

Table 1. Table showing the formulas and units for each performance attribute.

Dim	Performance attributes	Calculation	Units
Economic	Energy Yield (EY)	Biomass harvested (t/ha/yr) × energy content (Mj/kg dry matter)	Mj/kg dry matter/ha
	Protein Yield (PY)	Crop and milk yield × protein content coefficient	Kg/ha
	Gross Margin (GM)	Revenue - variable costs	€/ha
	Economic Dependency (ED)	Gross margin/revenue	Dimensionless
Environmental	Mineral N supplied by the ecosystem (Nsupp)	Cumulative amount of N mineralized during the crop cycle (sowing to harvest) + Amount of N fixed symbiotically between two cuts	Kg N/ha/yr
	Soil structure (SS)	SOC/% clay	Dimensionless
	Carbon storage in the soil (Csto)	SOC final - SOC initial/SOC initial , with SOC (Soil organic carbon) representing the amount of C in humified organicmatter (active + inert fractions) in mgC/ha/yr	Dimensionless
	Water quality regulation (WQR)	(total N + min N - Qles)/(total N + min N) with: minN = Qminh + Qminr, total N is the cumulative amount of mineral N added via mineral and organic fertilized (knN/ha/yr), Qles is the cumulative amount of NO3-N leached at the base of the soil profile (kgN/ha/yr), Qminh is the cumulative amount of mineralized N derived from humus decomposition (kgN/ha/yr), Qminr is the cumulative amount of mineralized N derived from organic residue decomposition (kgN/ha/yr)	Dimensionless
	Pesticide active ingredient (PAI)	Amount of pesticide active ingredients applied (dose L/ha ou kg/ha of active ingredients)	Dimensionless
	Blue water (BW)	drat/rr_mm, with drat the cumulative amount of waterdrained at the base of the soil profile during the simulation period (mm/yr) and rr_mm the precipitation (mm/yr)	Dimensionless
	Green House Gases (GHG)	GHGs = 296 · 44/28 · (NN2O + 0.01 · NNH3 + 0.0075 · Nleaching) - 44/12 · SOCdyn + Fertisynthesis , with NN2O is cumulative nitrous oxide emissions (in kg N-N2O/ha/year), NNH3 is ammonia volatilization (in kg N-NH3/ha/year), Nleaching is the annual amount of nitrate leached in drained waters (in kg N-NO3/ha/year), SOCdyn is soil organic C dynamics (in kg organic C/ha/year). These latter variables were calculated from AqYield-NC daily simulations and Fertisynthesis (in kg CO2 per ha) is the amount of CO2 emitted for the synthesis of fertilizers calculated using the data from the GESTIM+ reference (2020). Considering these latter up-stream emissions, the GHG balance is similar to the ones calculated in LCA approaches in agriculture.	kg CO2eq/ha/year
Social	Workload (WL)	Annual work measured in hours per hectare the farmer spends in the farming activity.	Hour/ha/yr