



## Black Scurf (*Rhizoctonia solani* Kuhn) Disease Incidence in Red and White Skinned Potato Varieties

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### Abstract

Present study was carried out at the Department of Plant Pathology, Narain College, Shikohabad, Uttar Pradesh during 2016-17. Red and white skinned potato varieties have been screened for black scurf disease incidence. Significant differences for black scurf disease incidence in red and white skinned potato varieties was observed. Red skinned varieties had less occurrence of disease (17.47%) compared to white skinned varieties (24.36%). The maximum disease index was noted in Kufri Bahar (25.11%). However, it was minimum in Kufri Sindhuri (16.38%). Red skinned varieties had significantly higher (42.31%) tubers with less than 5 per cent infected area compared to white skinned varieties (28.65%). Results of the present study indicated that red skinned potato varieties are less susceptible to black scurf disease than white skinned varieties. Furthermore, tubers having more infected surface area by black scurf disease was higher in white skinned potato varieties than red skinned ones. Findings of the present study is highly useful for selection of potato varieties for commercial cultivation.

Keywords: - Black scurf, *Rhizoctonia solani*, potato, *Solanum tuberosum*.

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### Introduction

The potato (*Solanum tuberosum* L.) is an important vegetable crop and striving to be recognized as one of the important food crops of the world. Potato crop is susceptible to many pathogens, some of which are wide spread and others are localized. *Rhizoctonia solani* Kuhn is one of the destructive plant pathogens, attacking wide variety of hosts under diverse environmental conditions (Scott, 1976). Black scurf is one of the most wide spread disease and found in all potato growing areas of the world. The typical symptoms are characterized by appearance of black coloured sclerotia on the tuber surface and brownish necrotic lesions on stem and stolon which can kill the eyes, delay in emergence, increases tubers defects (cracks, misshapen, netted skin with reduced quality and market value). It has been observed that varietal response of potato is variable for black scurf disease. It is also reported that skin colour of potato may have influence on development of black scurf disease caused by *Rhizoctonia solani* Kuhn. Though, Black scurf is purely cosmetic and does not reduce yield but reduces the marketability. Keeping in view the differential response of potato varieties to black scurf disease, a comparative study was undertaken to understand the susceptibility of red and white skinned potato varieties for this disease.

### Materials and Methods

The present study was carried out at the Department of Plant Pathology, Narain College, Shikohabad, Uttar Pradesh during 2016-17. Two potato varieties, namely, Kufri Lalima and Kufri Sindhuri having red skin and Kufri Badshah and Kufri Bahar having white skin have been used in the present study.

Tubers of potato varieties have been procured from farmer field and brought to the laboratory for further experimentation. In each variety total 120 tubers have been examined for incidence of black scurf disease. The potato tubers were washed thoroughly under running tap water to remove soil particles adhering to surface and then tubers were air dried. These tubers were then examined for presence of black sclerotial bodies on skin. The disease index was calculated based on tubers showing black scurf disease as suggested by Pandey and Pundhir (2008). The infected tubers were further visually observed for per cent skin area affected by the disease and grouped in to four categories, *i.e.*, less than 5.0%, 5.0-10.0%, 11.0-15.0% and >15.0%. The experiment was laid out in randomized block design (RBD) with three replications and 40 tubers per replication. The data have been subjected to analysis of variance (ANOVA) using OP Stat (Gomez and Gomez, 1984).

### Results and Discussions

The data presented in table 1 clearly indicated significant differences for black scurf disease incidence in red and white skinned potato varieties. Red skinned varieties had less occurrence of disease (17.47%) compared to white skinned varieties (24.36%). However, non-significant differences have been observed between varieties of same skin colour. It has also been observed that overall disease index was 20.92%, regardless of varieties and colour of skin. The maximum disease index was noted in Kufri Bahar (25.11%). However, it was minimum in Kufri Sindhuri (16.38%) (Table 1). Data pertaining to skin area infected by sclerotial growth clearly indicated that maximum percentage of tubers had less than 5 per cent infected area, regardless of potato varieties.

However, minimum percentage of tubers had infected skin area more than 16 percent. It was also observed that red skin varieties had significantly higher 42.31 per cent tubers with less than 5 per cent infected area compared to white skinned varieties (28.65%). Data also revealed that white skinned potato varieties had 2.5-fold tubers having more than 15% of infected skin surface compared to red skinned varieties.

Results of the present study indicated that red skinned potato varieties are less susceptible to black scurf disease than white skinned varieties (Table 1). Furthermore, per cent tubers having more infected surface area by black scurf disease was also higher in white skinned potato varieties than red skinned ones. Findings of the present study is highly useful for selection of potato varieties for commercial cultivation.

Table-1. Black scurf disease in red and white skinned potato varieties.

Variety	Disease index	Tubers (%)			
		Less than 5.0	5.0-10.0	11.0-15.0	More than 15.0
Infected skin area (%)					
<i>Red skinned</i>					
Kufri Lalima	18.57	40.16	26.33	23.65	9.86
Kufri Sindhuri	16.38	44.46	20.98	28.43	6.13
Mean	17.47	42.31	23.65	26.04	7.99
<i>White skinned</i>					
Kufri Badshah	23.62	30.45	23.64	26.22	19.69
Kufri Bahar	25.11	26.84	30.12	22.28	20.76
Mean	24.36	28.65	26.88	24.25	20.23
Overall Mean	20.92	35.48	25.26	25.64	14.11
C.D. @ 5%					
Colour (C)	2.41	1.56	NS	NS	1.33
Variety (V)	2.16	2.73	1.56	NS	2.18
C x V	3.23	3.56	2.38	2.61	3.37

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