

KUFRI MOHAN-A NEW HIGH YIELDING TABLE POTATO VARIETY

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ABSTRACT: Kufri Mohan is a medium maturing, main season, high yielding table purpose potato variety suitable for cultivation in Indo-Gangetic plains (northern and eastern). It is a clonal selection from a cross between MS/92-1090 × CP1704. The plants are tall with vigorous and semi-compact canopy and field resistance to late blight. It produces white cream, ovoid tubers with shallow eyes and white flesh. It possesses good keeping quality and moderate tuber dry matter (15-18%). The variety yields 35-40 t/ha and >90% marketable tuber yield under optimum agronomical practices.

KEYWORDS: Indo-gangetic plains, Kufri Mohan, late blight resistance, potato

INTRODUCTION

In India nearly 90% potatoes are grown and produced in Indo-Gangetic plains during winter season. Indo-Gangetic plains extending from Punjab to West Bengal offer fertile land and irrigation facilities for potato cultivation. Development of potato varieties and their adaption to the agro-ecologies is essential to harvest the sustainable breeding benefit of the variety. The potato varieties adapted to the Indo-Gangetic plains should be short to medium duration, having moderate resistance to late blight and good keeping quality under ambient temperature (Luthra *et al.*, 2006; Kumar *et al.*, 2011, Pande *et al.*, 2014). Kufri Bahar is the most popular variety of western plains, but it is susceptible to late blight and has moderate productivity. Kufri Jyoti is popular in eastern plains but its major R-genes derived resistance from *Solanum demissum*, has succumbed to late blight in due course of time owing to the development of matching virulences of the pathogen (Joseph *et al.*, 2007). There was a recurring demand from various potato stakeholders to develop variety having

white-cream ovoid tubers with high yield, moderate level of late blight resistance and good keeping quality for western and eastern Indo-Gangetic plains. Therefore, efforts were directed to meet the above demand and new variety, Kufri Mohan (MS/5-1543) was developed and released in 2016 for Indo-Gangetic plains (western and eastern plains). The adoption of new potato variety, Kufri Mohan by farmers will increase their farm productivity and income, thus improving livelihood of the farmers and meet the food and nutritional requirements of burgeoning population of the country.

MATERIALS AND METHODS

Advanced hybrid MS/5-1543, denominated as Kufri Mohan originated from a hybridization cross between MS/92-1090 × CP1704 made at ICAR-Central Potato Research Institute Campus, Modipuram, Meerut (29 °N and 76 °E; 222 masl) during 2003-04. The female parent MS/92-1090, an indigenous hybrid produces yellow ovoid, shallow eyed tubers with light yellow flesh and possesses field resistance to late blight, whereas male parent CP1704 (an exotic variety

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Claudia) produces white, ovoid, shallow eyed tubers with white flesh and possesses high resistance to late blight. The pedigree of Kufri Mohan is described in Fig. 1. The seedling and subsequent clonal stages were raised and evaluated (Luthra *et al.*, 2006) at ICAR-Central Potato Research Institute, Campus, Modipuram, Meerut. The clone MS/5-1543 was in seedling stage in 2004-05, five-hill plot in 2005-06, 30 hill plot in 2006-07, multiple row trial in 2007-08 and in replicated yield trials during 2008-09 to 2010-11. Based on consistent superior performance than control varieties in replicated yield trials, the hybrid was introduced into All India Coordinated Research Project on Potato (AICRP on Potato) in 2011 for multi-location testing across the country. Under AICRP on Potato, MS/5-1543 was evaluated in replicated yield trials along with regional controls in Northern plains (4 locations-Hisar, Jalandhar, Modipuram and Pantnagar), Central plains (4 locations-Chindwara, Deesa, Raipur, Kota), Eastern plains (8 locations-Bhubaneswar, Dholi, Faizabad, Jorhat, Kalyani, Kanpur, Pashigat and Patna) and Plateau regions (3 locations-Dharwad, Hassan and Pune) during 2012-13 and 2013-14. The hybrid was subsequently evaluated in on-farm trials during 2014-15 at 11 locations (North Indian plains: Hisar, Jalandhar, Modipuram, Pantnagar; Eastern plains: Bhubaneswar, Dholi, Faizabad, Jorhat, Kalyani, Kanpur and Patna).

The data were analyzed following standard statistical procedures as described by Gomez and Gomez (1984) using the software Windostat 8.5 (Ameerpet, Hyderabad, India). Based on its performance, the advanced

hybrid MS/5-1543 was recommended for release in Indo-Gangetic plains (northern and eastern plains) by 33rd AICRP Potato group meeting held during September 19-21, 2015 at GBPUAT, Pantnagar, Uttarakhand. The hybrid MS/5-1543 christened as potato variety Kufri Mohan has been notified by the Central Sub-Committee on Crop Standards Notification and Release of Varieties for Horticultural Crops, Ministry of Agriculture, Department of Agriculture and Co-operation, Government of India, New Delhi in 2016.

VARIETAL DESCRIPTION

For identification purpose, the salient morphological attributes of variety Kufri Mohan are described below-

Plant: Tall, plant canopy semi-compact, stem medium thick, predominantly green, wings highly developed and straight.

Foliage: Grey green, leaves close, leaflet width narrow, leaflets ovate, leaflet coalescence absent, rachis green, midrib green.

Flower: Flowering medium, inflorescence medium, floral stalk green, floral stalk-pedicel articulation clearly visible and located above the middle, calyx green, corolla white, corolla shape semi-stellate, anther orange, anther cone normally developed, stylar length longer than stamen column and stigma bilobed.

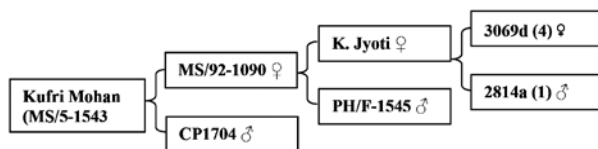


Fig. 1. Pedigree of Kufri Mohan



Morphological and tuber attributes of Kufri Mohan

Tubers: Tubers (8-10), ovoid, skin white-cream, eyes shallow, eyebrows normal, flesh white, texture mealy.

Sprout: Sprout white-green, shape conical, pubescence at sprout base is weak

RESULTS AND DISCUSSION

Yield performance

Campus trials: Advanced hybrid MS/5-1543 consistently out yielded the controls Kufri Bahar, Kufri Pukhraj and Kufri Sadabahar at 80 days in three successive replicated yield trials during 2008-2011 at Modipuram, Meerut, Uttar Pradesh (Table 1 & 2). MS/5-1543 (45.58 t/ha) recorded 48, 19 and 34% higher total

tuber yield in comparison to Kufri Bahar (30.84 t/ha), Kufri Pukhraj (38.30 t/ha) and Kufri Sadabahar (33.92 t/ha), respectively (Table 1). The hybrid produced >95% marketable tubers as reflected by its high marketable tuber yield (43.85 t/ha) which was higher by 52, 23 and 35% in comparison to Kufri Bahar (28.83 t/ha), Kufri Pukhraj (35.79 t/ha) and Kufri Sadabahar (32.49 t/ha), respectively (Table 2). At 90 days, MS/5-1543 (57.67 t/ha) produced 51, 28 and 34% higher total tuber yield than the controls Kufri Bahar (38.08 t/ha), Kufri Pukhraj (45.14 t/ha) and Kufri Sadabahar (42.99 t/ha), respectively. The marketable tuber yield of this hybrid accounted nearly 98% of total yield at 90 days crop duration (Table 3).

Table 1. Total tuber yield (t/ha) of MS/5-1543 at 80 days at Modipuram

| Genotypes | Total tuber yield t/ha | | | | % yield gain over controls |
|-----------------|------------------------|------------|-----------------------|-------|----------------------------|
| | 2008-2009 | 2009- 2010 | 2010-2011 | Mean | |
| MS/5-1543 | 39.39 | 50.57 | 46.79 | 45.58 | |
| Kufri Bahar | 24.88 | 37.06 | 30.58 | 30.84 | 47.80 |
| Kufri Pukhraj | 30.94 | 43.04 | 40.91 | 38.30 | 19.04 |
| Kufri Sadabahar | 28.71 | 38.58 | 34.47 | 33.92 | 34.38 |
| CD (0.05) | Genotype: 1.86 | | Genotype × Year: 3.23 | | |

Table 2. Marketable tuber yield (t/ha) of MS/5-1543 at 80 days at Modipuram

| Genotypes | Marketable tuber yield t/ha | | | | % yield gain over controls |
|-----------------|-----------------------------|------------|-----------------------|-------|----------------------------|
| | 2008-2009 | 2009- 2010 | 2010-2011 | Mean | |
| MS/5-1543 | 37.91 | 48.65 | 44.99 | 43.85 | |
| Kufri Bahar | 23.40 | 34.73 | 28.34 | 28.83 | 52.15 |
| Kufri Pukhraj | 28.85 | 40.41 | 38.10 | 35.79 | 22.52 |
| Kufri Sadabahar | 27.22 | 37.16 | 33.10 | 32.49 | 34.96 |
| CD (0.05) | Genotype: 1.80 | | Genotype × Year: 3.12 | | |

Table 3. Tuber yield (t/ha) of MS/5-1543 at 90 days at Modipuram

| Genotypes | Tuber yield t/ha (2010-11) | | % yield gain over controls | |
|-----------------|----------------------------|-------|----------------------------|-------|
| | Marketable | Total | Marketable | Total |
| MS/5-1543 | 56.47 | 57.67 | | |
| Kufri Bahar | 36.98 | 38.08 | 52.70 | 51.44 |
| Kufri Pukhraj | 43.41 | 45.14 | 30.09 | 27.76 |
| Kufri Sadabahar | 42.09 | 42.99 | 34.16 | 34.15 |
| CD (0.05) | 2.41 | 0.28 | | |

AICRP trials: The hybrid performed well in northern and eastern plains however, its performance in central plains and plateau region was not better than the control varieties. The results of MS/5-1543 in western and eastern plains are presented and discussed below:

Northern plains: In replicated yield trials, the hybrid out yielded all the controls at Hisar, Jalandhar and Modipuram at 75 and 90 days of harvesting. At 75 days, it out yielded the control Kufri Bahar by margin of 21, 12 and 14% respectively at Hisar, Jalandhar and Modipuram. Results pooled over locations at 75 days in northern plains indicated that MS/5-1543 (30.76 t/ha) yielded 9, 14 and 19% higher total tuber yield than Kufri Bahar (28.34 t/ha), Kufri Badshah (26.93 t/ha) and Kufri Sadabahar (25.87 t/ha), respectively (**Table 4**). At 90 days, MS/5-1543 out yielded the control Kufri Bahar by margin of 19, 13

and 27% respectively at Hisar, Jalandhar and Modipuram. Results pooled over locations at 90 days indicated that MS/5-1543 (42.03 t/ha) yielded 16, 18 and 18% higher total tuber yield than Kufri Bahar (36.19 t/ha), Kufri Badshah (35.76 t/ha) and Kufri Sadabahar (35.70 t/ha), respectively (**Table 5**). MS/5-1543 showed ability to produce 92 and 93% marketable tubers at 75 and 90 days of harvest.

In On-farm trials, the hybrid MS/5-1543 produced high total tuber yield than Kufri Bahar at Hisar, Jalandhar, Modipuram and Pantnagar. At 75 days, it out yielded the control Kufri Bahar by margin of 68, 25, 17 and 38% respectively at Hisar, Jalandhar, Modipuram and Pantnagar. Results pooled over locations at 75 days in northern plains indicated that MS/5-1543 (30.89 t/ha) yielded 23, 3 and 19% higher tuber yield than Kufri Bahar (23.33 t/ha), Kufri Pukhraj (29.98 t/ha)

Table 4. Total tuber yield (t/ha) of MS/5-1543 (pooled over 2012-13 to 2013-2014) in replicated trials under AICRP-Northern plains at 75 days

| Locations | MS/5-1543 | Kufri Bahar | Kufri Badshah | Kufri Sadabahar | % yield gain over Kufri Bahar |
|----------------------------|-----------|----------------|---------------|---------------------------|-------------------------------|
| Hisar | 34.20 | 28.18 | 25.92 | 24.51 | 21.36 |
| Jalandhar | 30.57 | 27.34 | 27.19 | 29.17 | 11.81 |
| Modipuram | 34.99 | 30.66 | 26.60 | 23.15 | 14.12 |
| Pantnagar | 23.28 | 27.18 | 27.99 | 26.64 | -14.35 |
| Mean | 30.76 | 28.34 | 26.93 | 25.87 | 8.54 |
| % yield gain over controls | | 8.54 | 14.22 | 18.90 | |
| CD (0.05) | | Genotype: 2.64 | | Genotype × Location: 1.18 | |

Table 5. Total tuber yield (t/ha) of MS/5-1543 (pooled over 2012-13 to 2013-2014) in replicated trials under AICRP-Northern plains at 90 days

| Locations | MS/5-1543 | Kufri Bahar | Kufri Badshah | Kufri Sadabahar | % yield gain over Kufri Bahar |
|----------------------------|-----------|----------------|---------------|---------------------------|-------------------------------|
| Hisar | 46.57 | 39.08 | 42.59 | 37.12 | 19.17 |
| Jalandhar | 38.67 | 34.16 | 33.54 | 36.94 | 13.20 |
| Modipuram | 54.96 | 43.17 | 38.46 | 38.50 | 27.31 |
| Pantnagar | 27.91 | 28.35 | 28.46 | 30.24 | -1.55 |
| Mean | 42.03 | 36.19 | 35.76 | 35.70 | 16.14 |
| % yield gain over controls | | 16.14 | 17.53 | 17.73 | |
| CD (0.05) | | Genotype: 1.30 | | Genotype × Location: 2.91 | |

and Kufri Sadabahar/ Kufri Garima (26 t/ha), respectively (Table 6). At 90 days, the hybrid out yielded the control Kufri Bahar by margin of 12, 12, 23 and 36% respectively at Hisar, Jalandhar, Modipuram and Pantnagar. Results pooled over locations at 90 days in northern plains indicated that MS/5-1543 (38.42 t/ha) yielded 19, 3 and 22% higher total tuber yield than Kufri Bahar (32.25 t/ha), Kufri Pukhraj

(37.36 t/ha) and Kufri Sadabahar (31.55 t/ha), respectively (Table 6). The hybrid recorded high proportion of 91 and 94% marketable tuber yield at 75 and 90 days of harvest, respectively.

Eastern plains: In replicated yield trials, the hybrid out yielded Kufri Jyoti at Dholi, Faizabad, Kalyani, Kanpur, Pashighat and Patna at both dates of harvest (Table 7 and 8).

Table 6. Total tuber yield (t/ha) of MS/5-1543 in on-farm trials (2014-2015) under AICRP-Northern plains

| Crop duration | Locations | MS/5-1543 | Kufri Bahar | Kufri Pukhraj | Other controls* | % yield gain over Kufri Bahar |
|---------------|----------------------------|-----------|-------------|---------------|-----------------|-------------------------------|
| 75 days | Hisar | 26.97 | 16.03 | 20.33 | 23.22 | 68.25 |
| | Jalandhar | 38.70 | 30.88 | 38.10 | - | 25.32 |
| | Modipuram | 33.48 | 28.68 | 28.73 | 29.50 | 16.74 |
| | Pantnagar | 24.39 | 17.73 | 32.75 | 25.28 | 37.56 |
| | Mean | 30.89 | 23.33 | 29.98 | 26.00 | |
| | % yield gain over controls | | | 32.40 | 3.04 | 18.81 |
| 90 days | Hisar | 31.33 | 28.03 | 25.13 | 28.31 | 11.77 |
| | Jalandhar | 45.90 | 40.98 | 44.90 | - | 12.01 |
| | Modipuram | 49.01 | 39.76 | 43.89 | 40.76 | 23.26 |
| | Pantnagar | 27.45 | 20.24 | 35.52 | 25.57 | 35.62 |
| | Mean | 38.42 | 32.25 | 37.36 | 31.55 | |
| | % yield gain over controls | | | 19.13 | 2.84 | 21.77 |

*Other controls: Hisar, Pantnagar: Kufri Sadabahar, Modipuram: Kufri Garima

Table 7. Total tuber yield (t/ha) of MS/5-1543 (pooled over 2012-13 to 2013-2014) in replicated trials under AICRP-Eastern plains at 75 days

| Locations | MS/5-1543 | Kufri Jyoti | Kufri Pushkar | % yield gain over Kufri Jyoti |
|----------------------------|-----------|----------------|---------------|-------------------------------|
| Bhubaneshwar | 18.95 | 18.31 | 16.66 | 2.95 |
| Dholi | 31.90 | 19.46 | 25.07 | 63.93 |
| Faizabad | 19.74 | 15.67 | 17.96 | 25.97 |
| Jorhat | 13.64 | 12.64 | 14.69 | 7.91 |
| Kalyani | 35.52 | 28.52 | 30.74 | 24.54 |
| Kanpur | 26.60 | 26.54 | 30.70 | 0.23 * |
| Pasighat | 37.69 | 31.55 | 33.68 | 19.46 |
| Patna | 28.31 | 27.14 | 28.26 | 4.31 |
| Mean | 26.53 | 22.48 | 24.72 | 18.02 |
| % yield gain over controls | | 18.02 | 7.32 | |
| CD (0.05) | | Genotype: 1.71 | | Genotype × Location: 2.96 |

Table 8. Total tuber yield (t/ha) of MS/5-1543 (pooled over 2012-13 to 2013-2014) in replicated trials under AICRP-Eastern plains at 90 days

| Locations | MS/5-1543 | Kufri Jyoti | Kufri Pushkar | % yield gain over Kufri Jyoti |
|----------------------------|-----------|----------------|---------------|-------------------------------|
| Bhubaneshwar | 18.71 | 19.76 | 17.40 | -5.31 |
| Dholi | 41.41 | 30.22 | 31.27 | 37.03 |
| Faizabad | 28.82 | 23.76 | 25.83 | 21.30 |
| Jorhat | 15.41 | 17.30 | 17.09 | -10.92 |
| Kalyani | 39.66 | 33.43 | 33.88 | 18.64 |
| Kanpur | 33.53 | 31.35 | 36.24 | 6.95* |
| Pasighat | 39.44 | 31.35 | 34.39 | 83.19 |
| Patna | 39.78 | 31.60 | 36.02 | 25.89 |
| Mean | 32.10 | 27.35 | 29.02 | 17.37 |
| % yield gain over controls | | 17.37 | 10.61 | |
| CD (0.05) | | Genotype: 1.62 | | Genotype × Location: 2.80 |

*Kanpur: Kufri Bahar in place of Kufri Jyoti

At 75 days, it out yielded the control Kufri Jyoti by margin of 3, 64, 26, 8, 25, 19 and 4% respectively at Bhubneshwar, Dholi, Faizabad, Jorhat, Kalyani Pashighat and Patna. Mean performance over locations at 75 days indicated that MS/5-1543 (26.53 t/ha) yielded 18 and 7% higher total tuber yield than Kufri Jyoti (22.48 t/ha) and Kufri Pushkar (24.72 t/ha), respectively (**Table 7**). At 90 day, MS/5-1543 out yielded the control Kufri Jyoti by margin of 37, 21, 19, 7, 83 and 26% respectively at Dholi, Faizbad, Kalyani, Kanpur, Pashighat and Patna. The hybrid (32.10 t/ha) yielded 17 and 11% higher total tuber yield than Kufri Jyoti (27.35 t/ha) and Kufri Pushkar (29.02 t/ha), respectively (**Table 8**). MS/5-1543 showed ability to produce 90 and 91% marketable tubers at 75 and 90 days of harvest.

In On-farm trials, MS/5-1543 out yielded Kufri Jyoti at Bhubaneshwar, Dholi, Kalyani and Patna at 75 days by margin of 43, 17, 39 and 26%, respectively. Based on mean performance over locations at 75 days, MS/5-1543 (24.88 t/ha) yielded 11, 5 and 7% higher total tuber yield than Kufri Jyoti (22.34 t/ha), Kufri Pukhraj (23.69 t/ha) and other controls (23.29 t/ha), respectively (**Table 9**). At 90 days, hybrid out yielded Kufri Jyoti at Bhubaneshwar, Dholi, Faizabad, Kalyani, Kanpur and Patna by margin of 47, 11, 21, 24, 13 and 14% respectively. Based on mean performance over locations MS/5-1543 (29.75 t/ha) yielded 12, 5 and 16% higher total tuber yield than Kufri Jyoti (26.66 t/ha), Kufri Pukhraj (28.37 t/ha) and other controls (25.75 t/ha), respectively (**Table 9**). The hybrid recorded high proportion of 86%

Table 9. Total tuber yield (t/ha) of MS/5-1543 (2014-2015) in on-farm trials under AICRP-Eastern plains

| Crop duration | Locations | MS/5-1543 | Kufri Jyoti | Kufri Pukhraj | Other control | % yield gain over local Kufri Jyoti |
|---------------|----------------------------|-----------|-------------|---------------|---------------|-------------------------------------|
| 75 days | Bhubaneshwar | 29.92 | 20.91 | 22.42 | 24.31 | 43.09 |
| | Dholi | 16.87 | 14.37 | 16.87 | - | 17.40 |
| | Faizabad | 26.33 | 26.51 | 25.73 | 26.00 | -0.68 |
| | Jorhat | 14.78 | - | 15.93 | 14.90 | - |
| | Kalyani | 31.30 | 22.46 | 30.50 | 27.70 | 39.36 |
| | Kanpur | 26.74 | 27.39 | 29.18 | 25.50 | -1.55 |
| | Patna | 28.22 | 22.39 | 25.22 | 21.31 | 26.04 |
| | Mean | 24.88 | 22.34 | 23.69 | 23.29 | 11.37 |
| | % yield gain over controls | | 11.37 | 5.02 | 6.83 | |
| 90 days | Bhubaneshwar | 32.66 | 22.22 | 25.65 | 26.24 | 46.98 |
| | Dholi | 18.75 | 16.87 | 17.50 | - | 11.14 |
| | Faizabad | 36.83 | 30.51 | 29.83 | 27.67 | 20.71 |
| | Jorhat | 16.10 | - | 16.82 | 16.57 | - |
| | Kalyani | 38.54 | 30.97 | 36.04 | 31.25 | 24.44 |
| | Kanpur | 33.31 | 31.27 | 41.51 | 28.29 | 12.61 |
| | Patna | 32.05 | 28.10 | 31.26 | 24.50 | 14.06 |
| | Mean | 29.75 | 26.66 | 28.37 | 25.75 | 11.59 |
| | % yield gain over controls | | 11.59 | 4.86 | 15.53 | |

Kanpur: Kufri Bahar: 75 days (27.16 t/ha) and 90 days (29.58 t/ha)

Other controls: Bhubneshwar, Kanpur: Kufri Garima, Faizabad, Jorhat, Kalyani, Patna: Kufri Ashoka

Local controls: Bhubaneshwar, Dholi, Faizabad, Kalyani, Patna: Kufri Jyoti, Jorhat: Kufri Pukhraj

marketable tuber yield at 75 and 90 days of harvest.

Overall performance in northern and eastern plains under AICRP centers: Based on pooled analysis of on-farm trials in seven locations (Northern plains: Hisar, Modipuram, Eastern plains: Bhubaneshwar, Dholi, Faizabad, Kalyani, Patna), MS/5-1543 (17.83, 27.58 and 34.17 t/ha) yielded higher than Kufri Pukhraj (14.92, 24.26 and 29.90 t/ha) at 60, 75 and 90 days, respectively (Table 10). The hybrid registered advantage of 22, 14 and 14% for total tuber yield and 25, 16 and 18 % for marketable tuber yield over Kuri Pukhraj at 60, 75 and 90 days, respectively. Based on pooled mean of locations and replicated/on-farm trials in north Indian plains, MS/5-1543 (30.83 t/ha and 40.23 t/ha) revealed 19 and 18% higher total tuber yield than Kufri Bahar (25.84 t/ha and 34.22 t/ha) at 75 and 90 days, respectively (Table 11). Likewise in eastern plains, MS/5-1543 (25.71 t/ha and

30.93 t/ha) produced 15% higher total tuber yield than Kufri Jyoti (22.41 t/ha and 27.01 t/ha) at 75 and 90 days (Table 11).

Disease resistance

Advanced hybrid MS/5-1543 (AUDOC 186) showed comparable field resistance to late blight than Kufri Bahar (AUPDC 1061) under field screening in short day sub-tropical conditions of Modipuram (Table 12) and also exhibited moderate resistance through detached leaf method (Lal *et al.*, 2013). Thus, variety Kufri Mohan can be apt replacement for table potato variety Kufri Bahar which is highly susceptible to late blight under similar conditions. Also, the tubers of this variety seldom exhibit external or internal defects and are not susceptible to skin damage at harvest.

Dry matter and keeping quality

Advanced hybrid MS/5-1543 recorded mean tuber dry matter of 15% in northern

Table 10. Performance of MS/5-1543 (pooled over locations) in on-farm trials

| Genotypes | Tuber yield (t/ha) at 60 days | | Tuber yield (t/ha) at 75 days | | Tuber yield (t/ha) at 90 days | | Dry matter (%) at 90 days |
|---------------|-------------------------------|------------|-------------------------------|------------|-------------------------------|------------|---------------------------|
| | Total | Marketable | Total | Marketable | Total | Marketable | |
| MS/5-1543 | 17.83 | 14.89 | 27.58 | 23.59 | 34.17 | 30.42 | 17.14 |
| Kufri Pukhraj | 14.56 | 11.92 | 24.26 | 20.36 | 29.90 | 25.86 | 17.68 |
| % yield gain | 22.46 | 24.92 | 13.69 | 15.86 | 14.28 | 17.63 | - |
| CD (0.05) | 2.33 | 2.31 | 2.36 | 2.72 | 2.50 | 2.36 | 1.28 |

Northern plains: Hisar, Modipuram, Eastern plains: Bhubaneshwar, Dholi, Faizabad, Kalyani, Patna

Table 11. Overall performance of MS/5-1543 in northern and eastern plains

| Trials/Zone | 75 days | | | 90 days | | |
|-----------------|-----------|-------------|-------------------------------|-----------|-------------|-------------------------------|
| | MS/5-1543 | Kufri Bahar | % yield gain over Kufri Bahar | MS/5-1543 | Kufri Bahar | % yield gain over Kufri Bahar |
| Northern plains | | | | | | |
| Replicated | 30.76 | 28.34 | 8.54 | 42.03 | 36.19 | 16.14 |
| On-farm | 30.89 | 23.33 | 32.4 | 38.42 | 32.25 | 19.13 |
| Mean | 30.83 | 25.84 | 19.31 | 40.23 | 34.22 | 17.56 |
| Eastern plains | | | | | | |
| Replicated | 26.53 | 22.48 | 18.02 | 32.10 | 27.35 | 17.37 |
| On-farm | 24.88 | 22.34 | 11.37 | 29.75 | 26.66 | 11.59 |
| Mean | 25.71 | 22.41 | 14.72 | 30.93 | 27.01 | 14.52 |

Table 12. Late blight reactions at Modipuram (mean of 3 years) and Kufri (1 year)

| Genotypes | AUDPC | Lesion area (cm ²) | Genotypes | AUDPC |
|---------------|---------|--------------------------------|-------------|--------|
| Modipuram | | | Kufri* | |
| MS/5-1543 | 186.17 | 5.04 | MS/5-1543 | 342.50 |
| Kufri Bahar | 1061.00 | 6.36 | Kufri Jyoti | 487.66 |
| Kufri Pukhraj | 305.75 | 3.94 | CD (0.05) | 110.22 |
| Kufri Jyoti* | 194.00 | 7.78 | *one year | |

plains and 18% in eastern plains (Table 13, 14). It is a good keeper under country store conditions and possesses medium tuber dormancy period i.e. >6 weeks (Table 15). Kufri Mohan showed comparatively less total weight loss than control varieties and therefore it was adjudged to be the good keeper. This will benefit small/marginal farmers who are unable to store potato in cold store and have to sell their produce in the market after on-farm short term storage of the produce. The tubers of MS/5-1543 are easy to cook (15-20 minutes) and have minimum peeling losses due to ovoid shape and shallow eyes. Cooked/boiled potato has acceptable aroma and mealy texture.

Agronomic management

The optimum tuber yield of Kufri Mohan can be obtained by adopting standard agronomical schedule for medium maturing varieties.

Planting time: 15 October - 5 November in north-central plains.

Seed rate: 35-40 q/ha. **Seed size:** 40-60 g.

Table 13. Tuber dry matter (%) of MS/5-1543 (pooled over 2012-13 and 2013-14) in AICRP trials (90 days) in Northern plains

| Locations | MS/5-1543 | Kufri Badshah | Kufri Bahar | Kufri Sadabahar |
|-----------|----------------|---------------|---------------------------|-----------------|
| Hisar | 14.55 | 14.76 | 15.62 | 17.22 |
| Jalandhar | 14.51 | 16.71 | 16.92 | 15.53 |
| Modipuram | 14.66 | 16.78 | 15.63 | 16.32 |
| Mean | 14.57 | 16.08 | 16.06 | 16.36 |
| CD (0.05) | Genotype: 0.43 | | Genotype x Location: 0.97 | |

Table 14. Tuber dry matter (%) of MS/5-1543 (pooled over 2012-13 and 2013-14) in AICRP trials (90 days) in Eastern plains

| Locations | MS/5-1543 | Kufri Jyoti | Kufri Pushkar |
|-------------|--------------|-------------|---------------------------|
| Bhubaneswar | 17.39 | 17.64 | 18.39 |
| Dholi | 20.50 | 19.31 | 19.16 |
| Faizabad | 17.93 | 17.96 | 18.17 |
| Jorhat | 18.25 | 16.5 | 17.42 |
| Kalyani | 18.82 | 20.86 | 16.30 |
| Kanpur | 14.91 | 15.90 | 17.11 |
| Pashigath | 20.15 | 18.59 | 20.09 |
| Patna | 14.61 | 15.60 | 16.72 |
| Mean | 17.82 | 17.80 | 17.92 |
| CD (0.05) | Genotype: NS | | Genotype x Location: 1.35 |

Spacing: Plants spaced at 20 cm in 60 cm rows provide optimum tuber size distribution for production of desirable tuber size for seed or table potatoes.

Fertilizer: At Modipuram, the optimum nitrogen, phosphorous and potassium doses are 219, 40 and 81 kg/ha, respectively with 50% N at the time of planting and 50% at earthing up. The full doses of phosphorus

Table 15. Storage behaviour at room temperature (mean of 2009, 2010 & 2011) at Modipuram

| Genotypes | Dormancy period (week) | Sprouting % | | % loss due to sprouting (75 days) | % loss due to rotting | Ph. weight loss % | Total weight loss % |
|-----------------|------------------------|-------------|---------|-----------------------------------|-----------------------|-------------------|---------------------|
| | | 6 weeks | 75 days | | | | |
| MS/5-1543 | >6 week | 26.02 | 67.48 | 0.24 | 0.69 | 9.79 | 10.71 |
| Kufri Bahar | >6 week | 45.39 | 73.53 | 0.67 | 0.44 | 10.16 | 11.27 |
| Kufri Pukhraj | >6 week | 43.20 | 71.11 | 0.40 | 0.29 | 10.30 | 10.99 |
| Kufri Sadabahar | >6 week | 27.30 | 66.73 | 0.14 | 0.46 | 10.85 | 11.45 |

and potassium should be applied at the time of planting. Nutrient management in other agro-ecologies may differ and thus needs to be fine-tuned for obtaining optimum productivity of this variety.

Irrigations: Locally recommended irrigation schedule may be followed.

Plant Protection Measures: Thimet @10 kg/ha at earthing up and foliar spray of Oxydemeton methyl @ 1.5ml/ litre or Imidacloprid @ 0.3ml/ litre after 70-75 days of planting (seed crop only).

Usage

The new potato variety Kufri Mohan is suitable for preparation of dishes expected from table potato variety. Kufri Mohan is likely to be preferred by consumers for its white cream ovoid tubers with white flesh and shallow eyes resulting in lower peeling losses. It is easy to cook (15-20 minutes) and cooked/boiled potatoes are free from discolouration. It possesses pleasant flavour, mealy texture. The attractive tubers and good culinary quality of Kufri Mohan will favour its acceptance in coming time.

CONCLUSIONS

Kufri Mohan has performed well in multi-location trials conducted under AICRP on potato in Indo-Gangetic plains (northern

and eastern plains) and therefore can be grown successfully for increasing the potato productivity in these areas. Kufri Mohan can meet the long felt demand of farmers for a variety with white cream skin ovoid tubers, shallow eyes, white flesh, good keeping and culinary quality, and field resistance to late blight along with high marketable and total tuber yield.

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