**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.

**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).
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.

**Figure 2**

Effect of rain 7 days after herbicide application
IACR, Long Ashton - 1991

<table>
<thead>
<tr>
<th>% control of barren brome</th>
<th>% of recommended dose of cyanazine</th>
</tr>
</thead>
<tbody>
<tr>
<td>No rain</td>
<td>0%</td>
</tr>
<tr>
<td>6mm rain</td>
<td>100%</td>
</tr>
</tbody>
</table>

**Further information:**

Project Reports: 146, 172

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