

Which harrow is suitable for weed control in organic cereals?

Problem

To achieve good yields and high grain quality, and to avoid increased weed pressure in subsequent crops, weeds must be controlled efficiently in organic cereal production. Different mechanical devices are available for weed control.

Solution

The tined harrow and the rotary hoe are two commonly used mechanical tools for weed control. In recent years, the Treffler Company re-invented the concept of the harrow and introduced the precision tined harrow. Inagro tested the tined harrow, the rotary hoe and the precision tined harrow to determine the most effective device.

Outcome

The precision tined harrow had the best impact on soil and weeds, as each tine leaves its own trace. The rotary hoe just created small holes, but broke up the soil crust. Two successive treatments doubled the efficiency against weeds.

Applicability box

Theme

Weed management

Geographical coverage

Global

Application time

Before emergence of the crop (blind harrowing) or from 3 leaves unfolded (GS 13) until late tillering (GS 29)

Required time

1 to 4 times; the required time depends on the crop stage, soil conditions and width of the equipment; 30 to 60 minutes for 1 hectare with a 6 m-harrow.

Period of impact

Current and succeeding crop

Equipment

Harrow

Best in

Applicable for almost all arable crops and in a large range of vegetables

Practical recommendations

- Weed management in organic farming requires an integrated approach, taking into account rotation, soil, available tools, prevalent weeds, etc.
- The smaller the weeds, the more sensitive they are to mechanical treatment with the harrow. The best results are achieved between the 'sprout' and 'first leaf' stage of the weeds. However, for mechanical weed management, the crop must be well established. Therefore, between the rising of the crop and the 3-leaves growth stage, mechanical control is not recommended.
- Soil conditions are crucial, especially in case of crust (e.g., after winter). An early harrowing or hoeing, when soil is 'drying white', is needed to break up the crust. The rotary hoe has proved to be the most effective tool for this.
- Do not be afraid of damaging your cereal crop from the 3-leaves stage onwards. Cereals are capable of recovering. Adjust speed and drive rather slowly in young crops. The rotary hoe and the precision tine harrow allow earlier treatments than the traditional tined harrow.
- If the results are not sufficient over the years, it is recommended to sow cereals with a row spacing of 30 cm. This allows the combination of hoeing and harrowing for better weed control.
- If you intend to buy a new harrow, inform yourself about the different devices available. Ask colleagues and advisors about their experiences.



Rotary hoe

Traditional tined harrow

Precision tined harrow

Figure: presentation of different harrows and their impact on soil and weeds under difficult conditions on the same experimental field with crusty soil.

Evaluation

Visual evaluation:

In order to evaluate the method's effectiveness, compare the development of the succeeding crop at various stages. With the help of photographs, you can document the result and consult it later on for analysis. Also, compare the development of weeds and the condition of the soil (humidity, structure, activity of earthworms) in both areas.

Quantitative evaluation:

To identify yield differences, you can compare the weight of the harvest yield from the trial field with the one from the standard field (convert yields on unit area from one a or ha).

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, applying it only on a part of the field. Treat the remaining land as usual.

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

- See the harrows in use and listen to the farmers' experiences in the video "[Mechanical weed control in cereals](#)"
- Find further tips for organic weed control at www.farmknowledge.org.

About this practice abstract and OK-Net Arable

Publishers:

INAGRO, Ieperseweg 87, 8800 Rumbeke, Belgium
Phone +32 (0)51 273 250, bio@inagro.be, www.inagro.be

IFOAM EU, Rue du Commerce 124, BE-1000 Brussels, Belgium
Phone +32 (0)2 280 12 23, info@ifoam-eu.org, www.ifoam-eu.org

Authors: Lieven Delanote and Karel Dewaele (Inagro), An Jamart (Bioforum Vlaanderen)

Contact: lieven.delanote@inagro.be

Permalink: [Orgprints.org/32612](https://orgprints.org/32612)

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; Ökologiai Mezőgazdasági 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

