



An EU-wide farm network demonstrating and promoting cost-effective IPM strategies

Field day / Seminar

Mechanical weed control in arable crops

May 2023 (9:30 - 14 o'clock)

**Where?**

LAWO (Hainweg 11 OT Pahren, 07937 Zeulenroda-Triebes)  
Verwaltungsgebäude der **Pahren Agrar** GmbH und Co. KG

**Program**

09:30 - 10:00 o'clock	Arrival
10:00 - 10:15 o'clock	Welcoming - Silke Dachbrodt-Saaydeh und Dr. Thomas Rottstock (JKI)
10:15 - 10:30 o'clock	Introduction of farm and production system - René Kolbe (CEO of the Pahren Agrar Cooperation)
10:30 - 11:00 o'clock	Practical experiences on harrowing and hoeing - Josef Rauwolf (Agrar GbR Tanna / Bioland)
11:00 - 11:15 o'clock	Discussion
11:15 - 11:45 o'clock	Potential of mechanical weed control – Insights in research and praxis - Dr. Arnd Verschwele (JKI Braunschweig)
11:45 - 12:00 o'clock	Discussion
12:00 - 12:30 o'clock	Lunch
12:30 - 14:00 o'clock	Field walk and practical demonstration of machinery for mechanical weeding in different crops.  Including a „Biostar“ rotary hoe - René Becker (GST Denmark)

**Reservation until 31<sup>st</sup> of May**

Dr. Thomas Rottstock

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## Report on the seminar “Mechanical weed control in arable crops”

In the view of increasing restrictions on the availability of authorised herbicides and the development weeds resistance, mechanical measures have an excellent potential in future weed management. For this reason, the Julius Kuehn – Institute (JKI) organised an IPMworks seminar for demonstration of different machines for mechanical weeding on June 2<sup>nd</sup>, 2023. Moreover, the performance of the different types of machines were tested in different crops (oats, maize, peas) and soil types. This event was aimed at interested farmers and other agricultural stakeholders. In total, 19 participants attended the Seminar “Mechanical weed control in arable crops” (5 farmers, 4 advisors, 3 students, 3 supply chain actors and 4 policy makers). The JKI is coordinating the German hub DE17, comprising ten conventional arable crop farmers in central Germany.

The seminar took place at the venue of a hub-members farm in Thuringia (07937 Zeulenroda-Triebes). This farm is managed partly conventional and partly organic. René Kolbe, who is the CEO of the Pahren agricultural cooperation, follows the approach of regenerative farming. Through associated IPM practices, the conventional farm has been successful in reducing the treatment frequency indices of pesticides. According to the host farmer, diverse crop rotations with year-round green soil cover are particularly important. Thus, he also contributes to the preservation of the nearby drinking water resources. The farmer is open to changes in cropping systems, which he is convinced help prepare the farm for future challenges in crop production and the legal regulatory challenges. For 30 years he has mostly avoided ploughing, which helps to mitigate soil erosion. The farm’s machinery comprises diverse hoes and harrows for mechanical weed control. Regarding mechanical weeding, the farmer stresses the importance of timing and the dependence on weather and soil conditions as well as the higher costs for weed control (fuel and labor). Mechanical weed control is a good option in conventional cropping systems but also recognizes that organic has limitations due to the lower yields.



Host-farmer Mr. Kolbe explaining the applied weed management (Photo by Silke Dachbrodt-Saaydeh)

The seminar began with a presentation by Mr. Josef Rauwolf, who is a “Bioland” certified organic farmer from the Agrar GbR Tanna. He farms approximately 300-hectares arable land, where he uses a combination of hoeing and harrowing for weed control. He has a hoe at the front of the tractor and a harrow in the rear, while the machines are guided by a modern camera system. This method was described as very effective, since it gives better results in less time. In order to use the hoe, it is necessary to sow the crops with sufficient space between the rows. A positive side effect of the mechanical measures is the increased aeration of the soil, which reduces the pressure of foot diseases. The farmer has seen a 5 to 10 percent increase in yields due to the mechanical weeding. During the discussion that followed, the participants were particularly interested in the camera system used.



Organic farmer J. Rauwolf reporting on his experiences in mechanical weed control (Photo by Silke Dachbrodt-Saaydeh)

The second talk in our seminar held by from Dr. Arnd Verschwele, who is a weed scientist at the Julius Kühn – Institut, Institute for plant protection in arable crops and grasslands. He has long time experience in mechanical weed control and a broad diversity of machines. He explained their potentials and limits of mechanical weed control. Thus, he described different observed effects of mechanical measures on weeds and crops. The following discussion was about advantages and disadvantages of selected machines for weed control.





Weed Scientist Dr. Verschwele from JKI (Photo by Silke Dachbrodt-Saaydeh)

After the lunch break, the host-farmer presented the various machines, which he uses for mechanical weeding. The individual machines were explained in detail by the dealers of the respective brands (Einböck, Horsch and GST Denmark).





A "Biostar" roller hoe from GST Denmark (Photo by Silke Dachbrodt-Saaydeh)

The presentation of the machinery was followed by on-field demonstrations of roller-hoes and harrows in diverse arable crops like for instance oats, maize and peas.



Finger hoe weeder (Einboeck) (Photo by Silke Dachbrodt-Saaydeh)





On-field demonstration of machinery for mechanical weed control (Photo by Silke Dachbrodt-Saaydeh)