

2-years rotation, an alternative to maize monocropping in Bearn (France)

Problem

In Bearn, maize is well adapted to the pedoclimatic context, with no loss of yield potential when grown as a monocrop. But, regulatory pressure and price volatility risks, as well as increasing attacks from bio-aggressors, threaten maize monocropping. It is essential to experiment with alternative cropping systems combining respect for the environment, efficient management of bio-aggressors, productivity and profitability.

Solution

As an alternative to maize monocropping, a 2-years rotation has been implemented (Figure 1). It consists of a sequence of 4 crops in 2 years: maize, cover crop (oats & mustard), soybean and oats as an energy catch crop (ECC). Thanks to the introduction of legumes and cover crops, which enable crop diversification whilst qualifying for coupled aids, this innovative system has proved to enhance agronomic, environmental and economic performances.

Benefits

On a 3 years average basis, the 2-years rotation has proven to release 32% less GHG than maize monocropping. This is mainly due to a significant decrease of operating costs enabled by lower nitrogen inputs (-40%) thanks to the soybeans. It also brings economic satisfaction as soybean is well adapted in this region and a biogas plant gives additional added value to the energy catch crop. Even with higher mechanisation costs due to the ECC, the net margin with aid remains higher than that of the reference monocropping (+ 37 €/hectare on average over 3 years, although similar margin per hour worked).

Practical recommendations

- Sow soybeans at the same time as maize (around **April 20th**).
- Sow soybeans with a 40cm spacing to facilitate row closing by the cover and reduce weed growth.
- Soybean and maize weeds are the same. It is advisable to weed at pre & post-emergence with a weeder or selective products.
- Except in deep black soils, **irrigation is essential** for a competitive soybean.

Applicability box

Theme

Rotation diversification, multiple cropping

Agronomic conditions of Bearn (southwest of France)

Climate : Warm oceanic

Average T°C in winter : 5°C

Average T°C in summer : 20°C

Precipitation/year : 1100 mm

Soil of the region :

25% clay - 70% silt - 5% sand
Organic matter : 4%



Application time

All year

Period of impact

All year

Equipment

Common tools

Best in

Maize monocropping

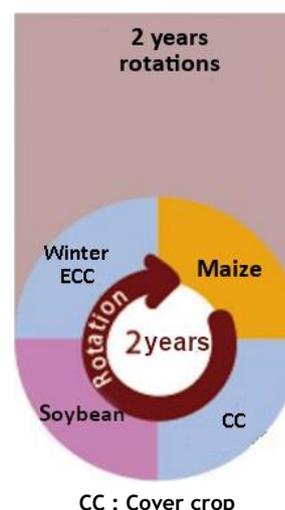


Figure 1: 2-years rotation (innovative system) as an alternative to maize monoculture. CC: Cover Crop, ECC: Energy Catch Crop. Source: Syppre

Further information

Article

- ALIAGA et al., 2019. *Soja et couvert d'avoine, un pari gagnant*. Perspectives agricoles n° 471, Novembre 2019, p.34-37 (FRENCH).

Weblinks

- Syppre Béarn (FRENCH): <http://syppre.fr/>

About this practice abstract and DiverIMPACTS

Publishers:

ARVALIS-Institut du végétal
21 Chemin de Pau, 64121 Montardon, France

Institut technique de la betterave sucrière
45 Rue de Naples, 75008 Paris, France

Terres Inovia
1 Rue de Monceau, 75008 Paris, France

Authors: Clémence Aliaga (Arvalis), Pierre Rochepeau (Arvalis)

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DiverIMPACTS: The project is running from June 2017 to May 2022. The overall goal of DiverIMPACTS - Diversification through Rotation, Intercropping, Multiple Cropping, Promoted with Actors and value-Chains towards Sustainability - is to achieve the full potential of diversification of cropping systems for improved productivity, delivery of ecosystem services and resource-efficient and sustainable value chains.

Project website: www.diverimpacts.net

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