

# 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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194-16 Radiation Use Efficiency, Forage Yield and Quality of Sorghum-Legume Intercropping Systems in the Southern High Plains.

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*Tuesday, November 2, 2010*

*Long Beach Convention Center, Exhibit Hall BC, Lower Level*

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Interest in intercropping of non-legume with legume crops to increase resources use efficiency is increasing. Increase in radiation interception and its subsequent use efficiency (RUE) by forage sorghum-legume intercropping systems can improve forage yield and quality. However, there is little literature available regarding intercropping systems in the Southern High Plains. A field experiment was conducted at the Agricultural Science Center in Clovis, New Mexico during the 2008 and 2009 summer growing seasons to study the effect of sorghum and sorghum-legume (lablab bean and pole bean) intercropping systems on RUE, forage yield and quality. Early in the 2008 cropping season (30 to 60 days after planting, DAP), radiation interception was greater for sorghum-lablab and sorghum-pole bean intercropping systems than a sorghum-only cropping system. Similarly, RUE of sorghum-lablab ( $1.98 \text{ g MJ}^{-1}$  Photosynthetically Active Radiation, PAR) and sorghum-pole bean ( $1.74 \text{ g MJ}^{-1}$  PAR) intercropping during 2009 was greater than that for the sorghum-only ( $1.04 \text{ g MJ}^{-1}$  PAR) cropping system. But later at the peak of the crop's radiation interception, the differences in RUE among sorghum-lablab, sorghum-pole bean intercropping and sorghum-only cropping systems were not as great as that in the early season ( $3.46$ ,  $2.85$  and  $3.06 \text{ g MJ}^{-1}$  PAR). Forage yield in 2009 at 30 DAP were greater (60%) with sorghum-legume intercropping systems than with sorghum-only. However, the differences were not seen at final harvest ( $17.4$  and  $16.6 \text{ t ha}^{-1}$  for sorghum only and sorghum-legume intercropping, respectively). Legume contribution to the total forage yield decreased as the season progressed and this may have been a reason for the less consistent yield improvement with intercropping at final harvest. Nevertheless, at final harvest averaged over years, legumes produced greater crude protein ( $1,148$  to  $1,458$  vs  $774$  to  $1,371 \text{ Kg ha}^{-1}$ ), for sorghum-legume and sorghum-only cropping systems, respectively). Thus, sorghum-legume intercropping system has potential to increase radiation interception and subsequent RUE leading to improvement in the forage yield and quality.

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