



What's left? – Investigations on soil cover of conservation tillage methods in Austria

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One of the most accepted and a practicable method to prevent soil from erosion is conservation tillage. If conservation tillage practices are performed in a proper way soil is protected from wind and water erosion.

This study deals with the effectivity of conservation tillage practices under real field conditions. Therefore we i) carried out rainfall simulation experiments employing conservation tillage practices which had been proposed by farmers to test whether actual conservation tillage practices would be effective, ii) did an observation of mean soil cover on arable land after seeding in Lower and Upper Austria for field sites where conservation tillage was funded.

Rainfall simulation experiments were carried out in the years 2011 and 2012 for various conservation tillage treatments consisting of different mulching and no tillage techniques. To evaluate results on surface runoff and erosion we additionally measured soil cover, bulk densities and surface roughness of the experimental plots. Soil cover estimation of the arable land in Lower and Upper Austria which is funded for conservation tillage practices was done in 2012 and 2013. Altogether on 146 randomly chosen field sites soil cover was estimated by using an object-based image analysis method.

Results reveal that the effectiveness of conservation tillage was depending on the existence of a sufficient soil cover. However, under conditions of actual farm practices, a sufficient soil cover was not obtained for mulching treatments in 2011 and only partially in 2012. Therefore, mulching treatments partially gained even higher surface runoff and soil loss rates than conventional tillage practices. Due to their high soil cover, soil loss and surface runoff of no tillage treatments were very small as compared to all other tested treatments. The results of the soil cover estimation in Lower and Upper Austria show that under practicable land use a mean soil cover of 12 percent can be reached, what's rather low in a sense of soil erosion prevention compared to the results of our rainfall simulation experiments and literature.