PRACTICE ABSTRACT NO. 27

The economic impact of integrating living mulch in a crop rotation

Problem

It is not always possible to successfully grow cover crops in a rotation. It is important to sow and manage them efficiently with the crops in the rotation.

Solution

Living mulch is an innovative form of cover crops. Yet, it is also important to identify the benefits and constraints of incorporating them into a rotation.

Outcome

A technical-economic evaluation was carried out on several trials in France to assess the impacts of living mulches.

Applicability box

Geographical coverage
Europe
Application period
All year
Required time
N/A
Period of impact
Continuous
Equipment
Not specific

Practical recommendations

- Living mulches can lead to a slight increase in working time: crushing (avoiding weed graining), or even hoeing before sowing. According to the crop nitrogen response curves, it is not always justified to adapt the fertilisation strategy.
- A living mulch does not necessarily lead to an increase in TFI*, especially since weed control programmes are designed accordingly and selective weed control solutions for the cover crop are less expensive.
- Incomes: depend on the effect of cover crop on yield. Sometimes they are negative if insufficiently regulated.
- Expenses: cost of seeds must be included. The other costs are generally not affected.
- Margin: can be positive or negative (**Table 1**).
- Cover crops destroyed in the crop generated net margin gains when sown with rapeseed.
    - Despite the trefoil in Dosnon the net margin was negative. This was due to the cost of the seeds and being insufficiently regulated.
    - At La Jaillière, the establishment of the clover mixture in the maize crop before sowing wheat was poor. It also generated higher costs (seeds, hoeing).
- Cover crops kept alive generate variable margins depending on their impact on yields.

Table 1: Impact of living mulches on net margin (in €/ha over the entire crop rotation). Dosnon trial in partnership with the CETA of Romilly. The data come from the 2011/2012 to 2015/2016 campaigns. Co: rapeseed; BTH: soft winter wheat, OP: spring barley, MF: forage maize, Luz: seed-bearing alfalfa

		Destroyed cover crop				Living mulch		
Site year	Succession	White clover	Alfalfa	Bird's foot trefoil	Annual clovers	White clover	Alfalfa	Bird's foot trefoil
Boigneville 2011/2013	Co-BTH-OP-BTH	+48 to +100						
Boigneville Synthesis	Co-BTH-OP-BTH	+64	-32			-396 to +76	+24	
Dosnon 2014/2016	Co-BTH-OP-BTH	+52	-54	-162		+116	+30	-186
La Jaillère Synthesis	MF-BTH				-168 to -162			
B Destouches 2015 & 2016	LUZ-LUZ-BTH-BTH						+114	
GACE St Armel 2015 + 2016	Intercrop period MF-BTH					+37		

Legends:

Deviation from the control over the whole rotation	<-75 €/ha	<-75 to -26 €/ha	<-25 to -26 €/ha	+25 to +75 €/ha	> +75 €/ha

***TFI: Treatment Frequency Index**
The number of pesticide applications per calendar year in conventional farming assuming use of a fixed standard dose (based on active ingredients)

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Practical testing/Farmers' experiences

Many French farmers establish perennial cover crops in arable crops. They are often sown in a rapeseed as a companion crop. White clover & lucerne are the most common species.

Further information

- LABREUCHE et al., 2017, **Une grande diversité de situations**. Perpectives Agicoles n°433 : https://www.perspectives-agricoles.com/file/galleryelement/pj/6d/65/7e/2d/443_494547842836153905.pdf
- Webpage: https://www.remix-intercrops.eu/
- Facebook Page: https://www.facebook.com/RemixIntercrops/
- Wiki: http://vm193-134.its.uni-kassel.de/En.DiversiWiki/index.php/Mixture_practice_for_farmers_and_advisors
- Check the Organic Farm Knowledge Platform for more practical recommendations.

About this abstract

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ReMIX is a H2020 multi-actor project that will allow designing cropping systems based on agro-ecology for the benefit of farmers and the whole EU agricultural community. ReMIX will exploit the benefits of species mixtures to design more diversified and resilient agro-ecological arable cropping systems. Based on a multi-actor approach, ReMIX will produce new knowledge that is both scientifically credible and socially valuable in conventional and organic agriculture. The project will tackle practical questions and co-design ready-to-use practical solutions. The project will span from the specification of end-user needs and the co-design of in-field and on-farm experiments to demonstrations with evaluation of new varieties and practices. ReMIX will contribute to the adoption of productive and resilient agricultural systems. The project is running from May 2017 to April 2021

Website: www.remix-intercrops.eu

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