

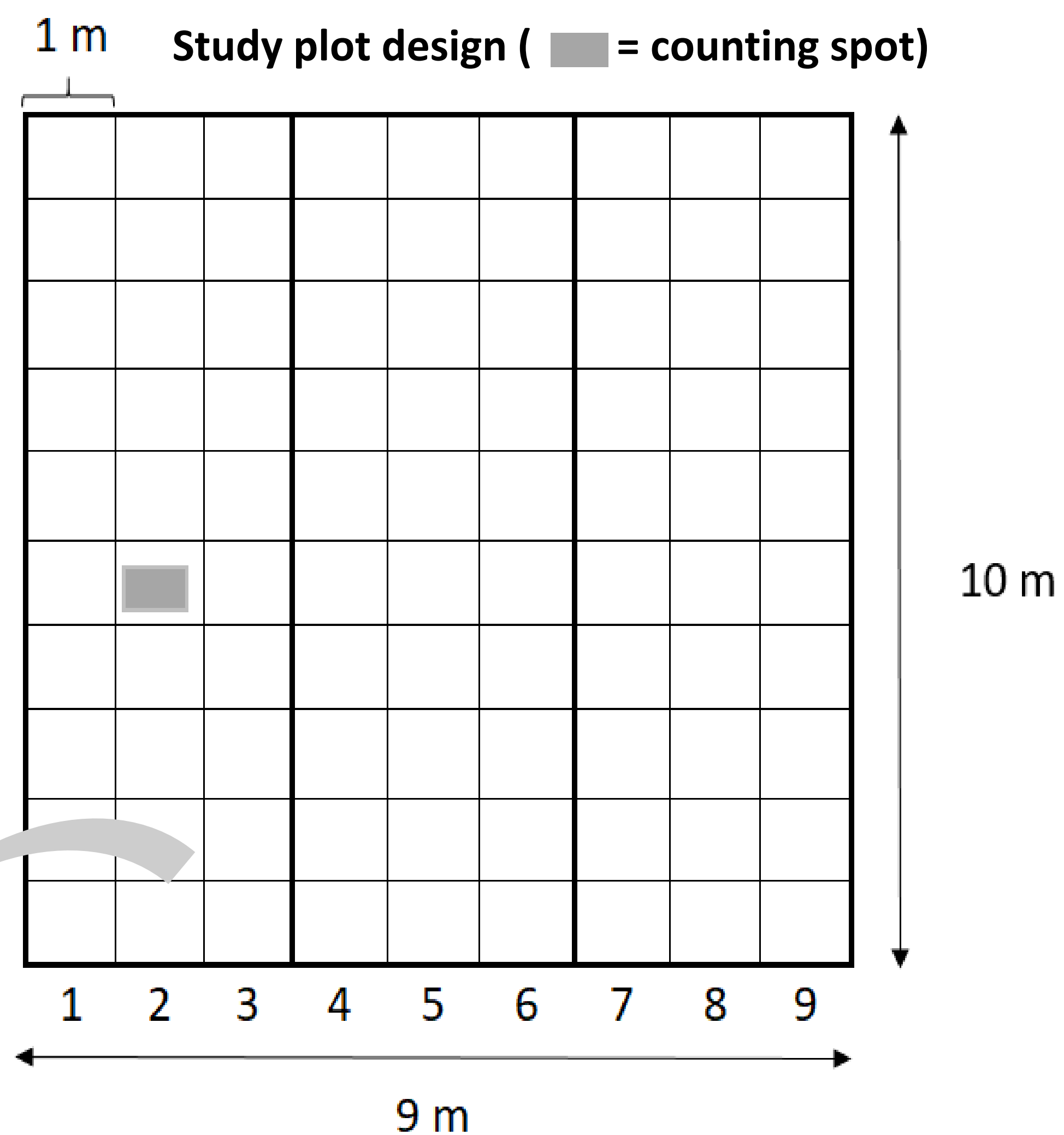
Background

Food availability is a key factor for the attractiveness of bare soil fields for birds and mammals (2009). In accordance with the EFSA guidance for birds and mammals (2009) and its draft revision (EFSA 2021) the availability of seeds on fields over-sprayed with pesticides has to be considered as a potential exposure route. Here we present how harrowing and sowing in sugar beet fields can reduce weed seed surface exposure, and how this can be recorded in an effective way.

Material & Methods

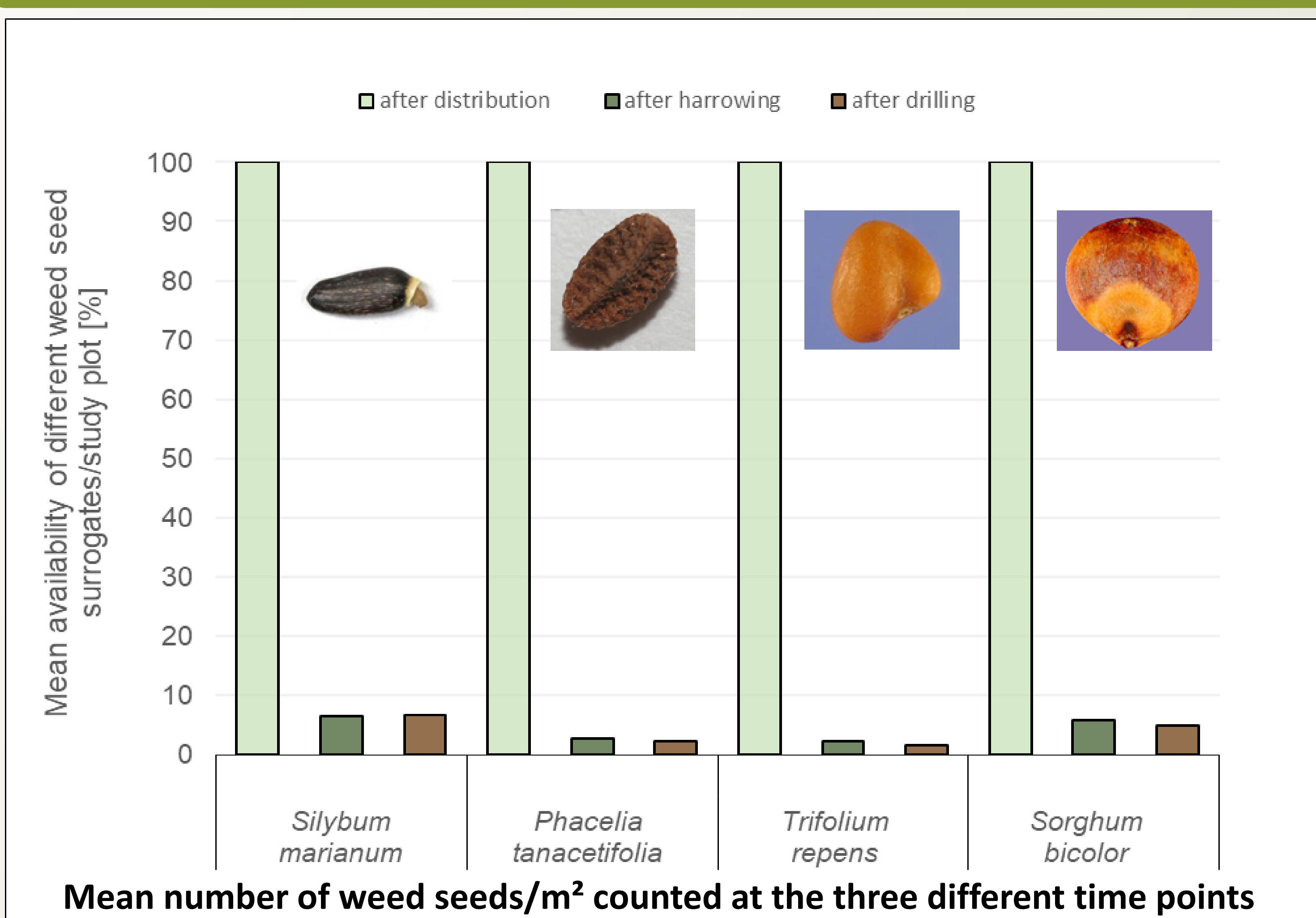
Study set up:

- four bare soil fields
- four comparable study plots (each 12 x 12 m) per field
- study plots divided into nine rows, each 1 x 10 m (perpendicular to the working direction of the farming machines), containing ten virtually assigned sub-squares of 1 x 1 m
- on each study plot one weed seed surrogate distributed by hand
 - milk thistle (*Silybum marianum*),
 - purple tansy (*Phacelia tanacetifolia*)
 - white clover (*Trifolium repens*)
 - great millet (*Sorghum bicolor*)
- weed seed surrogates dyed with fluorescent orange
- weed seed surrogates counted three times, each after:
 - 1) weed seed surrogates distributed on the study plots
 - 2) harrowing of the study plots
 - 3) drilling of the crop (sugar beet)
- harrowing and drilling carried out by local farmers shortly after the weed seed surrogates are distributed by hand
- Counting via a black light box (34 x 25 cm) with (wavelength 254 nm to 366 nm), placed over each counting spot



Visible seeds inside black light counting box

Results of a case study

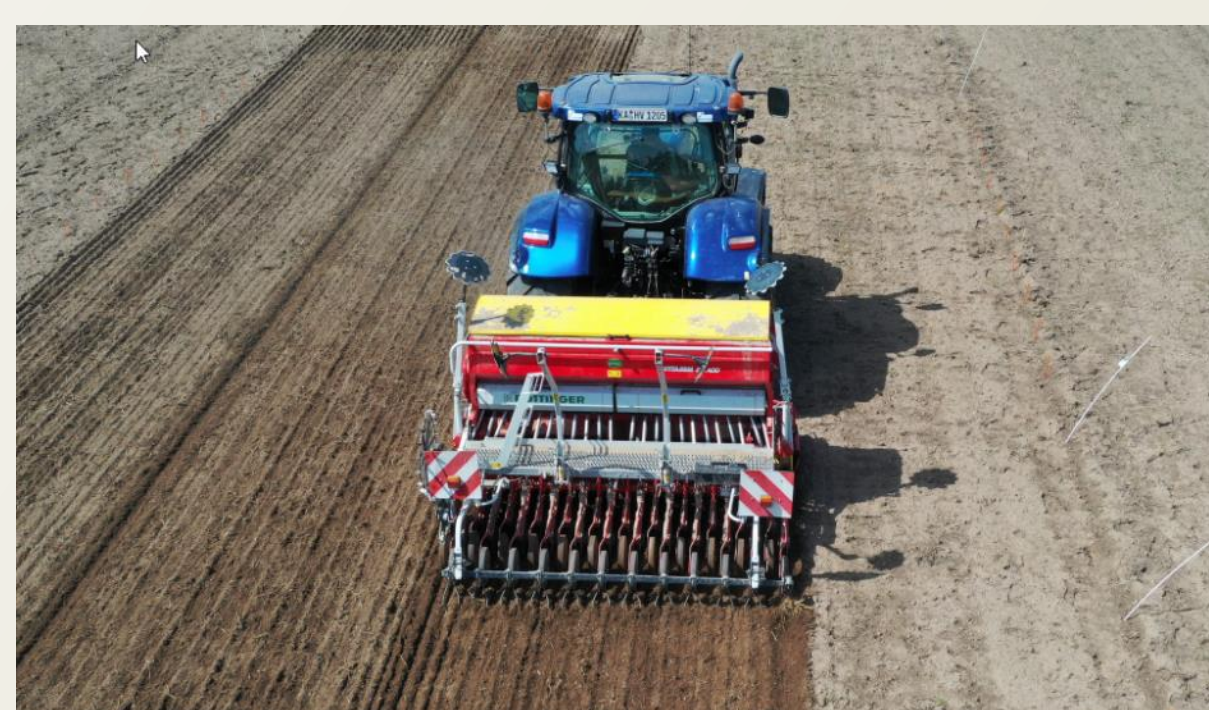


The number of weed seed surrogates can be easily recorded and shown to have decreased significantly after harrowing. This was found for all surrogate weed seed species tested. In addition, after the subsequent drilling of the sugar beet seeds, the remaining weed seed surrogates as a potential diet for birds and mammals remained at the same low level.

Summary & Conclusion

The presented study type is an easy and pragmatic method to investigate weed seed exposure on bare soil fields. Results show that the number of weed seeds on the surface is very low after harrowing and subsequent drilling of crop seeds.

Weed seeds buried in the soil after harrowing are not dug up again after the drilling of crop seeds, and such low weed seed densities on freshly drilled bare soil fields seems not to be a relevant food source for seed eating birds and mammals. Further studies on different soils and crops to increase the data base are planned. For more information to apply the method please contact the authors or meet us at booth 40.



Harrowing (left) and drilling (right) of the study plots