

Pusa Sponge gourd-29: A high yielding Tomato Leaf Curl New Delhi virus (ToLCNDV) resistant variety of sponge gourd suitable for *kharif* season

Pusa Sponge Gourd-29 (DSG-29), developed by ICAR-IARI, New Delhi, is India's first public-sector-bred sponge gourd variety resistant to the devastating Tomato Leaf Curl New Delhi Virus (ToLCNDV). Notified for the National Capital Territory of Delhi, this early-maturing variety allows farmers to safely cultivate sponge gourd during the *kharif* season- a period traditionally plagued by high whitefly populations and severe viral outbreaks. Ready for harvest in just 45–50 days after sowing, it yields attractive, dark green, 22–24 cm long cylindrical fruits featuring thick skin and tender white flesh, highly prized by consumers. In multi-year open-field trials, DSG-29 achieved an impressive average yield of 17.77 t/ha, outperforming the resistant check and outyielding susceptible checks. Boasting a remarkably low vulnerability index, this landmark variety offers a robust, high-yielding strategy to secure year-round availability and boost farmer income.

Keywords: DSG-29, Pusa Sponge Gourd-29, Resistant variety, Tomato Leaf Curl New Delhi Virus

THE sponge gourd (*Luffa cylindrica* L.), also known as *Chikni tori* in Hindi is a very popular and important vegetable grown in India. It is best adapted to tropical and subtropical regions and easy-to-grow. Its tender fruits are generally consumed immature as vegetable. Tomato Leaf Curl New Delhi Virus (ToLCNDV) is transmitted by whiteflies, causing symptoms like yellowing, leaf curling, chlorosis, mottling, stunting has been reported to be associated with sponge gourd and causing substantial yield loss in north Indian plains during *kharif* season. So far there is no ToLCNDV resistant sponge gourd variety/hybrid developed by any public/private sector. With the release of this variety, sponge gourd can be successfully grown by the farmers during *kharif* season which is conducive for whitefly multiplication and severe spread of the disease. Further, long, dark green and thick skinned fruits with tender flesh will be highly accepted by consumers of north Indian plains. Pusa Sponge Gourd-29 has been notified by the central sub-committee on crop standards, notification and release of varieties of horticultural crops.

Pusa Sponge Gourd-29 (DSG-29): It is the first ToLCNDV resistant sponge gourd variety developed by public sector suitable for *kharif* cultivation under north Indian plains. The fruits become ready for first harvesting in 45–50 days after sowing. Fruits have desirable marketable attributes and are attractive, uniform, dark green, elongated, cylindrical, 22–24 cm long having average fruit weight 105–110g, with superficial ribs, thick skin, smooth texture and white flesh. Presently, north

Indian plain farmers rely only on spring-summer crop and with the release of this variety; long term demand of the farmers can be met as they can successfully grow this crop during *kharif* season. The average fruit yield is 17.77 t/ha under natural field condition during *kharif* season. Pusa Sponge Gourd-29 is highly resistant to ToLCNDV under natural field condition with vulnerability index of 8.9 as compared to 85.3 in susceptible check Pusa Supriya.

Performance of Pusa Sponge Gourd-29 (DSG-29): Pusa Sponge Gourd-29 has been tested in yield trials under open field conditions during *kharif* season at ICAR-IARI, New Delhi from 2022 to 2024 along with DSG-6 and Pusa Supriya as resistant and susceptible checks, respectively. The results indicated that Pusa Sponge Gourd-29 yielded 17.77 t/ha which was 30.76% higher than the resistant check DSG-6 and 259.72% and 303.86% superior than the susceptible checks Pusa Supriya and Kalyanpur Hari Chikni, respectively.

Cultivation: Pusa Sponge Gourd-29 is suitable for cultivation in rainy seasons in NCT of Delhi. As a rainy season crop it is sown in June-end. It can be grown successfully on well-drained loam and sandy loam soils. Application of 20–25 t/ha of well-rotten organic manure before field preparation is beneficial. Seed rate is 2.5–3.0 kg/ha. Seed should be treated with 2g Captan/Thiram/Kg of seed. A spacing of 3.5–4.0 m row to row and 60–75 cm hill to hill is ideal. Fertiliser dose is 100:80:60 kg NPK/ha. Half dose of nitrogen is applied at the time of field preparation and remaining 30 days after sowing

Mean performance of Pusa Sponge Gourd-29 during Kharif season from 2022 to 2024 at ICAR-IARI, New Delhi

Variety	Yield (t/ha)			Average yield (t/ha)	Percentage increase over checks (Resistant and Susceptible)	No. of days to first harvest	Vulnerability Index & Category
	2022	2023	2024				
Pusa Sponge Gourd-29 (DSG-29)	18.53	18.20	16.58	17.77	30.76 (DSG-6), 259.72 (Pusa Supriya), 303.86 (Kalyanpur Hari Chikni)	45–50	8.90
DSG-6 (Resistant Check)	14.95	13.13	12.68	13.59		50–55	4.20
Pusa Supriya (Susceptible Check)	4.55	5.20	5.07	4.94		50–55	85.30
Kalyanpur Hari Chikni (Susceptible Check)	4.03	4.62	4.55	4.40		50–55	89.45

and before flowering. Irrigation is done through channels. Light irrigation, if required, is done depending upon the weather conditions. Earthing up is essential to cover the roots properly in rainy season crop. It requires 2–3 hoeing and weeding.

Pest and disease: for controlling fruit fly, the affected fruits should be plucked and destroyed along with the maggots inside them. Spray the crop with Malathion @ 2 ml/litre of water. Use light traps in night with poison baits. Powdery mildew is controlled by spraying of Bavistin (0.1–0.2%) twice at 10 days interval whereas downy mildew can be controlled by spraying of Ridomil (0.2%) or Dithane M-45 (0.2%) at 8 days interval. Fusarium wilt disease can be checked by drenching the soil and root zone of the crop by Bavistin. Mosaic virus infected plants should be eradicated from the field as soon as they are noticed. Four or five foliar sprays, either of Imidacloprid (0.03%) or Dimethoate (0.05%) or

Metasystox (0.02%) at 10 days interval reduces the spread of mosaic disease.

Harvesting and yield: Fruits are ready for harvesting 45–50 days after sowing. Immature fruits should be harvested at frequent intervals. Average fruit yield is 17.77 t/ha during *kharif* season. The harvested fruits should be kept in plastic crates with fillers instead of gunny bags to avoid bruises and injury.

SUMMARY

Pusa Sponge Gourd-29 is an early maturing variety of sponge gourd for *kharif* season cultivation developed by IARI for NCT of Delhi. It is resistant to Tomato Leaf Curl New Delhi Virus (ToLCNDV). Apart from superior quality characters, it has an average fruit yield of 17.77 t/ha during *kharif* season which is 30.76% and 259.72% superior over resistant check DSG-6 and susceptible check Pusa Supriya, respectively.

For further correspondence, contact:

¹Dr. Amish K Sureja, Principal Scientist, Division of Vegetable Science, ICAR-Indian Agricultural Research Institute, New Delhi 110 012, India. E-mail: aksureja@gmail.com; ²ICAR-Indian Institute of Horticultural Research, Hessaraghatta Lake Post, Bengaluru, Karnataka 560 089, India; ³Regional Station, ICAR-Indian Agricultural Research Institute, Karnal, Haryana 132 001, India; ⁴ICAR- National Bureau of Plant Genetic Resources, New Delhi 110 012, India.



Fruits of 'Pusa Sponge Gourd-29'

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INDIAN HORTICULTURE

Directorate of Knowledge Management in Agriculture
Indian Council of Agricultural Research, Krishi Anusandhan Bhavan-1,
Pusa, New Delhi 110012, India
editor.indianhorticulture@gmail.com