Section 3

BIOMASS CONNECT

Biomass Crops to feature at the AFBI open day : Farming for the Future

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AFBI is currently part of a UK wide demonstration project to increase knowledge and awareness of biomass crops and the potential for scaling up domestic biomass production for carbon resources and as a Climate Change mitigation strategy.

Key Messages

Biomass Connect is a demonstration and knowledge-sharing platform, showcasing best practice and innovations in biomass crop production. The project represents a collaborative networks of eight UK organisations (UKCEH, AFBI, Rothamsted Research, SRUC, IBERS, NIAB, Newcastle University & Bio-global Industries) and is funded by the UK Department of Energy Security and Net Zero Biomass Feedstocks Innovation programme (DESNZ BFIP).

Key objectives of the project include:

- Gathering long-term data on variations in biomass crop performance across the UK, with continued agronomic management and monitoring of the crops, soil, and climate.
- Testing and comparing new varieties of willows, miscanthus, energy grasses and SRC and SRF woody species.
- Trailing a number of different hemp varieties at AFBI, Hillsborough

- Assessing the effect of different crops on key outcomes such as soil carbon; water quality; biodiversity; and soil health.
- An associated Information Hub (website and social media) provides contemporary information, knowledge and engagement programme

As agriculture, land use and energy policy in the UK evolves, this UK wide platform will support land-based changes for climate mitigation options.

Background

Biomass crops are non-food plants cultivated for a number of purposes including for commercial power, heat & power, domestic fuels, domestic heat, anaerobic digestion, pulp, animal bedding, compost, mulch, construction materials, phytoremediation, cosmetics, skincare and food supplements. The project compares how well different crops and varieties grow in regions across the UK and demonstrates innovations which have the potential to maximise their economic and environmental benefits.

At AFBI we are demonstrating a wide range of tree varieties, energy grasses and other crops. These include varieties of willow, alder, black locust, eucalyptus and poplar, as well as a number of energy grasses and other crops such as miscanthus, reed canary grass, switch grass, sida, silphium and hemp. The Biomass Connect demonstration platforms were established to achieve the following:

1. To provide independent, impartial information on biomass crop agronomy, economics, and environmental impacts for perennial grasses, woody crops and short rotation forestry.
2. To de-risk biomass crop adoption through the production of long-term data on regional variations in biomass crop performance for ten biomass species including multi-site variety trials for SRC willow and Miscanthus.
3. To support and provide a showcase for DESNZ funded innovations addressing current barriers to increasing biomass supply in the UK.
4. To inspire, engage and educate individuals and organisations with an interest in biomass crop production and use.
5. To act as an essential bridge between government, research, industry providing a conduit for two-way information flow enabling the growth of the biomass sector.

The UK government recently published its Biomass Strategy which set out the important role biomass can play in reaching the Net zero targets. Although recognising that biomass is currently both imported and produced domestically, it identifies the need to ensure that future upscaling must comply with strict sustainability criteria ensuring genuine emissions savings.

To achieve this, it needs to be massively upscaled if our reliance on fossil fuel imports is to be drastically reduced, as required for the climate action agenda. As recently as March 2023, The UK Climate Change Committee's advice to Northern Ireland on "The Path to Net Zero" has included engineered carbon capture and storage from both solid biomass grown in Northern Ireland and anaerobic digestion to produce biomethane, especially for the hard to decarbonise sectors (heat, transport, industry). In fact, the committee specified that using biomass grown in NI, together with associated Carbon Capture & Storage (CCS), could sequester over 1 million tonnes of CO_2 equivalent annually by 2050.

In the UK, this would require a significant upscaling of the industry to enable a projected 700,000 ha planted by 2050, or indeed anywhere near that starting from a current estimated UK total of about 12,000 ha (predominantly miscanthus and willow).

Research studies

The primary aims of the platform are to provide independent information including any variations in the different crops across the regions of the UK. The current project will run for 3 years until 2025 where data on establishment, agronomy, yields, disease, environment and management will all be collected, centralised and interpreted. As well as being a project partner in the Biomass Connect Hub platform, AFBI also leads one of the innovation projects developing a Biomass Crops information and "pocket consultant" called Envirocrops (www.envirocrops.com). AFBI is also a project partner in the Rothamsted Research (Willow Trials) and Aberystwyth University (Miscanthus Trials) funded by the same DESNZ BFIP.

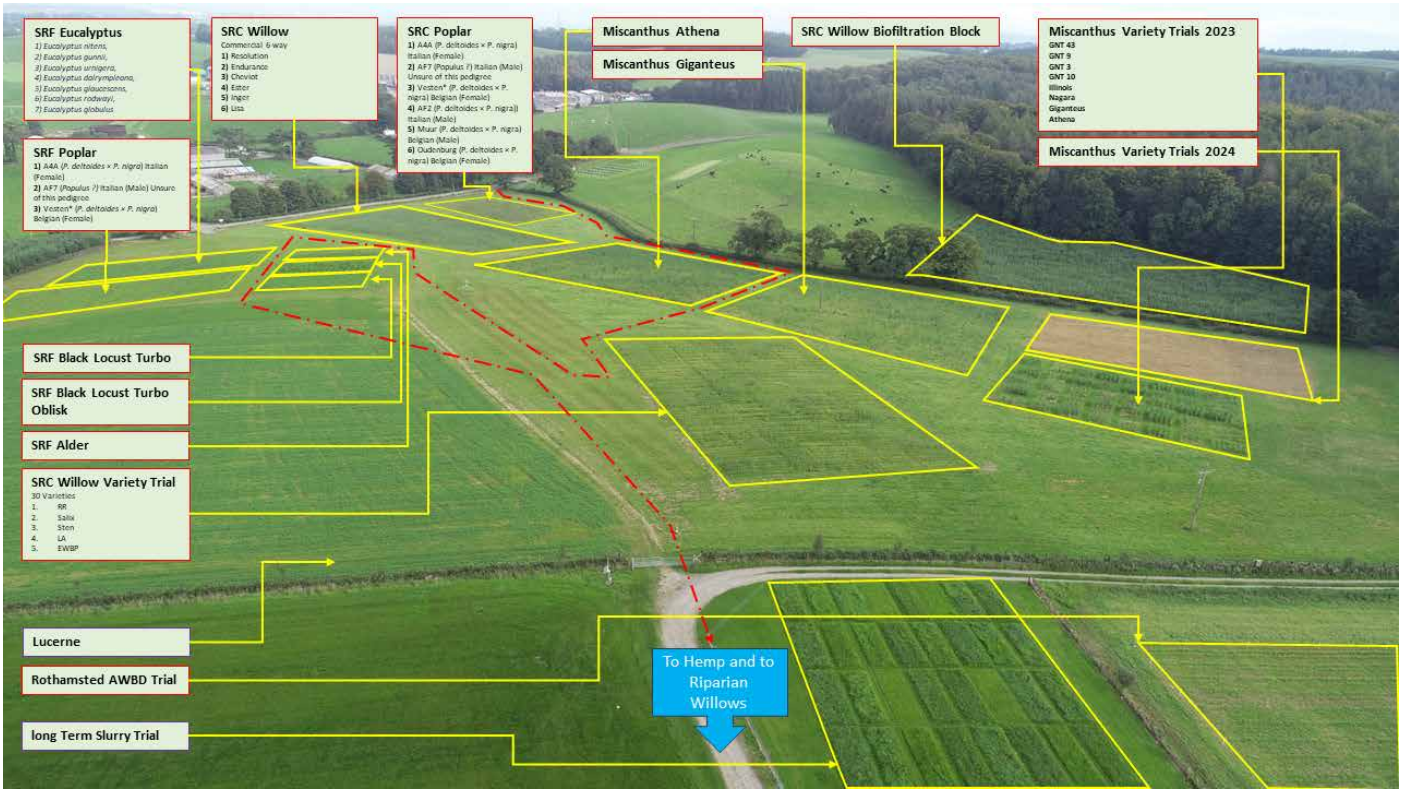

Fig 1. AFBI Hillsborough, 1 of 8 UK-wide Biomass crop Demonstration sites

The Biomass Connect platform has established a fully connected and regionally-based community which is contributing to the development, establishment and operation of the platform. Building this focal point for the industry will support the ambitious scaling up of planting capability.

AFBI monitors and manages this platform under strict protocols, in order to provide robust, independent information on biomass feedstock implementation, management, performance, agronomy, weed control, yields and environmental benefits. In doing this, AFBI is de-risking new crop adoption by ensuring that geographic variations in the efficacy of biomass feedstocks and relevant innovations are fully evaluated and demonstrated to a broad range of stakeholders across the UK. AFBI continues to contribute to an increasing number of technical articles, fact sheets and best practice guidelines.

AFBI staff regularly provide presentations, seminars and webinars on the opportunities for biomass crops, specifically on their role in waste management and environmental protection of the aquatic environment.

Research findings

Currently the Biomass sector represents just 0.14% of utilised UK agricultural land area. The vast majority of this is miscanthus, followed by SRC willow in England. These crops are almost predominantly used for both heat and combined heat & power generation. The eight biomass connect demonstration hubs are now functioning as living laboratories and in themselves represent a combined quarter of a million plants across more than 10 species offering potential growers, policy makers, agricultural community and advisors the opportunity to understand valuable insights into regional and climatic variation of these crops.

The Biomass Connect Information Hub is an online portal providing independent, impartial information on biomass crops and biomass innovations. Growers can access technical articles, factsheets, industry news, case studies, videos, podcasts and webinars through the Biomass Connect website (www.biomassconnect.org). A “What’s on” calendar of events and a webinar programme are also freely available with information on Biomass Connect events and resources shared across our social media channels.

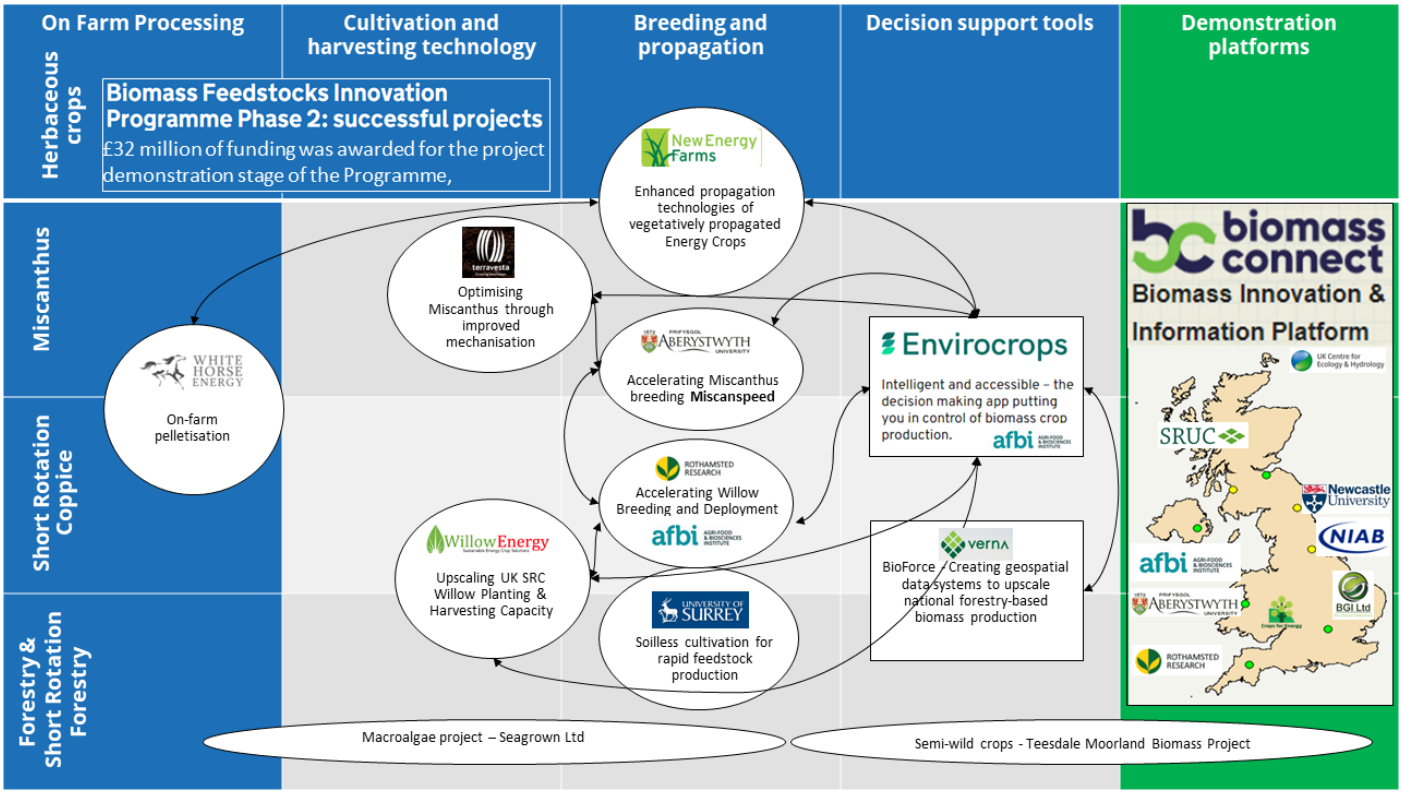

Fig 2. Department of Energy Security and Net Zero Biomass Feedstocks Innovation programme (DESNZ BFIP)

Potential Impact for Farming for the Future

The biomass Connect, functioning as a UK replicated demo site for novel biomass crops and related innovations under the DESNZ BFIP, offers real step changes in enabling the UK to incorporate biomass cropping as legitimate, practical and economic diversification opportunities to protect air, soil, water and biodiversity which removing and sequestering CO_2.