EGU22-6730
https://doi.org/10.5194/egusphere-egu22-6730
EGU General Assembly 2022

Quantification of the ecosystem services of collecting soil to form ridges with no-tillage in the purple soil region of China: A meta-analysis

Lizhi Jia
Institute of Geographic Sciences and Natural Resources Research, Chinese Academy of Sciences, Beijing, China (jializhi10000@126.com)

Collecting soil to form ridges with no-tillage (CSNT) is an important conservation tillage method in the purple soil region of China. Although the ecosystem services it can provide in agroecosystems have been proven. While there is no systematic quantitative research on the effect of CSNT on ecosystem services. We collected 611 data entries from previous publications to quantitatively evaluate the effect of CSNT on runoff and sediment loss, soil nutrients concentration, soil bulk density, soil moisture content, aboveground biomass and belowground biomass. Compared to conventional tillage, CSNT reduced runoff and sediment loss by 49% and 73%, respectively. This is mainly due to the blocking effect of the ridge-and-furrow structure. As for soil nutrients concentration, the concentrations of soil organic carbon, total nitrogen, available nitrogen, available phosphorus and available potassium increased by 15%, 14%, 30%, 58% and 17%, respectively under CSNT compared to conventional tillage. While no significant differences were found for total phosphorus and total potassium between CSNT and conventional tillage. Soil bulk density decreased by 11% on the ridges under CSNT compared to conventional tillage, while no significant different was found in the furrows. On the ridges, CSNT did not have a significant effect on soil moisture content, while it led to an increase of 27.6% in soil moisture content in the furrows. CSNT would also increase aboveground and belowground biomass by 23% and 63%, respectively. In general, the implementation of CSNT in purple soil region of China could significantly enhance the ecosystem services in agroecosystems.