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DIFFERENT MECHANICAL WEED CONTROL STRATEGIES IN SUGAR BEET

ABSTRACT

Weed infestations and associated yield losses require effective weed control measures in sugar beet. Besides chemical weed control strategies, mechanical weeding plays an important role in integrated weed management systems. The target of this field experiment at different locations in Germany was to investigate weed control efficacy with the use of: (i) different hoeing and band spraying technologies (ii) the use of automatic steering technologies, and (iii) the use of different intra row weed control implements in conservation tillage systems. The number of uprooted sugar beets (iv) were also measured.

Weed densities of up to 91 plants m⁻² were detected in the untreated control plots with *Chenopodium album*, *Polygonum convolvulus*, *Stellaria media* being the most abundant weed species. Band spraying in combination with inter-row hoeing reduced herbicide input by 50 to 75% compared to overall herbicide applications. Weed control efficacy was similar for conventional herbicide treatments and for the combination of weed hoeing and band spraying. Hoeing with the use of automatic steering technologies reduced weed densities in sugar beet by up to 82%. The use of finger weeders, rotary-harrow and torsion finger weeders reduced weed density by 29% compared to common hoeing strategies. Differences in the number of uprooted sugar beets were not measured across all treatments. Weed control treatments tested significantly increased white sugar yield (WSY) compared to the untreated control. We revealed the possibility of a more intense use of mechanical weeding technologies in combination with precision farming technologies in sugar beet.
