

# Cover crop mulches and no-till maize

## Problem

Maize is one of the most difficult field crops in terms of weed management. The low number of plants per m<sup>2</sup> and the relatively long time the crop requires to cover the soil surface encourage the growth of summer weeds and increase water evaporation.

## Solution

The mentioned problems can be avoided by sowing maize in a no-till system into a mulched cover crop. This method requires mechanical termination of the cover crop that precedes the maize crop with a roller-crimper, and, for sowing maize, a no-till planter is needed.

The mulch cover will control weeds during the initial growth phase of the maize crop and reduce water loss by evaporation. If leguminous cover crops are used, important amounts of nitrogen can be collected.

## Outcome

In a Northern Italian context, a field pea cover crop was tested as mulch for the maize crop. The roller crimper effectively terminated the cover crop (15 t per ha of wet biomass). However, the mulch did not last long enough, probably due to a narrow C/N-ratio and biologically active soil. The maize plants did not have enough time to develop and shade the entire soil surface. Weeds started to sprout through the decomposing mulch. For the test conditions, this cover crop has proven unsuitable as a long-lasting mulch to control weeds. No fertilization and no irrigation were applied. The maize yields amounted to about 5 t per ha.

## Practical recommendations

- The cover crop needs to be sown as accurately as the main crop. Poor cover crop stands do not result in good mulches.
- The effectiveness of the mulch depends on the amount of mulch biomass. However, more biomass also means more difficulty for the planter.
- On soils with low organic matter content, additional nitrogen fertilisation should be considered.



Picture 1: Roller-crimper. Picture 2: No-till planter. Picture 3: Pea mulch after planter passage.

## Applicability box

### Theme

Weed management, soil quality and fertility

### Geographical coverage

Maize growing areas

### Application time

Sowing of the cover crop in autumn, sowing of maize in May

### Required time

Total required time is a little less than the time required for traditional seedbed preparation and sowing of maize

### Period of impact

From autumn (soil cover during winter) to the end of the maize crop

### Equipment

Roller crimper, no-till planter

### Best in

Areas with low rainfalls in summer

### Evaluation

Results can be evaluated visually (i.e. qualitatively) or quantitatively for easier sharing. Define plots of a few m<sup>2</sup> in both no-tilled and tilled fields. Determine the following criteria in both plots:

- **Weeds:** identify, count, and, if possible, weigh the weeds;
- **Grains:** determine yield and grain moisture;
- **Soil:** take one or two soil samples (e.g. at 10 and 30 cm depth) and determine the soil water content. Watch this [video](#) to see a method for determining the soil water content using a microwave oven.

### Practical testing and sharing of results

If this method 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

#### Video

- This [video](#) (Italian) shows the termination of a cover crop and the sowing of the succeeding crop.

#### Link

- At [www.aiab-aprobio.fvg.it](http://www.aiab-aprobio.fvg.it), a lot of information on organic arable crop management is available in biweekly bulletins and topic-specific leaflets.
- A description of the technique is given in a [video](#) by the Rodale Institute.
- The [knowledge platform](#) offers information and practical updates on weed management and soil quality in organic arable cropping systems.

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

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