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Enhancing Productivity, Nutritional Security and Export Potential through Arid Legumes

Abstracts

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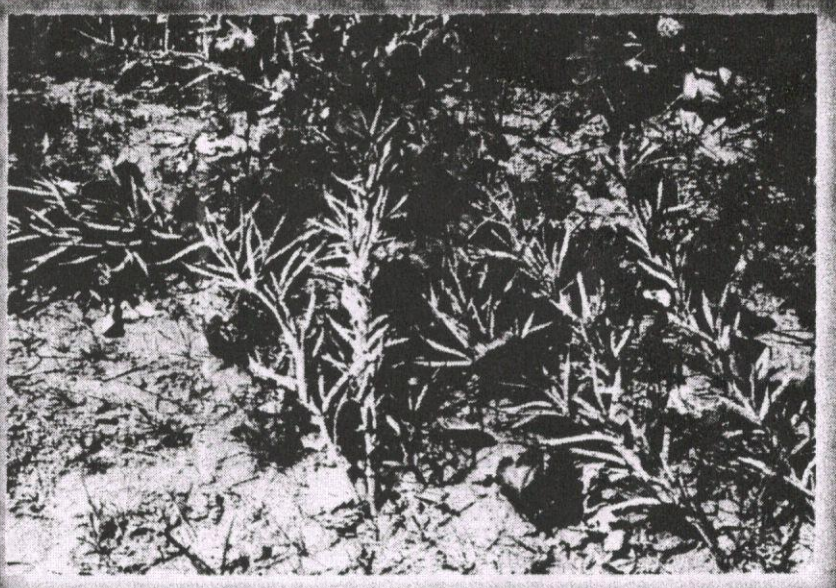

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The straw yield followed similar pattern and the yield decreased from 602.5 to 352.5 kg ha^{-1} of guar and from 918.5 to 331.2 kg/ha in cowpea. The economic evaluation of the two systems reveaed that under aonla-guar cropping system, gross income increased by 9.9% over aonla alone but with aonla-cowpea system, it increased by 36.9%. This indicated that for arid Gujarat aonla-cowpea system is more economically beneficial than aonla-guar system.

S3-P5: Productivity of sorghum + greengram intercropping system as affected by row ratio and nitrogen under rainfed condition

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Grain legumes like green gram (*Phaseolus radiatus*) offers an opportunity for intercropping with the latest release of short stature grain sorghum variety CSV-17 matching the moisture availability period of arid fringes. A field experiment was conducted during 2007 to study the effect of sorghum (variety-CSV 17) intercropped with green gram (RMG 62) at different N levels. The soil was sandy clay loam in texture having pH 8.1, organic carbon 0.36%, available N content 210.0 kg ha^{-1}, available P 11.6 kg ha^{-1} and available K 235.0 kg ha^{-1}. Three row ratio of sorghum: green gram 1:1, 2:1 and 3:1 each at four nitrogen level (0, 25, 50 and 75 kg ha^{-1}) along with their sole treatment were laid out in randomized block design with 3 replications. During 2007, onset of monsoon rainfall was 320 mm on a single day and 279.8 mm rainfall was recorded during pendency of crop growth. The total dry matter production increased significantly due to intercropping in different row ratio and nitrogen application. The highest grin yield of sorghum (CSV-17) was obtained with sole sorghum followed by sorghum + green gram in 2:1 row ratio with 50 kg N ha^{-1} and sorghum + green gram in 2:1 row ratio with 75 kg N ha^{-1} and sorghum + green gram in 3:1 row ratio with 50 kg ha^{-1}. The intercrop yield of green gram was highest under sole crop followed by sorghum + green gram in 1:1 row ratio at 50 kg N followed 75 kg N ha^{-1} (380 kg ha^{-1}). The maximum price equivalent ratio was obtained when sorghum intercropped with green gram in 2:1 ratio with 50 kg N (1.31) followed 75 kg N ha^{-1} under same row ratio (1.26) or 50 kg N ha^{-1} with 1:1 ratio of sorghum + green gram.

S3-P6: Improving productivity and profitability of clusterbean (*Cyamopsis tetragonoloba* L. Taub) + sesame (*Sesame indicum* L.) intercropping system with optimum row ratio and balanced fertilization under arid region of Gujarat

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A three year field study was conducted during rainy season of 2005, 2006 and 2007 to find out possibility of increasing production of pulses and oilseed through intercropping system in relation to spatial arrangement of crops and integrated nutrient supply. The soil of the experimental site was gravelly-sandy loam with shallow depth, EC

from 2 to 6.38 dS/m and pH from 8.4 to 9.2 with 0.25% organic carbon, 7.35 kg P_2O_5 and 215 kg K_2O ha^{-1}. Treatments were consisting of 15 combinations of cropping system, viz., sole sesame (cv. GUJ-1), sole clusterbean (cv. RGC-936), sesame + clusterbean (2:1), sesame + clusterbean (1:1) and sesame + clusterbean (1:2) and fertilizer level i.e., control, 40 kg N /ha and 20 kg N + 5 tonne farmyard manure (FYM)/ha applied to the crops were tested in randomized block design and replicated thrice. The grain yield of clusterbean was significantly higher under sole cropping compared to that of intercropping. However, clusterbean-equivalent yield, net returns and benefit: cost ratio (1.67) were higher with clusterbean + sesame (2:1) intercropping system over sole crop of clusterbean. Irrespective of cropping systems, application of 20 kg N/ha + 5 tonne FYM/ha recorded significantly higher clusterbean equivalent yield, net return and benefit: cost ratio (1.79) over 40 kg N/ha alone and absolute control. It was concluded that intercropping of sesame with clusterbean in the row ratio of 2:1 fertilized with 20 kg N and 5 tonne FYM/ha may be recommended to get more economic benefit and sustained yield in arid region of Gujarat.

S3-P7: Economizing fertilizer N use of *rabi* sorghum through legume –sorghum sequence under dryland conditions of the Scarcity zone of Maharashtra

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A field experiment was conducted during the years 1991-92 to 1997-98 to assess economy in the nitrogen fertilizer use of *rabi* sorghum through legume –sorghum sequence under dryland conditions of the Scarcity zone of Maharashtra. The experiment was laid out in split plot design with seven main plot treatments comprising *Kari* legumes with and without fertilizer and *rabi* sorghum without fertilizer and half RDF (25 kg N ha^{-1})as sub plot treatments. The main plot treatments comprised of blackgram, soybean and cowpea with and without fertilizer dose and *Kharif* fallow. The soil of experimental plot was clayey in nature, medium deep (Inceptisol) with low in available N, medium in available and high in available K. Pooled results of seven years revealed that Kharif cowpea for fodder with RDF followed by rabi sorghum recorded highest grain and fodder yield and total monetary returns as compared to other crop sequences as well as Kharif fallow - *rabi* sorghum. The same crop sequence also recorded highest CUM (222 mm) and MUE (6.52 Kg $hamm^{-1}$) over rest of the crop sequences.

S3-P8: Growth and yield of seena in association with neem

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Senna (*Cassia angustifolia* Linn.) an important medicinal plant with laxative properties, is becoming a popular crop in large areas in Rajasthan. Its ability to grow in wastelands and non-palatability of leaves has contributed towards its success. It is grown as a single crop as well as in association with trees. To study the effect of distance of neem trees on senna crop, eighteen accessions were sown between distance of 9 to 23m