

Soil Nutrient Stripping

Most wildflowers live in infertile soils. If land has been agriculturally improved using fertilisers, it may be too rich for wildflowers to be sown straight away. There are some methods of reducing soil nutrients to help wildflowers germinate. If there is rare

wildlife, such as [grassland fungi](#) and insects, these methods may be harmful and you should check that there is nothing that would suffer under these management practices before you begin.



Nutrient stripping

Nutrient stripping is the process of removing nutrients from land being considered for restoration or recreation of wildflower grasslands. If the field is arable prior to the wildflower grassland recreation, nutrient stripping is undertaken by growing a cereal crop and not putting any fertiliser on the land. On existing grasslands, a series of silage cuts may be taken, without adding any fertiliser, to have the same effect of reducing soil nutrients prior to wildflower restoration. Depending on the soil characteristics, nutrient stripping is not always successful and more intensive management techniques may be required on some sites, including turf stripping or deep soil inversion.

The most difficult soil nutrient to strip is phosphorous as it is only taken-up by plants in

relatively small amounts. As a consequence, lowering phosphorous by taking a cereal or grass crop may take a long time. This is especially the case if high amounts of fertiliser have historically been spread on the field. Phosphorous is more likely to be stripped from thin, light soils compared with heavier clay-based soils, and several years of nutrient stripping may be required.

Nitrogen is very mobile and may quickly deplete from the soil if fertiliser is not added. Soil stripping will help this process.

Potassium levels can be lowered on clay-poor fields by taking repeated cuttings of grass or cereal cropping without adding potassium. It may be harder to reduce potassium on sites with clay-rich soils as this is a natural element of the soil chemistry.



Inversion ploughing

Deep ploughing or soil inversion is where the topsoil is turned over and buried under a layer of subsoil. Subsoil tends to be nutrient poor compared with the topsoil. This mechanism of creating a nutrient poor soil for seeding with wildflowers can be very effective allowing them to germinate and grow.

Inversion ploughing should not be undertaken where there are archaeological remains, as the extensive ground works can be destructive to buried features. Also, if there is a risk of soil erosion and run-off, this method of reducing nutrients is not suitable as it can take a while for plants to grow and their roots to knit the soil together, preventing soil run-off.

Although this is a very effective method, some scientific studies have found that soil inversion only lowers nutrients in the first four years after the ploughing. This may make the effects temporary as the nutrients may leach into the newly formed topsoil over time, or external factors such as flooding, may increase the nutrients in the new topsoil.

Turf/topsoil stripping

Turf stripping is the removal of topsoil containing all of the soil nutrients. It is a very intensive process scraping off the existing vegetation and topsoil and removing it from the land where wildflower restoration is going to be undertaken. Wildflowers have been successfully restored to sites where topsoil has been removed. Topsoil stripping is most useful at priority locations such as linkages between blocks of wildflower grassland or at sites that will act as stepping stones for other priority species.

Before undertaking turf stripping and removing topsoil, several checks should be undertaken for any rare wildlife or archaeological features, and this practice should not be undertaken where there is a high possibility of soil erosion. It can also be expensive, especially if the topsoil needs to be removed from the site or spread very thinly, such as in floodplains.



Both turf stripping and inversion ploughing are very dramatic practices, creating lots of bare open ground. It is not recommended that these methods of creating nutrient-poor soils are undertaken unless specialist help is arranged and all of the archaeological and ecological checks are undertaken. If nutrient stripping does not lower the soil nutrient levels, there are a group of [wildflowers that can tolerate slightly richer soils](#). Depending on the soil pH and nutrient status it may be more effective to use this smaller selection of plants rather than deep plough or remove topsoil.

For more information on issues concerning soil stripping see Natural England's [TIN 054 Guidance on protecting soils and the historic environment when restoring or re-creating lowland heathland](#). Many of the issues concerning archaeological features and soil structure also apply to grasslands.