

Improving crop profitability by using minimum cultivation and exploiting grass weed ecology - LK0923

Sponsor: DEFRA

Partners: Velcourt., ADAS, HGCA, IACR-Rothamsted, J C Mann Trust, Morley Research Centre, Monsanto, Simba, Syngenta.

Total project cost: £961k

Contact: James Clarke, ADAS Boxworth, Boxworth, Cambridge, CB3 8NN
Tel: 01954 268219; Fax: 01902 748910; Emailjames.clarke@adas.co.uk

Background

Using Minimum tillage techniques (shallow non-inversion cultivation to a maximum of 5-10 cm), can help reduce cultivation costs but may lead to increasing grass weed (including black-grass) infestations and herbicide resistance. This project aims to improve knowledge on the ecology of black-grass so that it can be exploited to enable infestations to be managed and controlled under a minimum cultivation regime.

Objective

To generate and exploit information on black-grass ecology to reduce production costs of combinable crops by optimising the cultivation strategy.

Benefits

This project will provide cultivation management guidance by understanding the impacts of seed dormancy, currently only available from 'gut feel'. This will allow cultivation and drilling strategy to be optimised within a season and reduce the risks from grass weeds and minimise costs. The project will develop an indicative test for black-grass seed dormancy which can be used to aid this decision making.

Workplan

Developing a Petri-dish test of seed viability and dormancy. Germination of seed collected from experimental sites prior to harvest will be studied under ideal conditions in the laboratory and compared to seed germination in the field.

Timing: Autumn 2001 – Spring 2004

Field based but controlled environment studies will provide information on the following effects: soil moisture levels during seed maturation on dormancy, temperature during seed maturation; shallow seed burial on seed dormancy; disturbance of dormant seeds; impact of the presence of straw on seed behaviour; and the influence of soil moisture on seed germination.

Timing: Autumn 2001 – Autumn 2004

Post-harvest or pre-drilling cultivations with or without straw incorporation at widely geographically spaced long term sites will be used to quantify the relative importance of management and natural factors on black-grass populations.

Timing: Autumn 2001 – Spring 2005

The results obtained throughout the project will be used to update the life cycle model for black-grass, and modify management decision and advice. Experimental sites will be used for demonstration and results made available through the farming press. The revised models will also be used to update existing projects such as WMSS.

Timing: Throughout project, but especially from Autumn 2003 – Spring 2005