



RECIRCULATING NITROGEN



IMITATING NATURE

Nature does not produce waste. Any organic waste from a given ecological process naturally becomes the trigger for a subsequent process and so on. Therefore, in ecosystems, nutrients tend to be recycled and recirculated indefinitely.

Why does the agricultural sector not imitate this circular model?

THE KEYS



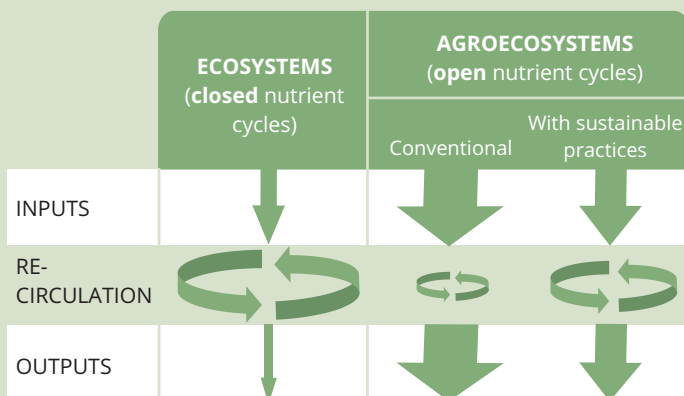
1 Favor a biodiverse community of organisms, especially in the soil of the olive grove.



2 Foster and maintain a herbaceous cover crop that provides nutrients and prevents them from being lost, especially by erosion.



3 Favor the presence of adequate levels of organic matter in the soil (by applying manure, shredded pruning leftovers, composted olive mill pomace, cover crop remains, wastes of other intercropped crops, etc.).



DID YOU KNOW THAT...

the application of sustainable management practices in olive groves can **potentially contribute to increase the amount of nitrogen available to plants by up to 30%**?

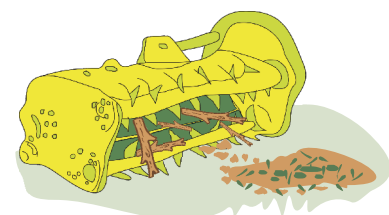
[extra info](#)

CLOSING NUTRIENT CYCLING

↓ CONTAMINATION ↓ INPUTS BILL ↑ SOVEREIGNTY

It is a process that aims to reduce the unnecessary loss of nutrients from agroecosystems in order to improve their self-sufficiency and reduce the need for external inputs. In agriculture, it is common for part of the nutrients (especially nitrate) to be lost through leaching, volatilization, denitrification, runoff or erosion processes, causing water and air pollution.

At a small scale (plot level), closing nutrient cycles can be achieved by applying techniques that mimic the proper processing of nutrients in ecosystems. For example, by crushing pruning leftovers instead of burning them, the nitrogen embedded in wood is retained within the farm system. Vegetation cover in the inter-rows captures from the soil the nitrogen not used by olive trees, turning it into organic nitrogen and, therefore, preventing its loss by leaching, erosion or surface runoff. In addition, the "free" nitrogen inputs can be increased if legumes that fix nitrogen from the atmosphere are introduced in the herbaceous cover.



On a larger scale, the application of olive mill pomace compost allows a very high proportion of the nutrients, that generally leave the farming system inner cycles, to return to these in the form of organic nutrients. Likewise, if livestock (sheep, chickens, horses...) is integrated into the olive grove, the nutrients of the herbaceous cover that are then used as food fodder, are returned to the soils along with livestock excrements.



Closing up nutrient cycles is considered as a key target of various EU framework programmes, including:



EU Biodiversity Strategy for 2030

[extra info](#)



EU Soil Strategy for 2030

[extra info](#)



Farm to Fork Strategy

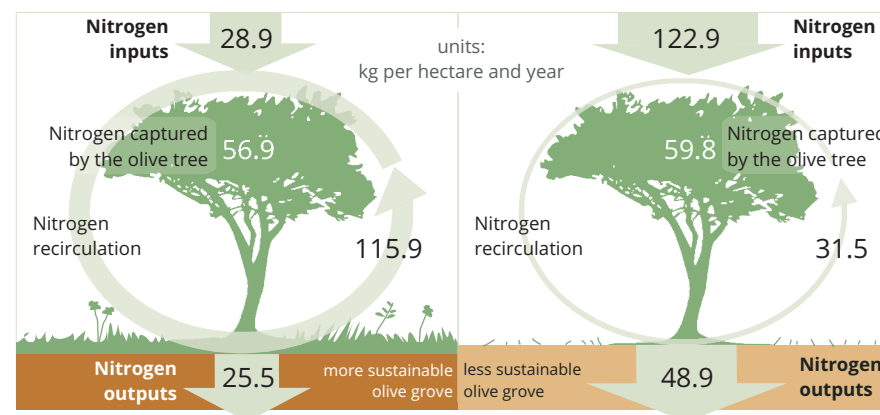
[extra info](#)



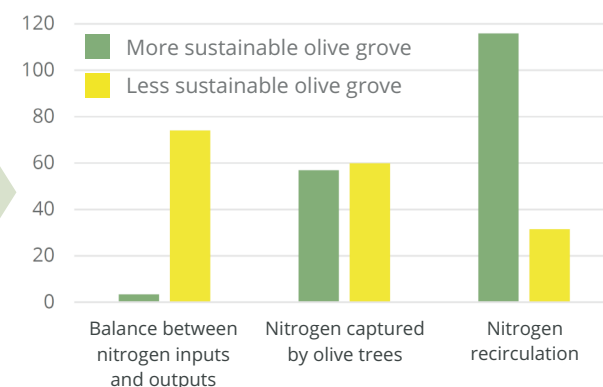
2030 Climate Target Plan

[extra info](#)

OUR FIGURES



Some key variables linked to the nitrogen cycle (expressed as kilograms of nitrogen per hectare and year)



The olive tree has specific nitrogen requirements. Once reached, the excess nitrogen supplied in the form of fertilizers will tend to leave the olive farming system, unless a herbaceous cover crop is placed that fosters a biological community allowing its recirculation, also avoiding its loss through leaching and erosion.

The application of sustainable agronomic practices and technologies not only significantly reduces the demand for external sources of nitrogen, but also reduces the loss of this essential nutrient by half. The result is that sustainable olive groves manage to recycle nitrogen more efficiently, **up to 3.5 times more so than olive groves that follow a conventional model.**

KEEP IN MIND THAT...

According to our results, after investing **€196 per hectare in nitrogen fertilizers**, the olive groves that did not implement sustainable agronomic practices ended up **losing nitrogen at a rate of €78 per hectare**. That is, 40% of the farmer investment in fertilizers was lost via (mainly) leaching and erosion processes. Therefore, merely adding more nitrogen to the soils of the olive grove in the form of fertilizers is not a solution in itself, and does not even financially compensate the farmer unless the agroecological processes that favor the nitrogen reserves that already exist in the soil to recirculate reiteratively within the farming system are effectively fostered.