

**PONDED WATER FLOW IN AN ALFISOL UNDER
DIFFERENT CROPPING INTENSITIES AND FALLOW
SYSTEMS IN SOUTHWESTERN NIGERIA**

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ABSTRACT

This study was carried out to determine the effects of various fallow management systems and cropping intensities on ponded water flow in an Alfisol in southwestern Nigeria between 1994 and 1996. The experiment, which was established in 1989, was a split-plot in randomized complete block design, having four replications. The main plots were *Pueraria phaseoloides*, *Leucaena leucocephala* and natural fallow while the subplots were 25, 33, 50 and 100% cropping intensities. Saturated hydraulic conductivity ranged from 22 to 525 cm h⁻¹. The 2-h infiltration rates ranged from 27 to 72 cm h⁻¹. Rapid water transmission was more sustainable with 25 or 33% cropping intensities under any of the fallow species. However, the effect of fallowing on infiltration rate was obscured by the high quantity of sand in the topsoil. Alley cropping or *Pueraria* live-much was more desirable than continues cropping without either of the practices. Soil water suction was relatively high under the *Leucaena* system in the dry season, and this was more pronounced for the *Leucaena* fallow than (*Leucaena*) alley cropping. Thus, fallow management significantly influenced unsaturated water flow. For sustainable agriculture, a cropping intensity of 33% with any of the fallow species is recommended.

Keywords: Ponded flow, Infiltration, saturated hydraulic conductivity, fallow management, cropping intensities, Alfisol.