

COMPARATIVE ASSESSMENT OF FOUR LAND USES IN THE MANZAREIE AREA USING SOIL QUALITY INDICES

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INTRODUCTION

Soil quality is defined as the capacity of a soil to function within natural or managed ecosystem boundaries, to sustain biological productivity, maintain environmental quality and promote plant and animal health. Therefore, it is one of the most important factors in developing sustainable land management and sustaining the global biosphere. Soil quality assessment is necessary for identifying the effects of different management systems on agricultural and natural ecosystems. Despite the importance of such studies and the extensive research that has been carried out in the world, there is limited information available on the influence of different land uses on soil quality in Iran.

MATERIALS AND METHODS

The research sites, including an alfalfa field, a wheat field, a pomegranate garden and a pasture area, are located in the Manzareie area (31° 94' N and 51° 87' W), about 90 km western south of Isfahan province. Soil samples were taken from the 0-20 and 20-50 cm of soil and a total of 10 samples were taken in each land uses. All in all, 40 samples were taken from 4 land uses. Organic carbon, soil nitrogen, pH, EC, mean weight diameter (MWD), bulk density and microbial respiration of the soil samples were measured.

RESULTS AND DISCUSSION

Results revealed that the amounts of organic carbon, MWD and microbial respiration were significantly highest in soils under alfalfa fields and lowest in pasture area. It seems that overgrazing and, as a consequence, the invasion of semiarid grasslands by shrubs decreases soil carbon and microbial respiration. The amounts of soil nitrogen were significantly higher in samples taken under pomegranate garden as compared to the other land uses. It may be due to application of N fertilizer in the garden. The results of this study indicated that land management in alfalfa field has improved the soil quality whereas the management practices in pasture areas have resulted in soil degradation. Also, this investigation showed the efficiency of soil quality studies for the evaluation of present conditions of soil in agricultural and natural ecosystems.

Keywords: soil quality, land uses, organic carbon, microbial respiration

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