

connect

The Biomass Connect Newsletter

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WELCOME

Welcome to the seventh edition of Connect, the Biomass Connect newsletter where we aim to keep you up to date with the latest news from the Biomass Feedstock Innovation programme and biomass in the UK in general.

There is so much going on - reading this information is a great way to stay Connected!



FOCUS ON INNOVATION – TAEDA TECH

Taeda Tech Project – Growing woody crops in aeroponics for a sustainable future

Innovation is critical for the sustainable advancement of all industries - and the biomass sector has some brilliant innovators!



Led by Dr Zoe Harris, senior lecturer at University of Surrey, and Mark Horler, chair of UK Urban AgriTech - UKUAT, the BFI innovation Taeda Tech project is focused on optimising aeroponic technology for sustainable propagation of SRC willow.

Compared to traditional field multiplication, aeroponic technology can:

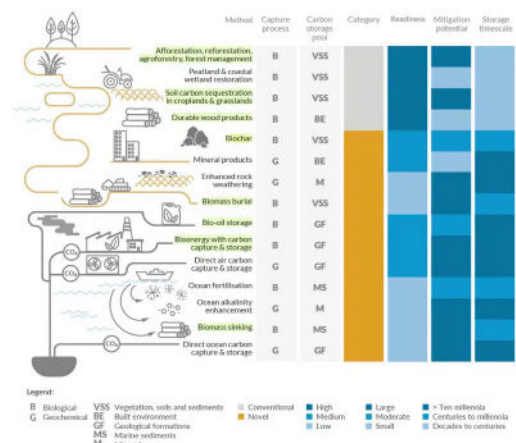
- ✓ Propagate SRC willow faster,
- ✓ Achieve a higher yield of planting material,
- ✓ Produce on a smaller land footprint,
- ✓ Deliver greater quality control.

Read more about the Taeda Tech project

SOME RECENT REPORTS OF INTEREST

- [DEFRA report on Bioenergy crops in England and the UK 2008-2023](#)
Includes breakdown and trends of areas and number of growers of different bioenergy crops. The data on Miscanthus and Short Rotation Coppice (SRC) only covers England.
- [Energy Catapult Bioenergy Modelling report](#)
This report estimates the amount of Miscanthus, SRC and Short Rotation Forestry (SRF) that might be planted in different parts of the UK in association with Bioenergy Carbon Capture and Storage (BECCS) plants up to 2050s.
- [2nd Edition of the State of Carbon Dioxide Removal \(CDR\) Report](#)
Highlights the current progress and future needs for CDR to meet the Paris Agreement’s temperature goals.

The report contains a useful infographic, and we’ve highlighted (in green) the many roles biomass can play in CDR.

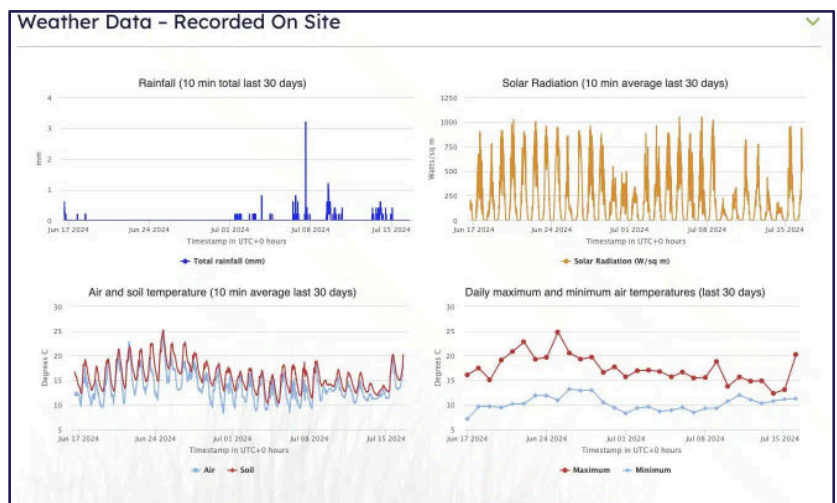


DEMONSTRATOR SITES ROUND UP

Climate and Soil Data at the Biomass Connect Demonstrator Hubs

As with all crops, the success, failure and overall yield of biomass crops is dependent on the weather. That's why we have weather stations and soil data-loggers recording climate and soil data at each of our demonstrator hubs. This data will be fed into our research and used to determine their contribution to differences in crop yields between the various sites situated across the UK.

Specifically, we will be investigating the effect of temperature, solar radiation and rainfall/moisture on the biomass crops. We may also be able to compare wind data with documented wind damage to specific crops to see how well they cope with particular wind events. All of this is of increasing importance given the changing climate and increase in extreme weather events.



Find out more here: <https://www.biomassconnect.org/news/climate-and-soil-data-at-the-biomass-connect-demonstrator-hubs/>

CASE STUDY:

Biofiltration blocks of Short Rotation Coppice willow used for riparian protection to reduce nutrient runoff into the water environment.

This case study features a field trial of willow used for riparian protection to reduce nutrient runoff at the Agri-Food and Bioscience Institute (AFBI) Research Farm near Hillsborough, Co. Down, Northern Ireland. The willow 14m x 9.75 m plots were planted in 2016. Water quality monitoring indicates an average reduction in Total Phosphorous load runoff of 35% compared to grass controls. These results have been consistent over a 6-year period and indicate that the targeted placement of SRC willow buffer strips does seem to reduce the diffuse runoff of P from the agricultural field.

You can read this case study here: <https://www.biomassconnect.org/technical-articles/afbi-case-study/>



BIOMASS CONNECT DEMO EVENTS

We are planning a series of demonstrator site events this autumn. There will be plenty of opportunity to see different crops and talk to experts.



Biomass Connecting with the Future – Now!



12th Sept 2024



BGI, Chesham

[Register Here](#)



Integrating biomass crops into farming or land management systems



26th Sept 2024



North Wyke, Devon

[Register Here](#)



Willow for biomass production



8th Oct 2024



Myerscough College,
Preston

[Register Here](#)



Miscanthus: Unlocking Opportunities for Carbon Sequestration and Biodiversity Enhancement



9th Oct 2024



Bishop Burton College

[Register Here](#)



Biomass crops for integrated land management



10th Oct 2024



SRUC, Edinburgh

[Register Here](#)

[Biomass Connect Demo Events](#)

DON'T FORGET!

Biomass Connect Final Event 2024 Warwick Conference Centre

Warwick Conference Centre will become the epicentre of the biomass world this November when we present the Biomass Connect Showcase. This event will showcase the technological developments of all the projects funded by the Biomass Feedstocks Innovation Programme.

[Further details available here soon.](#)

OTHER IMPORTANT DATES FOR YOUR DIARY.

New Energy Farms open days

NEF are holding a number of Open Days in 2024 to showcase the TEMPEC project (Technologies to Enhance the Multiplication and Propagation of Energy Crops) which is part of the UK Governments' Biomass Innovation Programme.

The Project is exploring the yield potential of a range of high yielding energy grasses, which include Miscanthus and other Energycanes, and demonstrating new systems to plant these crops based on NEF's synthetic seed technology (CEEDS).

These Open Days are the first opportunity for the biomass industry to view these exciting new studies which include

- Demonstration plots of new varieties of Miscanthus and other potentially exciting Energycanes for the UK.
- NEF synthetic seeds (CEEDS) and planters for establishing these crops.
- Work on the restoration of wetlands (Paludiculture) and contaminated land using high biomass crops
- An impressive range of end uses for biomass, some of which are well known, but also some exciting new opportunities.
- The Open Days will be of interest to farmers, biomass processors, end users of biomass feedstock and anyone with an interest in low carbon initiatives.



The open days are scheduled for:

- 19th September Taunton
- 23rd September Isle of Wight
- 25th September Wadebridge
- 26th September Taunton
- 3rd October Wadebridge
- 8th October Darlington
- 17th October Taunton
- 22nd October Taunton

Find out more and sign up on the [What's On](#) page.

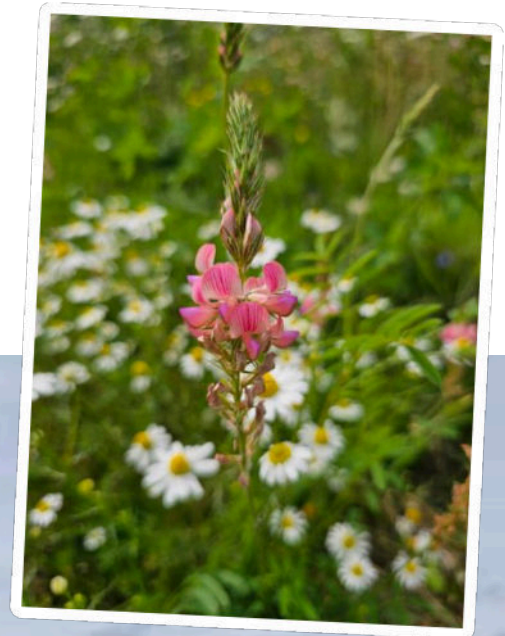
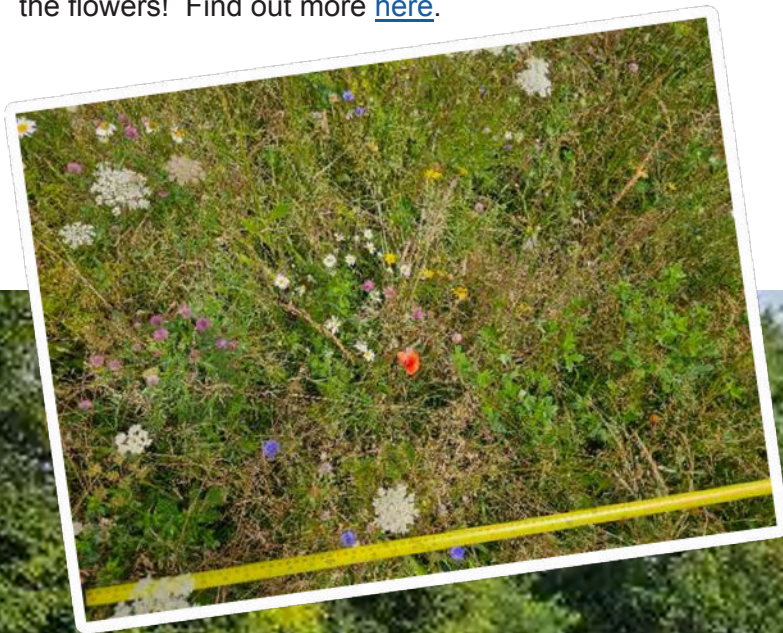


SFI CROP MARGINS AT OUR DEMONSTRATOR HUBS

Biomass Connect have planted Sustainable Farming Initiative (SFI) compliant crop margins at 3 of our Demonstrator Hubs:

- Chesham (Bio Global Industries Ltd.)
- North Wyke (Rothamsted Research)
- Headley Hall (NIAB)

Each have reported on the successful establishment and benefits to biodiversity from these initiatives. We will continue to monitor the margins to see how they perform over time and if any problematic weeds appear, but for now, we will enjoy the flowers! Find out more [here](#).



BIOMASS CONNECT AUTUMN WEBINAR SERIES

A sneak preview of Season 3 of the webinar series:

- Thurs 17th October at 4pm: Plan B's – How to turn it around when something goes wrong
- Thurs 14th November at 4pm - Biomass crops – some interesting alternatives #3 Poplar and Hemp
- Thurs 12th December at 4pm – To be determined
- Thurs 23rd January at 4pm - Tools for the Biomass Trade – Envirocrops and Farm Carbon Toolkit
- Thurs 13th February at 4pm - Harvesting your crop, everything you need to know

Keep your eyes peeled on the [What's On](#) page for more details.

IN CASE YOU MISSED IT!

The Biomass Connect website is a veritable conveyor belt of information! Here are a few other interesting things that if you blinked you may have missed:

[Energy Now Interview with Dr. Jeanette Whitaker on Biomass Energy Production in the UK](#)

[Upscaling UK Miscanthus Production – infographic](#)

[REA Wood Heat Forum Air Quality Leaflet](#)

Upscaling UK Miscanthus production: Benefits, challenges and trade-offs

The balanced net-zero pathway of the UK's sixth carbon budget stated a target of planting a minimum of 30,000 hectares of perennial biomass crops a year by 2035, with a view to establishing at least 700,000 hectares by 2050 (CCC, 2020).

Land use trade-offs – where to upscale and what are the impacts?

Smaller area of more productive land (AIC 1-3a) closer to end use markets

- Higher yield
- Greater profitability
- Higher C sequestration

More likely to:

- Be intensively managed arable land areas.
- Result in higher SOC gains
- Lead to biodiversity gains
- Compete with essential food production

Larger area of less productive (marginal) land (AIC 3b-5) further from end use markets

- Lower yield
- Lower profitability
- Lower C sequestration

More likely to:

- Be extensively managed grassland areas.
- Result in lower SOC gains or losses
- Lead to biodiversity losses
- Not compete with essential food production.

Carbon sequestration – Loss or gain?

Higher above ground yields enable greater carbon capture and storage via BECCS.

- Deeper rooting varieties enable greater carbon sequestration below ground.
- Longer rotation lengths (10+ years) enable greater SOC accumulation compared with annual crops.
- Loss or gain of soil carbon (SOC) following miscanthus establishment is better predicted by initial SOC content than by broad land use classifications of 'arable' or 'grassland'.
- Soils with SOC above 70 Mg C ha in the top 30 cm will likely lose carbon, and those below will likely gain it.

Strategies must complement long-term food security rather than compete with it

- On arable land, a miscanthus rotation can be employed as a fallow period for fields experiencing yield decline due to soil fatigue, drought, flooding or persistent weed problems.
- On improved grassland areas, miscanthus presents an option for diversification, flood mitigation and water quality improvement.

What are the main barriers to upscaling UK miscanthus production?

- Sufficient areas of UK land are suitable for upscaling miscanthus cultivation. However, the availability of that land and farmers' inclination to grow the crop depends on land tenure, farmer willingness and confidence in the stability of biomass markets.
- Strategies need to be developed to integrate miscanthus into farming systems in a way that is profitable, sensitive to local demand, climate, and geography, that complements rather than competes with food production by increasing overall farm profitability and resilience.
- Consistent long-term policies, which support the whole supply chain, are required to ensure sufficient upscaling to help the UK to realise its ambition of achieving Net Zero emissions by 2050.

HEMP LICENSE UPDATE

New Government regulations have been released which should make it easier for UK farmers to grow industrial hemp. From January 2025, farmers will be able to grow the crop anywhere on a licensed farm. In addition, it will be possible to extend the current 3-year licence to 6 years and farmers will be able to apply for a licence in advance. For more information visit the [Gov. UK website](#).

Want to know more about growing Industrial Hemp? Take a look at our [factsheet](#).

Factsheet: Growing Industrial Hemp for Biomass

Biology & interesting facts

- Botanical name: Cannabis sativa L.
- Summer annual crop, strongly photoperiod sensitive
- Mostly dioecious – male and female occur on separate plants
- Some commercial varieties are monoecious (male and female on same plant)
- One of the oldest non-food crops
- Genetically close to medical hemp or marijuana which led to a ban on its cultivation in Europe post WWII
- Differs from marijuana in containing < 0.2-0.3% THC (delta 9-tetrahydrocannabinol) the psychoactive ingredient in marijuana but contains high levels of cannabidiol (CBD)
- The 1980s marked revival of hemp – several EU countries passed laws to allow industrial hemp farming
- France – the leading producer of Hemp in Europe

Agromony

Cultivar selection

- depends on the harvestable component of interest (fibre, grain or cannabinoids or dual/biomass use)
- key to successful production of all hemp types
- the most important varietal trait is days to maturity
- First time hemp growers will need to understand varietal options that are available and carefully determine which hemp variety is most suitable to their production and marketing strategies

Conditions

General agronomic recommendations for the main harvestable components of industrial hemp

	Fibre	Grain/Dual Purpose**	Cannabinoids
Seeding rate†	40-60 PL/ha	30-40 PL/ha	30-40 PL/ha
Rowing space	8 inches	8-16 inches	8-16 inches
Soil pH	6.2-6.5	6.2-6.5	6.2-6.5
Applied nitrogen	50 t/ha	100 t/ha	50-100 t/ha
Available phosphorus	60 t/ha	60 t/ha	60 t/ha
Available potassium	300 t/ha	300 t/ha	300 t/ha
Harvesting time	<40% male flowering	~70% grain maturity	~75% tetrahydrocannabinol maturity

*Peak live seed (PLS) per acre ** Dual purpose grown for biomass

- Seed germination is impacted by lack of soil moisture at planting – seeds sensitive to lack of soil moisture
- Once successfully established, plants are very hardy

Insects and Diseases

- Insects reported to cause damage include: armyworm, grasshoppers, European corn borer.
- Plant diseases reported - Grey mould (Botrytis cinerea) and white mould (Sclerotinia sclerotiorum)
- No pesticide materials are currently registered for use on hemp - more research is needed to minimize these potential challenges

Hemp Cultivation in the UK

- Cannabis is a Class B controlled drug under the Misuse of Drugs Act 1971 (MDA 1971)
- Home Office license required for both cultivation and possession
- License covers low THC cannabis grown for commercial production of hemp fibre or seed oil
- After harvesting non-controlled parts (stems and seeds) are used
- Controlled parts (leaves and flowers) are either at licensed location or lawfully disposed of

An Excellent Biomass Crop

- High yield – up to 15 t/ha air dried biomass
- Direct combustion – heat, energy and biogas
- Hemp oil – conversion to liquid fuel
- Higher concentration of digestible cellulose and hemicellulose in bast fibres
- Higher ratio of digestible sugars to lignin in stems
- High calorific value of biomass

Industrial hemp can contribute to achieving the UK's climate change targets

Carbon sequestration	Phytoremediation	Carbon Neutral products
Can grow up to 5 m in 3 months sequestering 10-15 tonnes of carbon/ha – the fastest plant sequester	Little to no pesticides required	Biodegradable products from hemp can replace plastic
	Long tap root system that can extract pollutants and toxins	
	Restores condition of topsoil	

Department for Energy Security & Net Zero

<https://www.biomassconnect.org>

SPRING AND SUMMER BIRD SURVEYS: REPORT AND VIDEOS

Over the last 9 months we've performed three bird surveys at two farms in the south west of England, one with a Miscanthus crop and the other with willow. We've now added the Spring and Summer reports and videos to our website.

Together the three visits give a really good snapshot of what birds live and feed in and around these crops.



READ ALL THE REPORTS AT:
<https://www.biomassconnect.org/reports/>



And watch the films at:

[Bird Surveys on Biomass Plantations – June 2024](#)

[Bird Surveys on Biomass Plantations – March 2024](#)

[Bird Surveys on Biomass Plantations – November 2023](#)



COPPICE WILLOW FOR CATTLE GRAZING

It's widely known that farm animals and zoo animals eat willow but [new research led by Queen's University Belfast](#) is providing some interesting results on the changes in methane production when certain SRC willows are used as feed in beef cattle.

It's very early days at the moment and scientists are cautious about the findings but the initial results warrant larger, replicated experiments that can be peer reviewed. It's a very encouraging development and if the results can be shown to be repeatable and scalable it could provide a significant opportunity for livestock farmers to reduce their farm's emissions.

This news item also appeared on BBC Radio 4's Farming today. Listen to the [programme](#) from 08:45.



HAVE YOUR SAY

We would like to hear from you.

Are there topics you would like to find out more about, be that biomass crops, supply chains (e.g., production, harvesting, storage, processing, or markets), or particular case studies or technical articles that would help you with your project or help you make an informed decision? Please let us know.

In addition, if you have a great project that you would like us to feature that helps others follow in your footsteps, we'd love to hear from you!

Please contact us here

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