

**RESEARCH ARTICLE :**

# On farm trial: A technology tool for increasing pigeonpea yield in Nalgonda district of Telangana

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**SUMMARY :** The field experiment was carried out as an On Farm Trial among 10 farmers in 5 villages of Miryalaguda, Nalgonda District in the year 2015-16. Among all the pulses, pigeonpea is having long duration and indeterminate cropping pattern. When the crop is sown in *Kharif* season, flowering is coinciding with drought (terminal moisture stress) which is a major drawback with this crop in the district. To overcome the problem, a short and medium duration pigeonpea variety *i.e.*, Ujwala (PRG-176) was introduced to the farmers of Nalgonda through On Farm Trial. The OFT was conducted under close supervision of KVK scientists. The results of the OnFarm Trial indicated that the variety introduced is feasible and economic for the farmers and viable over farmers practice. 36% yield increase was observed with adoption of new variety.

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**KEY WORDS:**

Pigeonpea, PRG-176,  
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## **BACKGROUND AND OBJECTIVES**

The pigeon pea (*Cajanuscajan*) is a perennial legume from the family *Fabaceae*. Pigeon peas are very drought-resistant, so can be grown in areas with less than 650 mm annual rainfall. International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) aimed to promote the pigeon pea as a drought-resistant, nutritious alternative crop. It is a hardy, widely adapted and drought tolerant crop with a large temporal variation (90 – 300 days) for maturity. These traits allow its cultivation in a range of environments and cropping systems. Globally, pigeonpea area has recorded a 56% increase in area since

1976. It is currently grown on 4.8 M ha. It is grown in Asia, Eastern and Southern Africa, Latin America and Caribbean countries. It is cultivated worldwide on 4.92 million hectares (M ha) with an annual production of 3.65 Mt and productivity of 898 kg ha<sup>-1</sup>. India ranked first in area and production in the world with 74% and 63% of world area and production, respectively. In productivity, Philippines ranked first with 1669 kg ha<sup>-1</sup> (Pulses status.2016). Pigeonpea is grown in 2.747 lakh hectares in Telangana with maximum area under Southern Telangana Region (1.810 lakh hectares). Pigeonpea is grown in *Kharif* season in Telangana. Pigeonpea is cultivated in nearly 4 million ha in India.

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Invariably, the traditional pigeonpea cultivars and landraces are long duration types grown as intercrops with early maturing cereals and legumes. In addition to its main use as de-hulled split peas, its immature green seeds and pods are also consumed fresh as a green vegetable. The crushed dry seeds are fed to animals while the green leaves form a quality fodder. In rural areas, dry stems of pigeonpea are used for fuel. In a cropping season, pigeonpea plants fix about 40 kg ha<sup>-1</sup> atmospheric nitrogen and add valuable organic matter to the soil through fallen leaves. Its roots help in releasing soil-bound phosphorus to make it available for plant growth. With so many benefits at low cost, pigeonpea has become an ideal crop for sustainable agriculture systems in rainfed areas.

Earlier, farmers avoided pigeonpea due to its long maturity period. To tackle with this problem Regional Agricultural Research Station, Palem have released a short duration variety called PRG-176. Introduction of this short-duration variety in the region have encouraged more farmers to grow pigeonpea. Farmers in India consider short-duration pigeonpea varieties a boon as the crop requires fewer inputs, thrives well even under limited water conditions due to its deep root system. This gives farmers the opportunity to grow post-rainy season crops. There are distinct agroecological regions similar to Telangana in Maharashtra, Karnataka, Andhra Pradesh, Madhya Pradesh, Tamil Nadu, Odisha, Chhattisgarh, and Gujarat. Pigeonpea hybrids are already gaining momentum in these states. Short duration varieties of pigeonpea can be further expanded to other states to enhance productivity and to combat climate change.

## RESOURCES AND METHODS

On farm trial on Introduction of pigeonpea variety PRG-176 was conducted by Krishi Vigyan Kendra, Kampsagar in the year 2015-16 in 5 villages *i.e.* Duggapally, Garakuntapalem, Aghamotkur, Tripuraram and Neelaigudem of Nalgonda district. Ten innovative and receptive progressive farmers from all the villages were selected for conducting the trial to ensure their active participation. The demonstration of improved technology was taken in area of 0.40 ha of each farmer. Total 4 ha area was covered in 1 year for demonstration of short duration pigeonpea variety. The experiment was laid out with pigeonpea cultivated variety Ujwala (PRG-176). This variety was compared with farmers practice

*i.e.* treated as a control. The result was compared with the full package of practice.

The primary data on output of pigeonpea yield were collected from the selected pigeonpea farmers, besides the data on local practices commonly adopted by the farmers of this region were also collected with the help of interview schedule and presented in terms of percentage. Qualitative data was converted in to quantitative form and expressed in term of per cent increased yield was calculated by the using formula :

$$\text{Percent yield increase} = \frac{\text{Demonstration yield} - \text{Local check yield}}{\text{Local check yield}}$$

$$\text{B : C Ratio} = \frac{\text{Net returns}}{\text{Cost of cultivation}}$$

$$\text{Technology gap} = \text{Potential yield} - \text{Demonstration yield}$$

$$\text{Extension gap} = \text{Demonstration yield} - \text{Farmers yield}$$

$$\text{Technology index (\%)} = \frac{\text{Technology gap}}{\text{Potential yield}} \times 100$$

## OBSERVATIONS AND ANALYSIS

The qualitative characters and difference between demonstration package and farmers practices were also considered in the trial. The details presented in Table-1. Package of Practices were the same for both treatments except the variety.

### Yield :

During one year of frontier technologies results obtained are presented in Table 2. The results revealed that the pigeonpea an average yield was recorded 1690 kg ha<sup>-1</sup> under demonstrated plots as compare to farmers practice 1210 kg ha<sup>-1</sup>. This results clearly indicated that the higher average grain yield in demonstration plots over the year compare to local check. The average yield of pigeonpea increased to 36 per cent over farmers practice.

### Technology gap :

The technology gap in the demonstration yield over potential yield were 810 kg ha<sup>-1</sup> for pigeon pea. The technological gap may be attributed to the potential nature of the intervention, dissimilarity in the soil fertility status and weather conditions (Mukharjee, 2003).

### Extension gap :

The highest extension gap of 480 kg ha<sup>-1</sup> was

**Table 1 : Difference between demonstration package and farmers practice under OFT of pigeonpea**

Sr. No.	Package	OFT practice	Farmers Practice
1.	Variety	PRG-176	LRG-46
2.	Duration	135	210
3.	Date of Sowing	June 12-20 <sup>th</sup>	June 12-20 <sup>th</sup>
4.	Date of Harvest	October 25 <sup>th</sup> – November 20 <sup>th</sup>	January 25 <sup>th</sup> -February 10 <sup>th</sup>

**Table 2 : Yield of pigeonpea as influenced by different genotypes**

Year	Average yield (kg ha <sup>-1</sup> )		% yield increase over farmers practice
	Farmers Practice	OFT	
2015	1210	1690	36

**Table 3 : Economic Impact of pigeonpea as influenced by the change in the variety**

Economics of the demonstration		Economics of the farmers practice	
Net returns	B:C Ratio	Net returns	B:C Ratio
137610	1:6.45	92890	1.4.45

recorded in pigeonpea. This emphasized the need to educate the farmers through various means for the adoption of improved agricultural production technologies to reverse this trend of wide extension gap. More and more use of latest production technologies with high yielding variety will subsequently change this alarming trend of galloping extension gap. This finding is in corroboration with the findings of Hiremath and Nagaraju(2010).

### Technology index :

The technology index shows the feasibility of the evolved technology at the farmer's fields and the lower the value of technology index more is the feasibility of the technology (Jeengar, *et al.*, 2006). The technology index was 0.324 for pigeon pea.

### Economics :

Economics of the trial are presented in the Table 03. The results revealed that the demonstrated variety have recorded higher net returns and B:C ratio over farmers practice. Demonstrated variety PRG-176 have recorded 137610 rupees of net returns per hectare and benefit cost ratio of 1:6.45 over farmers practice (92890 Rs ha<sup>-1</sup> net returns and benefit cost ratio of 1:4.45).

### Conclusion :

The OFT produces a significant positive result and provided the researcher an opportunity to demonstrate the productivity potential and profitability of the latest technology under real farming situation, which they have

been advocating for long time. The productivity gain under OFT over existing practices of brinjal cultivation created greater awareness and motivated to the other farmers to adopt suitable production technology of pigeonpea in the district. Efforts should, therefore, be made by the extension agencies in their transfer of technology programmes to increase the production of pigeonpea.

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