Response of the Set of Anthracnose Differentials to other Foliar and Panicle Diseases in Niger

Bibata Ali Outani, Haougui Adamou, Louis Kajac Prom, Karimou Issa, Abdoulaye Abdoulaye Abdoulkadri, Oumarou Halilou Oumarou, Coumba Fall and Clint Magill

Introduction
Sorghum ranks second among cereals after pearl millet in Niger where it is used primarily as a staple food for the population and secondarily for animal feed, especially their haulms. With 3.7 Mha ranks third after Sudan (7.0Mha) and Nigeria (5.9Mha) [1]. Sorghum occupies 20.44 % of cultivated areas, that represents 19% of national cereal production. Naturally, sorghum faces high parasitic pressure due to diseases, insects and weeds. One of the factors in obtaining food security in resource poor areas is the effective management of plant diseases, especially the use of resistant sources [2].

The objective of this study was to determine the responses of the set of sorghum differentials used to delimit the anthracnose pathogen races to natural disease infection in two locations in Niger.

Material and Methods
Nineteen sorghum germplasms, including the 18 differentials lines that had been used to establish Colletotrichum sublineola pathotypes in the United States and Puerto Rico [3] were evaluated for foliar and panicle diseases in two regions, Tillabéri and Maradi in Niger. These regions have a Sahelian type of climate with ferruginous tropical soil type, and annual rainfall of 450 mm and 550 mm, respectively.

Seeds were planted in single 15-ft rows, with 36 in. row spacing. Standard field management protocol was followed as recommended. Plants were exposed to natural infection. At the soft to hard dough stage of development, incidence (i) of the different diseases that appeared in the nurseries was recorded.

\[ i = \frac{\text{number of plants with disease}}{\text{number of plant assessed}} \times 100 \]

Results and discussions
The anthracnose resistant check SC748-5 was infected with leaf blight, oval leaf spot, and zonate leaf spot but free of long smut, rough leaf spot, and target leaf spot. BTx623 and TAM428 which are susceptible to anthracnose were infected with leaf blight, long smut, oval leaf spot and zonate leaf spot. Across locations, all the lines tested were infected with leaf blight, caused by Exserohilum turcicum. PI570726, an accession from Sudan was infected with only leaf blight but free of all the other diseases observed in both locations.

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\[ i = \frac{\text{number of plants with disease}}{\text{number of plant assessed}} \times 100 \]

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Conclusion
Some of the sorghum anthracnose differentials, especially PI570726 may possess genes for resistance to multiple sorghum diseases and can be utilized as parents in breeding programs in Niger.

References

Evaluation of diseases’ incidence

Reactions of sorghum differentials to natural infection in Tillabéri (top) and Maradi (down) in Niger