

# Monitoring and comparing cover crop performances

## Problem

When farmers decide to implement cover crops on their farms, they usually lack available data regarding the performance of species and/or cultivars in their own pedo-climatic context.

## Solution

Testing different species and/or cultivars of cover crops on the farm generates useful local data on the performance of species and/or cultivars. The French MERCI tool (Méthode d'Estimation & des Restitutions par les Cultures Intermédiaires) facilitates their evaluation.

## Outcome

The acquired information on biomass production and expected nutrient release of cover crop species and/or cultivars will provide greater certainty for the selection of suitable varieties and the estimation of fulfilment of the nutrient requirements of the subsequent crop.

## Applicability box

### Theme

Nutrient management

### Geographical coverage

Europe

### Application time

During the cover crop cycle

### Required time

30 min of observation (at least twice during the cover crop cycle)

### Period of impact

Current and succeeding crops

### Equipment

A square frame, a bag and a scale

### Best in

Cover crops or relay intercropping

## Method and results of practical testing

MERCI is an easy-to-use tool which simplifies:

- Estimation of the dry matter produced per hectare (tonnes per hectare);
- Calculation of the nitrogen trapped (or stored) by the cover crop;
- Definition of the nitrogen refund levels for the subsequent crop (kg/ha).

The references used in the calculations are based on more than 10 years of trials on cover crops in Poitou-Charentes/France. Simulations are carried out with INRA's STICS software.

ITAB, together with a group of farmers, tested the MERCI method, undersowing different cultivars of white clover in a winter wheat field on a farm in Central France (Saint Fargeau, Yonne). The following 6 cultivars were grown: 3 dwarf cultivars (*Huia*, *Rivendel* and *Pirouette*), 2 intermediate "Hollandicum" cultivars (*Merwi* and *Jura*) and 1 giant cultivar (*Excell*). The cultivars were compared to a mixture of species as a control.

The white clover species was sown on 26 March 2017 into winter wheat. Weeds, cover crop development (plant density) and winter wheat development were monitored along the cover crop cycle (3 times). The performances of 4 cultivars were estimated in early November, using the MERCI method. Weeds were identified and their total ground cover was estimated. For each cultivar, the fresh biomass from three 1 m<sup>2</sup> plots was sampled (Fig. 1), weighed and used as an input in the MERCI tool. The most promising results were identified for *Merwi* cultivar (Tab.1).

	Dry biomass (t/ha)	kg of N/ha	kg of P <sub>2</sub> O <sub>5</sub> /ha	kg of K <sub>2</sub> O/ha
MERWI	2,3	25	10	95
JURA	0,8	10	0	35
HUIA	0,9	10	0	35
RIVENDEL	1	10	5	40

Table 1. MERCI outputs for dry biomass and potential nutrient release of 4 cultivars



Fig.1. Sampling of the cover crop

### Practical testing and sharing of the results

If this tool seems to be suitable for your farm, we recommend that you test it under your own farm conditions.

Use the comment section on the [Farmknowledge platform](#) to share your experiences with other farmers, advisors and scientists! If you have any questions concerning the method, please contact the author of the practice abstract by e-mail.



### Further information

#### Videos

- Watch the following [video](#) to learn more about the farmer group.
- Watch the [video](#) describing the MERCI tool (in French).

#### Further readings

- [Description of the MERCI tool \(in French\)](#)
- Vrignon-Brenas, S., Celette, F., Piquet-Pissaloux, A., David, C., 2016. Biotic and abiotic factors impacting establishment and growth of relay intercropped forage legumes. *Eur. J. Agron.* 81, 169–177. doi:10.1016/j.eja.2016.09.018
- Vrignon-Brenas, S., Celette, F., Piquet-Pissaloux, A., Jeuffroy, M.H., David, C., 2016. Early assessment of ecological services provided by forage legumes in relay intercropping. *Eur. J. Agron.* 75, 89–98. doi:10.1016/j.eja.2016.01.011

#### Weblinks

- [Download](#) the MERCI tool.

### About this practice abstract and OK-Net Arable

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among farmers, farm advisers and scientists with the aim to increase productivity and quality in organic arable cropping all over Europe.

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