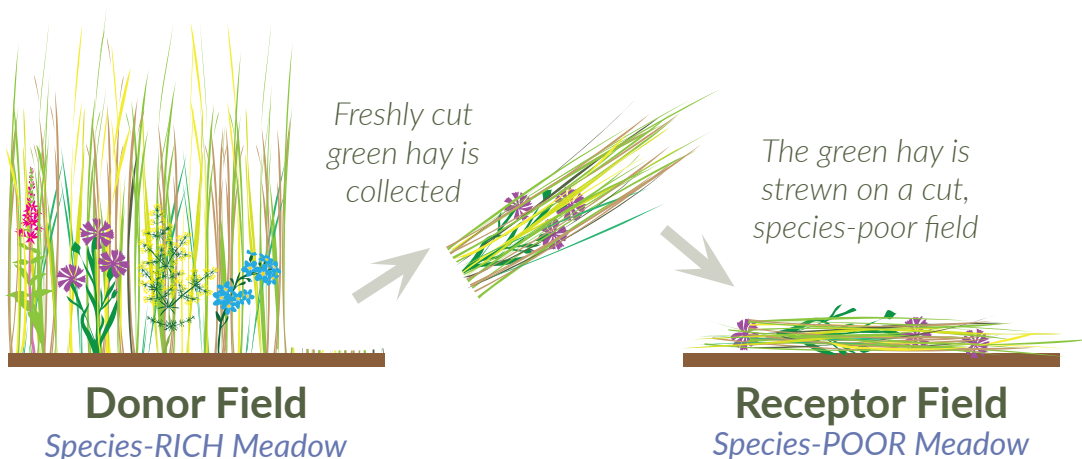


What is green hay transfer/strewing?

Freshly cut green hay from a species-rich meadow (donor field) is collected and then strewn on a cut species-poor field (receptor field), ideally on the same day.

It is a way of increasing plant diversity in the receptor field by transferring the seeds from the wild flowers & grasses growing in the donor field.



Why is it useful?

This practice has been found to be a successful nature-based solution for grassland restoration¹ and is commonly carried out in Europe to restore species-rich semi-natural grassland².

It has the added advantage of potentially transferring invertebrates and non-vascular plants (mosses etc) from the donor site which allows for a more complete restoration of a natural grassland ecosystem than seed sowing alone¹.



Where might it work?

It will most likely be successful on a receptor field that has not received fertiliser for several years, but such a situation doesn't rule out this method.²

Close proximity to the donor site is also favourable, both from the ecological and economic viewpoint, with a quick transfer of green hay from donor to recipient field being essential to its success.

Both the donor and receptor sites should have a similar geology, soil type, hydrology and pH to maximise seed germination and long-term restoration success³. The donor field should have few to no 'weedy' species such as docks and thistles.

Seeking advice from an experienced ecologist or farm/agri advisor is recommended.

Steps needed?

1. **Cut** vegetation on **receptor field** as tight to the soil as possible and remove. ➤ Creates open conditions exposing bare soil
2. **Disc-harrow/scarify** receptor field, at least once, in preparation for the addition of green hay. *This step may be skipped, but this may reduce the chances of success.*
3. **Cut** vegetation (green hay) on the **donor field** (August/September) and collect in a similar way to silage, but try to avoid using a conditioner mower or silage harvester ('low chop' setting has given good results) so as not to lose seed from the vegetation when mowing and collecting.
4. **Spread** collected green hay across the **receptor field** using a muck spreader; tossing from a trailer may also work if the site is small and resources allow.
5. **Tedd** the green hay three to four times over three days (skipping this step though has also given good results).
6. If possible, **roll** the spread green hay to ensure good contact between the seeds in the hay and the soil of the field – this can also be done by raking the hay.
7. The strewn green hay can be **removed** from the **receptor field** after a few days using a baler. *This step is optional as leaving in situ has also yielded good results.*

Creates a more suitable environment for seeds to make contact with the soil, increasing the germination success

Ideally Steps 3 and 4 should occur on the same day, in order to avoid the hay heating up and reducing seed viability



Depending on the sites, and the distances between the donor and receptor sites, it may be as easy to use a buck rake and pike, particularly if both sites are on the same farm.

Results to expect

Despite being used as a method of grassland restoration on mainland Europe for many years, green hay transfer is a relatively new technique in Ireland. It has been used in the United Kingdom for well over a decade and has proved to be a successful method of restoring both upland and lowland grassland communities^{4,5,6}.

Preliminary results from a green hay transfer in north Cork indicated that 80% of the species recorded from the donor site in 2021 established in the receptor fields in 2022. Species recorded from the receptor fields, but not from the donor site, are thought to have lay dormant in the seed bank of the soil (from when the site was previously under tillage) until the soil was disturbed via disc-harrowing prior to the spreading of the green hay.

The ratio of grasses to broad-leaved herbs (=flowers) changed from 85:15, to 33:66 in the receptor field, and the average number of species in a 2x2m square increased from 8.5 to 19.

Preliminary results from a green hay transfer in Athenry were also positive. Here the receptor field was used for intensive silage prior to the transfer. Despite rye grass being present in all plots, the plant diversity overall within the plots was high and consistent throughout after green hay transfer.

It should be noted that the donor sites in both cases were very diverse and of high quality in terms of a semi-natural grassland. Donor sites of this standard may not be available to the majority of potential green hay transfer users and so achieving similar success rates should not be taken for granted.

Considerations

- Is this the most appropriate method to use in terms of the existing habitat present?
- How close is the donor site to the receptor site and does it have similar soil conditions?
- A donor field just one third the size of a receptor field has been shown to be a useful ratio for calculating how much green hay is needed to adequately cover a site⁵.
- The whole process needs careful planning, coordination and timing to ensure success, with several participants taking part working together.
- It takes a lot of machinery together to carry out the process.
- Good weather is also an important factor for the operation.
- Be wary of cutting the green hay too late in the season. The donor site should be checked regularly for grass and wild flower seed production from July onwards, particularly in dry years⁷.
- If you have the necessary machinery, it tends to be a less costly method of restoring grassland ecosystems than purchasing commercial seed mixes, and it allows the transfer of species that are not commercially available². Furthermore, it is much more ecologically appropriate to use locally occurring species, and in the proportions and mixes that are naturally occurring already in grasslands. However, if the hiring of machinery is necessary, coupled with increasing costs of fuel, the process can be costly.
- If the amount of green hay available is not sufficient to cover the whole site, a smaller area could be treated and then it in turn could act as a potential green hay source in future years.
- How the receptor field will be managed in the future should also be considered.

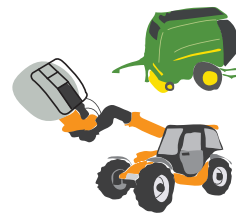
Equipment

Each site is likely to be a little different, but the following were used in the case studies:



Tractor and mower

Avoid conditioner mower so as not to lose seed from the stem when mowing. Avoid silage harvesters/shoots for same reason.



Round Baler

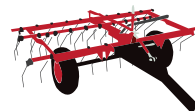
Telescopic Bale Handler



Trailer



Rear Discharge Muck Spreader



Harrow

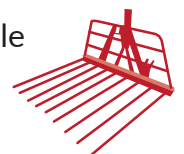
For scarifying the receptor site, which should be cut tightly and material removed.



Grass tedder

Roller

Depending on the sites and distance between sites (donor and receptor) it could be as simple as using a buck rake and pike (or whatever you call a pike where you are from!).



In fact, that may be a more likely scenario in many cases, if someone is ecologically minded and wanted to bring lower quality meadows up to the quality of their best meadows on the same farm.

Case study - North Cork

Receptor field August 2021
Prior to green hay transfer



Species-poor

Receptor field June 2022
Nine months after green hay transfer
(note this field has been grazed)



Species-rich

Receptor field April 2022
Seven months after green hay transfer



Receptor field April 2022
Seven months after green hay transfer



Case study - Athenry

Receptor field September 2021
Spreading of green hay



Receptor field September 2021
Directly following green hay transfer



Receptor field May 2022
Eight months after green hay transfer



Donor field September 2021
Close-up of vegetation just before
harvesting for green hay

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