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Intsormil

TRIP REPORT

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SUDAN

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☆ International Sorghum/Millet

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Institute of Agriculture and Natural Resources
University of Nebraska-Lincoln

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Trip Report Sudan

October 6, 1983 to October 18, 1983

T. L. Housley

October 8, 1983

Arrived in Khartoum at 1:30 a.m. Stayed at Meridian Hotel. Saturday, October 8 was a holiday in Sudan and as a result I was unable to make contacts with scientists at either University of Khartoum or Agriculture Research Corporation (ARC). Dr. Gebisa Ejeta suggested I rest and meet him in Wad Medani on Sunday, October 9.

October 9, 1983

Drove with Gezira Research Station technicians to Wad Medani at 6:00 a.m. Dr. Gebisa and I met with Dr. Abdellatij Mubarele Nour a sorghum breeder with ARC and Dr. A. M. El Anmabi, Crops Section at Gizera Agricultural Research Station, ARC. Dr. Nour took us on a tour of his Sorghum-Striga research plots. Dr. Gebisa's plots were recently watered and not available for collecting samples. Dr. Nour's plots of susceptible and tolerant sorghum lines would provide our samples. I took photographs of those plots from which samples were to be collected. Those selected were

Tolerant	Susceptible
P-967083	Dabar
IS-9830	Fiterita aryana
Tetron	Tajarab
N-13	

Met with Dr. Mohammed Bakheit Said the Director General of Sudan Agricultural Research Corporation.

October 10, 1983

Met with Dr. A. D. Hamdoun who related the history of Striga research in Sudan. The first experiments were conducted in the 50's and 60's and involved the influence of fertilizer and 2,4D application on Striga infestation. The current Striga research program has a central goal of controlling the parasite on small fields similar to those of the majority of farmers in Sudan. There are four major research objectives: 1) breeding more tolerant cultivars (Dr. Abdellatij Mubarele Nour participates in this effort); 2) describing or defining ecotypes of Striga (Dr. F. Bebawi, University of Khartoum, Shambat); 3) chemical control of Striga (Dr. Hamdoun's research area); 4) agronomic practices as a means for Striga control.

Dr. Hamdoun's research on Striga at the Gezira Research Station involves the influence of nitrogen and herbicides on parasitism of sorghum. In addition to this research and that of Dr. Nour and Gebisa there is an M.S. student from the University of Gizera that is working on a Striga germination stimulant from euphorbia species. These are the projects currently being pursued on Striga at the Gezira Research Station in Wad Medani.

We began to collect samples of the root-parasite tissues from plots selected yesterday. In each of our choosen plots we selected young (2-6 nodes above ground) and old (8 or more nodes, with terminal ends possessing flower buds) [illegible] sorghum root associations. By digging up both the sorghum and [illegible]ed Striga in a single mass and rinsing the soil away from the roo[illegible] running water we were able to preserve the desired root-parasite junction. These rinsed samples were placed in FAA fixative for transport to Purdue.

October 11, 1983

We completed taking samples in the early part of the morning (7:00 - 9:30). After breakfast (about 10:30 a.m.) we met once more with Dr. Hamdoun to enlist his aid in a part of this research project. He had in the early 70's grown sorghum seedings in plastic bags filled with nutrient agar. Then injected the bags with conditioned Striga seeds. He showed Gibesa and I photographs he had obtained illustrating germination, attachment, and establishment of Striga. Gibesa and I asked if he would cooperate with us in a project designed to produce this time course of parasitism with Dabar (susceptible) and P-967083 (tolerant). He began this experiment before I left Sudan. I am to send sample containers to Gibesa so he can package the various stages of the process and bring them to Purdue for analysis. Not only will we have the mature root associations from field material but also the various stages of the infection process. This is important since the tolerance of P-967083 is expressed in fewer Striga plants emerging and emergence of the Striga is much later than in other sorghum germplasm. IS 9830 may represent a different strategy of tolerance since it is a sorghum line which is very early maturing. It had headed before I arrived in Sudan. P-967083 is a late maturing line. I shall discuss more completely our observations concerning tolerance and susceptibility when I compare the trials at the Gezira Research Station with those of Dr. M. Osman Khidir at University of Khartoum, Shambat (October 12, 1983).

Gebisa and I both feel that this small cooperative project with Dr. Hamdoun is a very important and positive step toward future involvement between our efforts in Striga research at Purdue and the necessary field trials in Sudan.

In the early afternoon we visited Dr. Hamdoun's research plots and I took photographs of his field plots. The application of 1 N (40 lbs/acre) or 2 N (80 lbs/acre) nitrogen severely limited Striga infestation. The interaction of nitrogen (1 N) and sorgoprim herbicide was very clean (little Striga). Sorgoprim appeared to be the only herbicide in the trial that was effective in controlling Striga. No herbicide was as effective as nitrogen applied at the rate of 80 lbs/acre.

In the late afternoon Gebisa and I drove out of Wad Medani on the Sennar Rd. There we collected some samples from a farmers field. The Striga was growing on dwarf white Milo (DWM).

October 12, 1983

Gebisa and I drove to Khartoum to make calls on Dr. Jim Riley, Dr. L. Musselman and Dr. M. O. Khidir.

Dr. M. O. Khidir is the Striga Project Leader for Sudan. He took us to his Striga plots at the University of Khartoum in Shambat. There I took photographs comparing our susceptible and tolerant lines. P-967083 and IS-9830 were quite tolerant in this location. Dr. Khidir had an additional line showing tolerance to Striga, SRN 39. Although we did not take samples from this plot at some future time we may examine this plant because while tolerant it exhibited marked intervenal chlorosis and leaf margin firing. At Shambat Tetron did not exhibit tolerance but was quite susceptable. Why this location changed the tolerance of Tetron may be of future interest. Dobbs in Shambat showed tolerance to Striga, but at the Gezira Research Station it was susceptible.

The line N-13 was susceptible in both locations but is considered tolerant to Striga asiatica in India. Several other lines appear to exhibit some tolerance but were not as tolerant as P-967083 or IS-9830.

Dr. Khidir has agreed to cooperate in measuring the amount of stimulant produced by the roots of susceptible and tolerant lines that we have sampled. We hope that such cooperation will help provide us with information concerning the importance of Striga germination stimulant to tolerance in the sorghum germplasm we have begun to study. This will help to determine if low stimulant is a potential mechanism of tolerance in these plants.

Dr. Gebisa and I met with Dr. Musselman later in the afternoon. He provided us with addresses of several scientists that are working on physiological problems relative to Striga. We discussed with him our present involvement and future research interests. He was not encouraging regarding the possibility that our field collections would provide information concerning the mechanisms of tolerance. He did however feel that examining root development, stimulant production, endodermal development and perhaps chemical defense mechanisms of the roots might provide a more accurate description of the mechanism of tolerance.

October 13, 1983

Flew to Copenhagen to meet with Dr. Kirleis. He was in Yugoslavia visiting FAO administrators.

October 14, 1983

Dr. Kirleis arrived at 5:30 p.m. and I was able to deliver samples Dr. Gebisa had given me for him.

October 15, 1983

Dr. Kirleis and I toured the Carlsberg Laboratory where he is currently on sabbatical. There he gave me high and low tannin millet samples to deliver to Dr. Butler at Purdue.

October 17, 1983

Returned to Purdue University with samples.