

# Using a partner crop in maize for weed suppression

## Problem

It is very common to use chemical herbicides to control weeds in maize. Considering the negative environmental impact of this practice and the societal pressure to reduce herbicide use, finding alternative solutions is desirable.

## Solution

The diversification of the maize crop is a possible solution: sowing the maize in a (winter) partner crop, mowing the partner crop, and using the mulch for soil cover and weed suppression.

## Outcome

When the method is successful no chemical weed control is needed. Crop diversity increases due to the partner crop in between the maize rows. If the chosen partner crop flowers, it will also attract extra biodiversity.

## Practical recommendation

- One option is to sow a winter-crop mixture of cereals and peas. This can be harvested as fodder, and following this, maize is sown in the stubble using strip tillage.
- If you harvest the winter crop, it is important to choose a crop that regrows, so that there is enough material to form the mulch layer.
- It is important to choose the right maize variety; when you want to harvest fodder first, it will probably be too late for your normal maize variety, and so an earlier maturing variety might be required.
- Even when the partner crop includes legumes it is important to fertilise the maize at the start (around the time of sowing). If the legume provides some nitrogen, it will only be available later in the season, too late for the start growth of the maize.

## Applicability box

### Theme

Cropping system, strip cropping, intercropping, multiple cropping

### Agronomic conditions

The method was tested on sandy soils in the north of the Netherlands, with an average annual temperature of 11 degrees Celsius, and approximately 800 mm precipitation per year.

**Application time** Sowing of the partner crop should be done before maize sowing. If you want to harvest the crop it is best to sow it before winter, in November. Another possibility would be to do it at the first possible moment in spring, in March.

**Required time** Management of the partner crop during maize growth takes extra time

**Period of impact** Maize growing season (end of April - beginning of October)

**Equipment** Machine that can mow in between maize rows + strip till machine to sow maize in partner crop

**Best in** This method works for maize cropping systems, preferably with a pre-crop that is harvested early, so that the partner crop can be sown in October/November already.



Picture 1: Between row mowing machine here mowing the partner crop (photo: Johan Specken, WUR). Picture 2: In row harrowing machine in action (Michel Raaphorst, NMB)

- When mowing the partner crop after the maize has been established, a special machine is needed (see picture 1). This machine was custom-built. It is best compared to a series of lawn mowers that each mow approximately 50 cm in between the maize rows. The idea behind the methodology is that in future small robots will be available to do the mowing.
- Attention needs to be paid to the management of the partner crop in order to prevent competition with the maize. In 2021 in field trials in the Netherlands triticale proved to be a better partner crop (less competition) than rye.
- If the partner crop fails to re-grow after mowing, the resowing of the partner crop should be considered.
- Pay attention to controlling weeds in the maize rows. In our case a harrow was modified to only work in the row, and soil was moved into the row to bury the weed, see photo 2. This needs to be done a couple of times, since it is most effective when weeds are small.

## Further information

### Further readings

- Schulz VS, Schumann C, Weisenburger S, Müller-Lindenlauf M, Stolzenburg K, Möller K. Row-Intercropping Maize (*Zea mays* L.) with Biodiversity-Enhancing Flowering-Partners—Effect on Plant Growth, Silage Yield, and Composition of Harvest Material. *Agriculture* 2020; 10(11):524. <https://doi.org/10.3390/agriculture10110524>

### Weblinks

- <https://www.fwi.co.uk/arable/maize/companion-cropping-solve-maize-environmental-issues>

## About this practice abstract and DiverIMPACTS

### Publisher:

Wageningen University and Research

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**Permalink:** <https://zenodo.org/deposit/6483157>

This practice abstract was elaborated in the DiverIMPACTS project, based on the EIP AGRI practice abstract format. The method was tested in field trials and in practice on farmers' fields in the north of the Netherlands.

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](http://www.diverimpacts.net)

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