

**EFFECTS OF DRYING TEMPERATURE ON SOIL WATER
REPELLENCY IN JAMBOLAN (*Syzygium cumini*) NATURAL
FOREST IN VADDUVAAKAL, MULLAITIVU**



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ABSTRACT

Soil water repellency (SWR) has become burning issue as best characteristics of soil is needed for retention of water. Soil water repellency is often recognized in surface layers of soil that dry out frequently. The degree of water repellency of a soils can be measured by using the water drop penetration time (WDPT) test on field moist or dried soils, referred to as actual and potential water repellency, respectively. The aim of the study was to investigate the effects of different drying temperatures on the severity of soil water repellency in Vadduvaakal, Mullaitivu in Northern part of Sri Lanka. The study area was identified by using WDPT test and soils samples were collected, packed and transported immediately to the laboratory of Department of Agricultural Engineering. Further, actual water repellency was measured by WDPT test in field. Potential WDPT was determined at different temperature (Ambient, 40 °C, 50 °C, 70 °C, 90 °C and 105 °C), respectively. Soil physical parameters (bulk density, Soil texture), Chemical parameter (pH, electrical conductivity and organic matter content (%)) were measured in laboratory. The results reveal that, the study area belongs to the textural class of sandy soil since it has 91.4% of sand. According to the WDPT classification, 80% of surface soil belongs to the class 3(severe water repellent). The SWR at field condition reduces rapidly when the depth increases from the surface to the layer of 2-4cm, and then after SWR reduces slightly up to 4-6cm of layer. No soil water repellency observed when the depth increases from the layer of 4-6cm to the depth of 25cm. When the temperature increases from ambient to 40°C the SWR increases suddenly in the layers of 0-2cm and 2-4cm. And slow increases of SWR was observed in the above layers when the temperature increases from 40 °C to 50 °C, 50 °C to 70 °C, 70 °C to 90 °C and 90 °C to 105 °C. According to the results of WDPT, the SWR decreases suddenly in all drying temperatures, when the depth increases from the layer of 0-2cm to

2-4cm. Thereafter the SWR reduces slowly up to the layer of 4-6cm and then no SWR was observed up to the depth 25cm in all drying temperatures. There was a negative relationship between bulk density and SWR. The SWR decreases when the bulk density increases from the layer of 0-2cm (1.04gcm^{-3}) to 2-4cm (1.18gcm^{-3}). The organic matter content in the soil determines the severity of SWR. In my findings, it was observed that the SWR reduces with organic matter content, decreases from the surface soil to the layer of 22-25cm.

Keywords: Soil water repellency, Water drop penetration time, Bulk density, Soil organic carbon, Soil organic matter

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