

The conservation of rare arable plants

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The development of arable farming over the last 50 years has resulted in great changes to the flora of arable farmland, with many species unable to adapt or survive the revolution in farming methods. Improved seed cleaning, increased use of fertiliser inputs, new high yielding crop varieties and the introduction of herbicides, have all resulted in a more efficient control of arable 'weeds'. In fact, the rapid decline of many arable plant species across the UK combined with the number of species lost or under serious threat; makes arable plants the most threatened group of British flora. Corn Cleavers and Corn Buttercup, species once widespread across the south of England are now classed as Critically Endangered and under extremely high risk of extinction, Corn Cleavers now occupying just 3% of its total historic range.

In addition to the increased use of inputs the shift from spring to autumn cropping has favoured autumn germinating species, such as Barren Brome, Cleavers and Black-grass that have adapted to the increased use of nitrogen and thrive alongside the crop, to the extent that they out compete the diverse range of less common species. The modern methods used to control this small group of pernicious weeds have confined the majority of arable plants, including rare species, to the outer edge of the field where competition from the crop is less intensive and application of fertiliser and herbicides is less efficient. As a result, arable conservation management prescriptions developed over the last 10 years focus on the outer field margin and aim to maximise the botanical diversity of that limited outer strip, leaving the majority of the field to be managed conventionally. The key factors to remember when managing field margins for arable plants are that they will require annual cultivation (as the majority of arable plants are annual species) and there should be no application of herbicides or fertiliser. As many species are poorly competitive, not sowing a crop can also help rare species thrive. Under agri-environment schemes, cultivated margins can be managed in three ways, namely as:

- A 6 to 24 metre conventional *conservation headland* sown along with the rest of the cereal crop, usually with a full fertiliser programme, but with greatly reduced herbicide, insecticide and fungicide inputs;
- A minimal input *conservation headland*, sown with a crop but with no fertiliser or manure applied;
- An *uncropped cultivated margin or plot*, a 6 metre strip or area that is cultivated with the crop but not sown and has no fertiliser applied and minimal herbicide application with only spot treatment permitted.

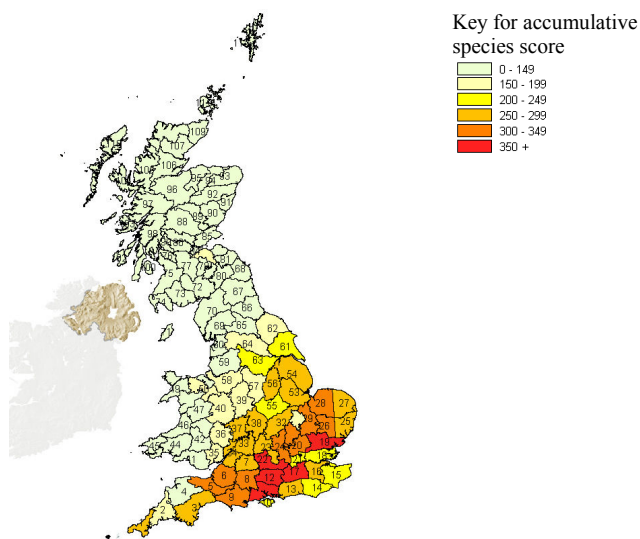
Recent DEFRA funded work on the effectiveness of agri-environment schemes to conserve arable plants, has actually found species richness within conventional conservation headlands is not significantly different from the margin of a conventionally managed crop. This is due to the application of fertiliser still resulting in a competitive crop that shades out the slow growing arable plants. The minimum input conservation headlands (with fertiliser and manure omitted) were significantly more species rich: the more open crop canopy allowing less competitive species to thrive, and the less fertile soils favouring uncommon species over more vigorous weeds. The uncropped cultivated margins have proven to be the most suitable for arable plants.

Although Plantlife would encourage all arable farmers to establish a network of cultivated margins on their farms not all sites will support suites of uncommon arable species. This is due to many arable species being very particular about where they grow, their distribution reflecting complex geological, climatic and management factors. Factors to take into account when considering sites for conservation include, soil type, site aspect, cultivation history and current and historic botanical records. The ability of the majority of species to lay dormant, yet viable in the seed bank for many years means that, if a site is known historically to have interesting species providing the right management in the right place can have instant results.

The site-specific nature of arable plant populations means that careful targeting of management is required to achieve maximum species conservation. Accordingly Plantlife has developed a methodology to assess the importance of particular sites for arable species. The Important Arable Plant Areas (IAPA) methodology assesses arable sites based on the presence of either a single threatened species and/or exceptional assemblages of arable species. The 'outstanding assemblages' criterion assesses sites based on a scoring system that tallies the individual score of 120 indicator species present, weighted according to their rarity and decline across Britain, and allows botanists, conservationists and others to instantly assess the value of a site – be it of county, national or European importance. The same cumulative scoring methodology provides a useful tool to assess the relative richness of individual areas based on the presence or absence of the indicator species, although does not take account of the relative abundance of such species (fig 1.)

The new Entry Level Stewardship (ELS) Scheme has options that provide the necessary management for arable plants. However, due to the “hands off” nature of the scheme and relatively low points allocation to these high value options, up-take has been low compared with low impact options such as boundary management or grass buffer strips. Plantlife is currently running a project that targets farms identified as IAPA and encourages them to implement appropriate management under the new Stewardship schemes in order to conserve as many rare arable plant populations as possible. It still remains difficult to convince farmers that they should manage their land for ‘weed’ conservation but if the relevant options were made more financially and practically attractive (with more flexibility to manage pernicious weeds) ELS could provide greater biodiversity gain. Plantlife would encourage all farmers who have long established arable land in a hotspot area to adopt some cultivated margin options within a new agri-environment scheme agreement.

Fig 1. Richness of British vice-counties based on cumulative weighted scores for 120 rare and/or declining species.



For more information on any of the above please see the arable plants website at www.arableplants.org.uk or phone Kate Still on 01722 342741.

This article is a summary of a paper given by Kate Still at the BCPC 43rd Annual Review of Weed Control on 1st November 2006.