



Study on bearing capacity of *Pinus tabulaeformis* plantation with soil water utilization as the core in arid and semi-arid area

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As a typical arid and semi-arid stony Mountain, the Daqing Mountain District [U+FF0C] Severe loss of soil water resources has become the most important limiting factor for afforestation survival rate and forest growth in this area. This paper takes the *Pinus tabulaeformis* plantation belt of Daqing Mountain in Inner Mongolia as the research object [U+FF0C] Focusing on the effectiveness and water retention of soil moisture, Based on the kinetic theory of soil water [U+FF0C] The soil moisture characteristics of different densities and forest age under similar site conditions were systematically studied, In order to maximize the use of limited natural precipitation through forest-learning measures, Increase soil water resources and maintain them for a longer period of time so that trees can be fully utilized [U+FF0C] It provides an important scientific theoretical basis for improving the survival rate and preservation rate of afforestation, expanding forest resources and restoring forest vegetation under the premise of suitable tree in this area and arid and semi-arid area. Research shows that [U+FF0C] The rainfall and was the main factor to affect the soil water content dynamic .The CV of soil moisture decreased as soil depth increased. Through dividing the effective threshold of soil moisture, we calculate the effective value of soil moisture of different stand, only in July and September the soil moisture could reach the range of middle efficiency water,another months the soil moisture were in the range of difficult efficiency water.The plants of different density stands were under soil water stress. The proportion of evapotranspiration was 60.19% ,and it was the maximal output. By the premise of water equilibrium ,computing the soil water bearying capacity of vegetation of *Pinus tabulaeformis* plantation in Daqing Mountain.It was 3000 stock/ha.