Temperature, precipitation, solar irradiance, soil class, fertility level, spacing

3-PG

1. Interception of light energy

Photosynthetically active radiation ($\Phi_p$)

Photosynthetically active radiation that can be absorbed ($\Phi_{pa}$)

Photosynthetically active radiation that can be absorbed and usable ($\Phi_{pa,ua}$)

2. Photosynthesis

Gross primary productivity ($P_G$)

Shoot biomass ($W(t)$)

3. Dry matter partition

Fine roots (0–3 mm)

4. Net rhizodeposition

C and N in solution (DOC and DON)

5. Uptake

C and N in microbiota

6. Enzyme synthesis

CO$_2$

7. Depolymerization

8. Return of the dead microbes

9. Soil protection

10. Respiration

N mineralized (µg cm$^{-3}$ h$^{-1}$)

11. Net mineralization

N balance (kg ha$^{-1}$ month$^{-1}$)

12. Uptake of degraded enzymes

N lost

Legend

Input variable direct effect
Subtractive-additive causal relation
Process or fluxes
Compartment

Moisture, temperature, soil density, fertility level, soil C/N, SOM concentration, root radius, rhizosphere thickness, C/N rhizodeposition, microbial C/N

Microbial emigration

Microbial immigration