

BPT 2846 (IET 28737), A High Yielding Slender Grain Rice Variety Suitable for Krishna Zone of Andhra Pradesh

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Abstract

BPT 2846, developed through pedigree breeding at the Agricultural Research Station, Bapatla, is a result of the cross between MTU 1061 and IR78585-64-2-4-3-1. During the *kharif* seasons of 2015-2017, it underwent station yield trials, demonstrating an average grain yield of 6352 kg/ha. This marked a substantial 18.6% improvement over the reference variety BPT 5204. In the Multi-location Trial-Slender grain of *kharif* 2019, BPT 2846 showcased a noteworthy average grain yield of 6355 kg/ha, exhibiting a 23.0% improvement over the common check BPT 5204. Nominated in the AICRIP trial under the Initial Variety Trial-Medium Slender category as IET 28737 in 2019, BPT 2846 displayed adaptability across various locations in the country, recording a mean grain yield of 4420 kg/ha. The rice variety was further subjected to adaptive minikit testing in farmers' fields by DAATT Centres for three years, resulting in an average grain yield of 6513 kg/ha. This reflected an 11.8% improvement over BPT 5204. Similarly, minikit testing conducted by DAOs recorded an average grain yield of 6497 kg/ha for BPT 2846, demonstrating a 12% yield improvement over BPT 5204. Belonging to the late duration group with a 145-150 days duration in the *kharif* season, BPT 2846 is well-suited for irrigated wetlands in Andhra Pradesh. It possesses characteristics such as non-lodging, a semi-dwarf and erect plant type, dark green foliage, two weeks of seed dormancy, low shattering and high grain yield. Additionally, BPT 2846 exhibits moderate resistance to leaf blast, neck blast and leaf folder. It boasts excellent cooking quality, intermediate values of alkali spreading and amylose content, high head rice recovery (65.2%) with translucent grains and a Kernel Length to Breadth ratio of 2.85. These attributes make it highly desirable for obtaining a premium market price.

Keywords: Rice variety, medium slender grains, high yielding, late duration

Introduction

One of the main objective of the Agricultural Research Station, Bapatla is to create a high-yielding rice variety tailored for the *kharif* season, featuring a duration of 145-150 days. Even though, BPT 5204 possess good yield potential and excellent grain and cooking quality, it is susceptible to major pests/diseases due to which

often farmers suffer heavy yield losses. Hence, there is a demand from the farming community for stable rice varieties with sustained production even under adverse climatic conditions with reduced cost of cultivation. Efforts are underway at Agricultural Research Station, Bapatla for the development of high yielding rice



varieties with 145-150 days duration (suitable for double cropped areas), non-lodging, low shattering of grains along with resistance to leaf blast, neck blast, plant hoppers coupled with good grain quality suitable for raw rice. Many varieties possessing high yield potential with tolerance to blast were released for replacement of Samba Mahsuri. But, many of them were not accepted by farmers due to their poor cooking quality traits. After years of dedicated efforts starting in 2009, BPT 2846, a rice variety with favorable features capable of replacing BPT 5204, was finally released by SVRC in 2023.

BPT 2846 possess excellent grain and cooking quality parameters similar to Samba Mahsuri. The cultivar BPT 2846 has the following desirable features.

- Duration: 145-150 days
- Erect plant type
- Strong culm, Non-lodging
- One-week seed dormancy
- Moderately resistant to leaf blast, neck blast and leaf folder
- Low shattering of grains

- Suitable for raw rice
- Medium slender grain with high market price and good consumer acceptability

The proposed cultivar, BPT 2846 is a high yielding, non-lodging, semi-dwarf, profuse tillering culture, possess medium slender grains with straw glume with 145-150 days duration suitable for double cropped areas also. It has two weeks seed dormancy. It is very much suitable for cultivation during *kharif* season in Krishna zone of Andhra Pradesh in realizing higher yields. Due to its non-lodging nature, the proposed culture is suitable for cultivation under direct sown conditions and for mechanical harvesting also.

Biotic stress resistance:

The screening trials data revealed that the suggested variety demonstrates moderate resistance to leaf blast, neck blast and leaf folder. This finding suggests that farmers may reduce pesticide sprayings, resulting in lower cultivation expenses and promoting sustainable yields (Tables 1 and 2).

Table 1: Reaction of BPT 2846 to major diseases

Variety	National Screening Nursery-II (AICRIP) testing during 2019)		Variety	ARS, Nellore during, 2020-21			
	Leaf Blast	Neck Blast		Leaf Blast	Neck Blast	Sheath Rot	BLB
BPT 2846	5.2	3.0	BPT 2846	5.0	5.0	3.0	5.0
Check (BPT5204)	6.3	7.0	Check (BPT5204)	9.0	9.0	7.0	9.0
Resistant Check (Tetep)	3.0	2.0	Resistant Check	-	-	-	-
Susceptible Check (Pusa 44)	5.3	8.0	Susceptible Check (NLR34242)	9.0	9.0	9.0	9.0

Table 2: Reaction of BPT 2846 to major insect pests

Variety	National Screening Nursery - II (AICRIP) testing during 2019)
	Leaf Folder Score
BPT 2846	0.8
Check (BPT5204)	2.46
Resistant Check (W1263)	1.85
Susceptible Check (TN1)	3.36

BPT 2846 grain quality:

BPT 2846 exhibits outstanding cooking quality, along with intermediate and desirable values of alkali spreading value and amylose content. Additionally, it boasts high head rice recovery (65.2%) characterized by translucent grains and a Kernel Length to Breadth ratio of 2.85, making it highly sought after for obtaining a premium market price (Table 3).

Table 3: Physico-chemical and Biochemical quality characteristics of unpolished BPT 2846 and BPT 5204

S. No	Trait/ Character	Description of BPT 2846	Description of BPT 5204
1	Hulling (%)	76.6	75.8
2	Milling (%)	69.3	68.4
3	Head rice recovery	65.2	62.8
4	Kernel length (mm)	5.42	5.63
5	Kernel breadth (mm)	1.90	2.14
6	L/B ratio	2.85	2.63
7	1000 grain weight (g)	13.5-14.0	14.5-15.0
8	Gelatinization temperature	Intermediate	Intermediate
9	Keeping quality	Good	Excellent
10	Cooking quality	Excellent	Excellent
11	Alkali spreading value	4.5	5.0
12	Amylose content (%)	22.7	22.65
13	Protein content in unpolished rice (%)	8.2	8.0
14	Fe content in unpolished rice (ppm)	6.2	8.7
15	Zn content in unpolished rice (ppm)	21.8	16.8

The organoleptic evaluation of BPT 2846 along with other rice varieties revealed that it recorded on par score with the popular BPT 5204 for overall acceptability and possess 8.2% protein content in brown rice. The unpolished rice of BPT 2846 possessed, 21.8 ppm Zn and 6.2 ppm iron content.

Performance in Multi-Location Trials and Adaptive minikit tests:

BPT 2846 was evaluated in station yield trials in *kharif* 2015-2017 and recorded an average grain yield of 6352 kg/ha in station trials with 18.6% yield improvement

over the check variety BPT 5204. In Multi-Location Trial-Slender Grain conducted during *kharif* 2019, BPT 2846 recorded 6355 kg/ha and showed 23.0% yield improvement over common check BPT 5204. BPT 2846 (IET 28737) was nominated in AICRIP trial (Initial Variety Trial- Medium Slender) during 2019 and recorded a mean grain yield of 4420 kg/ha in different locations tested across the country.

The entry BPT 2846 was evaluated in adaptive minikit testing conducted by DAATT Centres in farmer's fields of erstwhile Krishna, East Godavari, Guntur, Kurnool, Darsi, Srikakulam, Vizianagaram, Visakhapatnam, Nellore, Ongole and Peddapuram districts in *kharif* season during the years 2019-20, 2020-21 and 2021-22. Across all the locations over three years, it recorded an average grain yield of 6513 kg/ha and exhibited 10.6% yield superiority overchecks *viz.*, BPT 5204/BPT 2782 and exhibited 11.8% improvement over BPT 5204.

Minikit testing conducted by the JDA's of erstwhile Guntur, Nellore, Krishna, East Godavari, Prakasam, Visakhapatnam and Vizianagaram districts of Andhra Pradesh, BPT 2846 recorded an average grain yield of 6497 kg/ha and 11.3% yield improvement over checks *viz.*, BPT 5204/BPT 2782. When compared with BPT 5204 it recorded 6545 kg/ha and 12% yield improvement.

During 2021-22, BPT 2846 was tested against BPT 2782 in Guntur, Nellore, Krishna, Visakhapatnam and Prakasam districts and it recorded 6563 kg/ha grain yield and exhibited 8.6% yield superiority over the recently released variety *i.e.*, BPT 2782.

Agronomy trials were conducted for BPT 2846 at Agricultural Research Station, Bapatla. The results revealed that BPT 2846 recorded significantly superior grain and straw yield at 160 kg nitrogen/ha.



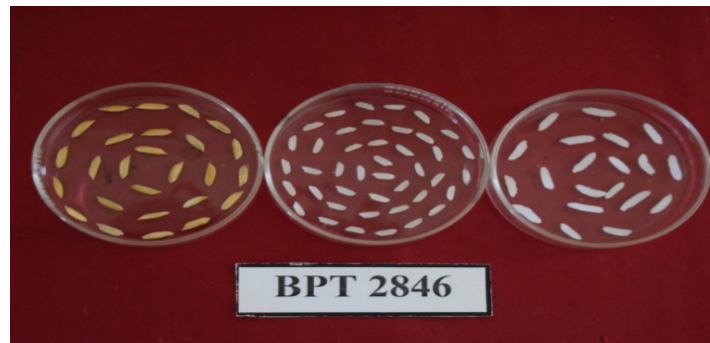
Conclusion

Farmers, industry (millers) and consumers alike have embraced BPT 2846. Over 50,000 acres in Krishna, Guntur, Nellore and Prakasam Districts were dedicated to planting BPT 2846 during the *Kharif* seasons of 2021 and 2022. Millers express great satisfaction due

to its impressive milling capabilities and high head rice recovery, accompanied by minimal breakage (2-3%). Consequently, millers are offering a premium price for BPT 2846. Consumers are content with the cooking and eating quality parameters of BPT 2846.



Field View of BPT 2846



Paddy and Rice of BPT 2846



Panicles of BPT 2846



Paddy and Rice of BPT 2846