

TEESDALE MOORLAND BIOMASS PROJECT

Heather has the potential to replace peat-based compost – and trials are assessing the most sustainable way to harvest and process this untapped natural resource.

England alone is home to around 350,000ha of managed moorland – a sizeable percentage of the estimated 1m ha or more that covers the British Isles and Ireland.



Although steeped in tradition and history, the practice of burning heather in order to manage moorlands is not the only way to tackle the needs of land managers. This project is investigating ways that retain the benefits to the landowner for vegetation control, but also adds a potentially lucrative additional revenue stream from the asset that is literally growing wild on the moors. Controlled burning on moorland is controversial but effective; but harvesting the heather achieves very much the same effect, has none of the downsides, and has the benefit of a commercially viable product and revenue stream.

Moorland has a diverse ecology, from lower lying wetlands to the uplands and hills. It supports an abundance of wildlife and vegetation, including species which rely on a single defined geographic location. But it has to be managed – and that presents an opportunity for better use of natural resources, which the Teesdale Moorland Biomass Project is seeking to understand. If left unmanaged, heather, grasses, gorse, bracken, and bilberry, become overgrown and invasive, forming tall, dense swathes of vegetation. This has negative, and potentially disastrous, consequences for moorland life:

- Loss of ground-nesting and hunting sites for vulnerable species like skylark and short-eared owl, respectively.
- Lack of moisture getting to soils, drying peat soils and increasing carbon emissions.
- Uncontrollable wildfires.
- Loss of grazing areas and grouse habitat, impacting rural enterprises and communities.

Moorland vegetation has traditionally been managed using methods like grazing, cutting and controlled burning. However, there is now increasing pressure to end reliance on controlled burning as a land management practice.

Project

Recognising this change in social licence, Ewan Boyd, director at North Pennines-based company Teesdale Environmental Consulting (TEC-Ltd) – in collaboration with Sir Edward Milbank of Barningham Estates – started the Teesdale Moorland Biomass project, enabled by the UK Gov funded, Biomass Feedstocks Innovation Programme (BFI).

With potentially up to 30,000ha of heather burned each year in England alone, the project sought to explore a switch from burning heather to using it for commercial biomass production.

The project initially undertook trials on Barningham Estate heather moorland in North Yorkshire to produce a sustainable solid fuel for domestic heating systems. It carried out small and then larger scale harvests to understand harvested crop quality and the impact of machinery on the land, with the crop dried in a bespoke drier and pressed into briquettes.

Despite successfully producing four tonnes of heather briquettes, the products failed to meet 'ready to burn' emissions standards, so the project pivoted from a solid fuel model to composting.

Latest

Maintaining its net zero ambitions, the project is now focused on producing a high value ericaceous compost for the domestic horticultural market.

Heather-based compost is also a strong candidate to replace peat growing mediums. . With a ban of horticultural peat to retail consumers by 2024 and to professional growers by 2028 looming, this stands it in good stead as a high value, sustainable commodity.

The project's new objective is to trial different methods of composting to better understand what can be achieved and at what cost. By May 2024 it will conclude current composting trials, including:

- Thermophilic composting: A slow, traditional process with other feedstocks added to achieve the right carbon: nitrogen balance.
- Two means of rapid composting to produce 'sterile' material:
 - A. Ompico Converter: A large drum which turns and heats the heather at speed, breaking it down and extracting moisture within one to two hours. This process produces dried heather 'flock' and a liquid. The former will be assessed as a peat-free compost medium, the latter as a plant feed or plant health product.
 - B. Biodigester: Access To Profit (ATP Ltd) heather biodigester uses heat and enzymes to create a compost-type product in around 24 hours.

The finished compost will then be subject to a variety of growing trials for the remainder of 2024 to assess its value as a horticultural product.

Within this time frame, to assess the suitability of heather compost as a growing medium, the project will also complete chemical analysis.

"We've successfully produced a sample batch of soil conditioner from the biodigester"

Additionally, it is carrying out yield assessments – based on standing biomass, the terrain, and ground conditions – to calculate the likely harvest yield and associated economics. This will allow for replication on other moorland sites, enabling an informed scale-up of sustainable heather harvesting.

"Initial soil analysis of peatland moisture retention and compaction has shown no degradation"

Soil analysis and harvest method assessments will build upon understanding of the impact on soils and the environment. To date, the impact has been minimal, with slight compaction immediately after harvest, which has naturally recovered within two to three months. Harvesting rotationally over a 10-year cycle, using a low ground pressure all-terrain vehicle to spread the weight across a larger footprint, helps achieve this. Commercially available, this machinery is already proven in its use for peatland restoration.

By its conclusion, under BFI Programme in March 2025, the project aims to have refined and entered its products into the horticultural market. It will have identified best practice for heather harvesting and processing as a valuable biomass commodity. And it will have rolled out its yield assessment methodology for use across other moorland sites.

Beyond the BFI Programme, the project will seek to continue to assess heather harvesting impacts on moorland ecology and develop its products for an evolving market.