REFERENCES

CIBA. 1969. NUVACRON : New systemic insecticide from Ciba-Geigy, Basel, 68 p.

NYIIRA, Z.M. 1971. The status of insect pests of cowpea (**Vigna unguiculata** (L.) Walp.) in Uganda and their control. **PANS, 17** : 194-197.

SINGH, S.R. and TAYLOR, T.A. 1978. Pests of grain legumes and their control in Nigeria. In : **Pests of Grain Legumes : Ecology and Control.** (Eds.) S.R. Singh, H.F. van Emden and T.A. Taylor. pp. 99-111. Academic Press, London.

SRIVASTAVA, K.M. 1980. Status of pod borers as pests of pigeonpea in Uttar Pradesh, India. **Tropical Pest Management, 26** : 262-264.

https://doi.org/10.29321/MAJ.10.A01816

Madras Agric. J.78, (1-4): 19-21 Jan.–Apr. 1991

VARIETAL REACTION OF SORGHUM LINES TO AFLATOXIN PRODUCTION

M.A. RAHMAN[1] and G. KOTESWARA RAO[2]
Agricultural Research Station, Amberpet, Hyderabad - 500 013 (A.P.)

ABSTRACT

Thirty two sorghum cultivars were tested against Aflatoxin production. Among them three sorghum cultivars *viz.*,M 35-I, N - 13 and 648 A x Y - 75 were found resistant to aflatoxin production (aflatoxin 0.05 ppm) and twelve entries were moderately resistant to aflatoxin production (aflatoxin between 0.05 to 0.25 ppm).

KEY WORDS : Sorghum, Aflatoxin, Varietal reaction

Sorghum is one of the important cereal crops which is found to be contaminated with the fungus *Aspergillus flavus* Link ex Fries, producing aflatoxins as a metabolite (hepatotoxic). The potent effects of this toxin has created worldwide interest in its study and control. Screening of resistant varieties is the most important method to control this malady. Rao and Tulpule (1967) and Nagarajan and Bhat (1973) screened peanut varieties against aflatoxin production and established resistant germplasm lines. On sorghum very little work has been done for identifying the resistant lines against the aflatoxin production. Anandam (1970) initiated this type of work and found only one variety IS 2602 out of ten varieties screened as not supporting the production of aflatoxin. The present work was initiated to screen sorghum line against aflatoxin production on the grains.

MATERIALS AND METHODS

Healthy seed samples of thirty two popular sorghum cultivars were collected from All-India Coordinated Sorghum Improvement Project, Agricultural Research Institute, Rajendra Nagar, Hyderabad. Twenty grams of seeds of each entry were placed in 100 ml. conical flasks, washed thoroughly and autoclaved at 15 lb. psi for 15 min. After shaking well the

1. Asst. Plant Pathologist (Rice); 2. Plant Pathologist

seeds were inoculated with 1 ml. spore suspension (consisting of approximately 6 x 10^5 spores per ml.) of a selected potent strain of *A. flavus*. The flasks were incubated for 10 days with regular shakings on alternate days. On the 11th day the fungus was killed by spraying ethylalcohol (95%) and dried in hot air oven at 80^0C for about 6 hr. After complete drying the seeds were powdered and the powder was defatted with dry petroleum ether for an hour in Soxhlet extractor and it was further extracted with methanol for 6 hr. The methanolic extract, after filtration, was kept over night with 10 percent lead acetate solution for removal of pigments. The toxin was then extracted with chloroform. The chloroform extracts were processed for estimation of aflatoxin by thin layer chromatography using Chloroform : Methanol (95:5) as developing solvent system. Aflatoxins were detected by the method developed at the Tropical Products Institute, London (1964) as per the following toxicity levels using a standard toxin for comparison.

Aflatoxin concentration	Toxicity level category
> 1.0 ppm	Very high
0.25 - 1.0 ppm	high
0.05 - 0.25 ppm	medium
< 0.05 ppm	low or negligible

RESULTS AND DISCUSSION

Among the thirty two sorghum entries, the quantity of aflatoxin production was estimated and results are presented (Table).

Table : Reaction of sorghum varieties to aflatoxin production.

S.No.	Name of the entry	Afla toxin conc. (ppm)	Toxicity level detected	S.No.	Name of the entry	Afla toxin conc. (ppm)	Toxicity level detected
1.	CSV-2	1.5	Very high	17.	G2	0.5	High
2.	CSV-6	1.5	Very high	18.	CSV-5	0.2	Medium
3.	1075	1.5	Very high	19.	285	0.2	Medium
4.	N-11	1.5	Very high	20.	555	0.2	Medium
5.	PJ 22 K	1.5	Very high	21.	1235	0.2	Medium
6.	NJ - 1031	1.5	Very high	22.	648A x 1235	0.2	Medium
7.	CSV-3	0.5	High	23.	H-106	0.2	Medium
8.	670	0.5	High	24.	CSV-7R	0.2	Medium
9.	2695	0.5	High	25.	IS 3687	0.2	Medium
10.	CSV-4	0.5	High	26.	CSH-5	0.2	Medium
11.	Y-75	0.5	High	27.	G-3	0.2	Medium
12.	D - 340	0.5	High	28.	PJ - 36K	0.2	Medium
13.	H-112	0.5	High	29.	PJ - 739	0.2	Medium
14.	CSV - 1	0.5	High	30.	648A x Y-75	0.02	Low
15.	IS 5470	0.5	High	31.	M 35-1	0.02	Low
16.	CSH - 1	0.5	High	32.	N -13	0.02	Low

Among the varieties screened, three entries *viz.*, 648 A x Y-75, M 35-1 and N-13 were found resistant for aflatoxin production as less than 0.05 ppm was detected (very minute quantity of aflatoxin). Twelve varieties viz., CSV-5, 285, 555, 1235, 648A x 1235, H 106, CSV-7R, IS 3687, CSH-5, G3, PJ-36K and PJ-739 were found under medium category where aflatoxin production was between 0.05 to 0.25 ppm and were grouped under moderately resistant entries. The remaining entries were found to produce high and very high aflatoxin. As certain levels of aflatoxin are harmful for human beings, cattles and birds (poultry) the sorghum entries grouped high and very high categories should be discouraged for cultivation and the entries which showed very low quantities of aflatoxin production may be encouraged for cultivation.

Amonth the resistant entries M 35-1 was found to be the best variety due to its other good characters. It is under cultivation in vast areas of Andhra Pradesh and Maharashtra and to some extent in Karnataka during rabi seasons. Though the variety N - 13 was found to be good with yellow grain type and resistant to Striga but it is not a good yielder.

Among the medium aflatoxin producing category, CSH-5 a hybrid variety and CSV-7R are under cultivation in some states In the country. This group of medium category may also be selected for cultivation as the aflatoxin production is tolerable.

ACKNOWLEDGEMENTS

The authors are thankful to Dr. Ramesh V. Bhat, National Institute of Nutrition, Hyderabad for the supply of the most potent and common strains of *Aspergillus flavus* Link ex Fries. Thanks are also due to Mr. K.N. Murthy, Senior Scientist (Millets) (Retired), A.P.A.U. for the supply of Sorghum cultivars and to the Professor of Plant Pathology, College of Agriculture, Rajendranagar for providing laboratory facilities throughout the work of this investigation.

REFERENCES

ANANDAM, R.J. 1970. unpublished thesis submitted to APAU, Hyderabad.

NAGARAJAN, V., and BHAT, R.V. 1973. Aflatoxin production in peanut varieties by **A. flavus** Link ex Fries, and **A. parasiticus** *Applied Microbiology*, 25 : 319-321.

RAO, K.S. and TULPULE, P.G. 1967, Varietal differences of groundnuts in the production of aflatoxin. Nature (London)., 14: 738-=739.