

Novel annual and perennial biomass systems produce large quantities for biorefinery and reduce nitrogen losses to the environment

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Tightening the nitrogen (N) cycle

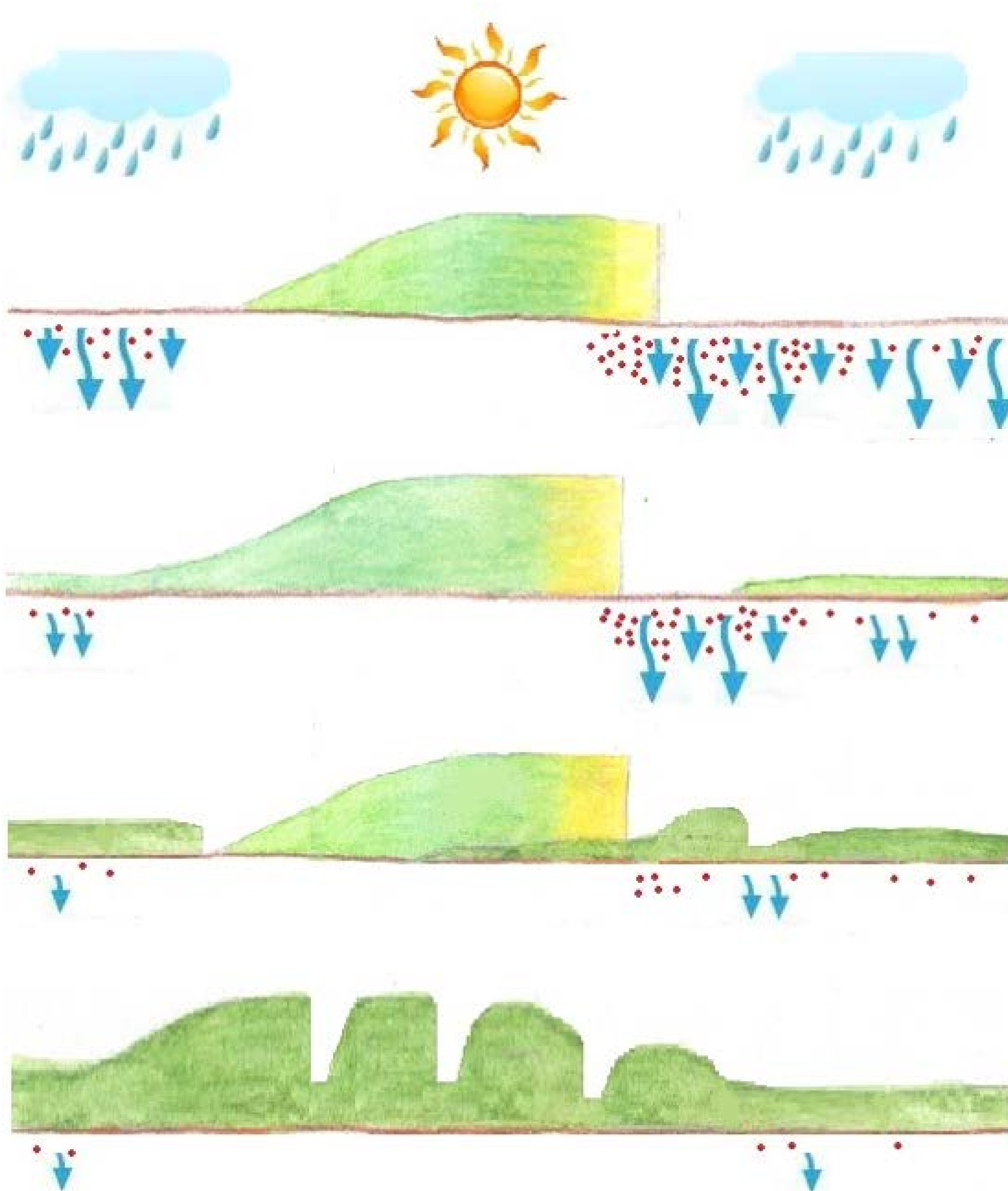


Figure adapted from E.M. Hansen, Aarhus University.

↓ Soil water (drainage)
 ■ Soil nitrate (leaching)

Mean annual values (2013-2015) for loamy/coarse sand.

System	Harvest Kg N ha ⁻¹ yr ⁻¹	Leaching
Maize	200/100	100/180
Triticale	170	60
1. Optim. rotation with annual crops	190/160	40/110
Perennial grasses:		
2. Highly fertilised	450/320	15/50
3. Unfertilised	250/200	18/20

... by three different approaches:

1. Optimal combination of annual crops in rotation and double cropping – increase biomass production without increasing N leaching
2. Sustainable intensification of perennial grasses – high N use efficiency and low soil nitrate concentrations
3. Extensification of perennial grass-legume mixtures – biological N fixation and build up soil N pool

