



Wildlife Trusts
Wales
Ymddiriedolaethau Natur
Cymru



Powys Cysylltiadau Gwyrdd Green Connections Powys

Green Hay and meadow seed harvesting and spreading
- a Green Connections case study

**Written by Caroline Gellor
for Green Connections Powys
November 2022**



This project has received funding through the Welsh Government Rural Communities - Rural Development Programme 2014-2020, which is funded by the European Agricultural Fund for Rural Development and the Welsh Government.

INDEX

AIMS AND OBJECTIVES

INTRODUCTION

Hay meadow management
What is green hay
Seed harvesting
The sites

BRECONSHIRE

Donor and Receptor Sites
Powered Green hay Harvesting
Green Hay Harvesting Conclusions
Seed Harvesting
Seed Harvesting Conclusions

RADNORSHIRE

Hand-powered Green Hay Harvesting
Hand-powered green hay harvesting conclusion
Case Study: Independent hand-powered hay making experience
Seed vacuuming

GREEN HAY

Valuing of Green Hay
Valuing
Advantages and disadvantages of green hay harvesting
Who is selling green hay commercially
Advantages and disadvantages of green hay harvesting
Case Study: Commercial Green Hay Experience – Goat Farm

SEED HARVESTING

Harvesting seeds – rules and regulations
“Meaning of Marketing”
Preservation Mixture
Route to marketing seed
Seed harvesting from a SSSI

KEY LEARNING POINTS

Green Hay
Seed Harvesting

RECOMMENDATIONS

Green Hay
Seed harvesting

APPENDICES

Green Hay and meadow seed harvesting and spreading - a Green Connections case study



Aims and Objectives

This is a Powys-wide study with Radnorshire and Montgomeryshire Wildlife Trusts and the Brecon Office of the Wildlife Trust for South and West Wales collaborating as part of the Green Connections project. Its aim is to empower people to take action for nature's recovery across the county through a suite of measures including landowner advisory work and community engagement activities.

During the summer of 2022, project staff have been piloting different ways of collecting and spreading seed in order to assess the effectiveness of the various methods.

This case study brings together these experiences, examines their cost effectiveness and seeks to establish how much a landowner might charge for meadow seed or green hay rich in desirable seed and what the costs include.

Introduction

Wildflower meadows and species rich grasslands are rare, and Wales has lost 97% of them since the 1930s. Those that remain cover only 1% of the land and these too are under threat. These habitats contain some of our most beautiful and rarest plants such as Wood bitter vetch and Viper's grass.



Wood bitter vetch
Vicia orobus



Viper's grass
Scorzonera aristata

These wildflower meadows and species rich grasslands support a diverse invertebrate population, which in turn, is an important food source for farmland birds, many of which are also threatened or rapidly declining. These habitats are an important part of the overall biodiversity of Wales.

Hay meadow management

Hay meadows are generally cut once a year and the timing of this affects whether early or late flowering plants thrive in the meadow. In habitat management for wildlife, it is best to cut as late as possible so that as many plants as possible are in seed. Cutting allows the seeds to fall to the ground and removing the hay prevents suffocation of the seed and the hay can provide fodder for farm animals.

Traditional management may involve grazing. Allowing sheep to graze for the early part of the year and the use of cattle to graze the meadow after cutting (aftermath grazing) helps to increase the variety of wildflowers, helps seed get trampled into the ground and improves the structural diversity of the meadow or grassland.

Wales's remaining meadows can be used as a source of seed to create new meadows and to improve degraded meadows.

This case study explores how green hay and meadow seed can be collected and spread on new or degraded meadows to improve the diversity and success of such meadows. The study also looks at how a value can be attributed to green hay and meadow seed as part of a diversified income to a landowner and provide guidance to receptor sites on what they should pay a donor site to enrich the diversity of their own meadow.

What is green hay

Green hay is the mowing of species rich grassland with the primary aim of collecting wild-flower and grass seed. The green hay cuttings are taken from the donor site to a nearby receptor site where species diversity is poor. Receptor sites must be prepared and ready to receive the donor hay or seed by mowing, raking and scarifying the ground. When the hay is spread the seed drops on to the ground. Good preparation ensures the seed reaches the soil.

Timing of this method is crucial. Green hay should be cut when seed heads are ripe. Donor sites should donate around a third of their seed or hay, in order to ensure the continued diversity of their own meadows. Ideally, the green hay should be delivered to the receptor site within three hours of baling for maximum seed viability.

In traditional meadow management the hay is cut and left to dry on the land before being collected into bales. Green hay is cut using similar methods to traditional hay, but the key feature is that the green hay should be transported to the receptor site as soon as possible.

Green hay is spread at a rate of 1:3 donor site to receptor site, it works out at a spread rate of around 40 small bales per hectare.

Seed Harvesting

Seed with local provenance is much better than buying in seed which may have come from other parts of the UK. Local sub-species may be better adapted to climatic and soil conditions in the area.

Methodologies used by the project in summer 2022

- **Cutting and collecting green hay in bales and then spreading**
Using a contractor with tractor, mower and baler to cut and bale the green hay.
- **Seed vacuuming and spreading**
Using a leaf blower with sucking action
Spread seed by hand
- **Seed harvester and spreading**
Using a hired seed harvester pulled by a quad bike.
Seed spread out on a sheet in the sun to dry for around an hour before loading up into bags.
- **Hand powered haymaking**
Hand scything and raking, hand bailing or dumpy bags

The Sites

Donor sites

A number of criteria were used to select the donor sites including the willingness of the owners to participate in the project, the quality of the meadow and the proximity to potential receptor sites. The optimum time for cutting the meadows for green hay is around the third week of July but any time in period between 15th July and 12th September is acceptable.

Receptor Sites

Receptor sites were chosen again, by the owner's willingness to participate in the project and their proximity to the donor sites, but also because their meadows either needed improving or were new meadows.

Site preparation including close cutting, aftermath grazing and scarifying or harrowing to reduce thatch and produce bare soils patches. Good preparation was critical to the project as the seed from the green hay requires open patches of soil in order to bed in and germinate.

BRECONSHIRE

Donor sites			
Site	Size (Ha)	Green hay or seed	Collection method
D1	1.68	Green hay	Powered mower and bailer
D2	5.7	Seed	Purchased
D3	0.0025	Seed	Hired Seed harvester and quad
D4	0.0075	Seed	Hired Seed harvester and quad

Receptor sites						
Site	Size (Ha)	Donor site	Green hay or seed	Quantity	Preparation	Method of spreading
RA	1.4	D1	Green hay	7 round bales	Cut, rake, scarify	Hand spread
RB	0.5	D1	Green hay	1 round bales	Cut, rake, scarify	Hand spread
RC	2.23	D2	Seed	10.72kg	Cut, rake, scarify	Hand spread
RD	Various	D3, D4	Seed	Various	Cut rake scarify	Hand spread

Powered Green Hay Harvesting

Donor site D1 - Receptor sites: RA and RB

Situated in the north of the county, nestling under the Cambrian Mountains, this site is a 1.36Ha hay meadow with a long history of traditional meadow management and is designated as a Local Wildlife Site. Part of the meadow was made into hay with the intention of feeding to stock – the rest of was left growing on site until it could be cut as green hay. This management has resulted in a diverse meadow flora making it a desirable donor site.

Green hay was collected from the most diverse half of the site (0.68Ha) by a tractor with flail mower and baled with a tractor pulled baler, producing eight round bales.

Unfortunately, the optimum harvesting time was missed as one of the Receptor sites was not ready to receive the green hay. This resulted in a low seed content.

Receptor site RA – Donor site D1

This 1.4Ha meadow is in the Basic Payment Scheme. The owner had booked a contractor to prepare the field but delayed this to wait for his existing yellow rattle seed to ripen. By the time this had happened his contractor was not available.

This delay meant that the owner of the donor field also had to reschedule the cutting of green hay. By the time the hay was cut lot of the seed had already dropped.

A visit to the site some three weeks later, by Trust staff, revealed that the scarifying had had very little effect as the ground was very hard due to the very dry weather this summer. The site appeared to be under-grazed. The strewn hay was sitting on top of regrowth and was clumping so any seed under the clods of grass would rot. Any seed thrown clear would have a chance of germinating.

Receptor site RB – Donor site D1

This 0.4Ha field is a meadow in reversion. Last year it was grazed off by sheep and ponies and then rested. Red and white clover and some vetches were present, as were dock and nettle but no yellow rattle. This year the dock was topped and the field was grazed again by sheep and ponies. In preparation for the green hay, the field was mown very short, raked and then harrowed. Because of the delay to the cutting of the donor site, the whole process was repeated to ensure plenty of bare patches.

The donated green hay was spread by hand. The owner reported that there was very little seed in the hay, but there was some yellow rattle. After a few weeks, the owner spotted grass regrowth under the hay, so they raked it up to prevent the grass and seed from rotting. The hay was made into a habitat pile at the back of the meadow.



Prepared site
(Photo: Michelle Pearce)



Large round bale arriving
(Photo: Michelle Pearce)



Hand spreading
(Photo: Michelle Pearce)



Hand spreading
(Photo: Michael Pearce)

Green Hay Harvesting costs:

Costs	Amount
Contractor hire: Cut, make bales and deliver	£490
Payment for the green hay	£440
Total cost	£930
Number of large round bales	8
Cost per bale	£116.25
Staff time (hours)	0

Green hay harvesting conclusions

A major issue with this part of the study was the weather. Unusually dry weather resulted in late ripening Yellow Rattle and left the ground too hard to scarify. Receptor Site, RA, delayed preparation of the field until the Yellow Rattle had ripened.

This in turn led to issues with contractor availability and ended with the Donor field being cut after most of the seed had dropped.

The delay in cutting the Donor field resulted in the second Receptor Site, RB, having to repeat the cutting and harrowing process.

Costs for this part of the Study were high producing 8 large bales, for £116.25 per bale. Each large round bale is equivalent to 10 small bales, giving a price per small bales of £11.16. Putting that figure into perspective, a typical bale of non-green hay at the time of the Study cost between £3-£4 a bale.

Seed Harvesting

Donor site D2 – Receptor site RC

Donor site D2 is a 5.7Ha wildflower meadow, located in the heart of the Brecon Beacons. This very large field is harvested by the owners using a seed collector and the seed sold commercially. The Trust purchased 10.72kg a seed from the donor.

Receptor site RC – Donor Site D2

This 2.23Ha meadow in the Brecon Beacons is a field in need of improved diversity. The owner agreed to take 10.72kg of seed but has been unable to scarify the ground due to the very dry summer. As the season moves into autumn and rain moves in the scarifying will take place and the seed will be sown.

Donor sites D3 and D4 – Receptor site RD

The Trust hired a seed harvester. The seed harvester is pulled across the field by a quad bike and the harvester brushes the seed into the collector bag. The Trust used their own Quad bike to pull the seed harvester.



Seed harvester and quad bike

(Photo: Stephanie Coates)



Seed harvester and quad bike on the flatbed trailer

(Photo: Stephanie Coates)



Seed drying *(Photo: Stephanie Coates)*

The Trust was unable to carry the quad bike and the harvester on their pick-up so the owners of the seed harvester kindly loaned the Trust a flat-bed trailer which could accommodate both the seed harvester and the quad bike. The trailer was pulled by the Trust's pickup. Trust staff had to learn how to man-handle the heavy trailer ramps. Two members of staff were required for this as the ramps were very heavy and health and safety rules require an extra person to support the quad bike rider. After collection the seed had to be dried in a dry location.

Donor site D3

The first site to have seed harvested with the seed harvester was D3, a nature reserve with a small, damp, flower-rich meadow at the foot of the Black Mountains. Much of Brecknock would have looked like this 100 years ago before the habitat was lost due to changes in farming practices. Flowers of interest in this meadow were Common Spotted and Early Purple orchids, Yellow Rattle, Betony, Ragged Robin, Meadowsweet and Great Burnet, all typical of a good quality meadow. Devil's-bit Scabious was present, but the seeds were not ready. The patches where it was dominant were avoided and staff collected the Devil's Bit Scabious seed with a seed vacuum on a second site visit. The site had fairly level access. D3 yielded 2kg seed



Donor site D3 (Photo: SSWT)



Donor Site D4 (Photo: SSWT)

Donor site D4

The second seed harvester site, D4, is another good example of a wildflower meadow but trickier all round for this operation. It is at a higher altitude with poor access, steep slopes and quite dry in places with amazing views of the Brecon Beacons. Trust staff managed to turn their pick-up around in the limited space to allow them to back the quad bike and harvester into the field. Knapweed, Eyebright, Harebells, Fleabane, and Sneezewort are among the flowers found here. Sneezewort seeds were also late in maturing, and these were collected later by seed vacuuming. D4 yielded 5kg seed.

Receptor Sites RD – Donor sites D3 and D4

The seed collected from D3 and D4 will be distributed to a number of small sites, including three Community Groups with areas of grassland they wish to convert to wildflower meadow and 5 landowners. Some of this land is roadside verges and some is community managed grassland.

The donations of seed to these sites will be used as an opportunity to organise Community days to promote local seed collection and donation, provide training and support and to assist in the preparation of the ground and seed distribution.

Seed Harvesting Costs:

Seed harvester	Amount
Seed harvester hire	£74.80
Flatbed trailer hire	Free
Seed produced	7kg
Staff time	16 hours
Seed cost per kg	£10.68
Total cost	£74.80
Seed purchase	
Quantity of seed	10.72kg
Seed cost per kg	£35
Total Cost Seed £35/kg	£375.20

Seed Harvesting Conclusions

The results of this part of the study clearly shows that hiring a seed harvester is more economical than buying seed from a company. With a typical seeding rate of 10kg/Ac the cost per acre for the seed alone varies between £350/Ac to as much as £1,800/Ac, depending on the supplier. That translates to is £1,068/Ha to £4,500/Ha.

There are, however, some caveats. In this study a flat-bed trailer was loaned to the Trust.

Hiring a flat-bed trailer

If it were necessary to hire a flat-bed trailer the cost would be between £30 a day for a small flat-bed to £58 a day for a car transporter. Additional costs for collection and return could push the hire in to two days with extra fuel costs on top. The total cost for hiring a car transporter could run from £90 -£150 pushing the seed price up to 23.54/kg - £32.15/kg.

The Wildlife Trusts in Powys jointly own a quad-towed seed harvester which is currently stored with Montgomeryshire Wildlife Trust. To share the use of it requires the other trusts to have a

suitable trailer to pick it up plus staff able to drive with a trailer and staff qualified to use a quad. Logistically this has always been a barrier for sharing its use. Over the last year, BBNP (Brecon Beacons National Park) and the Elan Valley have also purchased seed harvesters so logistics may make this more feasible in the future.

Health and safety

One of the issues facing the Trust staff with the flat-bed trailer was the manipulation of the ramps, which were heavy and awkward. A car transporter has ramps that slide out and a hydraulic tilting body, making the whole process easier and safer.

In some Trust Health and Safety policies two members of staff are required when using a quad bike in case of accidents



Car transporter being used by the Herefordshire Wildlife Trust

(Photo: David Hutton)

RADNORSHIRE

As part of the Case Study, the Radnorshire Wildlife Trust organised a training day in hand-powered hay making. They hired a contractor renowned for their training courses and sixteen participants took part in the training. A donor field was found whose owner was willing to allow the training take place and the resulting green hay was donated to three receptor sites.

Donor sites			
Site	Size (Ha)	Donor site	Green hay
D5	0.13	Green hay and seed	Contractor: Hand scythe and hand bale
D6		Seed	Seed: Vacuumed with a leaf blower

Receptor sites					
Site	Size (Ha)	Donor site	Green hay or seed	Quantity	Preparation
RD	0.05	D5	Green hay	2 bags	this area of meadow had been topped twice and raked but it hadn't gone low enough to expose soil so not expecting good results
RE	0.04	D5	Green hay	2.5 bags	Meadow had been cut very short so hopeful of some take
RF	0.015	D5	Green hay	1 bag	A bank had been cleared down to soil level to receive the hay
RG	Small/gardens	D6	Green hay and seed	Various	Grass cut hard and ground scarified

Hand-powered Green Hay Harvesting

Donor Site D5 – Receptor sites – RD, RE, RF

The Radnorshire Wildlife Trust contracted a company to hand scythe and hand bale the green hay at a single site as part of a hand scything training day. The site is a 0.13Ha meadow located in the south of Radnorshire adjacent to a larger meadow. The training took place over 3 days and included training participants in hand scything, spreading, turning, racking and hand baling.

The *hand bailer was purchased for £200 by the Trust from the Knighton Men's Shed, a small charity which makes bespoke timber items on request.



Hand racking

(Photo: Darylle Hardy)



Donor site D5

(Photo: Darylle Hardy)



Hand scything

(Photo: Darylle Hardy)



Hand baling

(Photo: Darylle Hardy)

The training event yielded 20 bales and 5.5 m³ which was collected in dumpy bags.

Receptor site RD – Donor site D5

This 0.5Ha site is a damp field near the river Wye and received 2 Dumpy bags (2m³) of green hay. The field had been topped twice and raked but wasn't cut low enough to expose the soil.

Receptor site RE – Donor site D5

The meadow at this 0.5Ha site was well prepared and received 2.5 Dumpy bags (3m³) of green hay which was thinly spread.

Receptor site RF – Donor site D5

This small bank measuring 0.015Ha had been completely cleared of vegetation and received 1 Dumpy bag (1m³) of green hay.



RF Cleared bank

(Photo: Darylle Hardy)

Hand-powered green hay harvesting training event - costs:

Hand scything	Amount
Costed as a training event	£525
*Green hay small bales	20
*Green hay Dumpy bags (Approximately 22 bales, based on 4 bales per bag)	5.5
Staff time (hours)	21
Total bales	42
Hay cost per bale	£12.50
Total cost	£525

*The green hay produced was a byproduct of the training day.

*The cost of the hand baler has not been included as it is a capital investment for the Trust and will be used outside of the Study.

Hand-powered green hay harvesting conclusion

The training day was very successful with outcomes met and sixteen people taking part and learning new skills. The whole field was cut and the green hay that couldn't be baled was put into Dumpy bags.

Even though the green hay was produced as a byproduct of the training day, the cost of running the event was equivalent to the cost of hiring the same company to scythe and bale the hay. Thus, the final cost per hay bale, £12.50 per bale, slightly more than the £11.16 per bale achieved in the powered green hay harvesting in the Breconshire part of the Study.

CASE STUDY: Independent hand-powered hay making experience

Separate from the work carried out by the Wildlife Trusts are the experiences of another landowner. One of their fields has restricted access and cannot be accessed by a tractor. They decided to hire a contractor to carry out hand scything, racking and baling on the 0.2Ha field.

When the contractor visited the site in June, temperatures had been relatively low during May and June, consequently the meadow was under-developed at that time. The contractor assumed that there would be a dominance of grass as in a typical meadow and did not notice how much Knapweed, Meadowsweet and thistle there was in the sward. After visiting the site, the contractor offered an estimate of between £495 and £720 itemised in the table below, charging £15.00 per hour per person and having two people doing the harvest.

In reality, the sward contained less grass and many tall and woody stems than expected. Additionally, two weeks of wet weather before the contractor started added to the difficulty of managing the sward. This resulted in a considerable under-estimation of the time needed to carry out the job.

In particular, the cutting took almost twice as long as estimated and the shifting and baling took nearly three times longer. The turning required a huge input of 14 hours by volunteers.

Eventually 84 bales were produced, and the contractor agreed to charge the original maximum estimate of £720 giving a price of £8.57 per bale. Had the contractor estimated correctly, the cost per bale would have been £13.06. The bales weigh around 10kg so the landowner should get a good price for them.

It is worth noting that even with all this extra work two ricks were left unbaled.

Task	Estimated time (hours) 2 people	Actual time taken (hours) 2 people	Volunteer time (hours)
Cut	5.5	9	
Initial spread	1	4	0.75
Turning	1.5	3.5	14
Rack up	2	4	4
Shift to house in sheets or bags and hand bale	6.5	16	4
Total hours per person	16.5	36.5	22.75
Total hours 2 people	33	73	
Cost at £15 per hour	£495	£1097.00	
Number of bales	84	84	
Price per bale	£5.89	£13.06	
Actual charge to landowner	£720		
Actual price per bale	£8.57		

Hand powered hay making



Hand scything, racking, stacking and baling (Photos: Darylle Hardy)

Seed Vacuuming

Donor site D6

This upland, organic meadow provided an opportunity to trial seed collection using a Makita leaf blower with a suction option and sweep netting. The hay had already been baled and cut.



Upland Meadow D6
(Photo: Darylle Hardy)



Makita leaf blower
(Photo: Darylle Hardy)

Leaf blower

Two methods of seed collection were tried. In the first field seed that had fallen to the ground during baling was vacuumed from the ground into the attached collection bag and then transferred to large buckets. As a consequence, significant quantities of hays stalks were also vacuumed so the collection bag and the tubs filled up quickly. In the second field, which had not been cut, seeds were sucked directly from standing plants into the collection bag and stored in fine net bags.



Method 2, sucking seed directly from the standing plants *(Photo: Stephanie Coates)*



Hay and seed from both collection methods
(Photo: Darylle Hardy)

Sweep net

Sweep netting was also tried and was thought to be more effective as some seed appeared to be lost through the leaf blower collection bag vent.

Seed vacuuming conclusion

Using a leaf blower on vacuum mode is an efficient way of collecting seed from the ground and from standing seed. It only took around 20 minutes to collect two buckets of seed from the ground and another 20 minutes to collect two bags of seed from standing plants.

Sweep netting seed from standing plants was effective but more labour intensive. Seed from all methods was distributed to garden owners who wished to convert their lawns to meadows.

One owner compared two adjacent plots by sowing one plot with the seed collected from the ground and the other seed collected from standing plants.

GREEN HAY

Valuing green hay

A range of organisations are using green hay to improve receptor sites including [Save our Magnificent Meadows](#), the [National Botanic Garden of Wales](#), the [Marches Meadow Group](#), [Caring for God's Acre](#) and [Plantlife's Meadow Makers Project](#). None of these organisations have, as yet, put a financial value on green hay.

However, one of them, the Marches Meadow Group, has been working on establishing a value. So far, they have established that there should be two grades of green hay according to the seed content, and consequently two prices, but have not determined what those prices are, except to say that £6/bale is too low.

The value of hay is usually determined by its nutritional value. With green hay the nutritional value is not a consideration. Nevertheless, in valuing green hay, it is useful to consider the current cost of meadow hay shown in the table below. It is worth noting that the cost of hay is high this year due to the dry summer.

Bale	Bales per tonne	Price per tonne	Price per bale
Large round	3	£140	£46.60
Large square	2	£140	£70
Small square	30	£150	£5

The current value of meadow hay by bale

Who is selling green hay commercially

Only two commercial sellers have been identified. Locally, a hay and straw merchant has been involved in selling meadow hay specifically for spreading at £130/tonne, equivalent to £4.30 per small bale. While this hay is not from a wildflower meadow, it does contain some wildflowers and is characterised by soft stemmed pasture grasses. The purpose, however, remains the same, to improve the quality of the hay produced on the receptor field.

A seed company based in SW England is selling green hay, cut and loaded for £50/line, equivalent to 1 round bale weighing 350KG costing £143/tonne. This hay contains 28 species of wildflowers and grasses.



Green hay sold at £50/line (Photos: Goren Farm Seeds)

What will people pay for green hay?

Feedback from local landowners indicates that the majority will only pay £1 more than normal hay. Two responded that they would pay the same as normal hay.

Advantages and disadvantages of green hay harvesting

Advantages

Commercial collection of green hay is not viable as combine- and brush-harvesters do not pick up the finer species which grow low down in the sward. These species, such as eyebright, lesser stitchwort, mouse-eared chickweed and tormentil are all hard to grow commercially from seed.



Eyebright (Photo: Caroline Gellor)

Mowing and collecting green hay provides the flexibility needed to obtain these species. Timing of the cut can be made to coincide with the ripening of these species, and mowing can be selective to allow the finer species to be collected by hand earlier or later than the traditional hay cut.

Even with the cost of hiring contractors and machinery, green hay harvesting is far cheaper than buying in wildflower meadow seed.

Disadvantages

The two biggest difficulties in collecting and distributing green hay is the time between collecting at the donor site to spreading at the receptor site and the preparedness of the receptor site.

Trampling by sheep, cattle or ponies after the seed has dropped is also necessary to embed the seed into the soil. If livestock are not available a roller can be used or people can stamp over the ground.

Commercial selling of green hay is only viable in the immediate local area to production. Delivery should ideally be made within 3 hours of cutting, but if stored correctly may be extended to 24 hours.

Both commercial producers and NGOs experience the same problems with the logistics of organising the cutting, spreading and preparation of receptor sites and the availability of contractors. All of this is also weather dependent. Wet weather defers cutting and dry weather results in dry, hard fields that are difficult to prepare.

Another concern using green hay is that both early flowering plants may have already shed their seed and late flowering plants may still be in flower. However, as was the case in this study, these species' seeds can be collected separately and spread by hand.

In this study the cost of the hay has been determined by either the cost of production, £12.50-£11.60 per bale, or at a price set by the landowner (£6 per bale). Which of these is correct?

It is clear from the independent hand-powered hay making experience that the make-up of the hay can dramatically affect the price per bale. The initial estimate would have worked out at just under £6 per bale, but the reality of the quantity of tough stems resulted in a cost of £13/bale. This difference may be put down to a poor estimate of the job or it may just be the nature of the beast. The quality of the hay is as much determined by weather as it is by management.

Certainly, compared to the price of seed, green hay is easily the cheaper option.



CASE STUDY: Commercial Green Hay Experience – Goat Farm

(Photo: Frank Hunter, Piper Hole Farm)

This goat farm is a traditional family run hill farm set on the borders of the Westmorland Dales and the Yorkshire Dales National parks. The farm is “Holistically” managed and has been for several generations, there are no artificial inputs.

The farm has SSSI meadowland which was covered by an agri-environment scheme to help protect and enhance plant diversity. The meadows are recognised as Cumbria’s first Coronation Meadows.

The goat-grazed pastures are equally rich and diverse. The animals benefit from this rich, herbal, nutrient source. The medicinal qualities of the meadow grass are down to the microbiota and micronutrient content. Only upland cattle can tolerate this biota. The importance of protecting the meadows from external contamination is paramount and no hay is imported to the site. In winter the animals are housed and fed on the crop taken from the herbal meadows.

Coronation Meadows

This was an appointment by Prince Charles whereby 60 counties throughout the UK would each have a meadow that would donate seed to a recipient site within the county to produce another hay meadow in a bid to enhance and increase the numbers of traditional hay meadows throughout the UK.

Coronation Meadows - In partnership with Plantlife, Wildlife Trusts and Rare Breeds Survival Trust

The farm was involved in commercial green hay harvesting for 15 years, selling to farms and landowners within a 10-mile radius.

The business regularly encountered problems which directly affected the amount of time devoted to the business. The summer climate in the Westmorland and Yorkshire Dales was cool and wet, often hampering harvesting. Receptor site readiness was also a problem. But, most importantly, the business yielded a very poor monetary return.

Added to all this was the need to buy in winter hay to feed the goats. This led to contamination of the meadows with other crops, especially robust grasses such as Timothy and Soft Brome. Eventually the nutritional and medicinal value of the green hay to the farm’s animals outweighed the value of the green hay as a sellable crop.

SEED HARVESTING

Harvesting seeds – rules and regulations

The regulations regarding green hay and seed appear, at first glance, to be daunting. However they are not as complicated as they seem. Firstly, let's look at the Exemptions:

- Green hay harvested from a donor site and spread directly on a receptor site is not considered to be seed and is therefore not covered by this legislation.
- Seed donor and receptor sites under the same ownership do not need a licence.

These exemptions are clear. No licence required for donating green hay, no licence required for moving seed from site to site under the same ownership.

With prices for wildflower seed mixes varying greatly, from £200/acre (£494/Ha) for a basic grass rich meadow seed to £740/acre (£1,827/Ha) for conservation grade wildflower mix with no grass, it is sensible to consider whether the Trusts can sell or donate their seed to other wildflower sites.

The answer to this question lies in the Seed Marketing Regulations 2011 and the given definition of marketing. View the full regulations at [Seed Marketing Regulations](#).

Under the Seed Marketing Regulations 2011 marketing is defined as:

“Meaning of “marketing”

2.— (1) In these Regulations “marketing” means the sale, holding with a view to sale, offer for sale or any disposal, supply or transfer aimed in each case at commercial exploitation of seed to third parties, whether or **Preservation Mixture** not for consideration.

(2) But marketing does not include trade that is not aimed at commercial exploitation, such as—

(a) the supply of seed to official testing and inspection bodies; or

(b) the supply of seed to a person who provides processing services but who does not acquire title to the seed.”

According to this definition the distribution of harvested seed to not-for-profit community groups and small landowners such as gardeners is permissible, providing that no profit is made from the resulting hay or seed grown from the donated seed.

However, the distribution of harvested seed to landowners who will then profit from the resulting hay is **not** permissible unless authorisation has been obtained from the National Institute of Agricultural Botany (NIAB), which runs the seed certification scheme on behalf of the Animal and Plant Health Agency (APHA).

In summary, who can profit from the hay grown from donated seed?

- Anyone who grazes livestock on the hay grown from the donated seed
- Anyone who sells the hay grown from the donated seed
- Anyone who collects and sells the seed grown from the donated seed

Preservation Mixture

The harvested seed is known as a preservation mixture. The official definition is as follows:

‘Means a mixture containing seed of prescribed (regulated) species of Fodder Plants covered by Schedule 1 of the Seed Marketing Regulations and is exempt from some of the usual requirements, in particular for variety registration and seed certification. The mixture may also contain seed of plants that are not covered by the legislation. Mixtures consisting entirely of non-prescribed species do not require authorisation.

Preservation mixtures are of species and ecotypes compatible with specific natural and seminatural habitats and intended for use in preservation of the natural environment and the conservation of plant genetic resources.’

It is important to note that many of the species found in preservation mixtures, such as grasses, trefoils, clovers and vetches are prescribed (regulated) species and authorisation is required. A list of Schedule 1 Species, Seed marketing regulations can be seen in Appendix 1. A guide to applying for an authorisation to market preservation mixtures consisting of crop-grown or directly harvested uncertified fodder plant seed can be found in Appendix 2.

Route to marketing seed

Step 1

Obtain a licence from the APHA for the purpose of seed marketing operations under the Seed Marketing Regulations. This is a straightforward form filling exercise. Once you are licensed the APHA will visit your site once a year.

Step 2

Register the donor and receptor sites by filling in a spreadsheet. This should be carried out in the spring of the year seed harvesting will take place. The APHA also need to know whether you

are moving ‘prescribed (regulated) species of Fodder Plants’ covered by Schedule 1 of the Seed Marketing Regulations. These species include fine grasses such as common bent and sweet vernal grass, as well as fodder grasses like cock’s foot and herbs such as red and white clover and vetches. If any of these species are present, they must be noted on the spreadsheet. Required information for the route to marketing and the information needed can be found in Appendix 3.

Name of collection site(s) (e.g. farm, nature reserve)	RLR no	Grid ref (at least 6 fig)	Source habitat (habitat type on collection site) See Section 3 below.	Crop-Grown only: Species and sub-species if relevant (scientific & common name)	Crop-grown only: multiplication site(s) of each component	Directly Harvested applications only: Species/sub-species typical of habitat type	Year(s) of collection	Source Area
Lower Farm	TQ12 34 5678	TQ12 3342	Lowland Meadow	Festuca rubra ssp rubra, Red fescue	Upper Farm, Long Road, Old Town. AB1 2CD		2010	East Sussex
As above	As above	As above	As above	Trifolium pratense, Red clover	As above		2009	East Sussex
High ground local nature reserve	TQ22 34 5678	TQ22 35 3425	Lowland Calcareous Grassland	Agrostis capillaris Common bent	As above		2010	East Sussex

Spreadsheet to register donor and receptor sites

Step 3

Retain a 100g sample of all seed collected in a container. The sample and container should be labelled with reference to the relevant spreadsheet and stored for 3 years. The APHA will check the storage and labelling every 2 years.

Seed harvesting from a SSSI

For SSSI seed harvesting, consent must be obtained from Natural Resources Wales 4 months before you start harvesting.

Advantages of seed harvesting

Harvesting seed is less labour intensive than making green hay. It can be relatively quick to produce significant quantities of seed. Three methods of seed harvesting were tested in this study:

Quad bike drawn seed harvester – This method of seed collection involved 16 hours of staff time to produce 7kg of seed, whereas green hay making took 21 hours of staff time and 16 volunteers to bring the hay in.

Vacuum leaf blower – Easy to use and portable, the leaf blower is much easier to use and produced 0.5kg in 20 minutes. It can be used to suck seed off the ground and from standing plants. It is particularly useful for collecting early and late fruiting plant seed.

Sweep netting is more labour intensive than the leaf blower but can only collect seed from standing plants. Again, it is useful for collecting early and late fruiting plant seed.

Disadvantages of seed harvesting

The most obvious disadvantage is having to obtain a licence and register donor and receptor sites in order to donate to sites which may achieve some future value from the donated seed. However, once the licence has been obtained, the registration of sites is straightforward. No seed analysis is required.

Using the quad drawn seed harvester presents several problems. It needs an off-road capability truck and trailer to get it to site, it uses carbon-based fuel and therefore contributes to air pollution, and it is tricky to manhandle due to its weight. It requires two, fit members of staff.

The main disadvantage of the leaf blower is the battery run time, lasting only 20 minutes on a full charge. This is a considerable drawback given the remote locations of the sites. There is, however, a petrol version, which will use less fuel than the quad drawn seed harvester.

KEY LEARNING POINTS

Green hay

- Organisation is key, ensuring Donor and Receptor sites are prepared and contractors hired for a specific date.
- Green hay must be cut and spread within 3 hours.
- Readyng the receptor site is crucial to the success of the green hay. If the ground is not sufficiently broken down by harrowing or scarifying, then the seed will not drop onto bare soil.
- Donor fields should be inspected before cutting to identify any species whose seed has not ripened. If possible, these species should be left uncut and hand collected when ripe.
- Similarly, regular inspections of the donor field should identify early ripening seeds which can then be collected by hand.

Seed harvesting

Donating seed

- Locally collected seed can be donated to community groups and individuals providing they will not make any financial gain from growing the donated seed. This includes selling the resulting hay or seed and grazing with animals that will later be sold.
- Like green hay, locally produced seed is preferable as it more likely to be adapted to local conditions.
- As long as it is properly stored, locally harvested seed does not have to be spread within a specific time limit.
- Receptor sites must be properly prepared by mowing and removing and scarifying or harrowing to create bare soil patches to receive the seed. Trampling by livestock is also advisable to embed the seed in the ground.

Selling seed or donating seed to commercial ventures

- A licence from the APHA is required in order to sell seed commercially. It is also required if you are donating seed to someone who will subsequently 'market' the products of the seed.
- In the case of donating seed, Donor and Receptor sites must be registered with the APHA.
- Seed samples must be retained and labelled and stored for 3 years.
- If you are harvesting seeds from a SSSI permission from the NRW must be obtained 4 months before the harvesting begins.

RECOMMENDATIONS

Green Hay

Green hay harvesting and spreading is an excellent method of spreading seeds of local provenance to improve existing meadows or create new ones. It is particularly suitable for local projects where Donor and Receptor sites are within easy reach of each other.

There are many benefits to using locally produced seed to improve and create meadows. The donor plants are adapted to the soil conditions, the climate and have a certain resistance to local pests and diseases. In addition, the role of mycorrhizal associations cannot be underestimated in the successful transfer of green hay.

Green hay harvesting can be undertaken as part of a wider funded scheme such as Coronation Meadows or Plantlife's Making Meadows project, as locally funded projects or by agreement with local landowners.

Green hay, however, is not a viable business proposition. The market size is limited due to the short time between cutting and spreading and the location of Receptor sites within 10 miles of the Donor site. This is especially true in upland areas where farms are large and often split up over wide areas.

Seed harvesting

When donating seed to community groups or small landowners, where no financial gain will be made, there is no necessity to obtain an APHA licence.

In the case of donating seed to a Receptor site which will subsequently make a financial gain from the seed by selling the hay, seed or grazing livestock on the resulting hay, it is a simple case of filling in an application form for a licence for seed marketing operations. Once the licence has been obtained, register the Donor and Receptor sites by filling in the spreadsheet with the relevant information. Include any 'prescribed (regulated) species of Fodder Plants' covered by Schedule 1 of the Seed Marketing Regulations. This can be achieved at little or no cost.

Seed harvesting is best achieved using a combination of all three methods, quad drawn seed harvester, vacuum leaf blower and hand sweep netting to obtain maximum yield and to cope with remote locations.

Appendices

Appendix 1

SCHEDULE 1

Seed to which these Regulations apply

<i>Plants to which the Regulations apply</i>	<i>Common name (for guidance only)</i>
Beet	
<i>Beta vulgaris</i> L.	sugar beet, fodder beet (including mangel)
Cereals	
<i>Avena nuda</i> L.	small naked oat, hullless oat
<i>Avena sativa</i> L. (includes <i>A.byzantina</i> K. Koch)	oats and red oat
<i>Hordeum vulgare</i> L.	Barley
<i>Secale cereale</i> L.	Rye
<i>Triticum aestivum</i> L.	Wheat
<i>Triticum durum</i> Desf.	durum wheat
<i>Triticum spelta</i> L.	spelt wheat
x <i>Triticosecale</i> Wittm. ex A. Camus – hybrids resulting from the crossing of a species of the genus <i>Triticum</i> and a species of the genus <i>Secale</i>	Triticale
<i>Zea mays</i> L. (partim)	maize (except popcorn and sweetcorn)
Fodder plants	
Fine grasses:	
<i>Agrostis canina</i> L.	velvet bent
<i>Agrostis capillaris</i> L.	brown top
<i>Agrostis gigantea</i> Roth	red top
<i>Agrostis stolonifera</i> L.	creeping bent grass
<i>Festuca filiformis</i> Pourr.	fine leaved sheep's fescue
<i>Festuca ovina</i> L.	sheep's fescue
<i>Festuca rubra</i> L.	red fescue, Chewings fescue
<i>Festuca trachyphylla</i> (Hack.) Krajina	hard fescue

<i>Plants to which the Regulations apply</i>	<i>Common name (for guidance only)</i>
<i>Poa annua</i> L.	annual meadowgrass
<i>Poa nemoralis</i> L.	wood meadowgrass
<i>Poa pratensis</i> L.	smooth-stalked meadowgrass
<i>Poa trivialis</i> L.	rough-stalked meadowgrass
<i>xFestulolium</i> Asch. & Graebn. – Hybrids resulting from the crossing of a species of the genus <i>Festuca</i> with a species of the genus <i>Lolium</i>	Festulolium

Fodder grasses:

<i>Arrhenatherum elatius</i> (L.) P.Beauv.ex J. Presl & C. Presl	tall oatgrass
<i>Bromus catharticus</i> Vahl.	rescue grass
<i>Bromus sitchensis</i> Trin.	Alaska brome-grass
<i>Dactylis glomerata</i> L.	Cocksfoot
<i>Festuca arundinacea</i> Schreber	tall fescue
<i>Festuca pratensis</i> Huds.	meadow fescue
<i>Lolium multiflorum</i> Lam.	Italian ryegrass including Westerwold ryegrass
<i>Lolium perenne</i> L.	perennial ryegrass
<i>Lolium x boucheanum</i> Kunth	hybrid ryegrass
<i>Phleum nodosum</i> L.	small timothy
<i>Phleum pratense</i> L.	Timothy

Small seeded legumes:

<i>Lotus corniculatus</i> L.	birdsfoot trefoil
<i>Medicago lupulina</i> L.	trefoil, black medick
<i>Medicago sativa</i> L.	Lucerne
<i>Medicago x varia</i> T. Martyn	sand lucerne
<i>Onobrychis viciifolia</i> Scop.	sainfoin
<i>Trifolium hybridum</i> L.	Alsike clover
<i>Trifolium pratense</i> L.	red clover
<i>Trifolium repens</i> L.	white clover

<i>Plants to which the Regulations apply</i>	<i>Common name (for guidance only)</i>
--	--

Large seeded legumes:

<i>Lupinus albus</i> L.	white lupin
<i>Lupinus angustifolius</i> L.	narrow leaved lupin (previously known as blue lupin)
<i>Lupinus luteus</i> L.	yellow lupin
<i>Pisum sativum</i> L. (partim)	field pea
<i>Vicia faba</i> L. (partim)	field bean
<i>Vicia pannonica</i> Crantz	Hungarian vetch
<i>Vicia sativa</i> L.	common vetch
<i>Vicia villosa</i> Roth	hairy vetch

Crucifers:

<i>Brassica napus</i> L. var. <i>napobrassica</i> (L.) Rchb.	Swede
<i>Brassica oleracea</i> L. convar. <i>acephala</i> (DC.) Alef. var. <i>medullosa</i> Thell. + var. <i>viridis</i> L.	fodder kale
<i>Raphanus sativus</i> L. var. <i>oleiformis</i> Pers.	fodder radish

Oil and fibre plants

<i>Brassica juncea</i> (L.) Czern.	brown mustard
<i>Brassica napus</i> L. (partim)	swede rape (including plants commonly known as fodder rape and oilseed rape)
<i>Brassica nigra</i> (L.) W.D.J. Koch	black mustard
<i>Brassica rapa</i> L. var. <i>silvestris</i> (Lam.) Briggs	turnip rape
<i>Cannabis sativa</i> L.	Hemp
<i>Glycine max</i> (L.) Merr.	soya bean
<i>Helianthus annuus</i> L.	Sunflower
<i>Linum usitatissimum</i> L.	flax, linseed
<i>Sinapis alba</i> L.	white mustard

Vegetables

<i>Allium cepa</i> L. (Cepa Group)	onion, Echalion
<i>Allium porrum</i> L.	Leek

<i>Plants to which the Regulations apply</i>	<i>Common name (for guidance only)</i>
<i>Apium graveolens</i> L.	celery, celeriac
<i>Asparagus officinalis</i> L.	Asparagus
<i>Beta vulgaris</i> L.	beetroot including Cheltenham beet, spinach beet and chard
<i>Brassica oleracea</i> L.	Brussels sprouts, cauliflower, curly kale, kohlrabi, red cabbage, Savoy cabbage, sprouting broccoli or calabrese, white cabbage
<i>Brassica rapa</i> L.	Chinese cabbage, turnip
<i>Cichorium endivia</i> L.	endive (curled-leaved, plain-leaved)
<i>Cichorium intybus</i> L.	large-leaved (Italian) chicory
<i>Cucumis melo</i> L.	Melon
<i>Cucumis sativus</i> L.	cucumber, gherkin
<i>Cucurbita maxima</i> Duchesne	Gourd
<i>Cucurbita pepo</i> L.	marrow or courgette
<i>Daucus carota</i> L.	carrot, fodder carrot
<i>Lactuca sativa</i> L.	Lettuce
<i>Lycopersicon esculentum</i> Mill	Tomato
<i>Petroselinum crispum</i> (Mill) Nyman ex A.W Hill	Parsley
<i>Phaseolus coccineus</i> L.	runner bean
<i>Phaseolus vulgaris</i> L.	French bean (dwarf, climbing)
<i>Pisum sativum</i> L. (partim)	wrinkled pea, round pea, sugar pea
<i>Raphanus sativus</i> L.	radish, black radish
<i>Spinacia oleracea</i> L.	Spinach
<i>Vicia faba</i> L. (partim)	broad bean
<i>Zea mays</i> L. (partim)	sweet corn, popcorn

Appendix 2

Annex 7 – Guide to applying for an authorisation to market preservation mixtures consisting of crop-grown or directly harvested uncertified fodder plant seed

INTRODUCTION

The requirements for marketing Fodder seed preservation mixtures in England have been revised following the introduction of new European legislation (Commission Directive 2010/60/EU) and corresponding English regulations. This guide explains the procedure for applying for an authorisation.

1. DEFINITIONS

a. Preservation Mixture

Means a mixture containing seed of prescribed (regulated) species of Fodder Plants covered by Schedule 1 of the Seed Marketing Regulations and is exempt from some of the usual requirements, in particular for variety registration and seed certification. The mixture may also contain seed of plants that are not covered by the legislation. Mixtures consisting entirely of non-prescribed species do not require authorisation.

Preservation mixtures are of species and ecotypes compatible with specific natural and seminatural habitats and intended for use in preservation of the natural environment and the conservation of plant genetic resources.

Note: 'Green hay' harvested from a donor site and spread directly on a recipient site without processing is not considered to be seed and is therefore not covered by this legislation.

b. Region of origin

This will be the UK unless Animal and Plant Health Agency or the Devolved Administrations have a specific reason to draw it more tightly. Seed of preservation mixtures may only be marketed in the region of origin.

c. Source area

Means an area within the region of origin designated as a special area for conservation or recognised as a UK Biodiversity Action Plan (BAP) priority habitat. The location of the BAP Priority Habitat can be defined at the National Character Area (NCA) level, County/Local Authority level, by Area of Outstanding Natural Beauty (AONB), or Site of Special Scientific Interest (SSSI) the seed is collected from.

d. Collection Site

Means a site within the source area from which the seed is collected. It must not have been sown with agricultural or amenity varieties in the 40 years prior to the date of the application by

Dec 2016 Page 108 of 136

the producer.

e. Crop-Grown seed

Means seed of individual species taken from a collection site and multiplied outside the site as single species. It may then be used to create a mixture typical for the habitat type of the collection site.

f. Directly harvested seed

Means a seed mixture marketed as harvested from the collection site with or without further cleaning.

g. Legislation:

Commission Directive 2010/60/EU

Fodder Plant Seed Marketing Directive 66/401/EEC

The Seed Marketing Regulations 2011

2. GENERAL REQUIREMENTS FOR APPLICATIONS FOR AN AUTHORISATION

a. Applicants wanting to market preservation mixtures of crop-grown or directly harvested uncertified fodder plant seed must be licensed for the purpose of seed marketing operations under the Seed Marketing Regulations.

b. Preservation mixtures may not be marketed until an authorisation has been approved and confirmed in writing (see Section 3 for details of how to apply). Authorisation conditions include the reporting requirements in paragraph 8 below.

c. Once the applicant has been licensed for seed marketing operations and an authorisation for preservation mixtures has been confirmed, the mixture may be marketed freely within the region of origin, subject to the conditions set out in the authorisation. The prescribed species in the mixtures must be those stated in the authorisation.

d. The authorisation will last for one year after which it can be renewed.

e. For crop-grown seed, multiplication after collection from the original site may take place for five generations.

f. For prescribed species in crop-grown mixtures, each batch of seed must be tested at an Official or Licensed Seed Testing Station to determine germination and ensure that certified seed standards for analytical purity and other seeds are met. Certified seed standards can be found in Annex II of the Fodder Plant Seed Marketing Directive 66/401/EEC. Ideally, seed should be sampled by a Licensed Seed Sampler (contact Seed Marketing Team at Animal and Plant Health Agency for information on Seed Sampler courses).

g. Visual inspection of the collection site of a directly harvested mixture may be necessary to assess some requirements in the legislation. Any inspections will be overseen by Natural England.

Dec 2016 Page 109 of 136

3. APPLYING FOR AN AUTHORISATION

The information required in an application for authorisation to market preservation mixtures is set out at the end of this Annex. It should be sent to the Seed Marketing Team at Animal and Plant Health Agency (preferably on an Excel spreadsheet) by email to seed.cert@apha.gsi.gov.uk. If you require advice or guidance about applying for an

authorisation please email or telephone 0208 02 65718.

4. SEALING OF PACKAGES AND CONTAINERS

- a) Preservation mixtures may only be marketed in closed and sealed packages or containers.
- b) The sealing system shall be at least the label or a separate seal.
- c) The packages or containers shall be sealed so they cannot be opened without damaging the seal or leaving evidence of tampering on the producer's label or on the package or container.

5. LABELLING - SUPPLIER'S OWN

Each package or container must be labelled with a pink label with the following information:

1. Inscribed 'EU rules and standards'
 2. Name and address of the person responsible for labelling or his licensing number.
 3. Harvesting method: whether directly harvested or crop-grown.
 4. Year of sealing expressed as: 'sealed.....'(year)
 5. Region of origin (as specified in the application)
 6. Source area (as specified in the application)
 7. Collection site(s). Alternatively, for crop-grown mixtures, if the number of collection sites is high, information about the sites can be provided separately.
 8. Habitat type¹ of the collection site
 9. The words 'preservation seed mixture'
 10. Reference number of the lot
 11. For crop grown mixtures, the percentage by weight of the components as species and, where relevant, subspecies. Alternatively, the mixture can be given a name and information about the components provided separately.
 12. For directly harvested mixtures, the components as species and, where relevant, subspecies typical of the habitat type of the collection site with approximate percentage weights. Alternatively, the mixture can be given a name and information about the typical components provided separately.
 13. Declared net or gross weight
 14. For crop-grown mixtures, a specific germination rate for components which do not meet the relevant germination standard set out in the regulations. Where the number of required specific germination rates is more than five, an average can be given
- 1 Habitat of intended use taken from the BAP classification. Suppliers may also add a less technical descriptor e.g. chalk downland mix (as well as Lowland Calcareous Grassland).

Dec 2016 Page 110 of 136

15. Any chemical treatment if applicable

6. COMPANY RECORDS

Information relating to marketing seed of preservation mixtures, including a list of all components and their source, must be retained for at least three years and made available for inspection by an official from Animal and Plant Health Agency.

7. SEED SAMPLES

A sample representing each seed lot must be kept for one year and made available to an official from Animal and Plant Health Agency.

8. REPORTING INFORMATION TO ANIMAL AND PLANT HEALTH AGENCY

At the beginning of each season, producers must provide Animal and Plant Health Agency (Seed Marketing Cambridge) with information on the size and location of their intended collection and seed multiplication sites together with an estimate of quantities for marketing in the coming year. Producers are required to provide details, no later than 30 June, of the amount of seed of preservation mixtures marketed in the previous season. This can be done at the same time as renewing authorisations.

Appendix 3

REQUIRED INFORMATION

1. General

Crop-Grown and Directly Harvested

- Name and address of producer and licence number.
- Harvesting method (direct or crop grown)
- Region of origin (e.g. England, UK)
- Collection site, Rural Land Register reference, grid reference
- Source Area
- Source habitat type
- Year of collection
- Habitat of intended use (this should be the same as source habitat)

Crop-Grown

• For crop-grown seed, the application should list all of the prescribed species that have been or will be collected and subsequently bulked up as cropgrown seed for marketing in mixtures.

- Multiplication site(s)
- % by weight of components

Directly Harvested

- Species and sub-species typical of habitat type

2. Origin

Example of required information on origin of seed;

Name of collection site(s) (e.g. farm, nature reserve)	RLR no	Grid ref (at least 6 fig)	Source habitat (habitat type on collection site) See Section 3 below.	Crop-Grown only: Species and sub-species if relevant (scientific & common name)	Crop-grown only: multiplication site(s) of each component	Directly Harvested applications only: Species/sub-species typical of habitat type	Year(s) of collection	Source Area
Lower Farm	TQ12 34 5678	TQ12 3342	Lowland Meadow	Festuca rubra ssp rubra, Red fescue	Upper Farm, Long Road, Old Town. AB1 2CD		2010	East Sussex
As above	As above	As above	As above	Trifolium pratense, Red clover	As above		2009	East Sussex
High ground local nature reserve	TQ22 34 5678	TQ22 35 3425	Lowland Calcareous Grassland	Agrostis capillaris Common bent	As above		2010	East Sussex

3. Habitat(s) of intended use (i.e. the natural or semi-natural habitat for which the mixture is suitable)

UK BAP Priority Habitat types (Please tick as appropriate)	Machair Maritime cliff and slopes Mesotrophic lakes Mudflats Native pine woodlands Open mosaic habitats on previously developed land Purple moor grass and rush pastures Reedbeds Traditional orchards Upland calcareous grassland Upland hay meadows Upland heathland Upland mixed ashwoods Upland oakwood Upper birchwoods Wet woodland Wood-pasture and parkland Other (if 'other' ticked, please provide additional notes - see below)
Arable field margins Blanket bog Calaminarian grasslands Coastal and floodplain grazing marsh Coastal saltmarsh Coastal sand dunes Coastal vegetated shingle Hedgerows Limestone pavements Lowland beech and yew woodland Lowland calcareous grassland Lowland dry acid grassland Lowland fens Lowland heathland Lowland meadows Lowland mixed deciduous wood Lowland raised bog	

Append separate details describing any 'other' habitats for which mixtures will be marketed and describe how the re-creation of these habitats will contribute to the conservation of genetic resource. (Note: this can be explained in terms of rarity of past destruction of habitat type and likely associated loss of genetic diversity).