Experiment 1.1

The primarly objective was *'To enhance farmland biodiversity by integrating novel habitat management approaches within the crop'.*

The hypothesis was that:

- *manipulating vegetation architecture in the crop areas (i.e. providing Undrilled patches and Wide Spaced Rows) would create a diverse sward, thus increasing farmland biodiversity in general and, by enhancing the diversity, abundance and availability of arable plant and invertebrate food, and the provision of nesting habitats, would benefit farmland birds*.

Materials and methods

Field Sites

Field trials were carried out in April-August 2002 and 2003, on 10 sites in each year. Nine sites were constant between both years, the other being replaced due to repeated vandalism of the experimental layout in 2002. All sites were winter-sown wheat-based cropping systems, covering a representative range of soil types (comprising clay, medium over chalk and sands).

The sites were sown with winter wheat in both years of the study, giving a total of 20 replicates (site / year pairings). Fields adjacent to the treatments were sown with a variety of crops; including other cereals, oilseed rape, sugar beet, potatoes, field vegetables, pulses and grass.

Treatments

On each site, winter-sown wheat crops were established with three treatments:

- Conventional husbandry (CONV), the experimental control, with normal row spacing.
- Undrilled patches (UP), c. 4 m x 4 m, at a density of 2 per ha.
- Wide-spaced rows (WSR), double the normal drill width.

Treatment areas were selected with characteristics likely to maximise densities of crop-dwelling organisms key to this study, notably skylark. Thus, each treatment area was >5 ha and had a relatively open aspect, with minimal influence from surrounding tall hedges, treelines and woodland.

The experimental design aimed to locate the treatments within the same set of fields in both years of the study, with the location of individual treatment blocks randomly switched between years. However, on three sites, soil condition in autumn 2002 meant that it was not possible to establish a second winter-sown wheat crop on the original treatment areas, and consequently, the 2003 treatments were moved to the nearest available area of winter-sown wheat, matching the above criteria. In addition, one site had to be replaced completely between years (see 2.2.1.) and, in 2003, one site was unable to drill WSR, while the UP treatment at another site was established by spraying out with glyphosate.

Due to constraints on the availability of the correct crop rotations with suitable associated habitat requirements within the same farm, treatments could be either whole or split fields. In four replicates, all three treatments were in a single large field; in two replicates, the treatments were in three separate fields; in the remaining 14 replicates, the three treatments were in two fields (one whole and one split). In all but two sites, the treatments were adjacent to each another.

Assessments

Agronomic

Plant population, row width, weeds, pest sand disease levels, fertile tiller numbers and crop yield.

Vegetation

Plant species composition, reproductive status and structure were assessed in the cropped areas of each treatment and also within the actual undrilled patches.

Invertebrates

Vacuum sampling, Sweep netting and Pitfall traps were done in the cropped areas.

Birds

Standardised Area Watches were used to assess the density of territorial birds present at different times in the breeding season. Breeding behaviour was also noted. Nests were visited and assessments made