Legume-maize double cropping effects on yields, greenhouse gases and soil carbon dynamics

Jesús Fernández-Ortega[1], Jorge Álvaro-Fuentes[2], Carlos Cantero-Martínez[1]
[1]Crop and Forest Sciences Dpt., Agrotecnio Center, University of Lleida, Av. Alcalde Rovira Roure, 191, 25198 Lleida, Spain. jesus.fernandez@udl.cat
[2]Soil and Water Dpt., Estación Experimental de Aula Dei (EEAD), Spanish National Research Council (CSIC), Avd. de Montañana, 1005, 50059, Zaragoza, Spain

OBJECTIVES

To evaluate leguminous – maize double cropping systems together with different tillage systems and nitrogen fertilisation rates on the basis of:

- Yield and resource use efficiency
- Greenhouse gas emissions
- Soil carbon dynamics

METHODOLOGY

A field experiment was carried out on a long-term experimental plot, comparing a maize monoculture and a leguminous-maize double crop with three types of tillage and three rates of nitrogen fertilization.

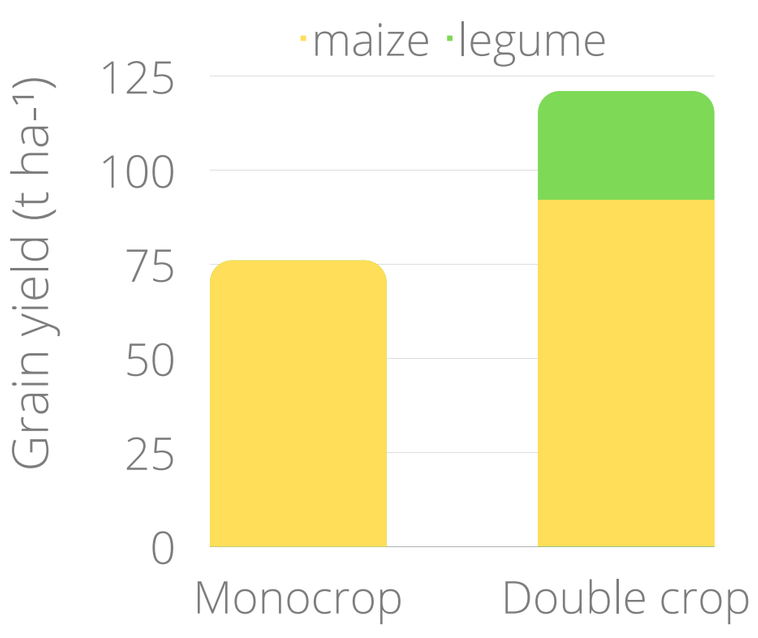
Introduction

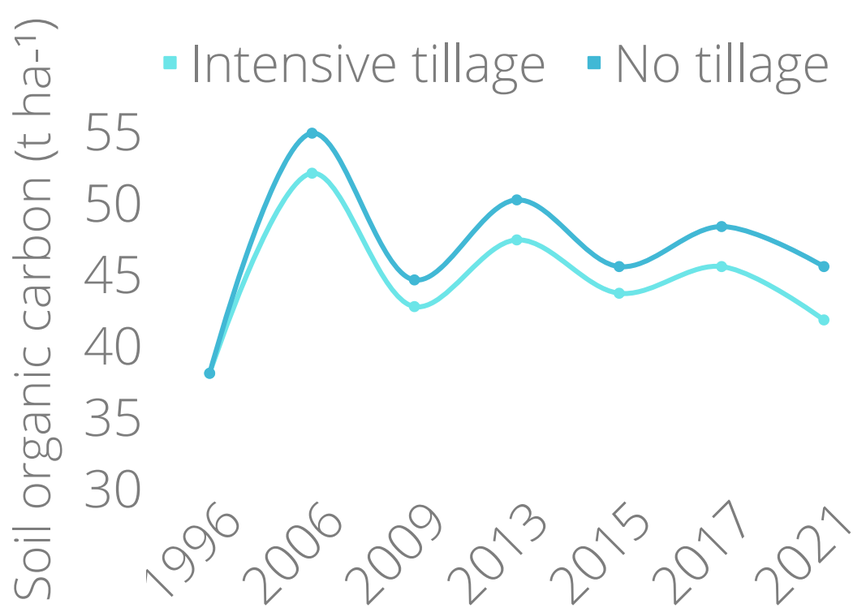
The low profitability of extensive crops is forcing the search for solutions that enable the sustainability of the agricultural sector. From an environmental point of view, agriculture is one of the main greenhouse gas sources, but it also has an important potential as a greenhouse gas sink.
Thanks to the technification of today's agriculture, it is possible to grow two crops in one year. This can make it possible to increase the profitability of farms. In addition, it can help to capture carbon in the soil and reduce greenhouse gas emissions if it is complemented by the appropriate techniques.

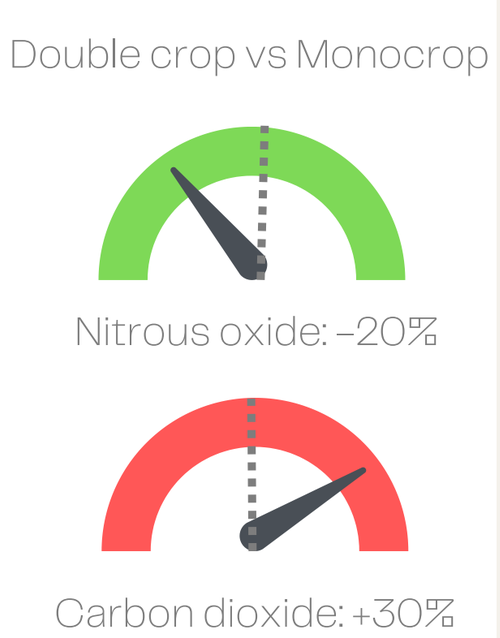
Is it possible to increase yields by using double cropping?

Is it possible to reduce greenhouse gas emissions with double cropping?

Did double cropping promote carbon sequestration in soils?







Conclusion:

The use of double cropping is a good strategy in the conditions studied for increasing crop yields. From an environmental point of view, double cropping reduced nitrous oxide emissions and increased carbon dioxide emissions. However, if complemented with no-tillage systems and low N fertilization rates, it can be a good strategy to favour soil carbon sequestration.

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