





Flowers return to the meadows

One quarter of the land surface of the Netherlands is dominated by meadows with cows on monocultures of English rye grass. There is very little role for biodiversity in dairy farming. But that is beginning to change with initiatives such as 'On the way to planet-proof', the Dairy Farming Biodiversity Monitor, and precision grassland management. The search is on for new business models.

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What could be lovelier than the traditional Dutch landscape with cows grazing in green meadows edged by the flowering banks of ditches with culverts and bridges? A cultivated landscape with wide vistas as well as natural features such as hedges and hedgerows. It's been this way for centuries but nowadays this meadow landscape is not as rich in nature as it might appear. 'The fundamental quality of the agricultural ecosystem in dairy farming has deteriorated badly in recent decades; that has got to be improved,' says biologist Anne van Doorn. The monoculture of high-yield English ryegrass, the lack of herbs and the impoverished state of the soil life all illustrate the condition of the agro-ecosystem today, says Van Doorn, nature-inclusive agriculture project leader at Wageningen Environmental Research. 'We have strong evidence that insect numbers are plummeting in the Netherlands, and we know that for sure in the case of grassland butterflies, among other species.'

The most obvious indicator of the status of biodiversity may be the rapid decline in the field bird population, particularly the Dutch national field bird, the black-tailed godwit. A 'plan of attack' was launched at the end of last year to protect this beautiful breeding bird, whose numbers have been falling for decades in spite of all sorts of measures

'Farmers' professional expertise is in demand again'

taken to improve its habitat, which consists of wet, herb- and insect-rich grassland. The eggs in the ground nests and the chicks fall victim to early mowing, drought and food shortages, or they are easy pickings for predators such as foxes, martens, crows and birds of prey.

FIXING CARBON

And yet it puts this story in perspective to hear from Jelle Zijlstra of Wageningen Livestock Research that the biodiversity on dairy farms is in better shape than it is on land used for arable farming, flower bulbs and horticulture: 'Long-term grassland captures a lot of carbon and has a rich soil life. That makes it a richer ecosystem than you find in fields that are ploughed and sown every year.'

Yet Zijlstra too sees that biodiversity plays

very little role in the management of most grassland and maize cultivation at the moment. Farmers drive heavy machinery over the still sodden ground in the early spring, compacting the soil. 'That causes an oxygen shortage for billions of soil organisms and closes up the passages that creatures like earthworms depend on.' Ammonia emissions from barns and manure storage cause nitrogen precipitation in a radius ranging from 100 metres to several kilometres. The overdose of nitrogen damages vegetation and causes species that thrive on nitrogen-rich soils, such as brambles and stinging nettles, to overwhelm specialist species. So there is much to be done. The dairy sector takes up the most space in the Netherlands: 50 to 60 per cent of agricultural land – which comes to roughly one million hectares of grassland, and one quarter of the country's land surface – is used for 1.6 million cows, most of them Holstein-Friesians. This dairy cow needs large quantities of English ryegrass, which produces the biggest yields on large plots that are well-drained and can easily be irrigated in times of drought. 'And then there is the need for maize as supplementary coarse feed,' says Zijlstra. 'That makes ploughing, sowing, weedkilling, irrigation and harvesting necessary every year again, which does the biodiversity and the soil no good at all.'

SUSTAINABILITY GOALS

But the past five years have seen the launching of many initiatives to improve biodiversity on dairy farms, says Zijlstra. 'Partly through our research, on the approach to sustainability goals in the dairy sector for example, we now find more attention being paid to herb-rich pasture, and more agricultural nature management. To speed up this process, the focus of payments to farmers based on EU agricultural policy needs to shift to the environment and biodiversity, and we need a bigger joint effort from farmers, nature management, water boards,





PHOTO: SHUTTERSTOCK

Mowing less and fertilizing the edges of fields can get grasses and herbs flowering again.

provincial government, dairy producers, and retailers,' says the researcher. Within the dairy industry too, steps have been taken to improve biodiversity in recent years. The dairy multinational FrieslandCampina led the way in establishing the 'On the way to PlanetProof' system in 2018, which incentivizes farmers to dedicate more hectares to nature management, herb-rich grassland and permanent grassland with a label under the auspices of Stichting Milieukeur. Farmers are also encouraged to grow more feed on their own farms. Wageningen Economic Research and Wageningen Livestock Research have supported this development with aids such as indicators for identifying long-term environmental gains on dairy farms. Only companies that meet criteria on greenhouse gases and nitrogen emissions can participate in the PlanetProof scheme. 'That reduces the dairy sector's negative impact on biodiversity,' says Zijlstra. The cows must have access to pasture on at least 120 days

per year, with a maximum of 10 cows per hectare. Spraying former pastureland with glyphosate has also been forbidden since 2020. Zijlstra is hopeful. 'PlanetProof is a driver on the market for getting consumers to contribute to investments that dairy farmers have to make in order to work on biodiversity. Several retail chains have already started their own programmes, which also establish biodiversity-related criteria and enable farmers to get a higher milk price.' Another instrument for promoting biodiversity is the Biodiversity Monitor for Dairy Farming, developed since 2015 by institutes including Wageningen and the Louis Bolk Institute for FrieslandCampina, Rabobank and the WWF. The monitor makes use of key performance indicators (KPIs). These are indicators for such things as environmental pressure, the percentage of herb-rich grassland on a farm, or the number of landscape features that are maintained. The aim of measuring these things is to provide dairy farmers who book measurable biodiversity

gains with new business models, for example because water boards, estate managers, provinces, lessors, and even banks reward the dairy farmers for their progress in these areas, says Anne van Doorn. Accumulating these kinds of rewards is a principle from the Delta Plan for Biodiversity Restoration of 2018. 'Trial projects are running in Drenthe and Brabant,' says Van Doorn. 'On a small scale, the Rabobank offers a cut in interest to initiatives that pay extra attention to biodiversity. Eventually, the bank aims to upscale this incentive.'

LESS MOWING

Biodiversity is in a bad way, but the situation is not hopeless, agrees Gerard Migchels of Wageningen Livestock Research, who leads a project on Green Enterprise with Livestock. He firmly believes the tide is turning. At the dairy innovation centre Dairy Campus in Leeuwarden, Migchels demonstrates how biodiversity can be improved. He gestures expansively towards the >



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now still monotonous fields with a carpet of uniform green grass that are soon to be transformed into more herb-rich grassland with flowery edges. Flowering plants are good for insects and therefore for birds. Herb-rich grassland also enriches soil life, delivers stable yields and is more resilient to droughts, says Migchels during a guided tour.

His project ‘Towards more biodiversity with precision’ started at the Dairy Campus last autumn. ‘Around the edges of the fields we are going to fertilize less or not at all, and mow less as well, so that grasses and herbs can start flowering.’

GRASSLAND MANAGEMENT

He calls his approach ‘precision grassland management’ and hopes it will represent a breakthrough for dairy farmers who want to increase biodiversity but who cannot or do not wish to generate extra income for it through niche market sidelines like farm shops, farmhouse cheese, organic dairy produce or a farm campsite. At least 70 per cent of dairy farmers fall into this ‘conventional’ category, says Migchels. The key feature of precision agriculture as a way of improving biodiversity is extensification and raising the water table on 25 per cent of the land, enabling a considerable increase in biodiversity, according to the researcher. On the remaining 75 per cent, however, production is increased by fertilizing thoroughly and harvesting grass along fixed tractor paths. ‘Using sensors, soil scans, satellite images and drones, we can see exactly which fields need more or perhaps less fertilizer. In consultation with the farm worker, we can adjust the amount of manure that is spread,’ says Migchels. ‘We think such precise fertilization will make it possible to save on artificial fertilizer. And with better quality coarse feed (maize silage), you can also save on concentrate (soya).’

The same optical techniques are used to mow the extensive fields with great respect for the field edges and the nests of field

birds. ‘The farm worker can see on the dashboard of his harvester not just the nests but in future also the foraging chicks, so he can avoid them.’ Testing of these techniques will continue on 250 hectares at the Dairy Campus until 2024.

FIXED TRACKS

The cows on the Dairy Campus get a precise diet containing more herb-rich grass and less concentrate with soya and brewers’ grains that come from elsewhere. The goal is to achieve the same milk yield on herb-rich grassland with lower ammonia and methane emissions. ‘The yield the farmer loses on a quarter of his grassland, he recoups on the rest. If that works, his net income stays the same so the additional biodiversity doesn’t cost him anything,’ concludes Migchels. He thinks that the use of fixed tracks for muck-spreading, mowing and harvesting reduces the compacting of the soil on the more intensive fields, so the soil quality can improve and a higher water table is possible. ‘Not only is that good for nature, but it will be less drought-prone too.’ If the trial in Leeuwarden is successful, the space for biodiversity will increase fivefold from five per cent to 25 per cent, and 250,000 hectares of grassland in the Netherlands will have been freed up for more biodiversity.

And Migchels is hoping for more. The research includes a study of the hypothesis that the cows will be healthier on the herb-rich diet, saving the farmer on veterinary costs. He also foresees a diversification in cattle breeds in future. ‘We won’t just welcome more robust breed like Jerseys and Blaarkops, but we shall also breed within the standard Holstein-Friesian lines and select for animals that maintain their milk yields optimally on a more herb-rich diet.’ More emphasis on biodiversity also has direct consequences for the raw nerve in the agricultural debate of today: the nitrogen crisis. Emissions of nitrogen in the form of

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Ammonia can be reduced by putting cows out to pasture, says Jelle Zijlstra. ‘Ammonia is formed when the cow’s faeces and urine come together. Out in the meadow, the cow poos on the left and urinates on the right, so less ammonia is formed than in the barn,’ he explains. ‘And more outdoor grazing is more in line with the cow’s natural behaviour. This local fertilization also increases the soil’s water-retaining capacity, so that field birds can find more food.’ Spreading manure that has been diluted with water on days when it is not too windy or too hot can reduce nitrogen emissions by 20 per cent, showed earlier research by Wageningen Livestock Research. Less protein-rich feed and more grazing can add another 15 per cent. Nitrogen emissions in the barn can be reduced too, using low-emissions flooring, for example. The 500 cows on the experimental farm are testing a variety of different kinds of flooring and the ammonia and methane emissions are being monitored.

REFORMING AGRICULTURAL POLICY

For years, the government too has been searching for economic incentives for more biodiversity on farms. The obvious option is to reform European agricultural policy, including the subsidies, to make it a greener system with more positive incentives for biodiverse dairy farming. In the period 2015-2020, 30 per cent of the income support for farmers was to be made dependent on their meeting green targets such as reserving five per cent of their land for biodiversity.

‘Five per cent is the absolute minimum if you want to have any effect. And the rule only applied to farmers with more than 15 hectares of arable land, so farmers with a lot of grassland didn’t get any incentives at all,’ says Anne van Doorn. ‘What’s more, there were no specific, measurable goals.’

In a fresh attempt to green EU agricultural policy, seven trial projects have been running in the Netherlands since 2019. In 20 collectives, 500 farmers, including non-dairy farmers, examine area plans and ‘measures menus’, including a points system for evaluating measures. This is a different system to the key performance indicators of the Dairy Farming Biodiversity Monitor. ‘The idea is that the systems should be combinable,’ says Van Doorn. Apps have been developed too that give the farmer an idea of whether the measures are adequate for complying with the three pillars of a new agricultural subsidy policy: the green criteria for qualifying for the ‘basic premium’, the criteria for more far-reaching measures that give you an ‘eco premium’, and the criteria laid down for agricultural nature management. ‘It is all in the trial stage right now,’ says Van Doorn. She adds: ‘The trial projects are going well, and the nice thing is that farmers’ professional expertise is in demand again. Not just about milk production but also their knowledge about the soil and soil processes, ecology and feed rations. We forgot about that in all those years of focusing on maximizing production.’ ■

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