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EFFECT OF DIFFERENT COVER CROP CULTIVATION SYSTEMS FOR WEED SUPPRESSION IN SUGAR BEETS

ABSTRACT

In our study we tried to evaluate the effects of cover crops and cover crop mixtures in sugar beet. Two field studies were conducted at the University of Hohenheim and at Renningen in 2014 and 2015. We tried to investigate the weed suppression ability of cover crops planted in autumn and the resulting mulches during sugar beet vegetation in spring. 6 different treatments were used, containing: one untreated control, 3 cover crops in mono-cultivation and 2 cover crop mixtures (CCM). Sugar beets were sown at the beginning of April into the 6 treatments, only at the 2015 vegetation period. We wanted to see, if (i) single and mixture cultivation of cover crops resulted in similar weed control efficacy in autumn and in spring during the sugar beet growing season; and (ii) if CCMs lead to higher biomass (in autumn) and mulch (in spring) compared to mono-cultivation. Weed densities in the field experiments ranged from 20 to 300 plants m^{-2}. Mustard (*Sinapis alba* L.), fodder radish (*Raphanus sativus* var. *niger* J. Kern), spring vetch (*Vicia sativa* L.) and the different CCMs resulted in weed suppression of up to 80% compared to the untreated control. Highest biomass yields were observed in the mustard mono-cultivation. In spring, before planting of sugar beets, mustard provided the highest soil coverage (60%) and reached the highest plant biomass and residues. Measurements prior to the first crop`s herbicide application, showed that cover crop mulches reduced weed density by 60% and 55% in mono- and mixture cultivation, respectively. In all treatments white sugar yield was significant higher compared to the untreated control. This study has proven a potential of cover crops and cover crop mulches as weed suppressors in different cover crop - sugar beet systems.