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Determination of the Seedling Reactions of Some Turkish Barley Cultivars to the Net Blotch

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Abstract: Seedling reactions of 15 Turkish barley cultivars to 4 net blotch isolates were determined with assays under controlled conditions. Isolates were collected from Ankara province. There were clear differences among the reactions of the cultivars to the isolates of the fungus ranging from very susceptible to resistant. The reactions of the cultivars Bülbül 89, Karatay 94, Tokak 157/37, Yesevi 93, Orza 96, Kalaycı 97 and Hamidiye 85 ranged between susceptible and moderately susceptible-susceptible. The response of the cultivars Avcı 2002 and Vamıkhoca 98 was between resistant and moderately resistant. The response of the cultivars Çetin 2000 and Şahin 91 ranged between resistant-moderately resistant to moderately resistant. The response of the cultivars Akhisar 98, Tarm 92, Çumra 2001 and Aydanhanım was between moderately resistant and moderately resistant-moderately susceptible. There were small differences among the cultivars in response to isolates. Gölbaşı isolate was the most virulent.

Key words: Net blotch, *Drechslera teres*, *Pyrenophora teres*, disease resistance, Turkey

INTRODUCTION

Net blotch caused by the fungus *Drechslera teres* (Sacc.) Shoem. (teleomorph: *Pyrenophora teres* (Died.) Drechs.) is an important disease of barley worldwide^[1,2]. Losses due to this disease range between 10-40%. However, under suitable conditions losses can reach to 100%^[3]. Aktaş^[1] found that the disease was common in the Central Anatolia region of Turkey. He added that spot form was predominant. Using resistant cultivars is the easiest and the most economical way of controlling the disease. Studies are needed regarding the reactions of important barley cultivars grown in Turkey to the pathogen. Also, pathogenic variability of this fungus should be studied in detail. Therefore, we have studied, under controlled conditions, seedling reactions of 15 Turkish barley cultivars to 4 *Drechslera teres* isolates.

MATERIALS AND METHODS

Fifteen Turkish barley cultivars were obtained from Central Research Institute for Field Crops, Ankara, Turkey and The Variety Registration and Seed Certification Institute, Ankara, Turkey. Cultivars Bülbül 89, Karatay 94, Tokak 157/37, Yesevi 93, Orza 96, Kalaycı 97, Hamidiye 85, Şahin 91, Tarm 92, Çumra 2001 and Aydanhanım are 2-rowed cultivars and Avcı 2002, Vamıkhoca 98, Çetin 2000 and Akhisar 98 are 6-rowed cultivars.

In April of 2003, diseased leaves were collected from different localities of the Ankara Province (Kalecik,

Gölbaşı, Bala districts and Field Crops Department experimental area in Dışkapı Campus). Diseased leaves (spot form) were surface sterilized one minute with 1% NaOCl and then transferred to petri plates containing moistened filter paper. After sporulation, single conidia were taken and placed into Potato Dextrose Agar. Ten seeds of each cultivar were sown into 7 cm in diameter plastic pots containing sterile soil. Plants were maintained in a controlled growth room at 18-22°C night/day and 14/10 h light and dark regimes. Plants were inoculated at growth stage 12-13^[4] with an inoculum concentration of $15-20 \times 10^4$ mycelium parts mL⁻¹^[5]. One drop of Tween 20 was added to per 100 mL of inoculum^[6]. After inoculation, plants were kept in moistened plastic bags for 76 h. Seven days after inoculation, disease evaluations were made using a 1-9 scale developed for spot form of the disease by Tekauz^[7]. Experiments were repeated three times.

RESULTS AND DISCUSSION

Two days after inoculation, disease symptoms started to appear in susceptible cultivars. Disease symptoms started to appear three and four days after inoculation in all other cultivars.

The response of 15 barley cultivars to the 4 isolates of *Pyrenophora teres* ranged from resistant to susceptible (Table 1). The response of the cultivars Bülbül 89, Karatay 94, Tokak 157/37, Yesevi 93, Orza 96, Kalaycı 97 and Hamidiye 85 ranged between Susceptible and Moderately Susceptible-Susceptible. The response of the cultivars

Table 1: Seedling response of 15 Turkish barley cultivars to 4 *Drechslera teres* isolates (spot form) under controlled conditions developed by Tekauz^[7] was used

Barley cultivars	Kalecik isolate	Gölbaşı isolate	Bala isolate	Department isolate	Mean
Bülbül 89	8.33 (MS-S)	9.00 (S)	8.33 (MS-S)	8.67 (S)	8.583
Karatay 94	7.33 (MS)	9.00 (S)	8.00 (MS-S)	8.67 (S)	8.250
Tokak 157/37	8.67 (S)	8.67 (S)	8.00 (MS-S)	8.33 (MS-S)	8.418
Yesevi 93	8.00 (MS-S)	8.00 (MS-S)	8.00 (MS-S)	7.67 (MS-S)	7.918
Orza 96	7.67 (MS-S)	8.67 (S)	7.67 (MS-S)	8.67 (S)	8.170
Kalaycı 97	8.33 (MS-S)	8.6 (S)	7.67 (MS-S)	8.33 (MS-S)	8.250
Hamidiye 85	8.00 (MS-S)	9.00 (S)	8.00 (MS-S)	8.00 (MS-S)	8.250
Avcı 2002	1.67 (R-MR)	1.67 (R-MR)	1.33 (R)	2.00 (R-MR)	1.668
Vamıkhoca 98	1.33 (R)	1.33 (R)	1.67 (R-MR)	2.00 (R-MR)	1.583
Çetin 2000	2.33 (R-MR)	2.67 (MR)	2.00 (R-MR)	3.00 (MR)	2.500
Şahin 91	2.33 (R-MR)	3.60 (MR)	2.67 (MR)	2.67 (MR)	2.818
Akhisar 98	4.33 (MR-MS)	5.00 (MR-MS)	3.33 (MR)	2.67 (MR)	3.833
Tarm 92	4.33 (MR-MS)	4.33 (MR-MS)	3.00 (MR)	5.00 (MR-MS)	4.165
Çumra 2001	3.67 (MR)	4.33 (MR-MS)	4.33 (MR-MS)	4.33 (MR-MS)	4.165
Aydanhanım	4.33 (MR-MS)	3.67 (MR)	3.67 (MR)	5.00 (MR-MS)	4.168
General mean	5.377	5.841	5.178	5.667	5.516

For evaluation, a 1-9 scale (R-Resistant; MR-Moderately Resistant; MS-Moderately Susceptible; S-Susceptible). Numbers are mean of three replications

Avcı 2002 and Vamıkhoca 98 was between Resistant and Moderately Resistant. The response of the cultivars Çetin 2000 and Şahin 91 ranged between Resistant-Moderately Resistant to Moderately Resistant. The response of the cultivars Akhisar 98, Tarm 92, Çumra 2001 and Aydanhanım was between Moderately Resistant and Moderately Resistant-Moderately Susceptible. Gölbaşı isolate was found to be the most virulent.

Aktaş^[6] studied the reactions of Turkish and German barley cultivars to a virulent Turkish strain of *D. teres*. He found the cultivars Bülbül 89, Tokak 157/37 and Hamidiye 85 as susceptible. In this study, these cultivars showed reactions in the Susceptible to Moderately Susceptible-Susceptible range. It appears that genotypic differences exist among Turkish barley cultivars to *D. teres*. Six rowed cultivars appear to be more resistant than two rowed cultivars. There were small differences among the cultivars in response to isolates. It appears that pathogenic variability was low among the isolates tested. Pathogenic variability should be further determined using a comprehensive number of isolates from significant regions of Turkey, to assist breeding protocols in developing effective screening protocols.

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