

## Will it harm native biodiversity?

### ■ Varied landscapes are key to UK biodiversity

While *Miscanthus* does not produce nectar or fruit for wildlife, when set in the mosaic of an agricultural landscape of crops, grassland, hedgerows and woodland its fast growing, 3m tall canes provide an extremely useful, changing structural resource. Particularly useful over winter where the continuous cover prevents the repeated soil exposure and potential erosion seen in common cropping systems.



Both woodland and farmland birds make the most of the cover in the crop, and the invertebrate populations that it harbours, at different times of year. The lack of need for nitrogen fertiliser, pesticide or fungicide mean that conservation headlands and hedgerows do not suffer from chemical run-off, especially useful in nitrate vulnerable zones.

## Future developments



### ■ Continuously improving agronomy

Lessons learnt over the last 10 years have dramatically improved commercial agronomy techniques and establishment success, meaning less land disturbance and reduced need for herbicide control of weeds in the early years. Faster maturing crops compete naturally with weeds reducing the need for chemical controls.

### ■ Introduction of seed based hybrids

The introduction of seed based hybrids will remove the need for energy intensive rhizome propagation, improve GHG mitigation and reduce costs for farmers with care taken to tailor crop characteristics to regional soils and climates.

**For more information and links to the science behind the statements, please visit our website...**

[www.aber.ac.uk/en/ibers/research/research-groups/energy\\_crop\\_modelling/](http://www.aber.ac.uk/en/ibers/research/research-groups/energy_crop_modelling/)

**Or for general enquiries...**  
[jhc@aber.ac.uk](mailto:jhc@aber.ac.uk)



## Environmental impact of growing *Miscanthus*

Some questions answered...



*Quantifying carbon and water exchange between land and atmosphere at field scale*

## Why grow *Miscanthus* in the UK?

- **Government 2020 target for 350 kha extra biomass production to reduce GHG emissions and mitigate climate change through sustainable energy production**
- ***Miscanthus* currently being grown on 12,000 ha with supply chains already producing 1000s of tonnes of biomass**
- **Market is established, and hungry for growers to adopt the crop.**
- **Growing knowledge is making crop establishment reliable and cheaper**
- **Perennial nature and efficient nutrient recycling mean very few inputs and less effort for the farmer**

## Predictive spatial modelling of soil organic carbon under *Miscanthus*

### SOC change t C/ha

- Organic soils
- loss 2-3
- loss 1-2
- loss 0-1
- No change
- gain 0-1
- gain 1-2
- Excluded areas



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## How does a land use change to *Miscanthus* affect soil carbon?

- **Soil carbon increases in arable soils**
  - **Soil carbon is maintained in grassland soils**
- Any soil disturbance through ploughing and cultivation stimulates microbe populations which consume and release carbon stored in the soil; repeated yearly tillage explains why lands under annual crops have much lower soil organic carbon levels. The great advantage of perennial systems such as grassland and *Miscanthus* is that soil disturbance is minimal with single cultivations lasting many years; this allows carbon cycled into the ground through leaf litter and harvest residues to quickly compensate establishment losses and build to much higher organic matter and carbon contents.

## Will it compete with food production?

- **Complements food production**
- Land adoption for *Miscanthus* should avoid competing for high grade land used for food production. GIS studies show 400 kha of land could be available even when restricted to less productive areas of farms. A low effort/input *Miscanthus* crop could free resources to improve conventional crop yields on better areas of the farm.

## Can it be removed when a new crop is required?

- **Easily**
- Miscanthus* is removed through conventional means of spraying and ploughing out over a growing season. Autumn sown grasses or arable can follow immediately. It could possibly play a role as an extended rotational break crop to improve soil health and combat weed resistance over the long term.

## What are the chances of this non-native spreading like Himalayan Balsam or Japanese Knotweed?

- **Highly unlikely**
- Current commercial crop is sterile, cannot reproduce and does not spread far underground while new seed based hybrids are bred not to flower in the UK and have limited rhizome creep.