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Sustainable management of ecosystem and control of natural secondary disaster in soil and water loss regions**Zhongsheng Guo**

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Statement of the Problem: High-yield and high-benefit plantation forest can effectively conserve soil and water loss and improve ecological environment. But currently, soil desiccation, a natural secondary disaster, often occurs and sometime changes into severe desiccation, which causes soil degradation, vegetation decline and death, which does not benefit ecosystem sustainable management and soil and water conservation in the soil and water loss regions.

Methodology & Theoretical Orientation: The changes of soil water, soil water supply or soil water consumption in the soil profile with plant growth and planting density was investigated at the same condition. The relationship between soil water and plant growth and the relationship between soil water supply or soil water consumption and plant density was analyzed.

Findings: SWRULP is the soil water storage in the Maximum Infiltration Depth (MID) in which the soil water content in every soil layers equal to wilting coefficient which changes with soil depth. SWCCV is the maximum plant population quantity or plant density of the indicator species in a plant community when the Soil Water Supply (SWS) is equal to Soil Water Consumption (SWC) in the root zone in a least death day of indicated plant. Indicator plant is the constructive species for natural vegetation or the principal or purpose species of trees or grasses for plantation. SWCCV changes with plant community, site condition and climate change, such as temperature, wind and rainfall.

Conclusion & Significance: Regulating the relationship between plant growth and soil water at the appropriate time on SWCCV enable ecosystem sustainable management and control of natural secondary disaster in the soil and water loss regions.

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