

Miscanthus trials could provide solution for flood plain problems

Farmers looking for a crop to grow on flood-prone land, to simultaneously improve soil health without the need to apply additional fertiliser, may soon have the answer. This is thanks to some new trials being jointly-run by the Institute of Biological, Environmental and Rural Sciences at Aberystwyth University, and miscanthus supply chain specialist, Terravesta.

Some 18 months from the headline-hitting flooding of the Somerset Levels, these cutting edge trials are set to examine how the energy crop, miscanthus, copes with flooding.

The trials are being funded by the Engineering and Physical Sciences Research Council (EPSRC) and will cover a two-year period.

"We know miscanthus has the ability to tolerate flooding when it's mature, but there's a gap in the data about its tolerance during its establishment stage, and this is during the first two years of growth," says Aberystwyth University plant physiologist, Dr Sarah Purdy.

"What's really exciting about these trials is that we're also going to analyse the health of the soil when compared to other land-uses," says Sarah.

The trials will see miscanthus grown on commercial flood-prone sites, on plot-scale sites and in controlled environments such as under glass. They will monitor how the crop copes with prolonged flooding, particularly in its establishment stage, and analyse the structure and nutritional health of the soil under the miscanthus field sites.

"We believe miscanthus may be beneficial to soil because this perennial crop has a life cycle lasting up to 20 years in which

time the soil experiences no tillage, just an annual harvest. So the soil can maintain its structure which promotes colonisation by beneficial microbes and creatures such as earthworms. Miscanthus has a large under-ground rhizome which recycles nitrogen and other essential nutrients from the stems before harvest so that no fertiliser needs to be applied to achieve high yields," she says.

"The implications for farmers struggling to grow crops on waterlogged land, are vast," Sarah continues. "If the nutrient recycling benefits offered by miscanthus can still promote healthy growth after a flood event, growers could reduce expenditure on rehabilitating land through fertiliser application by growing this crop.

"The trials will also be able to establish whether the crop has multiple uses, such as increasing soil stability, restoring water-damaged soils and mopping up nutrients on the edges of waterways," she says.

According to Sarah, some crop will be analysed during its establishment phase (the first two years of growth), and some mature four to six year old miscanthus crops will be monitored, for comparison.

European study

One of the sites testing established crops is also part of another major miscanthus research project called OPTIMISC (Optimising Miscanthus Biomass Production) a study located in multiple locations across Europe including Aberystwyth. "This land has been part of the OPTIMISC trials that have been looking at the impact of climate on different genotypes of miscanthus. The sites will be tested as part of the flood plains project, because the Aberystwyth field site



▲ Miscanthus trial plots at Aberystwyth.

▶ Waterlogged trials.

is located on low-grade land that's waterlogged for most of the winter. Despite this, the yields from some of the genotypes are very promising even on this land," says Sarah.

"We will also be monitoring plant performance and soil health under a mature field site in the Somerset levels that's prone to annual flooding. This allows us to scale our research up from laboratory based studies, to plot scale field trials, to commercial plantations," says Sarah.

Terravesta, the miscanthus supply chain specialist, is the trial's project partner, providing land to be tested on the Somerset levels. The land is operated by Terravesta's southern region manager, Mike Cooper. Mike manages the rhizome supply to other growers, but also grows crop supplying Terravesta, for biomass pelleting. He already successfully grows some of the cropping area on flood-prone land.

"We've believed for a long time that miscanthus improves



Miscanthus could be the long-term answer for soils affected by flooding.

the quality of soil, and we know it thrives on problem, flood-prone land. We need to plan for the future, especially on the Somerset levels, where growers are looking at planting alternative crops," says Mike.

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