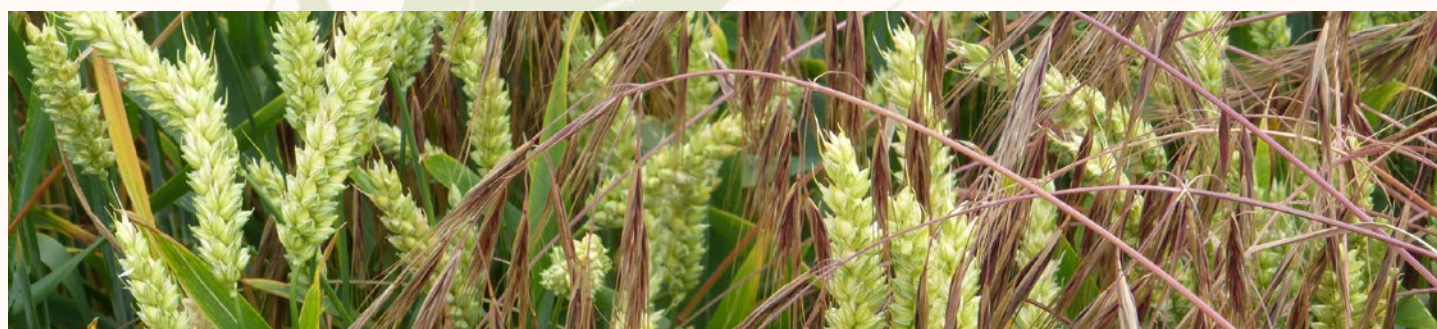
Bromes are some of the most competitive grass-weed species with similar competitive abilities to wild-oats and Italian rye-grass and more competitive than black-grass.

Acknowledgements

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A population of five *Bromus sterilis* plants/m² typically causes a yield loss of 5% in cereals - but much higher crop losses can occur in severe infestations.



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