

# Cover crop mulches and no-till soybean

## Problem

Soybean is a challenging crop in organic systems due to its low ability to compete with weeds during growth. 2 to 4 hoeing passages with camera-controlled steering systems are an option, but they significantly increase production costs. Moreover, in the traditional Italian growing areas, irrigation is becoming a necessity to ensure good yields. However, not all areas can be irrigated at a reasonable cost.

## Solution

As a solution, soybeans may be sown into mulched cover crop in a no-till system. The mulch cover suppresses the weeds during initial growth of the crop and reduces the amount of water lost by evaporation.

## Outcome

Several methods of sowing into mulch were tested:

- No-till sowing into a standing cover crop, then rolling the cover crop with a roller crimper;
- No-till sowing into a standing cover crop, then creating mulch by passing over it with a flail shredder;
- No-till sowing into a standing cover crop, and no follow-up procedures;
- Mulch obtained with a flail shredder, then no-till sowing with a tine air seeder; and
- Roller crimper followed by no-till sowing with a tine air seeder.

All of these methods, except method B, have shown good results in terms of weed control, and preservation of soil water (even during the dry summer in 2016). Yields were comparable with those of the tilled fields, except for method C.

## 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.



Picture 1: Roller crimper



Picture 2: No-till tine air seeder, method E

## Applicability box

### Theme

Weed management, soil quality and fertility

### Geographical coverage

Soybean growing areas

### Application time

Sowing of cover crop in autumn, sowing of soybeans in late May

### Required time

A little less than for traditional seedbed preparation and sowing of soybeans

### Period of impact

Autumn (cover crop sowing) and spring-time (soybean planting)

### Equipment

Roller crimper or flail shredder, no-till planter

### Best in

Areas with low rainfall in summer



Picture 3: Left, method A; right, method B



Picture 4: Left, method E; right, method C

## Evaluation

Results can be evaluated visually (i.e. qualitatively) or, for easier sharing, quantitatively. Define small plots of a few m<sup>2</sup> in the no-tilled and tilled fields. In each plot evaluate:

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

### 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 in a [video](#) by the Rodale Institute.
- The [knowledge platform](#) of OK-Net Arable 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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**Project website:** [www.ok-net-arable.eu](http://www.ok-net-arable.eu)

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