

## Annual Project Report March 2017 to February 2018

<b>Project title</b>	Investigating the distribution and presence, and potential for herbicide resistance of UK brome species in arable farming		
<b>Project number</b>	211200059		
<b>Start date</b>	01/03/17	<b>End date</b>	28/02/21

### Project aim and objectives

**Objective 1.** Assess the increasing presence of problematic brome populations in UK arable farming and how control for black-grass may have influenced brome control and resistance evolution

**Objective 2.** Build on existing knowledge of mechanisms that lead to herbicide resistance evolution in grass weeds to assess possible herbicide resistant populations and investigate the processes that may lead to herbicide resistance in bromes

**Objective 3.** Determine the best herbicide application timing for brome to maintain and improve herbicide control and help prevent resistance evolution

**Objective 4.** To agree and communicate an integrated weed management system for bromes across the industry to help prevent the evolution of herbicide resistance in brome species

### Key messages emerging from the project

- Sterile brome is the most common species in the UK
- Other species are more prevalent than thought - correct brome identification is very poor;
- Brome control problems appear to be increasing
- Worst affected areas: North, South East, West Midlands, South West - most cereal growing areas
- Perceived problems with ALS-inhibitor herbicide control

### Summary of results from the reporting year

**Online questionnaire:** Over 200 farmers and agronomists responded to the survey. Bromes are more wide-spread than previously thought, present across all cereal growing areas. Correct brome ID was low, with 38% of the 58 samples sent misidentified, however there was no confusion between *Anisantha* and *Bromus*. 59% of respondents thought that brome had increase in the last 10 years.

**Herbicide screening:** 70 populations were tested (51 from the survey, 8 BGRI samples, and 9 populations that were either standards or previously received). Meadow, rye, great, and sterile bromes were tested against two ALS-inhibitor herbicides – Broadway star and Pacifica Plus – at half and full recommended field rate. Survival and fresh weight varied significantly between brome populations. Some populations showed poor control and will be further investigated in year 2. The same 70 populations are currently being tested for sensitivity to ACCase and glyphosate herbicides.

The results described in this summary report are interim and relate to one year. In all cases, the reports refer to projects that extend over a number of years.

While the Agriculture and Horticulture Development Board seeks to ensure that the information contained within this document is accurate at the time of printing, no warranty is given in respect thereof and, to the maximum extent permitted by law, the Agriculture and Horticulture Development Board accepts no liability for loss, damage or injury howsoever caused (including that caused by negligence) or suffered directly or indirectly in relation to information and opinions contained in or omitted from this document. Reference herein to trade names and proprietary products without stating that they are protected does not imply that 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.

AHDB Cereals & Oilseeds is a part of the Agriculture and Horticulture Development Board (AHDB).

## Annual Project Report March 2017 to February 2018

**Low dose herbicide selection:** 3 rye and 3 sterile brome populations have undergone selection with: no herbicide, glyphosate, and ALS-inhibitors. ACCase selection was not successful with too high survival after 2 treatments – this will be repeated in year 2. Plants will be grown on to produce seed.

**BGRI field surveys:** 83 BGRI fields were surveyed for the presence of bromes. 29% of fields had no brome, 8% had *Anisantha* species, 35% had *Bromus* species, and 28% had both. However, brome levels were extremely low. This is a good contrast to the online survey, and provides data on fields where bromes are not present, giving a more balanced picture of brome presence on UK farms.

### Key issues to be addressed in the next year

Detailed dose-response experiments will be conducted on brome populations that responded poorly to herbicide control in year 1 screening. Further selection will be completed using ALS-inhibitors, glyphosate, and ACCase herbicides. Additional BGRI fields will be monitored for the presence of brome in the headlands and field centre. Outdoor container trials will investigate the influence on resistance evolution of growth stage at herbicide application. Brome workshops will begin and an Innovative Farmer's network will be set up. KT will be ongoing.

<b>Lead partner</b>	ADAS
<b>Scientific partners</b>	Rothamsted research
<b>Industry partners</b>	BASF, Bayer, Dow-DuPont, Monsanto, UPL
<b>Government sponsor</b>	n/a

### Has your project featured in any of the following in the last year?

<b>Events</b>	<b>Press articles</b>
ADAS Rosemaund open day 2017: poster Cereals 2017: promotion of survey	31/05/17 Farmers weekly; 12/06/17 AHDB web article; 12/06/17 Farmers guardian; 13/06/17 Agronomist and arable farmer; 20/07/17 CPM; 01/02/18 Farmer's guide
<b>Conference presentations, papers or posters</b>	<b>Scientific papers</b>
AHDB agronomists conference 2017: Presentation AICC conference 2018: Presentation AHDB North agronomy meeting 2018: Presentation Further presentations x6	
<b>Other</b>	
ADAS technical publications x3	

The results described in this summary report are interim and relate to one year. In all cases, the reports refer to projects that extend over a number of years.

While the Agriculture and Horticulture Development Board seeks to ensure that the information contained within this document is accurate at the time of printing, no warranty is given in respect thereof and, to the maximum extent permitted by law, the Agriculture and Horticulture Development Board accepts no liability for loss, damage or injury howsoever caused (including that caused by negligence) or suffered directly or indirectly in relation to information and opinions contained in or omitted from this document. Reference herein to trade names and proprietary products without stating that they are protected does not imply that 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.

AHDB Cereals & Oilseeds is a part of the Agriculture and Horticulture Development Board (AHDB).