

# HEATHLAND ARISING CASE STUDY

## Pantirion Farm | Heath & Hedgerow

### Site details

Pantirion Farm is a 440 acre holding near Llandudoch/St Dogmaels run by Lyn Evans (trading as J.O Evans & Co). Lyn Evans has been farming the land since 1978. The farm rears livestock (beef and sheep), grows forage crops and some vegetables for sale.

Pantirion Farm is currently trying to reduce dependency on non-organic fertiliser inputs and has been experimenting with producing on-farm composting and fertilisers to increase soil fertility. The farm has never used heathland 'arising' or products before.



Peni Ediker (Heath & Hedgerow) and Lyn Evans (Pantirion Farm) working together at the farm

Static Pile Inoculated Compost Extension (SPICE) under plastic sheeting at Pantirion Farm



## Aim

The aim of piloting use of the arisings on Pantirion farm was to produce compost which would add fertility to the land. They were already producing hot compost, so the question was whether the heathland arisings - a waste product - would improve yield and/or quality of their compost.

Another aim was to investigate making biochar from the arisings, and adding this to the on farm compost.

## Outcomes

The heathland arisings were collected by Lyn Evans from the Frenni Fach in November 2022. In June 2023, they are still in static composting piles at Pantirion farm. The arisings have started to compost down, but, will need more time to fully break down. Part of the reason for this is that some of the arisings were too large to break down during the limited time period, and over the colder winter months when the compost piles are less active. Lyn Evans noted that the trailer loads he picked up were mixed - one load looked like it was made up of smaller sized pieces, the other look liked it was made of unusable large pieces.

It is expected that the compost can be sifted and used, but this adds an extra process, time and cost.

The Heath & Hedgerow team was able to support Pantirion Farm to utilise their organic waste products and develop other techniques for their on farm composting. This included:

- making biochar from a mix of the arisings from the Frenni Fach and brash and windfall trees from Pantirion farm (the biochar has been incorporated into the large hot composting piles)
- inoculating biochar (the inoculated biochar will be incorporated into the composting piles and trialed on farm)
- making biofertilisers which have been sprayed and mixed into the static composting piles
- developing other composting techniques (including static pile inoculated compost).

organic matter ready for mixing

# Learning

The main learning from this pilot is that the size of arisings for composting needs to be consistent, and the use of larger arisings were unsuitable for quick composting. Monitoring water content and adjusting gradually (in static pile compost) is more effective than trying to add the exact amount at the start. To further improve the compost quality and produce an alternative to commercial fertiliser, the addition of minerals from basalt rock dust could be a viable alternative.

If used again, the larger arisings should be shredded or chipped before incorporating into the compost heap. It might also be useful to 'bokashi' compost, a process of fermenting plant matter, to begin the decomposition process before incorporating.

For biochar production, dry material is essential. The biochar was made using a Kon Tiki kiln, and the use of farmland windfall brush/trees worked well. We did several smaller burns which took about 2 hours for 250 litres of biochar each. From the learnings on other sites, we estimate we can produce 1000 litres in 4 hours. Through trial and error, we learnt the most efficient method for crushing the biochar into fine powder was rolling over it with a tractor.

Biofertilisers, using plants and products from the farm, was a cost and time effective method which could replace synthetic fertilisers. Due to the limited timeframe of the project, results from this are not yet available.

Pantirion Farm would use the arisings again if the size was smaller, and are interested in trialing their use as animal bedding before incorporating into the composting process.





**Adding rock dust and biochar to the compost pile**



## Next Steps

- Continue to monitor the arisings being composted
- Trial using the Frenni Fach arisings to make biochar.
- Continue to develop the on farming composting trials.
- Research the viability of creating a social enterprise around producing and selling biochar and composts while managing organic waste / biomass effectively and productively.

## Fire Breaks on the Frenni Fach

The Frenni Fach Common is located north of the village of Tegryn in Pembrokeshire. In 2022, Cwm Arian Renewable Energy commissioned a Management Plan, following the desire from graziers and the community to maintain its unique biodiversity.

The common is currently ungrazed, and reintroducing grazing is deemed too difficult and costly at this time. In order to maintain biodiversity and reduce fire risks, the Management Plan identified areas to be cut, and advised the removal of most materials to reduce nutrient levels, leading to increased biodiversity.

In November 2022, Cwm Arian Renewable Energy in partnership with the Pembrokeshire Coast National Park, cut firebreaks on the common and distributed the 'arisings' (cut materials) to farms and smallholdings for trials. The project received funding from Welsh Government Rural Communities - Rural Development Programme 2014 - 2020.

# ASTUDIAETH ACHOS DEILIANNAU RHOSTIR

## Fferm Pantirion | Rhos a Chlawdd

### Manylion busnes/safle

Mae Fferm Pantirion yn ddaliad 440 erw ger Llandudoch sy'n cael ei redeg gan Lyn Evans (sy'n masnachu fel J.O Evans & Co). Mae Lyn Evans wedi bod yn ffermio'r tir ers 1978. Mae'r fferm yn magu da byw (cig eidion) a defaid, yn tyfu cnydau porthiant a rhai llysiau ar werth.

Mae Fferm Pantirion ar hyn o bryd yn ceisio lleihau dibyniaeth ar fewnbynnau gwrrtaith anorganig ac wedi bod yn arbrofi gyda chynhyrchu compost a gwrrtaith ar y fferm i gynyddu ffrwythlondeb y pridd. Nid yw'r fferm erioed wedi defnyddio deiliannau gwastraff rhostir na chynnyrch o'r blaen.

Peni Ediker (Rhos a Chlawdd) a Lyn Evans (Fferm Pantirion) yn gweithio gyda'i gilydd ar Fferm Pantirion



Phentwr Statig Estyniad  
Compost Wedi'i Brechu (SPICE)  
o dan haenau plastig ar Fferm  
Pantirion



## Nod

Bwriad treialu'r defnydd o'r deiliannau ar fferm Pantirion oedd cynhyrchu compost a fyddai'n ychwanegu at ffrwythlondeb y tir. Roeddent eisoes yn cynhyrchu compost poeth, felly'r cwestiwn oedd a fyddai'r deiliannau gweundir - cynnyrch gwastraff - yn gwella cynnyrch a/neu ansawdd eu compost.

Nod arall oedd ymchwilio i wneud bio-ologsg o'r deiliannau gwastraff, ac ychwanegu hwn i'r compost ar y fferm

## Canlyniadau

Casglodd Lyn Evans o rhostir y Frenni Fach ym mis Tachwedd 2022. Ym mis Mehefin 2023, maent yn dal i fod mewn pentyrrau compostio sefydlog ar fferm Pantirion. Mae'r deiliannau wedi dechrau compostio i lawr, ond bydd angen mwy o amser i ddadelfennu'n llawn. Rhan o'r rheswm am hyn yw bod rhai o'r deiliannau yn rhy fawr i'w torri i lawr yn ystod y cyfnod cyfyngedig o amser, a thros fisoedd oerach y gaeaf pan fydd y pentyrrau compost yn llai actif. Nododd Lyn Evans fod y llwythi treilar a gododd yn gymysg - roedd un llwyth yn edrych fel ei fod wedi'i wneud o ddarnau llai o faint, a'r llall yn edrych i fod wedi'i wneud o ddarnau mawr na ellir eu defnyddio.

Disgwylir y bydd modd sifftio a defnyddio'r compost, ond mae hyn yn ychwanegu proses, amser a chost ychwanegol.

Roedd tîm Rhos a Chlawdd yn gallu cefnogi Fferm Pantirion i ddefnyddio eu cynhyrchion gwastraff organig a datblygu techneg arall ar gyfer eu compostio ar y fferm. Roedd hyn yn cynnwys:

gwneud bio-ologsg o gymysgedd o ddeilliannau o'r Frenni Fach a malurion a choed ar hap o fferm Pantirion (mae'r bio-ologsg wedi'i ymgorffori yn y pentyrrau compostio poeth mawr)

brechu bio-ologsg (bydd y bio-ologsg wedi'i frechu yn cael ei ymgorffori yn y pentyrrau compostio a'i dreialu ar y fferm)

gwneud biowrtaith sydd wedi'i chwistrellu a'i gymysgu i'r pentyrrau compostio sefydlog

datblygu technegau compostio eraill (gan gynnwys compost wedi'i frechu mewn pentwr statig).

# Dysgu

Y prif ddysgu o'r peilot hwn yw bod angen i maint y deiliannau ar gyfer compostio fod yn gyson, ac roedd defnyddio deiliannau mwy yn anaddas ar gyfer compostio cyflym. Mae monitro cynnwys dŵr ac addasu'n raddol (pentwr compost statig) yn fwy effeithiol na cheisio ychwanegu'r union swm ar y dechrau. Er mwyn gwella ansawdd y compost ymhellach a chynhyrchu dewis arall yn lle gwrtaiith masnachol, gallai ychwanegu mwynau o lwch craig basalt fod yn ddewis arall ymarferol.

Os caiff ei ddefnyddio eto, dylai'r deiliannau gwastraff mwyaf gael ei rwygo neu ei naddu cyn ei ymgorffori yn y domen gompost. Gallai hefyd fod yn ddefnyddiol compostio 'bokashi', sef proses o eplesu deunydd planhigion, i ddechrau'r broses ddadelfennu cyn ei ymgorffori.

Ar gyfer cynhyrchu bio-olosg, mae deunydd sych yn hanfodol. Roedd y biochar yn cael ei wneud gan ddefnyddio olyn Kon Tiki, ac roedd defnyddio malurion/coed ar dir fferm yn gweithio'n dda. Fe wnaethom sawl llosgiadau llai a gymerodd tua 2 awr am 250 litr o fio-olosg yr un. O'r hyn a ddysgwyd ar safleoedd eraill, rydym yn amcangyfrif y gallwn gynhyrchu 1000 litr mewn 4 awr. Trwy brofi a methu, dysgon ni mai'r dull mwyaf effeithlon o falu'r biochar yn bowdr mân oedd rhoio drosto gyda thractor.

Roedd biowrtaith, gan ddefnyddio planhigion a chynhyrchion o'r fferm, yn ddull cost-effeithiol ac amser-effeithiol a allai ddisodli gwrtaiith synthetig. Oherwydd amserlen gyfyngedig y prosiect, nid yw canlyniadau hyn ar gael eto.

Byddai Fferm Pantirion yn defnyddio'r deiliannau gwastraff eto pe bai'r maint yn llai, ac mae ganddynt ddiddordeb mewn treialu eu defnydd fel gwasarn anifeiliaid cyn eu hymgorffori yn y broses gompostio.



gwneud bio-olosg  
gydag olyn bio-  
olosg Rhos a  
Chlawdd ar Fferm  
Pantirion



## Camau nesaf

- Parhau i fonitro'r deilliannau sy'n cael eu compostio
- Treialu gan ddefnyddio deilliannau Frenni Fach i wneud biochar.
- Parhau i ddatblygu'r treialon compostio ar ffermio.
- Ymchwilio i ymarferoldeb creu menter gymdeithasol o amgylch cynhyrchu a gwerthu bio-ologsg a chompostau tra'n rheoli gwastraff organig / biomas yn effeithiol ac yn gynhyrchiol.

## Atalfeydd Tân ar y Frenni Fach

Mae Comin Frenni Fach i'r gogledd o bentref Tegryn yn Sir Benfro. Yn 2022, comisiynodd Ynni Adnewyddadwy Cwm Arian Gynllun Rheoli, yn dilyn dymuniad y porwyr a'r gymuned i gynnal ei fioamrywiaeth unigryw.

Nid yw'r comin yn cael ei bori ar hyn o bryd, a bernir bod ailgyflwyno pori yn rhy anodd a chostus ar hyn o bryd. Er mwyn cynnal bioamrywiaeth a lleihau risgiau tân, nododd y Cynllun Rheoli ardaloedd i'w torri, a chynghori y dylid cael gwared ar y rhan fwyaf o ddeunyddiau i leihau lefelau maetholion, gan arwain at fwy o fioamrywiaeth.

Ym mis Tachwedd 2023, torrodd Ynni Adnewyddadwy Cwm Arian mewn partneriaeth â Pharc Cenedlaethol Arfordir Penfro, atalfeydd tân ar y comin a dosbarthu'r 'deunyddiau wedi'u torri' i ffermydd a thyddynnod ar gyfer treialon. Derbyniodd y prosiect arian gan Gymunedau Gwledig Llywodraeth Cymru - Rhaglen Datblygu Gwledig 2014 - 2020.