

Sustainable Arable Farming For an Improved Environment (SAFFIE)



Dr Jeremy
Wiltshire

The Department for Environment, Food and Rural Affairs (Defra) has a Public Service Agreement to reverse the decline in a suite of farmland bird species by 2020, and a BAP target to increase the area of cereal field margin under conservation management. Alongside this, farmers are under economic pressure to improve the efficiency of their farming practices.

The SAFFIE project aims to show how these competing pressures may be balanced. ADAS has a major role in managing and co-ordinating this five-year project, which began in autumn 2001. The main objective is to enhance farmland biodiversity by novel habitat management in wheat crops and non-cropped margins, without compromising profitability.

Changes in margin can benefit the abundance and diversity of plant and invertebrate species, above standard practices (Table 1).

Table 1. Biodiversity scores (1-3, 3 = greatest benefit or response) for two margin seed mixes and three management techniques (Gramin = low rate of a graminicide).

Biodiversity categories	Biodiversity scores (1-3) for combinations of seed mix and management technique					
	Tussock grass mix			Fine grass mix		
	Cut	Scarify	Gramin	Cut	Scarify	Gramin
Invertebrate abundance	3.0	1.0	2.0	2.0	2.0	2.0
Invertebrate diversity	1.5	3.0	1.5	2.0	3.0	1.0
Pollinators	1.5	1.5	3.0	2.0	2.0	2.0
Unsown plant diversity	1.5	3.0	1.5	1.5	3.0	1.5
Sown plant diversity	3.0	1.5	1.5	2.5	2.5	1.0
Access for birds	1.0	3.0	2.0	1.5	3.0	1.5
Total (biodiversity value)	11.5	13.0	11.5	11.5	15.5	9.0

Changes in wheat crop management have also shown benefits for biodiversity. For example, for two years on 10 sites, conventionally-sown winter wheat was compared with wheat crops containing undrilled patches (two 16 m² patches per hectare). Skylarks had a prolonged breeding season, fewer nest failures, larger clutch sizes, and more chicks per breeding attempt.

Work on 26 commercial farms in England and Scotland aims to provide an understanding of the ecological interactions between margins and crops. Results have shown some interesting and complex interactions between margin and crop management practices. In fields with undrilled patches and margins, skylark nesting attempts yielded fewer chicks than other treatments, including the control (Figure 1). This may be caused by mammalian predation, and is the subject of further investigation and analysis. However, fields with undrilled patches and margins had the greatest density of birds (all species).

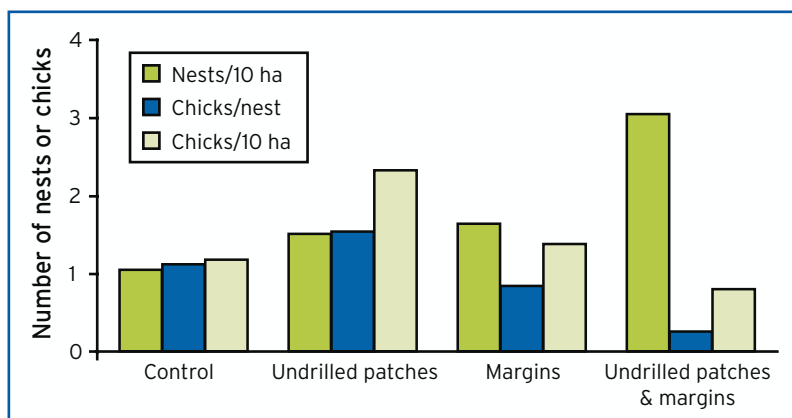


Figure 1. The effect of undrilled patches and field margins on breeding performance of skylarks in wheat fields (14 sites). Data were collected by RSPB and British Trust of Ornithology in 2004 and 2005.

The understanding to be gained from the SAFFIE field studies on crops and margins will lead to sound advice on the best options for biodiversity in the arable environment. This will be combined with an understanding of the costs for farmers, so they can incorporate cost-effective management options into their farming businesses.



Adding wildflowers to grass margin seed mixtures is good for bees and butterflies.

Defra, the Scottish Executive Environment and Rural Affairs Department (SEERAD) and Natural England (formerly English Nature) sponsor this project through the Sustainable Arable LINK programme. The industrial funders are British Potato Council, Agricultural Industries Confederation (AIC), Crop Protection Association, Home-Grown Cereals Authority (HGCA), Jonathan Tipples, Linking Environment And Farming (LEAF), Royal Society for the Protection of Birds (RSPB), Sainsbury's Supermarkets Ltd., Syngenta, the National Trust, and Wm Morrison Supermarkets PLC. Other project partners include British Trust for Ornithology (BTO), Central Science Laboratories, Centre for Agri-Environment Research - University of Reading, Centre for Ecology and Hydrology, and Game Conservancy Trust.

jeremy.wiltshire@adas.co.uk