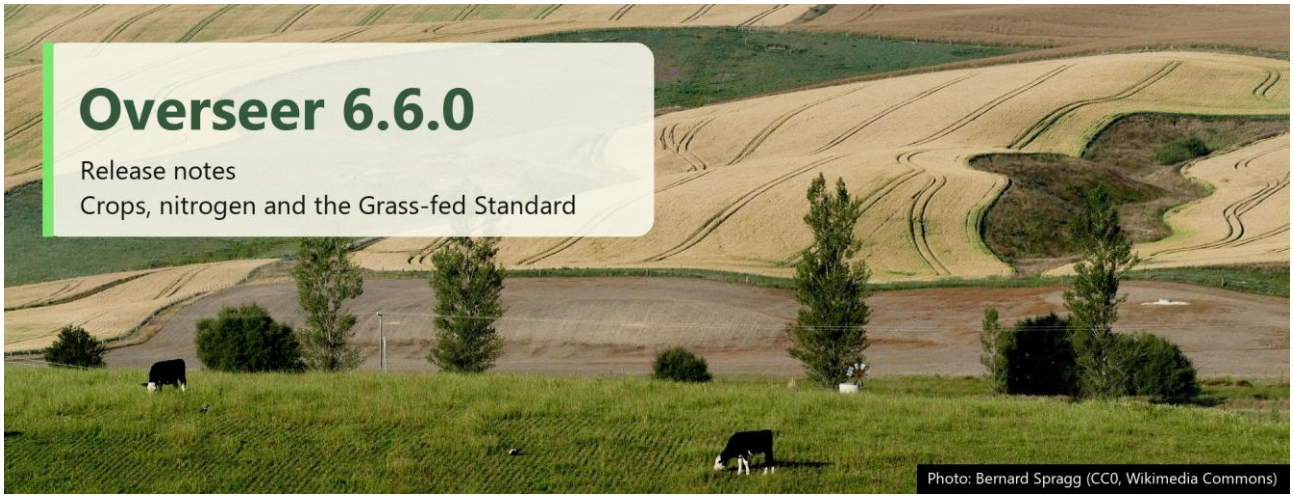
Overseer



What's new in 6.6.0

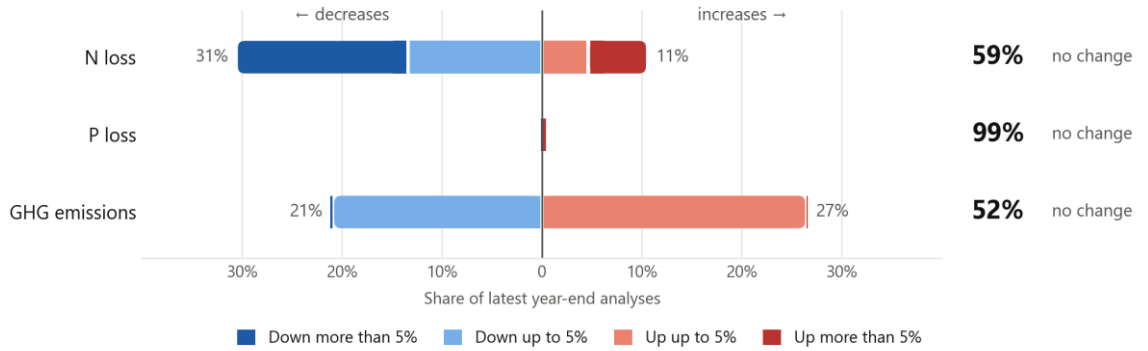
Overseer 6.6.0 introduces two major improvements to how crop nitrogen (N) uptake is calculated. First, the crop coefficients have been updated following an independent scientific review. Second, the amount of N taken up by crops now directly responds to the mineral N available in the soil. The release also corrects five existing issues affecting crop root biomass, methane emissions, animal diet calculations and the Grass-fed Standard. Most farms will see little or no change. Farms growing crops may see their N loss and greenhouse gas (GHG) emissions change; farms with outdoor pigs will see lower methane; and some dairy farms using a wintering pad will see less time with access to pasture in their Grass-fed Standard report. These changes reflect improvements to the modelling, rather than changes in actual farm performance.

- **New features:** updated crop coefficients and five new crops; crop N uptake that responds to the soil N available.
- **Corrections:** root biomass, outdoor pig methane, grazed crop digestibility, a model comment, and the Grass-fed Standard wintering pad and milking time.

At a glance

Results of the latest year-end analyses from real farms, before and after the update:

58.8%	99.5%	99.7%	1 in 4
of analyses: no change in N loss	of analyses: no change in P loss	of analyses: GHG within ±5% of before	dairy herds: slightly less time with pasture access

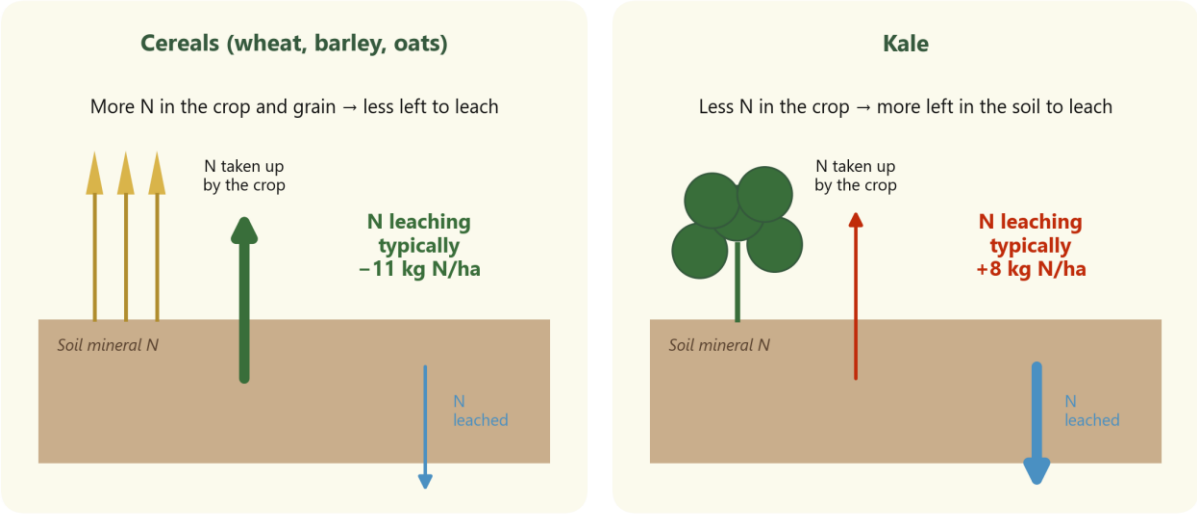


How results change: percentage of latest year-end analyses with valid results before and after the update (approximately 8,900 analyses). Decreases to the left, increases to the right.

Every change in N loss is on a farm with crops, on crop blocks or as fodder crops: no farm without crops changes its N loss. The full impact assessment tests every analysis and publication in OverseerFM (195,590) and is available with these notes ("Full Impact Assessment – version 6.6.0").

Crops and nitrogen

Updated crop coefficients

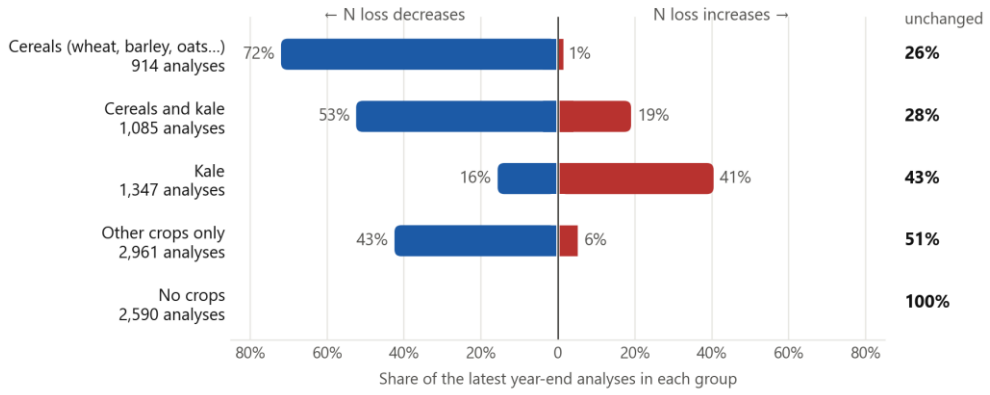


What has changed. Overseer estimates the N taken up by each crop from the user's inputs (yield, sowing and end dates) and the crop's coefficients: the N concentration in the harvested product, stover and roots, and the profile of the crop's growth over time. These coefficients have been reviewed by the Bioeconomy Science Institute (Khaembah et al., 2025), and an external science peer reviewer, using new documented experimental evidence.

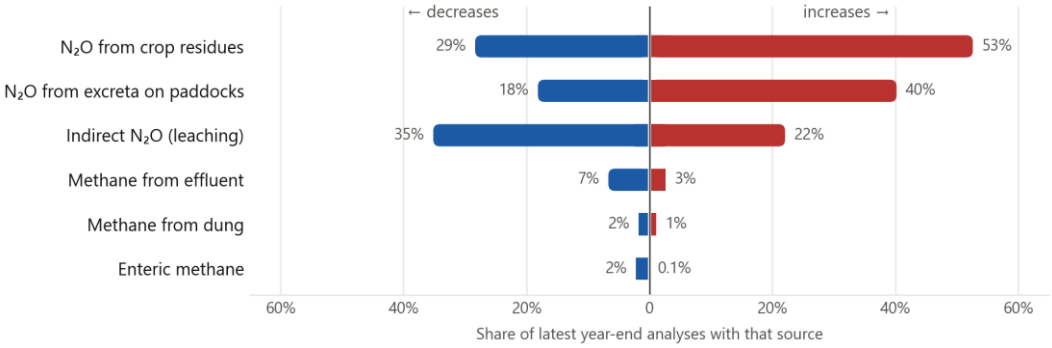
The N concentrations of the harvested product and stover, the growth curves and the harvest stage have been revised for most crops. Each crop now also has a root mass proportion, a root N concentration and a maximum "luxury" N uptake (the N a crop can take up above its baseline demand when soil N is plentiful). Five crops have been added: annual/Italian ryegrass as a forage crop system (alongside the existing grazing system), pumpkin, leek, leafy lettuce and

spring onion.

What you may see. Where the revised coefficients increase crop N uptake, mainly in cereals (wheat, barley, oats), more mineral N is taken up from the soil and more N is exported in the harvested product, so less remains at risk of leaching and modelled N loss generally decreases. Where they reduce crop N uptake, mainly in kale, more mineral N remains in the soil profile, so modelled N loss generally increases. Nitrous oxide emissions from crop residues and from excreta change with the amount of N in the residues and in the crops eaten by animals. On irrigated farms, the revised growth curves change crop water demand and therefore the modelled irrigation applied, which causes small changes in P loss.



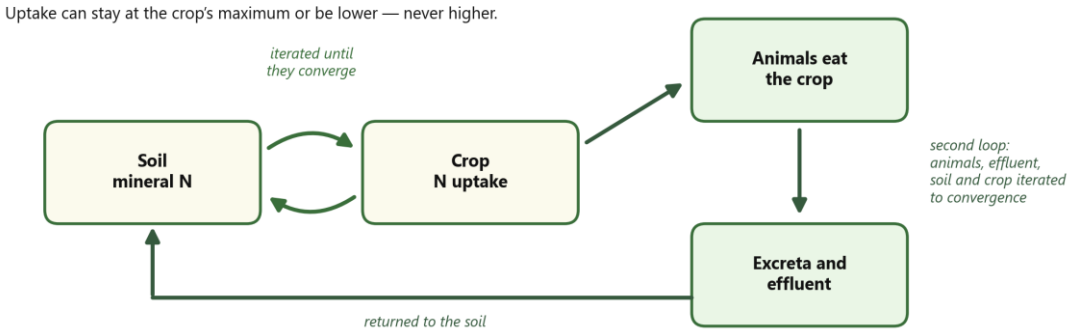
Change in N loss by crops grown (latest year-end analyses, share of each group). Most farms with cereals decrease; farms with kale increase more often than they decrease; no farm without crops changes.



Which greenhouse gas sources change: share of the analyses with each source that see it decrease or increase. Nitrous oxide follows the N in crops, residues and leaching; methane emissions change far less often.

What stays the same. Farms without crops are not affected by the updated crop coefficients. Annual ryegrass is now available as two separate crops. The existing crop, renamed "Annual/Italian ryegrass – grazing system", is still modelled as pasture, as before. The new "Annual/Italian ryegrass – forage crop system" is modelled as a crop with the new coefficients and applies only when users select it. Existing crop selections are unchanged and need no action.

Dynamic crop N uptake

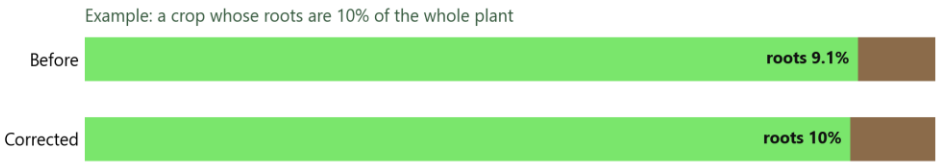


What has changed. The luxury N uptake of each crop now depends on the soil mineral N available: the crop and soil calculations are repeated until they converge. Crop uptake can stay at its maximum or be lower, never higher. Because crop N uptake also affects the feed available to animals, their excreta and the effluent returned to the blocks, a second loop iteratively recalculates the animal, effluent, soil and crop components until their results converge.

What you may see. Where the soil mineral N is limited, crops take up slightly less N, which slightly reduces the N in products, residues and grazed crops, and the nitrous oxide from residues and excreta. Enteric methane can decrease slightly on farms with grazed crops, as the energy content of the diet is recalculated. On a few dairy farms with crops, the change in crop feed is enough for an existing feed check to stop the analysis; reviewing the feed inputs, as for any feed check message, resolves it.

Corrections

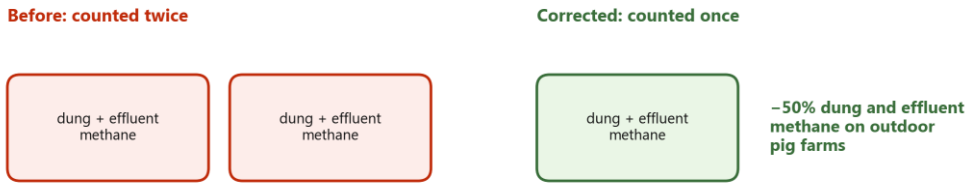
Correction to root biomass as a proportion of total crop biomass



The root proportion coefficient is defined as the share of the total plant biomass, roots included, that is in the roots. Previously, the model multiplied the above-ground biomass by this coefficient, so root biomass was underestimated (for example 9.1% of the total instead of 10%). Roots now make up the stated proportion of the total plant biomass.

Only analyses with crops are affected. Larger roots take up slightly more N and return more N in root residues, which slightly increases nitrous oxide from crop residues. Changes in N loss are small.

Correction to outdoor pig methane from dung and effluent



The methane from outdoor pig dung (pigs in huts) and from the outdoor pig effluent system (farrowing villages and barns) was added to totals that were not set back to zero between the model's two passes through the outdoor pig calculation, so it was counted twice. It is now counted only once.

Only analyses with outdoor pigs are affected: methane from outdoor pig dung and effluent halves, and total GHG emissions decrease accordingly. N loss and P loss are unchanged.

Correction to grazed crops in the digestibility of the diet

The average digestibility of the crops eaten by an animal enterprise combined crops grazed in place, counted per hectare, with crops from other sources, counted as totals, so grazed crops carried too much or too little weight in the average. All crop sources are now combined as total dry matter.

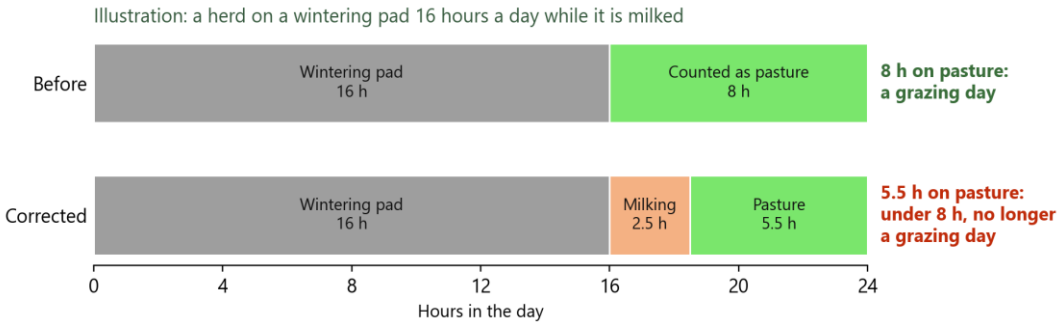
Only enterprises eating crops from several sources, or from crop blocks of different sizes, are affected. The amount of crop eaten is unchanged; methane from dung and effluent changes very slightly, up or down. N and P losses are unchanged.

Correction to the totals behind a model comment

Two totals, the nutrients eaten by each animal enterprise and the nutrients exported in its products, were not reset in the same way when a calculation is repeated, so the comment "Total product loss is greater than nutrient intake" could appear when it should not. Both totals are now reset at the start of each calculation.

Modelled results are unchanged; only the comment is affected.

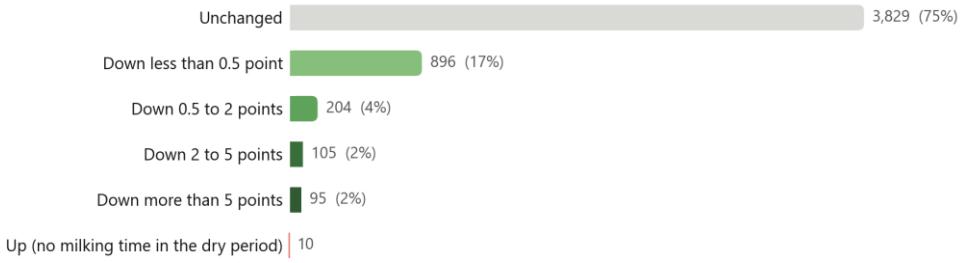
Correction to the Grass-fed Standard: time on a wintering pad and milking time



The Grass-fed Standard report of a dairy herd counts the hours per day the herd could be on pasture, then takes off the time on feed pads, wintering pads and stand-off pads. A day counts as a grazing day when the herd has at least 8 hours on pasture.

Previously, the time on a wintering pad was calculated as 24 hours minus the sum of milking time and the hours entered for grazing on pasture. The effect was that milking time reduced the time on the pad rather than the time on pasture. The milking time also excluded the time cows spend on the lanes to and from the farm dairy, and it was subtracted all year, including the dry period. Now the time on a wintering pad is 24 hours minus the hours entered for grazing, and the time on pasture is the hours entered for grazing minus the milking time. The milking time includes the time on the lanes and is subtracted only while the herd is lactating.

Only the Grass-fed Standard report of dairy herds is affected; N loss, P loss and GHG emissions are unchanged. For herds using a wintering pad, the time with access to pasture decreases, and days with fewer than 8 hours on pasture no longer count as grazing days. Of the 5,139 latest year-end dairy herds, 1,300 show slightly less time with access to pasture (typically 0.2 percentage points), 10 show slightly more, and 36 change their number of grazing days. For herds using a feed pad or a stand-off pad, days in the dry period may now count as grazing days, as no milking time is taken off.



Change in the time with access to pasture of the 5,139 latest year-end dairy herds (percentage points). Three in four are unchanged.

Want the detail?

The full impact assessment for version 6.6.0 explains every change with graphs and statistics. Peer-reviewed technical documents are in the “Reports & Science Papers” section of the Knowledgebase.