Integrated control of wheat blossom midge - LK0924

Sponsor: **DEFRA**

Partners: **ADAS; IACR Rothamsted; John Innes Centre; Morley Research Centre;Home-Grown Cereals Authority; Nickersons UK Ltd; Agrisense-BCS Ltd; Advanta UK Ltd; Elsoms Seeds Ltd; Dow AgroScience Ltd**

Total project cost: **£415k**

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Abstract

The orange wheat blossom midge is a common part of wheat which caused extensive damage to crops in 1993. Since then severe attacks have occurred in some parts of the country each year. As well as affecting the yield, damage by midge larvae reduces quality, particularly Hagberg falling number and introduces disease. Fear of midge damage has been the main driver for maintaining the prophylactic use of summer insecticide on wheat at around 250,000 ha per annum, even in years of very low aphid incidence.

Some varieties of wheat proved to be more vulnerable to attack than others, with some showing a form of antibiotic resistance. The variety Rialto proved to be very susceptible and wheat blossom midge induced problems with Hagberg falling number had a serious impact on its potential as a high yielding bread wheat for UK farmers. Several recent introductions are as or more susceptible to damage than Rialto, as sensitivity to the pest has not been taken into account during the selection process. Recent work in Canada has demonstrated that the levels of two phenolic acids affect susceptibility and that this resistance can be built into breeding programmes.

This project brings together the World leading expertise on the wheat genome at the John Innes Centre and of the chemical basis of insect attraction of IACR Rothamsted to tackle this problem. Working in combination with ADAS, the Morley Research Centre, the plant breeders Nickersons, Advanta and Elsoms, the pheromone trap specialist Agrisense and agrochemical manufacturer Dow, and with support from the HGCA, the consortium will

Identify chromosomes within the UK wheat breeding programme delivering resistance to wheat blossom midge and measure the relative susceptibility of current varieties.

Develop a dual trapping system using the recently described sex pheromone to bait traps to provide a warning system of midge activity on a farm, and a crop volatile system to bait traps to assess the level of egg laying in crops at the vulnerable growth stage at that time.

Develop an integrated control system using a variable threshold for trap catches according to the susceptibility of the variety grown to minimise the need for insecticide application.

Reduced insecticide application should allow the wheat blossom midge's parasitoids to increase in number and make a greater contribution to control, further reducing the need for insecticides.