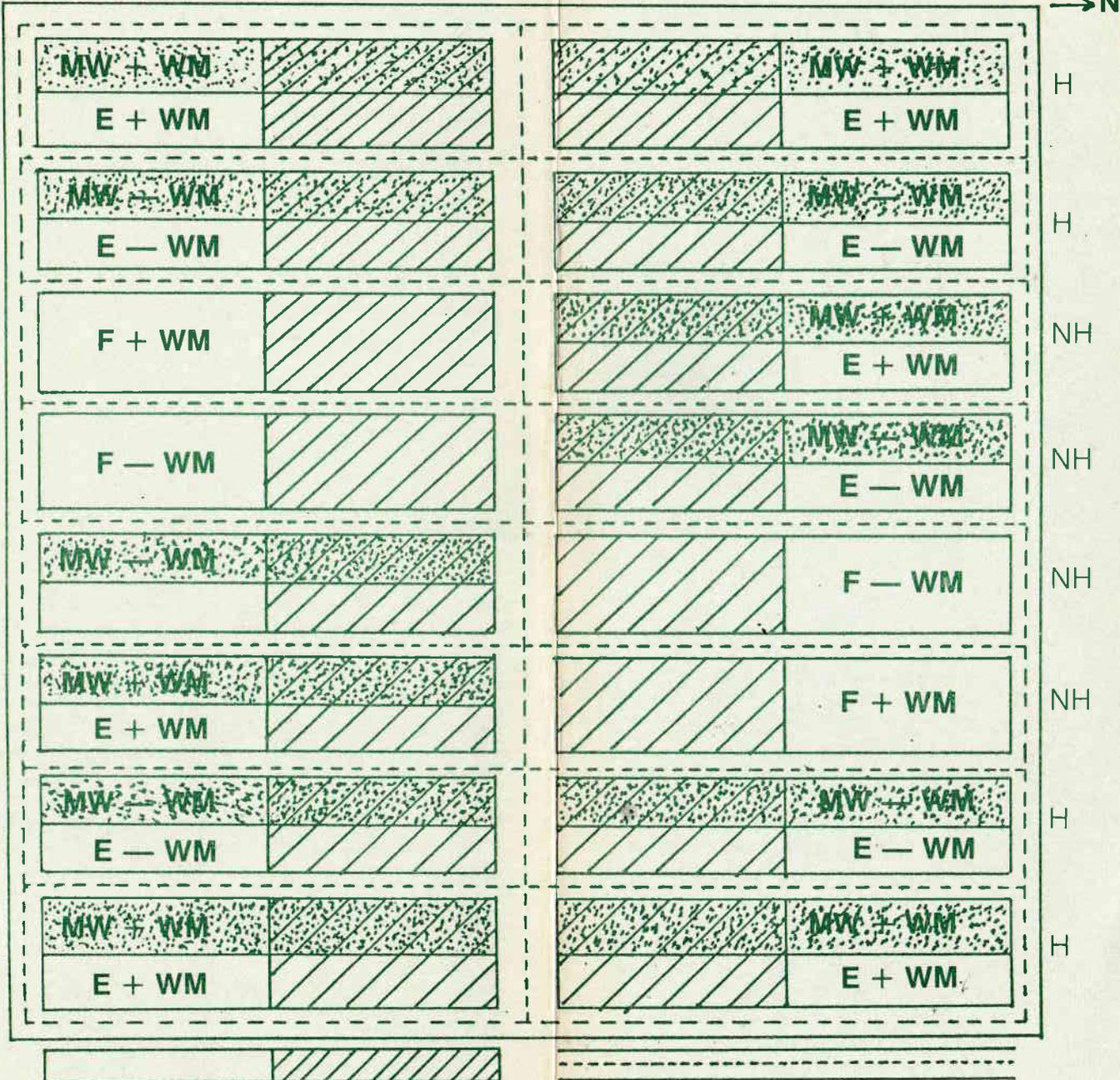


WINTER SOWN

SPRING SOWN

→ N



Non-Manured	Manured
MW = Modern Wheat	F = Fallow
E = Emmer	H = Hoed
WM = Weed Mix	NH = Non-hoed

Pathways

BUTSER ANCIENT FARM, NEXUS HOUSE, GRAVEL HILL, HORNDEAN.
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RARE ARABLE WEEDS

A Research Programme
 for
 Conservation & Management



NATURE CONSERVANCY COUNCIL
 AND
 BUTSER ANCIENT FARM PROJECT TRUST

Agriculture has changed dramatically over the last thirty years. With the advent of chemical sprays, herbicides, pesticides and fertilizers, farming has become more intensive, more efficient and more successful. In practical terms there has been an agricultural revolution which has significantly altered the landscape. The physical changes include the loss of hedgerows to create larger fields to accommodate modern machinery, the reclamation of previously unsuitable land areas to put to the plough and the change of use of pastoral landscape for arable crops.

While progress must not be denied nor farming be attacked for its success, the effect upon the landscape, the countryside heritage, has been remarkable. At no other time during the history of agriculture, from the first farmers of prehistory to the mid-twentieth century, has change been so swift or all embracing. Especially is this the case regarding the natural plantstock of the United Kingdom. Of the plants under threat, those at greatest risk are the arable weeds. The way it was is typified by the paintings of the late nineteenth and early twentieth centuries when cornfields were a common subject because they presented such a riotous blend of colour against the golden background of the wheat. Now large numbers of those colourful plants are under virtual sentence of death. Naturally their effect upon growing cereals is damaging and it is a mark of the success of herbicide sprays that they are disappearing. A modern cereal field averages less than ten such weeds per square metre. The problem is made slightly worse by the change to predominantly autumn sown crops which encourage the growth of grass weeds like sterile brome and black grass. These germinate after the crop is sown and gain a firm foothold by spring at the expense of the potentially less damaging broad leaved annual weeds.

Nevertheless to allow any plant to become extinct whatever the motivation is not necessarily a good thing. At the very least it reduces the ecological heritage and a loss, potentially irretrievable, undoubtedly alters the delicate natural balance. While the technology to destroy or eradicate is available, real knowledge of many such plants, their role *inter alia* is extremely sketchy. Given that

farming has gone on as the economic basis of this country for at least five thousand years, the arable weeds can hardly have been particularly deleterious and, perhaps, may have even contributed toward the success of certain crops. However, there is little doubt that the modern hybrid cereals will not compete with heavy weed infestation without considerable loss of yield.

Attention has been focussed upon the arable weed communities over the last decade or so by the Nature Conservancy Council with a view to their conservation on the one hand, on the other to increasing our understanding of their behaviour patterns and specific roles. Similarly at Butser Ancient Farm, research programmes have been implemented to examine the particular problems posed by arable weeds within the cropping régime of prehistoric type cereals. This area of research has recently been expanded by the N.C.C. and the Game Conservancy with a study of the effects of herbicide sprays and non-spraying of headlands. In order to complement this major programme, small scale research programmes into the effects of cultivation, sowing times and germination/fruiting patterns are necessary. Hence this particular programme conducted under the aegis of the Nature Conservancy Council and Butser Ancient Farm.

The objective is to examine the effects of cultivation upon a number of more threatened species of arable weeds under a range of different treatments. The research design and the variables under examination are detailed in the diagram. The field area is divided into sixteen plots, half of which are cultivated and planted in the autumn, half in the spring. Two plots each half are left fallow. Each plot is divided into two halves, one of which is manured, the other not. All the plots are sown with equal amounts of seed of each weed species in the autumn. Excluding the fallow plots the remainder, six in autumn, six in spring are planted with two types of wheat, a modern hybrid and the prehistoric type cereal Emmer Wheat (*Tr. dicoëcum*). During the growing season half of each treatment area of each plot, except the fallow plots, will be hoed between the rows to examine the effects of this treatment upon the weed population. Since the weeds grow within the rows of cereal plants, it is virtually impossible to eradicate them.

The major field analysis of this programme will take place in the summer with random squares and transects set into each variable to identify and quantify the weed populations and to compare the results treatment against treatment. Similarly the yield factors from the cereals as well as plant performance will be measured. The results of this programme will be made available in an annual report from the Ancient Farm.

Meanwhile you are invited to wander about this field area but please keep to the paths between the plots and please do not pick any of the plants. Because this field area has not been part of a modern farming régime, there will be a large number of typical arable weeds of chalkland present as well as those deliberately sown as part of the research programme. These rarer species are listed below with both botanical and common names.

Rarer Species

<i>Adonis annua</i>	Pheasants Eye
<i>Ajuga chamaepitys</i>	Ground Pine
<i>Anagallis foemina</i>	Blue Pimpernel
<i>Bupleurum rotundifolium</i>	Hares Ear or Thorrowwax
<i>Euphorbia platyphyllos</i>	Broad-leaved Spurge
<i>Filago pyramidata</i>	Broad-leaved Cudweed
<i>Galium tricornutum</i>	Corn Cleavers
<i>Geranium columbinum</i>	Long-stalked Cranesbill
<i>Ranunculus arvensis</i>	Corn Buttercup
<i>Scandix pecten-veneris</i>	Shepherd's Needle
<i>Teucrium botrys</i>	Cut-leaved Germander
<i>Torilis arvensis</i>	Spreading Bur Parsley
<i>Valerianella rimosa</i>	Cornsalad sub-species

More Common Species

<i>Chaenorhinum minus</i>	Small Toadflax
<i>Euphorbia exigua</i>	Dwarf Spurge
<i>Kickxia elatine</i>	Sharp-leaved Fluellen
<i>Kickxia spuria</i>	Round-leaved Fluellen
<i>Legousia hybrida</i>	Venus' Looking Glass
<i>Lithospermum arvense</i>	Corn Gromwell
<i>Papaver argemone</i>	Prickly Poppy
<i>Papaver hybridum</i>	Rough Poppy
<i>Silene noctiflora</i>	Night-flowering Catchfly
<i>Valerianella dentata</i>	Cornsalad sub-species