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Melia dubia tree spacing influence growth, yield and proximate principles of *Sorghum bicolor* x *Sorghum bicolor* var. *sudanese* and soil microbial status

D. R. Prajapati, N. S. Thakur*, R. P. Gunaga, V. R. Patel, Lalit Mahatma and D. P. Patel
Navsari Agricultural University, Navsari-396450, India
*Corresponding author e-mail: nsthakurverderer@nau.in
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Abstract
Present study was carried out to develop suitable *Melia dubia*---*Sorghum bicolor* x *Sorghum bicolor* var. *sudanese* (Sorghum sudan grass; SSG) silvi-pasture system in randomized block design with 6 treatments *viz*., LU (land use)$_1$ to LU$_5$ having *M. dubia* spacing of 2x2, 3x2, 3x3, 4x2 and 4x4 m with SSG as intercrop and LU$_6$ as sole SSG, with 4 replications. Land use systems had significant effect on growth, physiology, forage production, and nutritive value of SSG. The results showed that maximum fresh (64.20 t ha^{-1}) and dry forage yield (15.93 t ha^{-1}) was obtained from *M. dubia* (4 x 2 m)-SSG silvi-pasture. Significantly maximum dry matter (25.28%) and ether extract (2.69%) was in forage from *M. dubia* (4 x 2 m)-SSG system. However, crude protein (8.50%), nitrogen (1.36%) potassium (3.48%) contents were highest in forage from *M. dubia* (2 x 2 m)-SSG system. Dry matter and ash content was higher under wider *M. dubia* spatial geometries and sole cropping. The fungal and bacterial populations were affected by the *M. dubia* spatial configurations and count increased after SSG intercropping, except actinomycetes, in all LU systems. Among silvi-pasture and sole SSG, microbial population count was higher in closest spacings.

Keywords: Agroforestry, *Melia dubia,* Proximate principles, Soil microbes, Sorghum sudan grass