

A rattling good ruse

Richard Pywell and James Bullock report on parasitic plants that help farmers restore wildflower meadows.



Grasslands rich in wildflowers are important habitats for increasingly rare plants, insects and birds. These grasslands were once a common sight in the British countryside, but because of intensive farming, they have now all but disappeared, as farmers have reseeded them with rye grass and clovers, and increased their productivity with fertilisers and pesticides. Defra's new agri-environment schemes (www.defra.gov.uk/erdp/schemes/es/default.htm) offer farmers incentives to restore these flower-rich grasslands, but getting the wildflowers to grow in modern, productive pastures has proved difficult. Unlike the old days, the flowers now have to compete with the modern, vigorous varieties of grasses and clovers for the space and resources to grow.

Our recent research has shown that naturally occurring parasitic plants could solve this problem. Yellow rattle (*Rhinanthus minor*) is common in many of the UK's remaining wildflower meadows. This fascinating species feeds off neighbouring plants by tapping into their root network, but can also photosynthesise through its green leaves, so it is only partially parasitic (or hemi-parasitic). By feeding off the neighbouring grasses, which dominate the meadows, the yellow rattle reduces their competitive vigour and opens up the grassland for wildflower species. Another good thing about yellow rattle is that it's an annual, flowering and producing large amounts of seed in one year. These seeds are spread long distances across the meadow by traditional late-summer haymaking. This means that once established, the populations of yellow rattle grow quickly and can be easily moved to other fields with the hay or on farm machinery.

We carried out our experiment in partnership with the

Northmoor Trust as part of their Sustainable Farming Initiative (www.northmoortrust.co.uk) at Little Wittenham, Oxfordshire. The initiative aims to develop farming systems that benefit wildlife conservation, damage the environment less, and improve farm profitability. We found that it was relatively simple to establish thriving populations of yellow rattle in productive grasslands by sowing small amounts of seed in the autumn when the cattle had finished grazing. After a few years of traditional haymaking in late summer, the populations had grown to many thousands of plants. These significantly reduced the dominance of the competitive grasses, and sward heights decreased on average from 48cm to 16cm where yellow rattle was most abundant. This gave the wildflower seeds we sowed a much greater chance of getting established. With a helping hand from our friendly parasites we more than doubled plant diversity after just four years. Indeed, seven of the ten wildflower species we introduced survived much better after we grew yellow rattle. The New Atlas of the British Flora (www.defra.gov.uk/wildlife-countryside/ewd/flora/) suggests that some of these species, like knapweed, oxeye daisy and lesser trefoil, have declined in our countryside. We now hope to develop the use of parasitic plants as a practical management tool for grassland diversification under the agri-environment schemes at a much larger scale and for a wide range of grassland types.

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