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## Evaluation of potato (*Solanum tuberosum* L.) varieties/hybrids for their post-harvest physiological weight losses under ambient conditions

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### Abstract

The experiment was conducted with thirty six varieties/hybrids replicated thrice in Completely Randomized Design (CRD) during the summer of 2007 at the Laboratory of Department of Vegetable Science, Narendra Deva University of Agriculture and Technology, Narendra Nagar (Kumarganj), Ayodhya (U.P.). The small gunny bags of 5kg capacity were kept for 120 days at ambient storage condition. The physiological losses in weight was increases continuously in all the treatments from 30 to 120 days of storage period under ambient conditions. The minimum physiological loss in weight was recorded in varieties/hybrids J/95-229, Kufri Sutlej, J/95-221 and B-420(2) after 120 days of storage under ambient conditions.

**Keywords:** Variety/hybrids, Weight loss, Potato, post-harvest, ambient condition

### Introduction

The potato (*Solanum tuberosum* L.) is one of the most efficient horticultural food crop. It belongs to family solanaceae, which constitutes around 85 genera with 2200 species and Solanum is the largest genus with 1700 species. Among major potato growing countries, India ranks third after China and Russian Federation. The present area under potato in India is about 2.117 million hectares with production and productivity of 43.417 million tones and 20.50 t/ha (Anonymous, 2016) [1] respectively.

The potato is an easily grown plant that produces more food on less land. One hectare of potatoes can yield food value of 2-4 hectares of grain. The dry matter production in potato is 47.6 kg/ha/day, whereas in wheat and rice it is 18.1 and 12.4 kg/ha/day, respectively. Storage studies in potatoes stored at higher temperatures have been conducted by different workers but information are insufficient. In the present status of information on identification of varieties/hybrids with good shelf-life for a few months are desired.

### Method and Materials

The present investigation was carried out at the laboratory of Department of Vegetable Science, Narendra Deva University of Agriculture & Technology, Narendra Nagar (Kumarganj) Ayodhya (U.P.) during March to June, 2007. The experimental material comprised of thirty six varieties/hybrids of potato and were evaluated in Completely Randomized Design with three replications.

The recorded data in Completely Randomized Design (CRD) were analyzed statistically by the method suggested by Cochran and Cox (1963) [3].

### Result and Discussion

Studies on changes during ambient storage of different varieties/hybrids of potato revealed that physiological loss in weight increases continuously in all the varieties/hybrids from 30<sup>th</sup> to 120<sup>th</sup> days of storage period. During ambient storage, stored potatoes losses weight mainly due to two physiological processes *i.e.*, transpiration and respiration. The result of physiological losses of all the varieties/hybrids from 30<sup>th</sup> to 120<sup>th</sup> days of storage period has been presented in Table- 1.

**Table 1:** Physiological weight loss (%) in different varieties/hybrids of potato under ambient storage

Variety/Hybrid	Storage period (days)			
	30	60	90	120
Kufri Pukhraj	1.40 (1.38)	2.38 (1.68)	6.32 (2.61)	8.72 (3.03)
Kufri Pushkar	1.86 (1.53)	2.19 (1.64)	6.77 (2.69)	9.43 (3.15)
Kufri Ashoka	1.88 (1.54)	2.27 (1.65)	7.91 (2.90)	10.29 (3.28)
Kufri Anand	1.67 (1.47)	1.93 (1.56)	6.06 (2.56)	8.29 (2.96)
Kufri Sutlej	1.52 (1.48)	2.88 (1.84)	3.68 (2.04)	5.68 (2.49)
Kufri Chipsona-2	2.00 (1.58)	2.50 (1.72)	5.10 (2.37)	7.31 (2.79)
Kufri Chipsona-3	2.17 (1.63)	2.46 (1.72)	4.90 (2.32)	6.87 (2.71)
Kufri Surya	2.34 (1.68)	2.70 (1.79)	5.10 (2.37)	7.51 (2.83)
Atlantic	1.89 (1.54)	2.05 (1.59)	5.40 (2.43)	6.27 (2.60)
Kufri Lalima	1.59 (1.44)	2.94 (1.85)	6.60 (2.63)	8.27 (2.96)
J/95 - 144	1.97 (1.57)	2.66 (1.78)	6.12 (2.56)	7.45 (2.82)
J/95 - 221	1.78 (1.51)	2.14 (1.62)	4.78 (2.30)	5.80 (2.51)
J/95 - 227	2.20 (1.64)	2.62 (1.75)	6.42 (2.60)	7.36 (2.80)
J/95 - 229	1.60 (1.45)	2.15 (1.62)	3.37 (1.97)	4.86 (2.31)
J/95 - 242	1.85 (1.52)	2.20 (1.64)	5.25 (2.40)	7.60 (2.85)
J/95 - 378	2.01 (1.58)	2.92 (1.84)	6.03 (2.54)	9.67 (3.19)
J/96 - 84	2.30 (1.67)	2.62 (1.77)	5.12 (2.37)	6.92 (2.72)
J/96 - 149	2.26 (1.66)	2.43 (1.71)	6.27 (2.60)	7.79 (2.88)
J/96-171	2.07 (1.60)	2.22 (1.63)	5.66 (2.48)	8.07 (2.93)
J/96-238	1.99 (1.57)	2.13 (1.61)	6.65 (2.64)	8.53 (3.00)
DSP-7	2.30 (1.67)	2.54 (1.74)	7.97 (2.90)	11.52 (3.47)
DSP-19	2.74 (1.81)	3.09 (1.89)	8.57 (3.01)	13.16 (3.70)
MS/92-1090	1.69 (1.48)	2.56 (1.75)	6.17 (2.56)	10.38 (3.30)
MS/94-899	2.22 (1.64)	2.70 (1.77)	6.39 (2.60)	11.35 (3.44)
MS/95-1309	2.43 (1.70)	3.10 (1.90)	6.87 (2.71)	12.24 (3.57)
MS/99-1871	2.97 (1.87)	5.37 (2.42)	9.53 (3.16)	14.51 (3.87)
B-420 (2)	1.40 (1.38)	2.10 (1.60)	4.32 (2.18)	6.11 (2.57)
PS/96-14	2.02 (1.58)	2.15 (1.63)	6.34 (2.59)	9.96 (3.23)
MP/99-637	2.58 (1.76)	3.10 (1.90)	7.82 (2.88)	8.34 (2.97)
MP/97-644	2.48 (1.72)	2.80 (1.81)	8.30 (2.96)	12.64 (3.62)
MP/97-699	1.98 (1.57)	2.12 (1.62)	6.56 (2.63)	9.53 (3.17)
MP/97-921	2.37 (1.68)	3.23 (1.93)	7.28 (2.77)	10.75 (3.35)
MP/98-172	1.72 (1.48)	2.86 (1.83)	8.11 (2.93)	11.56 (3.47)
MP/99-322	1.72 (1.48)	2.20 (1.64)	6.75 (2.63)	8.70 (3.03)
MP/99-406	2.58 (1.75)	4.32 (2.19)	6.88 (2.71)	10.27 (3.28)
JX-576	1.93 (1.56)	2.52 (1.72)	6.40 (2.62)	10.80 (3.36)
SEm ±	(0.084)	(0.099)	(0.157)	(0.182)
CD at 5%	(0.24)	(0.28)	(0.44)	(0.52)
CV%	(9.15)	(9.79)	(10.50)	(8.28)

Figures in parenthesis are angular transformed values

The minimum physiological loss in weight was recorded in varieties/hybrids J/95-229, Kufri Sutlej, J/95-221 and B-420 (2) after 120 days of storage under ambient conditions. An increase in weight loss with storage period has also been reported by Patel *et al.* (2008) [6], Arora and Malik (2008) [2], Kumar *et al.* (2001) [4] and Kang *et al.* (2001) [5].

Thus, it could be concluded that there exist ample variation in physiological loss among all varieties/hybrids under study which reflects the more scope of storage techniques of potato for long period storage with minimum loss of weight and quality.

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