

# Establishing a wildflower meadow from an agricultural perspective

Most wildflowers thrive on poor, infertile soils. One of the reasons for this, is that they suffer under competition from vigorous grasses which will smother the flowers by establishing themselves more quickly. Wildflower and grass mixtures utilise slower growing, finer grasses, such as Crested Dogtail (*Cynosurus cristatus*) and fine Fescues, which are much less competitive to the wildflowers than tougher species such as the Ryegrasses. On the poorer soil, the grasses and weeds lying in the seedbed can't take a hold as much as they would in nutrient rich topsoil, allowing the wildflower seed to germinate and grow to the best of its ability.

Nitrogen is relatively easy to deplete from soil, if no fertiliser is added. It is very 'mobile' and easily taken up by crops and grasses. Soil stripping will also help with this process. The most difficult soil nutrient to strip is phosphorous, as it is taken up by plants in relatively small quantities. As a consequence, lowering phosphorous by growing a cereal or grass crop, may take a long time. This is highlighted if a large amount of fertiliser has historically been applied to the area to be used. Phosphorous is more likely to be stripped from thin, light soils as opposed to heavier clay-based soils where several years of nutrient stripping may be required.

Potassium levels can be lowered on light soil fields, by taking repeated cuttings of grass or cereal cropping without adding any more. It can be a harder job to reduce potassium on sites with clay-rich soils, as this is a natural element of the soil chemistry. Care needs to be taken if there is rare wildlife or desirable species present, as some of the methods below can have a detrimental effect. It would be wise to be sure you will cause as little negative impact to what you wish to achieve, so that the goal is attained as quickly and easily as possible. Luckily, there are several methods of reducing soil nutrients to give the wildflowers the best start they can.



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## **Method 1 – Nutrient stripping.**

Nutrient stripping is the process of removing nutrients from land to be used for the creation or restoration of wildflower meadows. If the field is of arable use prior to the wildflower project, nutrient stripping is undertaken by growing a cereal crop **WITHOUT** the use of added fertiliser. The theory being, that the crop will draw from the existing levels of NPK, thus 'un-improving' the quality of the soil in that area. On existing grass-land, a series of silage cuts can be taken, again - very importantly - **WITHOUT** added fertiliser, to achieve the same effect.

Depending on the actual soil characteristics, nutrient stripping is not always successful and more intensive management techniques may be required on some sites, such as turf/topsoil stripping or deep soil inversion, which we will cover in more depth shortly.

## **Method 2 – Inversion ploughing**

Deep ploughing or soil inversion, is where the topsoil is turned over and buried under a layer of subsoil. The subsoil tends to be nutrient poor when compared to topsoil. Especially in areas such as flood plains where fluvial deposits will enrich the surface layers of the soil even further.

Inversion ploughing should not be undertaken on archaeological sites, as the extensive groundworks can be rather destructive to buried features. Also, if the area is prone to soil erosion and surface run off, it can take the newly establishing plants time to grow and put down a root network which holds the soil together. For this reason, inversion ploughing is not the best method in these areas either.

Other than that, this is a very effective method of lowering nutrients quickly, although maybe somewhat short term. Scientific studies indicate that the effect may only last for the first 4 years or so after ploughing, as the nutrients may leach back into the newly formed topsoil over time; re-invigorating the surface layers. Deposits from flooding, as mentioned earlier, would only bring this process forward.



### **Method 3 – Turf and topsoil stripping**

This method is similar to inversion ploughing, but involves the complete removal of the turf and topsoil containing all of the soil nutrients. Wildflowers can be readily established on sites where the topsoil has been removed.

Before turf stripping and removing topsoil, several checks should be undertaken for any rare wildlife or archaeological features and this practice should not be undertaken, if there is a high possibility of soil erosion/run-off.

In conclusion, nutrient stripping would be the first port of call and if this is unsuccessful, then the incorporation or removal of topsoil can be undertaken if it so suits. If all else fails, there are a group of wildflowers which may not thrive, but will tolerate slightly richer soils. Depending on factors such as soil pH, nutrient status and environmental conditions, it may be more effective (both physically and financially) to use these plants, rather than inversion ploughing or topsoil stripping.

The seeds of some species require a period of vernalisation, which means a cold snap is required to begin the process of germination. Therefore, a wildflower meadow is an evolving, long term project. Not all wildflowers will bloom in the first year, for example if the seed is sown in the spring, some species will need to be overwintered before they start to show. The meadow can look vastly different in the second year to what it did in the first, different again in the third and so on. It may be several years before it is fully established. It will be attracting a variety of pollinating insects, such as bees and drawing in other wildlife such as birds, which feed on both the seeds of the grasses and the insects themselves. The meadow will then be performing at its best.

