



Study on oasis soil heterogeneity in the watersheds of Bohe and Jinghe (Xinjiang, NW-China)

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The change of oasis stability is essential for the investigation of oases in arid areas. Physical and chemical soil properties are the important components of oasis stability. Given identical climatic conditions, spatial heterogeneity (generally characteristic for soil resources of arid regions) is the main aspect contributing to the formation of plant patterns, and, hence, has a strong influence on oasis stability. The watersheds of Bohe and Jinghe in Xinjiang (NW-China) are representative as far as processes of eco-environmental change in the Junggar basin are concerned. So far, frequent human activities have severely affected the local eco-environment and social development.

For the first time, physical and chemical soil properties of this region are analyzed, which include pH and the contents of nutrients, alkali-hydrolyzed nitrogen, available phosphorus, rapidly-available-potassium and salt.

We have found that soil fertility is not high and even lower than that 20 years ago. This is due to the existence of large soil particles, low soil organic matter, and high alkaline levels. Regular patterns of soil fertility, based on Kriging interpolation method, have been studied leading to the result, that the soil fertility in the south-east is higher than that in the north-west. Finally, we investigated the driving factors of soil heterogeneity by grey correlation analysis. While cultivation of land and chemical fertilizer wastage are the major human-driven factors, evaporation and disaster weather are the major natural factors. Among the variety of factors which affect soil heterogeneity, the human-driven factors dominate the natural factors. Our findings will be helpful for the return and reconstruction of the eco-environment of the Bohe and Jinghe watersheds.