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Pusa Prateek – A high yielding nutrient rich improved variety of tropical carrot

***Pusa Prateek* (IPC-3) is a high-yielding, nutrient-rich tropical carrot variety developed for cultivation during the *rabi* season in Zone VI (Rajasthan, Gujarat, Haryana, Delhi) and Zone VIII (Karnataka, Tamil Nadu, Kerala, Puducherry). The variety produces narrow, obtriangular roots with a small self-coloured red core, high carotenoids, lycopene, β-carotene and TSS content. It matures in 85–90 days and has an average yield of 30–32 t/ha, which is approximately 19% higher than the national check *Pusa Rudhira*. *Pusa Prateek* is suitable for salad, juice, cooking and *halwa* preparation, offering both enhanced farmer returns and nutritional benefits to consumers.**

Keywords: Carotenoids content, High-yield variety, *Pusa Prateek*, *Rabi* cultivation, Tropical carrot

THE carrot (*Daucus carota* subsp. *sativus* L.), known as *Gajar* in Hindi is a very popular and important vegetable grown in hills and plains of India. It is used as salad, juice, *halwa*, pickle and cooked vegetable dishes. Carrots are valuable for their taste, good digestibility and high contents of provitamin A, other carotenoids and fibres. Subtropical-tropical carrots are juicy and rich in lycopene. The development of improved varieties in carrots would bring genetic improvement with an increase in yield of uniform, smooth, marketable roots having high nutritive values and wider adaptability. The tropical carrot variety *Pusa Prateek* has been recommended for the main/normal season in October, sowing under irrigated conditions in Zone VI (Rajasthan, Gujarat, Haryana, and Delhi) and Zone VIII (Karnataka, Tamil Nadu, Kerala, and Puducherry). It has been duly notified by the Central Sub-Committee on Crop Standards, Notification, and Release of Varieties of Horticultural Crops. With its high yield potential and superior nutrient content, this variety offers farmers better economic returns while contributing to enhance nutritional security for customers.

Pusa Prateek (IPC-3)

It is an early-maturing variety, with roots ready for harvesting in 85–90 days after sowing during the winter season. The foliage is medium green, with intermediate leaf dissection and a normal leaf type. Plants reach a height of 60–65 cm. Roots are 20–22 cm long, weighing 100–120 g, narrow obtriangular in shape, with flat to rounded shoulders and a strongly pointed tip. Both external and internal root colour is red, with a small self-coloured red core. Root surface ribbing is medium. The average root yield under normal conditions is 30 t/ha, approximately 19% higher than the national check *Pusa Rudhira*. It is suitable for salad, juice, cooking, and *halwa* preparation. *Pusa Prateek* contains carotenoids 6076 µg/100 g, lycopene 1,562.5 µg/100 g, β-carotene 456.8 µg/100 g, TSS 9.25 °Brix, and polyphenols 2.55 mg/100 g FW.

Turn to page 3

Continued from Cover II

Pusa Prateek...

Performance of *Pusa Prateek* (IPC-3)

Pusa Prateek demonstrated impressive performance in field trials conducted at various locations under the All India Coordinated Research Project (Vegetable Crops) from 2016–17 to 2018–19 during the *rabi* season. When tested alongside the national check variety *Pusa Rudhira*, *Pusa Prateek* achieved a yield of 31.71 t/ha, which is 19.24% higher than that of *Pusa Rudhira*.

Table 1. Mean yield of tropical carrot *Pusa Prateek* (IPC-3) across AICRP centers

Entry	IET (2016-17)	AVT–I (2017-18)	AVT–II (2018-19)	Average root yield (t/ha)	Percentage increase over check
2016/CARVAR -7 (IPC-3)	27.59	32.72	34.81	31.71	19.24
2016/CARTVAR-2 (*Pusa Rudhira*) (Check)	22.12	28.59	29.05	26.59	

Table 2. Mean yield of tropical carrot variety *Pusa Prateek* (IPC-3) during *rabi* season at ICAR-IARI, New Delhi

Variety	Root yield (t/ha)			Average root yield (t/ha)	Percentage increase over check
	2022-23	2023-24	2024-25		
Pusa Prateek (IPC-3)	31.25	28.85	32.50	30.87	19.10
Pusa Rudhira (check)	24.50	27.35	25.90	25.92	

At ICAR-IARI, New Delhi, the variety *Pusa Prateek* when tested alongside the national check variety *Pusa Rudhira* from 2022-23 to 2024-25 during *rabi* season, recorded an average root yield of 30.87 t/ha which is 19.10% higher than *Pusa Rudhira*.

Cultivation

Pusa Prateek is recommended for cultivation in Zone VI (Rajasthan, Gujarat, Haryana, and Delhi) and Zone VIII (Karnataka, Tamil Nadu, Kerala, and Puducherry) during *rabi*. It grows well in well-drained sandy loam soil rich in organic matter with a pH of 6–7. The field should be ploughed 2–3 times until the soil is well-pulverized and tilled to a depth of 40 cm to ensure unrestricted root penetration. Soil crusting should be avoided, as it prevents seedling emergence.

The seed rate is 5–6 kg/ha. Seeds are sown in October on ridges spaced 45–60 cm apart at a depth of 2 cm. After ridge preparation, the herbicide Stomp at 3.3 L/ha should be applied with proper moisture. Seeds should be treated with Captan or Bavistin at 2.5–3 g/kg and covered with fine soil, keeping the ridge moist until germination. Throughout the growing period, irrigation should be applied at 10–15 day intervals, with light irrigation 2–3 days before harvesting. When plants reach suitable height, thinning should maintain 8–10 cm plant-to-plant spacing.

Fertilizer doses should be based on soil testing. Generally, at land preparation, well-decomposed farmyard manure (10–15 t/ha), 35 kg N, 40 kg P_2O_5, and 60 kg K_2O/ha are incorporated into the soil. An additional 35 kg N is top-dressed at the first earthing-up, 1.5 months later. Two earthing-ups are essential to achieve proper root shape and size.

Plant protection

Cercospora leaf spot/blight develops rapidly in hot or humid conditions, appearing as round to elongated tan or gray-brown spots with a white dead center on the leaflets, causing curling. Avoid overcrowding and grow the crop in well-drained beds. Use treated seeds. Spray mancozeb at 2.5 g/L or copper oxychloride at 3 g/L as soon as symptoms appear.

Early symptoms of Sclerotinia rot (*Sclerotinia sclerotiorum*) include water-soaked lesions at the base of the foliage, followed by cottony white mycelial growth. Apply 3–4 sprays of Carbendazim 50 WP at 1 kg/1,000 L water at 15–20 day intervals. Collar rot, which affects the root collar region, can be minimized by drenching with Captan at 2 g/L water.

Harvesting and yield

Roots of the carrot variety *Pusa Prateek* are harvested when fully developed, typically 85–90 days after sowing during the *rabi*. The roots are dug, foliage removed, washed, and prepared for the market. Harvested and cleaned roots are packed in plastic crates to prevent bruising and damage.

SUMMARY

Pusa Prateek is a high-yielding, improved tropical carrot variety recommended for cultivation during the *rabi* season in Zone VI (Rajasthan, Gujarat, Haryana, and Delhi) and Zone VIII (Karnataka, Tamil Nadu, Kerala, and Puducherry). It features a small, self-coloured red core and is rich in carotenoids, lycopene, and TSS content.

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