

Transplanting and sowing seed of common cow-wheat *Melampyrum pratense* to increase its distribution at Blean Woods RSPB Reserve, Kent, England

Walter M.

Royal Society for the Protection of Birds, The Lodge, Sandy, Bedfordshire, SG19 2DL, UK

SUMMARY

In an attempt to increase distribution of common cow-wheat *Melampyrum pratense*, turves containing cow-wheat were transplanted in April and May, and seeds were sown in July. Both methods resulted in only a few seedlings maturing to adults with some seed set but neither produced viable populations. Cow-wheat is a hemiparasite but both the host species and the ectomycorrhizal fungus requirements are unknown, and it may be that the appropriate hosts were absent.

BACKGROUND

The heath fritillary *Mellicta athalia* is a rare butterfly in the UK. One key management objective at Blean Woods, an ancient woodland nature reserve in southeast England, is to maintain a healthy population of the fritillary. Their only larval food-plant at Blean Woods is common cow-wheat *Melampyrum pratense* (an annual, ant-dispersed herb, mostly hemiparasitic on roots of trees) which occurs in quite restricted areas of the woodland following coppicing. Most coppiced plots however, lack cow-wheat and it was considered desirable to increase the plants' distribution and in so doing, in the long term, hopefully bolster the heath fritillary population.

ACTION

Two approaches to common cow-wheat *Melampyrum pratense* introduction were tried at Blean Woods RSPB reserve (Kent, southeast England) in an attempt to increase its population size and distribution, translocation of plants growing in turves and sowing of seed.

Translocation of turves: Translocation of turves containing cow-wheat plants was first attempted in 1985. On 1 May, four woodland 'turves' each about 20 cm square were dug up. The turves contained naturally growing cow-wheat seedlings (37, 39, 47 and 44 in each),

between 5 to 10 cm in height. The selected areas had no previous history of cow-wheat occurrence were selected. The turves were then laid in appropriately dug shallow holes and watered in.

Sowing: Between 100 and 200 ripe seeds were collected in July 1986 and scattered in two plots of roughly scarified (raked) ground each about 0.5 x 0.5 m in area. The seeds were then covered with a fine layer of soil. As in the turve transplant experiment, The two plots were in areas where there was no history of common cow-wheat presence.

CONSEQUENCES

Translocation of turves: The fate of the transplanted cow-wheat or plants from seed was recorded at roughly fortnightly intervals from early May to late July. At the time of transplantation the four turves contained 37, 39, 47 and 44 seedlings. By mid-July numbers had fallen to 3, 26, 0 and 0. All surviving plants were stunted, making virtually no growth in 10 weeks, and no seed was produced.

In Year 2 (1986) the experiment was repeated at five sites in the same general areas but with an earlier planting date (22 April) when the seedlings were only 1-4 cm tall. At this earlier stage of growth it was considered that the seedlings might be more likely to survive the

transfer. However, numbers of seedling per turf declined from 33, 128, 36, 91 and 80 to 0, 3, 4, 0 and 0, in 14 weeks. Four seeds were produced and shed at one site.

In Year 3 (1987) the five sites produced very few (0, 0, 2, 1 and 0) sickly seedlings, none of which are thought to have produced any seed. The failure of this experiment may have been due to cow-wheat being hemiparasitic (growing probably mostly on tree roots) therefore roots of the host plants would have been severed when the turves were dug up.

Sowing: Of the 100-200 seeds sown, in total 10 seedlings germinated in one plot and 40 in the other. These seedlings declined to five and eight healthy plants respectively, which produced some seed in July. There were also a few very sickly individuals which did not set seed. The following year, ten and twelve seedlings appeared in the two plots, declining to five and four in July but few flowers were produced and very little seed was formed. No plants appeared in either plot the following season. Neither plot was able to produce a self-perpetuating colony. A third plot established in Year 2 where seed was sown, subsequently produced no plants at all.

Conclusions: Neither method of introduction of common cow-wheat proved successful.

Common cow-wheat is hemiparasitic on tree roots (probably) at Blean Woods. The relationships between the plant host and ectomycorrhizal fungi, and their influence on *Melampyrum* growth and reproduction may have been a reason for the failure of the turf translocation as tree roots/rootlets of host plants would have been cut. Possibly also, the appropriate hosts were absent where introduction was attempted by both sowing and turf translocation, as *Melampyrum* had not previously been recorded in these localities.

It remains unclear exactly what the cow-wheat at Blean parasitizes upon. A research project in the 1980s initially suggested that honeysuckle *Lonicera* might be a host, but this was not borne out by subsequent work. It would appear that the common denominator in virtually all sites where it occurs is the presence of oak. However, there are sites where cow-wheat is present but the nearest oaks are probably too far away, in which case the host may be one or more grass species. Unfortunately though, there are often sites with no grass at all present, so grass cannot be the principal host and the host-plant(s) remains at Blean a mystery.