PRACTICE ABSTRACT NO.005

No-till cultivation of maize in rolled forage peas

Problem

Tilling the maize crop leads to soil compaction and reduces soil quality, which can have a negative impact upon the growing conditions of subsequent crops. No-till processes are soil-conserving, but highly challenging in organic farming.

Solution

For the conservation of soil quality, no-till maize cultivation in a rolled green manure has proved to be successful in practical trials by FiBL. The use of lush peas (EFB33 peas) is recommended as they almost stop growing after being rolled, and cover the soil well. With the mulching process, the trials achieved crop yields virtually equal to the ploughing method.

Outcome

The non-tilled, constantly covered soil has improved water retention and also shows a better carrying capacity during harvest, and is less affected by weed infestation, compaction, nutrient-leaching, and erosion. Stockless farms especially benefit from the nitrogen input of the legume-green manure.

Applicability box

Theme
Soil quality and fertility, crop-specific measure

Geographical coverage
In European maize-cultivation areas with soils that are not too heavy

Application time
Stubble tillage and sowing of the forage peas in October, rolling and sowing of maize end of May

Required time
A single application of the roller. Dispensing with tilling and weed control leads to a reduction of effort of up to 10 % in the mulch process in comparison to using the plough.

Period of impact
Beginning of August (harvest of preceding crop) until end of May (maize harvest)

Equipment
Knife-cylinder roller, direct-seed drill

Best in
Forage or corn maize

Practical recommendation

- At the beginning of August, carry out 1 to 2 stubble-tillage operations after cereal or rape harvest.
- Sow the wintering forage peas in October.
- At the end of May, kink the peas' stems with a knife-cylinder roller, after which you drill in the maize with row cleaners. The green manure lying on the ground must be properly dried off for sowing.
- The mineralisation performance, lowered due to the soil cover, can be compensated for with focused nitrogen fertilisation in the rows.

Picture 1: Rolling the forage peas (to the right) and no-till cultivation of maize in the rolled peas. Picture 2: Seed-drilling into the dry mulch layer. Picture 3: Maize stock with peas mulch. (Photos: Thomas Alföldi, FiBL)

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Practical testing

If this method seems to be suitable for your farm, we recommend that you test it under your own farm conditions as follows:

1. After harvesting the previous crop, delimit a part of the field for testing.
2. Apply the new method on one of the two plots. The other plot can be cultivated as usual.

Evaluation and sharing of the results

Visual evaluation: In order to evaluate the efficiency of the method, you can compare the development of maize crops at different stages. Photographs of the trial plots document the result and facilitate the analysis at a later time. Additionally, compare the development of weed as well as the soil composition (humidity, structure, earthworm activity) in the two plots.

Quantitative evaluation: For the evaluation of yield differences, you can compare the weights of the harvested crops from a trial plot and from a standard plot (convert the yields into a unit area of 1 a or 1 ha).

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

- Direktsaat von Körnermais ohne Herbizide (No-till cultivation of corn maize without herbicides) is a German spoken video with English and French subtitles that shows the technique.

Links

- The Farmknowledge Tool Database offers practical follow-up information on no-till cultivation.
- The no-till method was tested in Switzerland from 2012 to 2016. The experiences are documented in four reports (in German).

About this practice abstract and OK-Net Arable

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Translation: Andreas Basler

Language editing: Simon Moakes

Permalink: Orgprints.org/31020

OK-Net Arable: This practice abstract was elaborated in the Organic Knowledge Network Arable project. The project is running from March 2015 to February 2018. OK-Net Arable promotes exchange of knowledge among farmers, farm advisers and scientists with the aim to increase productivity and quality in organic arable cropping all over Europe.

Project website: www.ok-net-arable.eu

Project partners: IFOAM EU Group (project coordinator), BE; Organic Research Centre, UK; Bioland Beratung GmbH, DE; Aarhus University (ICROFS), DK; Associazione Italiana, per l'Agricoltura Biologica (AIAB), IT; European Forum for Agricultural and Rural Advisory Services (EUFRAS); Centro Internazionale di Alti Studi Agronomici Mediterranei - Istituto Agronomico Mediterraneo Di Bari (IAMB), IT; FiBL Projekte GmbH, DE; FiBL Österreich, AT; FiBL Schweiz, CH; Ökológiai Mezõgazdasági Kutatóintézet (ÖMKI), HU; Con Marche Bio, IT; Estonian Organic Farming Foundation, EE; BioForum Vlaanderen, BE; Institut Technique de l'Agriculture Biologique, FR; SEGES, DK : Bioselena, Bulgaria

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 652654. This communication only reflects the author's view. The Research Executive Agency is not responsible for any use that may be made of the information provided.