Brome control in winter cereals

Topic Sheet No. 17
Autumn 1998

The Home-Grown Cereals Authority (HGCA) has provided funding for this project but has not conducted the research or written this report. While the authors have worked on the best information available to them, neither the HGCA nor the authors shall in any event be liable for any loss, damage or injury howsoever suffered directly or indirectly in relation to the report or the research on which it is based.

Reference herein to trade names and proprietary products without stating that they are protected does not imply they may be regarded as unprotected and thus free for general use. No endorsement of named products is intended, nor is any criticism implied of other alternative, but unnamed products.

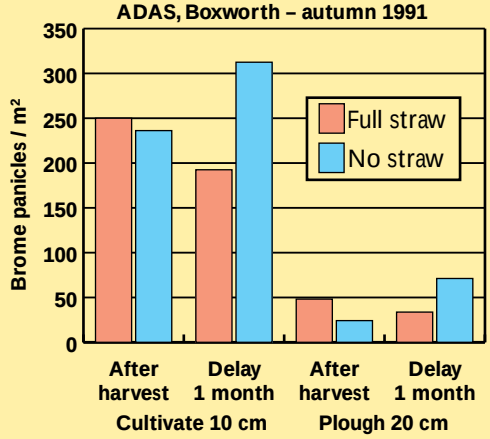
Background

Several brome grass species are weeds of intensive rotations of autumn-sown crops, particularly where non-plough tillage and early drilling are practised. Control with selective herbicides in cereals is often poor. Jim Orson of ADAS, now Director of Morley Research Centre, has led HGCA-funded projects on their biology and chemical control.

The brome species in cereals

Barren brome (*Bromus sterilis*), the most common species, often infests cropped headlands. Incidence varies considerably between years according to autumn soil moisture conditions. Meadow brome (*B. commutatus*) and soft brome (*B. hordeaceus* spp. *hordeaceus*) frequently infest continuous winter wheat crops.

Figure 1
Effect of cultivations and straw cover on barren brome poulations in the following winter cereal crop
ADAS, Boxworth – autumn 1991



Cultural control

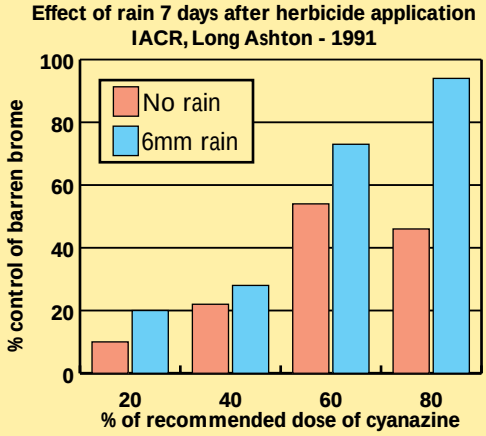
The vast majority of seeds of barren, meadow and soft brome, when buried in the autumn, will have died or emerged by the spring. Hence, growing spring crops can help to control them.

Very few seeds of all three species survive more than a year in the soil. But seed must be effectively buried to 15 cm or more by ploughing and the soil must be consolidated to prevent them emerging. Timing of ploughing does not affect the control of barren brome (Figure 1).

However, it is best to leave soft and meadow brome seed on the soil surface for a month after harvest, before ploughing. Some seed loses its dormancy and survival in soil is reduced. Because of this, and because control of these bromes with herbicides is relatively poor, ploughing is recommended to control soft and meadow brome prior to drilling winter cereals.

Barren brome seeds germinate more rapidly in the dark than in the light. In the absence of complete straw cover, shallow cultivation immediately after harvest stimulates barren brome seed to germinate (Figure 1).

Figure 2



However, the stale seedbed technique only significantly helps to reduce barren brome populations in a succeeding autumn-sown crop if the soil is sufficiently moist both after harvest and subsequent shallow cultivations.

Some barren brome populations may have dormant seeds which fail to germinate rapidly, despite being in moist and dark conditions. Contrary to the general recommendation, these seeds should be left on the soil surface for as long as practical before ploughing to help reduce seed dormancy.

Early autumn drilling increases the chance that all brome species may germinate with or after the crop, particularly following non-plough tillage.

Chemical control

Selective herbicides in cereals may control barren brome well, but give very poor control of meadow and soft brome.

Tri-allate, usually applied as granules, enters the plant as a gas, so soil moisture is not particularly important.

Isoproturon and cyanazine are taken up by weeds in solution, so the soil should be moist at the time of application. Thereafter, sufficient rain is needed to move these herbicides into the root zone before they degrade and lose efficacy (Figure 2). Less rain is required in a well consolidated seedbed where the roots are closer to the soil surface. Application conditions must be optimal with all three weeds.

Further herbicide applications may be needed if recovery growth occurs, especially if initial populations of barren brome are high.

Future issues

Possible restrictions on the use of isoproturon are a cause for concern. Follow the guidelines for usage produced by the isoproturon stewardship programme. However, some new selective herbicides are currently being tested which control all brome species in wheat. Their use may reduce the need for ploughing.

HGCA

Brome control in winter cereals

Topic Sheet No. 17
Autumn 1998

Action:

All brome species

- **Plough to bury seeds more than 15 cm deep in consolidated soil; grow spring crops; delay drilling.**

Barren brome

- **In the absence of complete straw cover, shallow cultivate stubble immediately after harvest to encourage seeds to germinate, particularly when the soil is moist.**

- **Apply herbicides or sequences of them to control high populations.**

1. **Apply tri-allate before weed emergence to a wet or dry soil surface.**

2. **Apply isoproturon with or without cyanazine to seedlings at the 1-3 leaf stage when the soil surface is moist. Hope for some rain to move these herbicides into the root zone!**

Meadow and soft brome

- **Delay ploughing or stubble cultivation until one month after harvest to reduce seed dormancy. Do not place too much reliance on selective herbicides.**

Further information:

Project Reports: 146, 172

Contact: Jim Orson, Morley Research Centre
Tel: 01953 605511

Home-Grown Cereals Authority
Research & Development
Caledonia House
223 Pentonville Road
London N1 9NG
Tel: 0171 520 3945
Fax: 0171 520 3992