

# Farmers cause less peat degradation with high water levels

*Idse Hoving  
of WUR.*

Peat soils in the Netherlands subside by about half a centimetre to one centimetre per year. This not only results in skewed houses and frequent ditch level reductions, but also to additional CO<sub>2</sub> emissions due to peat degradation. WUR is researching how higher water levels reduce CO<sub>2</sub> emissions and how dairy farms can adapt to such change. ►

## WUR, Deltares

**Problem:** the subsidence of peat areas in western and northern Netherlands frequently requires ditch level reductions and CO<sub>2</sub> emissions due to peat decomposition.

**T02 Solution:** saturation, thus wetting the soil, helps to counter soil subsidence and CO<sub>2</sub> emissions. WUR is conducting research into how peat bogs can continue to function properly with the help of water infiltration at high groundwater levels.

**Impact:** the aim of the research is to lower the groundwater level to twenty centimeters below ground level in the summer and to see what the impact is for farmers. It is estimated that this could reduce peat decomposition by three quarters, which would also significantly reduce CO<sub>2</sub> emissions.

Parts of Western and Northern Netherlands consist of peat grassland areas, a type of soil formed by decayed plants in marshes. “For many of these areas, their drainage in the 1960s and 1970s was increased by reducing the level of water level in ditches. This resulted in degradation of the peat, causing the soil to settle and subside,” says Idse Hoving, researcher of livestock and water management at WUR. Once every few years, the water boards review the water level, but this is increasingly becoming more expensive due to soil subsidence, he explains. Costs for dewatering and draining the water are increasing.

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### Additional soil subsidence

Peat degrades because oxygen gets to the decayed plants. “As a consequence, the soil subsides”, Hoving continues. “Saturation in particular protect peat soils against oxygen penetration. Degradation accelerates due to low water levels in ditches, but also due to drier spells as a result of climate change. CO<sub>2</sub> is released in this process, which is precisely what we want to prevent, to combat climate change.” Saturation, thus wetting the soil, helps to counter soil subsidence and CO<sub>2</sub> emissions. Many dairy farms are established in peat grassland areas and the question is to what extent can saturation be stretched. Grasslands must not be allowed to get so marshy that farmers can no longer render it usable for cows and machines.

### Farmers dealing with high water levels

“Severe saturation calls for a change in the farmer's business operations”, says Hoving. Together with various partners, he is conducting research at the high groundwater farm in Zegveld in the province of Utrecht into how dairy farms can operate with very high groundwater levels. “Farmers are likely to be able to produce less grass per hectare than they do nowadays, which increases costs”, says Hoving. It is important to quantify the impact on business

operations so that the economic disadvantage can be calculated. It is up to managers to decide how to proceed with this.

### Water infiltration

At the high groundwater farm in Zegveld, the water in ditches is kept at twenty centimetres below the surface level and water infiltration also takes place. Perforated horizontal pipes spaced four metres apart allow water to flow out of the ditches into the soil to additionally raise the groundwater level. Water infiltration is Hoving's speciality: he looks at how you can do this as best possible and what the effects are on the groundwater level during the summer. The aim is to bring the groundwater level in peat grasslands to twenty centimetres below ground level – it is currently at an average of around sixty centimetres in summer and can drop to more than a metre during long dry spells. “We expect that with a groundwater level of twenty centimetres below ground level, the peat degradation will be a three quarters less than it is today.” The high groundwater farm is also one of the locations of the National Research Programme for GHG Peat Grasslands of the WUR, Deltares and other research partners. The partners of this project measure the impact of groundwater levels on CO<sub>2</sub> emissions for plots with and without water infiltration. ■

**Who:** WUR, Deltares.

**Duration:** ongoing.

**Follow-up:** this project is part of the Veenweiden Innovatie Programma Nederland (VIPNL). The greenhouse gas measurements take place from

the National Research Programme GHG Peat Grasslands and 'Region Deal – Soil Subsidence Green Heart'.