

Smart Variety Choice Pays Off: NBeG-776 Improves Chickpea Productivity, Profitability and Harvest Efficiency in SPSR Nellore District

K. Kiran Kumar Reddy

Subject Matter Specialist (Crop Production), Krishi Vigyan Kendra, Nellore, Acharya N. G. Ranga Agricultural University

Corresponding Email: kiranreddy.msc94@gmail.com

1. Situation Analysis / Problem Statement

Chickpea is a major *rabi* pulse crop cultivated under rainfed Vertisol conditions in SPSR Nellore district of Andhra Pradesh, covering an area of approximately 4,416 ha. In Brahmeshwaram village of Duttaluru mandal, the variety JG-11 is predominantly grown due to its adaptability to the local agro-climatic conditions. However, continuous monocropping of JG-11 has resulted in a gradual decline in productivity, primarily due to increased susceptibility to pests and diseases. The variety exhibits comparatively lower yield potential (2051 kg ha⁻¹), less number of pods per plant (54), and lower test weight (22.78 g). Furthermore, its shorter plant stature (44.4 cm) and low first pod height (20.0 cm) render it unsuitable for mechanized harvesting, thereby increasing dependence on manual labor, elevating the cost of cultivation, and causing delays in harvesting operations.

2. Plan, Implement and Support

To address the existing production and mechanization constraints in chickpea cultivation, a Frontline Demonstration (FLD) was conducted by Krishi Vigyan Kendra (KVK), Nellore, on the field of progressive farmer Sri B. Krishna Reddy in Bramheshwaram village, Duttaluru mandal of SPSR Nellore district. The demonstration aimed to evaluate the performance of an improved chickpea variety, NBeG-776, under farmer's field conditions. NBeG-776, developed and released in 2022 by Acharya N.G. Ranga Agricultural University, has been specifically bred for compatibility with mechanical harvesting. The variety is characterized by an erect growth habit, increased plant height, and higher placement of pods above the ground level. These morphological traits effectively overcome the limitations of conventional chickpea cultivars, such as low height of the first pod and spreading growth habit, which hinder efficient mechanical harvesting. Consequently, NBeG-776 is well-suited for mechanized, labour-saving, and cost-effective chickpea production systems. The FLD included a comprehensive package of improved crop management practices, comprising seed treatment, timely sowing, recommended agronomic practices, and need-based plant protection measures. Continuous technical guidance and periodic monitoring were provided throughout the crop growth period to ensure proper implementation of the recommended practices. The performance of NBeG-776 was systematically evaluated in

comparison with the locally cultivated check variety JG-11 under identical field conditions. This comparative assessment enabled the analysis of yield performance, adaptability, and suitability of the improved variety for enhancing productivity and facilitating mechanization in chickpea cultivation.

3. Output

Performance of Chickpea Varieties under Rainfed Conditions during 2025-26 (SPSR Nellore)

S.No.	Parameters	T ₁ : NBeG-776	T ₂ : JG-11
1.	Plant Population/m ²	41.0	45.0
2.	Plant height (cm)	59.6	44.4
3.	No. of branches/Plant	15.0	12.0
4.	No. of pods/plant	66.0	54.0
5.	Test weight (g)	27.12	22.78
6.	Height of first pod from base of the plant (cm)	33.5	20.0
7.	Seed yield (kg/ha)	2,557	2,051
8.	Increase in yield (%)	19.78	-
9.	Cost of cultivation (Rs./ha)	55,913	50,913
10.	Gross returns (Rs./ha)	1,32,964	1,06,652
11.	Net returns (Rs./ha)	77052	55740
12.	B-C ratio	2.38	2.09

The improved chickpea variety NBeG-776 demonstrated significantly superior growth and yield attributes compared to JG-11. It recorded a higher plant height (59.6 cm), more number of branches per plant (15.0), and higher number of pods per plant (66.0), in contrast to JG-11, which exhibited 44.4 cm plant height, 12.0 branches, and 54.0 pods per plant. The test weight of NBeG-776 was also higher (27.12 g) than that of JG-11 (22.78 g). Notably, the height of the first pod from the base of the plant was



significantly higher in NBeG-776 (33.5 cm) compared to JG-11 (20.0 cm), an important trait that enhances its suitability for mechanized harvesting. These favorable morphological and yield-contributing traits resulted in a higher seed yield of 2557 kg ha^{-1} in NBeG-776, representing a 19.78% increase over JG-11 (2051 kg ha^{-1}). Furthermore, the erect growth habit, higher pod-setting capacity, and higher first pod position collectively facilitate efficient mechanical harvesting. This reduces labour requirements and minimizes harvest losses, thereby improving overall production efficiency.

improved economic performance of NBeG-776 can be partly attributed to its suitability for mechanized harvesting, which reduces dependence on manual labour. Under prevailing conditions of agricultural labour scarcity and rising wage rates, this trait assumes significant importance by minimizing labour-related constraints, ensuring timely harvest operations, and reducing harvesting losses. Thus, NBeG-776 not only enhances profitability through higher yield but also offers resilience against labour shortages, contributing to its overall economic viability and adoptability.

5. Impact

The frontline demonstration exerted a significant positive impact on farmer's by effectively illustrating the advantages of adopting improved chickpea varieties. Participating farmer's observed superior performance of NBeG-776 over JG-11 in terms of higher yield potential, improved plant architecture, and suitability for mechanized harvesting. These attributes contributed to enhanced productivity and higher economic returns at the farm level. The intervention also addressed prevailing labour constraints by reducing dependence on manual labour, particularly during harvesting operations, which are often affected by labour scarcity and escalating wage rates. This reduction in labour requirement not only ensured timely harvest but also minimized associated losses, thereby improving overall production efficiency. Furthermore, the demonstration enhanced farmer's confidence in improved production technologies and facilitated greater acceptance of NBeG-776. It generated increased demand for quality seed and promoted faster horizontal spread of the variety. Additionally, the initiative strengthened the extension linkage between the Krishi Vigyan Kendra (KVK) and the farming community, thereby creating opportunities for large-scale dissemination and adoption of the improved variety in the district.



4. Outcome

The economic analysis clearly demonstrated the superiority of NBeG-776 over JG-11. Although the cost of cultivation was marginally higher in NBeG-776 ($\text{₹}55,913 \text{ ha}^{-1}$) compared to JG-11 ($\text{₹}50,913 \text{ ha}^{-1}$), the higher productivity resulted in substantially greater gross returns ($\text{₹}1,32,964 \text{ ha}^{-1}$) as against $\text{₹}1,06,652 \text{ ha}^{-1}$ in JG-11. Consequently, net returns were markedly higher in NBeG-776 ($\text{₹}77,052 \text{ ha}^{-1}$) compared to $\text{₹}55,740 \text{ ha}^{-1}$ in JG-11, reflecting an additional net return advantage of $\text{₹}21,312 \text{ ha}^{-1}$. The Benefit-Cost ratio was also superior in NBeG-776 (2.38) relative to JG-11 (2.09), indicating enhanced economic efficiency. Importantly, the

Conclusion

The Frontline Demonstration (FLD) results conclusively demonstrated that the chickpea variety NBeG-776 outperforms the traditionally cultivated variety JG-11 under rainfed Vertisol conditions in the SPSR Nellore district. The superior performance of NBeG-776 can be attributed to its higher yield potential, better adaptability to prevailing agro-climatic conditions, and enhanced economic returns. Additionally, its suitability for mechanized harvesting provides a significant advantage in addressing labour scarcity, thereby improving operational efficiency. The findings suggest that large-scale dissemination of NBeG-776

through systematic demonstrations and timely seed distribution could facilitate faster varietal replacement. Such an approach would not only alleviate labour constraints but also contribute to improving productivity and ensuring sustainable chickpea cultivation in the region.

* * * * *