

Comb harrow: efficient weed control in cereals

Problem

Weeds are a major problem in organic cereal production. The most common weeds are wild poppy, forking larkspur, cleavers, chamomile, common speedwell, podium *Anthemis*, combine, stork's bill, burdock, Bermuda grass and *Sorghum halepense*. Weed development before tillering can reduce yields, hinder the harvest, and increase weed pressure in the subsequent crop.

Solution

In organic farming, the use of herbicides is prohibited. Therefore, organic farmers depend on preventive weed control measures such as crop rotation and mechanical control measures for weed control. In many countries, the comb harrow is a standard tool for weed control in early stages of cereal growth. The aim is to achieve the lowest possible weed density until the end of tillering. Growth of problem weeds such as cleavers, chamomile, hollow tooth, field foxtail, mustard, etc. should be prevented until the end of stem extension.

In Bulgaria, many farmers are not familiar with the comb harrow, and some have doubts about its efficiency. Hence, the effect of harrowing was tested in Bulgaria on 3 farms for 3 cereals (wheat, spelt and einkorn). Within each field, 2 experimental plots were created: one with comb harrow use, and a control plot without harrow use.

Outcome

In the beginning, weeds with shallow roots were successfully eradicated by the harrow. Others (e.g., burdock and stork's bill) were controlled to a certain extent. The results of FAO "Bioselena" show that the application of the comb harrow had a significant impact on the yield, with an increase of 12.7 % for wheat, 16.7 % for spelt and 23.4 % for einkorn. The weeds decreased by 51.15 %, 58.14 % and 36.37 %, respectively.

Practical recommendations

- Drill winter cereals in rows with an increased sowing rate of 7-10 % compared to conventional cereal crops during the most appropriate period (September 25 to October 5 for Northern Bulgaria, 5 to 15 October for Southern Bulgaria).
- When the crop is in the „3-leaf“ stage, control the emerging weeds with a comb harrow.
- Repeat the procedure, when the wheat plants start tillering.
- Use the harrow again at the earliest possible time in spring to destroy the soil crust and aerate the soil.



Photos 1-3: Application of comb harrow in spelt, April 04, 2017 (Photos: FOA Bioselena)

Practical Testing

To verify the effectiveness of the method on your farm, we recommend dividing your next cereal field into two plots. Then apply the comb harrow as recommended on one plot and cultivate the other plot as usual.

Evaluation and sharing of the results

Visual evaluation:

- Count the number of cereal plants per m² and the number and types of weeds per m² at the 3 leaves stage of the crop in both plots.
- Repeat the procedure a second time during the “tillering” phase and a third time in March.
- Document the development of the crop and weed density in both plots with photos for later evaluation.
- Assess the effectiveness of the method.

Quantitative evaluation:

- Compare the yields of the two plots (for 1 acre 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

- [Comb harrow use](#) on Bulgarian organic farms

Weblinks

- The [OK-Net Arable Tool Database](#) offers practical follow-up information on weed control in arable crops.

About this practice abstract and OK-Net Arable

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