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Production potential and economic feasibility of maize (*Zea mays*)-Soybean (*Glycine max*) intercropping system under various row proportions and zinc levels in rainfed condition

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A field experiment was carried out during the rainy (*Kharif*) season of 2009-10 at Rajendranagar, Hyderabad, to find out production potential and economic feasibility of rainfed maize (*Zea mays L.*) intercropping with soybean (*Glycine max* L.) under row proportion of 1:1 and 1:2 at varying doses of zinc through zinc sulphate (0, 25, 50 and 75 kg ha^{-1}). The result revealed that growth and yield components of maize and soybean were less in intercropping systems compared to sole cropping. Intercropping of 1:1 and 1:2 ratios declined the seed yield by 14.75 and 11% in maize and 52.19% and 38.34% in soybean as compared to sole crop. However, the total productivity of systems in terms of maize grain equivalent and LER (6182 kg ha^{-1} and 1.47) was found to be higher with maize + soybean 1:2 ratio. Irrespective of the cropping system, application of 50 kg $ZnSO_4$ ha-1 recorded significantly higher grain yield of maize and soybean (5301 and 936 kg ha^{-1}), maize-equivalent yield (6850 kg ha^{-1}) and LER. Highest net return (Rs. 43594) and B:C ratio (2.26) were found in maize + soybean 1:2 ratio with 50 kg $ZnSO_4$ ha^{-1} application.

Biography

Malve Sachin Himmatrao has completed his M.Sc. at the age of 24 years from ANGRAU and is pursuing Ph.D. in Dept. of Agronomy, College of Agriculture, Rajendranagar, ANGRAU, Hyderabad, Andhra Pradesh.

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Detection and estimation of damage caused by thrips *Thrips tabaci* (Lind) of cotton using hyperspectral radiometry

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Hyperspectral radiometry is a technique widely employed for assessing crop condition in ground based and satellite remote sensing. Use of remote sensing techniques for detection of crop stress due to pests and diseases is based on the assumption that stresses induced by them interfere with photosynthesis and physical structure of the plant, affect absorption of light energy and thus alter the reflectance spectrum of plants. Field experiments were conducted to detect and estimate damage caused by thrips in RCH2BGII and Surabi from 70 to 90DAS using GER1500 spectroradiometer, from which canopy reflectance was recorded and vegetation indices (VIs) were worked out. In both the variety and hybrid studied, there was a decrease in near infrared (770-860 nm) while blue (450-520 nm), green (520-590 nm) and red (620-680 nm) reflectances increased compared to undamaged plants. The mean VI values in damaged plants were comparatively lower than undamaged plants in all days of observation. Among bands and VIs, red band and GRVI were found to be more sensitive to thrips damage respectively. The sensitivity curve shows single peak in blue region (about 496 nm). There was a significant negative correlation between damage and VIs with R2 values of VIs was significant indicating the capability of VIs to estimate damage. Linear regression equations were developed based on spectral indices. Linear correlation intensity analysis revealed that the most positive (r=0.81) and most negative (r=-0.42) correlation was located in red (691 nm) and NIR (710 nm) bands. Thus, it was found that detection and estimation of damage caused by cotton thrips can be done using hyperspectral radiometry.

Biography

Ranjitha Gurram completed her BSc (Ag) at S.V. Agriculture College, Tirupati and M.Sc. (Ag) with specialization in Agricultural Entomology at Tamil Nadu Agricultural University, Coimbatore. She obtained 67th rank in the ICAR-JRF examination at national level (2011). She had also participated in first Agricultural Graduate Student Conference (AGSC-2013) held at TNAU, Coimbatore and her topic was selected for oral presentation (2013). She published her research article "Hyperspectral Radiometry for detection of damage caused by Thrips *thrips tabaci* in cotton" in special issue of *Madras Agricultural Journal*, Coimbatore (2013).

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