

ASA, CSSA, and SSSA 2010 International Annual Meetings

Oct. 31-Nov. 3 | Long Beach, CA

Green Revolution 2.0: Food+Energy and Environmental Security

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286-15 Spatial Arrangement, Population Density and Legume Species Effect On Yield of Forage Sorghum- Legume Intercropping.

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Wednesday, November 3, 2010: 2:30 PM
Hyatt Regency Long Beach, Seaview Ballroom C, First Floor

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Sorghum is a stress tolerant forage crop grown extensively in the Southern High Plains. However, sorghum forage quality is lower than that of corn. Intercropping sorghum with legumes can improve quality and productivity of forage. However, tall statured sorghum limits the resources for legumes, especially sunlight. Therefore, appropriate spatial arrangements and sorghum-legume populations are needed to reduce interspecies competition. The objectives of this study were to understand the effect of spatial arrangements and sorghum populations on light interception, productivity and quality of forage in intercropping systems with three different legume species. A field experiment was conducted during the 2009 summer growing season at the Agriculture Science Center of the New Mexico State University in Clovis, New Mexico on Olton silty clay loam soil under center pivot irrigation. Three annual forage legumes lablab cowpea and pigeon pea were intercropped with sorghum at three different row configurations (Mixed, 1:1 and 2:2) with two sorghum plant densities (250,000 and 190,000 plants ha⁻¹). For the mixed and 1:1 systems, sorghum was planted in 75 cm rows with legumes either mixed in the row or planted between sorghum rows; while in the 2:2 systems, paired rows of sorghum were followed by palred rows of legumes and the rows were 37.5 cm apart. Leaf area index and light interception were greater in lablab and cowpea intercropped in 1:1 configuration. It suggests a greater use of sunlight with more ground coverage by legume intercrops. Forage yield of legumes ranged from 180 to 1,814 kg ha⁻¹ with a contribution of up to 10 to 12% of the total forage biomass. Significant improvement in legume biomass was observed when sorghum population was reduced to 190,000 plants ha⁻¹ with paired rows of either lablab or cowpea. Sorghum and total forage yield was higher in both 1:1 and 2:2 with 250,000 plants ha⁻¹ and was not affected by legume type. Results suggest that sorghum planted at normal population with paired rows of lablab or cowpea can improve sorghum-legume intercrop productivity.

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