Geophysical Research Abstracts,
Vol. 11, EGU2009-3321, 2009
EGU General Assembly 2009

Influence of Different Fertilization on moisture Characteristics of Black Soil under Drought Year in Semi-arid Regions in Northeast China

X Han and W Zou

Northeast Institute of Geography and Agroecology, Chinese Academy of Sciences, harbin, China (xzhan@neigaehrb.ac.cn)

Water was a mainly limited factor for crop yield in rain-feed agriculture of semi-arid region. Whereas, fertilization can regulate capability of soil water supply. Therefore, field experiments were set up at the National Field Research Station of Agroecosystem of Chinese Academy of Science in Hailun County, Heilongjiang Province, China, in 1990, including three fertilizer treatments: no fertilizer (NF), applying chemical nitrogen and phosphorus fertilizer (NP), applying chemical nitrogen and phosphorus fertilizer plus organic manure (NPM). The experiments were carried out to investigate the effects of different fertilization on soil water supply, water consumption of maize, water use efficiency under drought year. The results showed that rainfall didn't satisfy water need of maize in drought year, the deficient water was compensated by soil water reservoir, Fertilizer application, especially organic manure application, can improve the capability of soil water supply, the ratio between soil water supply and water consumption of NF, NP, NPM were 22.23%[U+FF0C]23.58% and 25.99% in the whole development period of maize, respectively. Total water consumption and water consumption rate of maize were significantly impacted by different fertilization and increased with application of chemical fertilizer and organic manure, results showed total water consumption of maize were 485.82mm[U+FF0C]494.83mm and 509.91mm for NF, NP and NPM, respectively, while water consumption rates were 3.18mm d-1[U+FF0C]3.23mm d-1 and 3.33mm d-1 for NF, NP and NPM, respectively. The effect of fertilizer application on water use efficiency was in the order of NPM > NP > NF. From the study, it can be concluded that soil water supply buffered and regulated soil water condition, and played an important role on guaranteeing crop yield; fertilizer application, can enhance soil water supply, increase crop yield and water use efficiency, especially organic manure application.