The Pharma Innovation Journal 2022; SP-11(7): 4194-4197

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277-7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2022; SP-11(7): 4194-4197

www.thepharmajournal.com
Received: 13-04-2022
Accepted: 16-05-2022

Praveen N
Principal Scientist (Agril. Extension) & Coordinator, District Agricultural Advisory and Transfer of Technology Centre, Prof Jayashankar Telangana State Agril. Univ., Hyderabad, Telangana, India

Sudharani JS
Scientist (Agronomy), Electronic Wing, Prof Jayashankar Telangana State Agril. Univ., Hyderabad, Telangana, India

Yamuna C
Scientist (Plant Pathology), District Agricultural Advisory and Transfer of Technology Centre, Prof Jayashankar Telangana State Agril. Univ., Hyderabad, Telangana, India

Maheshwaramma S
[4]Scientist (Breeding), Regional Agricultural Research Station, Prof Jayashankar Telangana State Agril. Univ., Hyderabad, Telangana, India

Sandeep S
Scientist (Breeding), Agricultural Research Station, Prof Jayashankar Telangana State Agril. Univ., Hyderabad, Telangana, India

Manikya Minnie C
Scientist (Breeding), Agricultural Research Station, Prof Jayashankar Telangana State Agril. Univ., Hyderabad, Telangana, India

Sudhakar C
Principal Scientist (Agronomy), Agricultural Research Station, Prof Jayashankar Telangana State Agril. Univ., Hyderabad, Telangana, India

Sujatha K
Scientist (Breeding), Agricultural Research Station, Prof Jayashankar Telangana State Agril. Univ., Hyderabad, Telangana, India

Shekar K
Scientist (Agronomy), Agricultural Research Station, Prof Jayashankar Telangana State Agril. Univ., Hyderabad, Telangana, India

Rajeshwar Reddy T
Scientist (Plant pathology), Agricultural Research Station, Prof Jayashankar Telangana State Agril. Univ., Hyderabad, Telangana, India

Sudha Rani C
Principal Scientist (Agronomy) & Head, Agricultural Research Station, Prof Jayashankar Telangana State Agril. Univ., Hyderabad, Telangana, India

Corresponding Author
Praveen N
Principal Scientist (Agril. Extension) & Coordinator, District Agricultural Advisory and Transfer of Technology Centre, Prof Jayashankar Telangana State Agril. Univ., Hyderabad, Telangana, India

Impact of front-line demonstration of millets + redgram intercropping under rain-fed situation in Rangareddy district

Praveen N, Sudharani JS, Yamuna C, Maheshwaramma S, Sandeep S, Manikya Minnie C, Sudhakar C, Sujatha K, Shekar K, Rajeshwar Reddy T and Sudha Rani C

Abstract
The present investigation was carried out in DAATTC Rangareddy district to study the impact of FLDs conducted during 2017-18, 2018-19 and 2019-20 in Millets + Redgram intercropping under rain-fed situation in Rangareddy district under low rainfall situation. DAATTC Scientists promoted this technology in different villages through On-farm trials, Frontline demonstrations, Training programmes, Field days and Exposure visits since its introduction in 2017-18, 2018-19 and 2019-20. The farmers of Yacharam mandal of Ranga Reddy district has obtained low yield rates in Cotton, Maize, Paddy and other vegetable crops due to low rainfall for the past few years, but the farmers who cultivated high yielding varieties of sorghum and pearl millets as intercrops with redgram harnessed good yields even under severe drought conditions. This opened the eyes of other farmers that minor millets can be grown under less rainfall conditions. To minimize the risk and to bring stability, intercropping systems were demonstrated, in Gaddamallaihguda, Rangarpur and Gungal villages, Yacharam mandal under Ibrahimpatnam Division of Ranga Reddy district. An area of 28 and 18 ha of land was cultivated with Sorghum + Red gram and Bajra+ redgram at 4:1 ratio in 60 farmers' fields respectively, during *kharif* 2017-18, 2018-19 and 2019-20. The high yielding varieties of sorghum (PYPS-2) and bajra hybrid (PHB-3) recorded a grain yield of 1640 kg/ha and 1210kg/ha respectively, which were 16.5% and 15.2% higher over local varieties of sorghum (1409 kg/ha) and bajra (1050 kg/ha). The demonstrated plots gave higher gross returns with higher benefit cost ratio compared to farmer's practice. The horizontal spread has increased by 99%. In this study, the works carried out by DAATTC, Scientists on millet and pulse-based intercropping are discussed. This review would be useful to the researchers who are involved in this field.

Keywords: Front-line demonstration, millets + redgram, rain-fed situation

Introduction
Millets are important cereal crops. In recent years, there has been increasing recognition of the importance of millets as a substitute for major cereal crops viz., rice, wheat, and maize. Millets are the crops that have potentiality of contributing to increase food production both in developing and developed countries. Sorghum (*Sorghum bicolour*) is a staple cereal grown in both rainy and post-rainy seasons in the semi-arid and arid parts of India on marginal and low fertile soils. It is also an important source of green and dry fodder for animals. Being a widely row spaced and short to medium duration crop (90-120 days) it provides opportunity for growing intercrops for better use of natural resources. Intercropping cereal with a pulse crop not only produces higher yields per unit area and time, but also provides nutritional security, economic benefits as well as soil nutrition. Sorghum intercropped with pigeon pea is generally practiced in many sorghum growing areas.

With the increasing population, urbanization and industrialization the total land area which is after all finite, is under constant pressure and there is hardly any scope for increasing the area under cultivation. The strategy to meet the growing needs for agricultural produce therefore has to be aimed at increasing productivity. The intercropping sorghum and pearl millet with legumes augments the utilization of available light, moisture and nutritional factors with reference to space and time assumes a great importance. The division Ibrahimpatnam of Ranga Reddy district has received low rainfall for the past five years resulted in yield loss from paddy, coriander and cotton, but the farmers who cultivated high yielding varieties of sorghum and pearl millets as intercrops in redgram harnessed good yields even under such drought conditions. This opened the eyes of other farmers that minor millets can be grown under less

rainfall conditions. The farmers of Yacharam mandal of Ranga Reddy district has obtained low yield rates in Cotton, Maize, Paddy and other vegetable crops due to low rainfall for the past few years, but the farmers who cultivated high yielding varieties of sorghum and pearl millets as intercrops with redgram harnessed good yields even under severe drought conditions. This opened the eyes of other farmers that minor millets can be grown under less rainfall conditions.

To minimize the risk and to bring stability, intercropping systems were demonstrated, in Gaddamallaihguda, Rangarpur and Gungal villages, Yacharam mandal under Ibrahimpatnam Division of Rangareddy district. An area of 28 and 18 ha of land was cultivated with Sorghum + Red gram and Bajra+ redgram at 4:1 ratio in 60 farmers' fields respectively, during *kharif* 2017-18, 2018-19 and 2019-20. The high yielding varieties of sorghum (PYPS-2) and bajra hybrid (PHB-3) recorded a grain yield of 1640 kg/ha and 1210kg/ha respectively, which were 16.5% and 15.2% higher over local varieties of sorghum (1409 kg/ha) and bajra (1050 kg/ha).

Materials and Methods

The present study was carried out by DAATTC in Rangareddy district based on the FLD's conducted from 2017-18, 2018-19 and 2019-20 in the farmer's field in different locations of the district. Total 60 demonstrations were conducted on Millets intercropping with Redgram in different villages for three continuous years. Each frontline demonstration was laid out on 0.4 ha area and the critical inputs were applied as per the package of practices while adjacent 0.4 ha was taken as control for comparison of farmer's practice. The selection of farmers was done, on basis of survey by DAATTC and imparted trainings to the selected farmers on agronomic and package of practices in Millets intercropping with Redgram. Field days were also conducted in each cluster to show the results of front-line demonstrations to the farmers of the same and neighboring villages. The yield and economic performance of front-line demonstrations, the output was collected from FLDs as well as local control plots from all selected farmers of Millets intercropping with Redgram for analysis and interpretation of the data. The data is interpreted and presented in terms of percentage and the qualitative data were converted into quantitative form and expressed in terms of per cent increased yield. Finally, the grain yield, cost of cultivation, net returns with benefit cost ratio was worked out. An average of cost of cultivation, yield and net returns of different farmers was analyzed by the formula. Average = [F1+ F2+F3. . . . . .. Fn]/N; F1 = Farmer; N = No. of Farmers. In the present study, technology index was operationally defined as technical feasibility obtained due to implementation of front-line demonstrations.

Results and Discussions

To minimize the risk and to bring stability, intercropping systems were demonstrated, in Gaddamallaihguda, Rangarpur and Gungal villages, Yacharam mandal under Ibrahimpatnam Division of Rangareddy district. An area of 28 and 18 ha of land was cultivated with Sorghum + Red gram and Bajra+ redgram at 4:1 ratio in 70 and 45 farmers' fields respectively, during *kharif* 2017. The high yielding varieties of sorghum (PYPS-2) and bajra hybrid (PHB-3) recorded a grain yield of 1640 kg/ha and 1210kg/ha respectively, which were 16.5% and 15.2% higher over local varieties of sorghum (1409 kg/ha) and bajra (1050 kg/ha).

Table 1: Performance of intercropping system in Manchal and Yacharam mandal of Rangareddy district

Inter cropping system	No. of. farmers	Area (ha)	Demo plot Yield (kg/ha)						FP (kg/ha)			
			Sorghum Yield	Sorghum stover yield	SEY of sorghum stover	Redgram yield	SEY of Redgram	System yield	Grain yield	Stover yield	SEY of stover	System yield
Jowar (PYPS-2) + Pigeonpea (PRG-176)	60	28	1640	5215	386	536	851	2877	1409	3512	260	1669

Table 2: Performance of intercropping system Bajra (PHB-3) + Pigeonpea (PRG-176) in Manchal and Yacharam mandal of Rangareddy distric

Inter cropping system	No. of. farmers	Area (ha)	Demo plot Yield (kg/ha)						FP (kg/ha)			
			Bajra grain Yield	Bajra stover yield	BEY of bajra stover	Redgram yield	BEY of redgram	System yield	Bajra grain Yield	Bajra stover yield	BEY of stover	System yield
Bajra (PHB-3) + Pigeonpea (PRG-176)	60	28	1210	3216	494	485	2014	3718	1050	2405	370	1420

Table: 3 &4 Cost of cultivation, gross returns, net returns per acre

Intercropping systems of Sorghum + Red gram or Bajra + Redgram gave net income of Rs. 46450/- and 28684/- respectively, compared to sole crop of Sorghum (22450/-) or Bajra (5960/-). While intercropping sorghum with Redgram or Bajra with Redgram recorded yield of 2877 kg/ha and 3718 kg/ha compared to sole crop of sorghum 1669 kg/ha or bajra 1420 kg/ha. PYPS-2 + Pigeon pea (4:1) and PHB-3 + Pigeon pea (4:1) were sown during *kharif*, 2017 in 70 farmers' field on 28 ha area. Intercropping system of PHB-3 & pigeon pea (4:1) gave additional net income of 6030 Rs/ha over the sole crop sorghum (Table 1). The proven intercropping systems based on the experiences of are being scaled up by the DAATTC, Ranga Reddy district through front line demonstrations, involving department of agriculture through continuous training and technology back up given by DAATTC, Rangareddy scientists.

Table 3: Economics of millet intercropping system in Manchal and Yacharam mandal of Rangareddy district

Parameter	Demo plot	Farmer's practice
System Yield kg/ha	2877	1669
Gross income Rs. 24/- per kg Jowar & Redgram Rs. 54/- per kg	68600/-	40056/-
Cost of cultivation (Rs)	21250/-	20100/-
Net returns (Rs)	46450/-	22450/-
CB ratio	1:2.18	1:1.1

Table 4: Economics of millet intercropping system intercropping system Bajra (PHB-3) + Pigeonpea (PRG-176) in Manchal and Yacharam mandal of Rangareddy district

Parameter	Demo plot	Farmer's practice
System Yield kg/ha	3718	1420
Gross income Rs. 13/- per kg Bajra & Redgram Rs.54/- per kg	48334/-	18460/-
Cost of cultivation (Rs)	19250/-	12500/-
Net returns (Rs)	28684/-	5960/-
CB ratio	1:2.51	1:1.47

Fig 1: Bajra (PHB-3) + Redgram (PRG-176) intercropping system

Fig 2: Sorghum (PYPS-2) + Redgram (PRG-176) intercropping system

Fig 3&4: Field Day Celebration in farmers field at Gaddamallaiguda

Conclusion

The farmers harvested good crop yield from intercropping of high yielding sorghum variety with redgram compared to sole cropping with local variety and obtained highest net returns of Rs. 46450/- with benefit cost ratio of 2.18. During the period Ibrahimpatnam division experiences dry spells that coincided with tasseling and silking stage of maize. Cotton that was raised in red soil has suffered due to drought and sucking pest complex resulted in yield loss 40-50%. The farmers benefited with of high yielding sorghum and pearl millet intercropped with red gram, which was introduced as alternate to crop to maize and cotton. DAATT center conducted field days and showed the results to other farmers in the village. The field demonstrations were conducted in farmers' fields during 2017 *kharif*. The demand from farmer was for about 50 ha and the DAATTC Ranga Reddy facilitated the procurement of seed from Regional Agricultural Research Station, Palem. Seeing at the performance of Sorghum (PYPS-2) and bajra (PHB-3) has been proposed by DAATTC, in coordination with NICRA, project, at RARS, palem to be included in the cropping systems of the district by state Agricultural Department and supply of seeds to the framers in the district.

References

1. Adeoye GO, Sridhar MKC, Adeoluwa OO, Akinsoji NA. Evaluation of naturally decomposed solid waste from municipal dump sites for their manorial value in southwest Nigeria. Journal of Sustainable Agriculture. 2005;26(4):143-152.
2. Ahlawat I, Gangaiah B, Singh O. Production potential of chickpea (*Cicer arietinum*)-based intercropping systems under irrigated conditions. Indian Journal of Agronomy. 2005;50(1):27-30.
3. Ajibola AT, Kolawole GO. Agronomic evaluation of performance of sesame varieties in maize-based intercropping system in the southern guinean savanna of

Nigeria. Journal of Experimental Agriculture International. 2019;37(3):1-10.
4. Anbukkani P, Balaji SJ, Nithyashree ML. Production and consumption of minor millets in India-A structural break analysis. Annals of Agricultural Research New Series. 2017;38:1-8.
5. Anchal Dass, Sudhishri S. Intercropping finger millet (*Eleusine coracana*) with pulses for enhanced productivity, resource conservation and soil fertility in uplands of Southern Orissa. Indian Journal of Agronomy. 2010;55(2):89-94.
6. Ansari MA, Rana KS, Rana DS, Kumar P. Effect of nutrient management and anti-transpirant on rainfedsole and intercropped pearl millet (*Pennisetum glacum*) and pigeonpea (*Cajanus cajan*). Indian Journal of Agronomy. 2011;56(3):209-216.
7. Banik P, Sharma R. Yield and resource utilization efficiency in baby corn-legume-intercroppingsystem in the eastern plateau of India. Journal of Sustainable Agriculture. 2009;33(4):379-395.
8. Basavarajappa R, Prabhakar A, Halikatti S. Foxtail millet (*Setaria italica* L.) based inter cropping systems under shallow alfisols. Karnataka Journal of Agricultural Sciences, 2010, 16(4).