sufficient drying, if grain is damaged during harvest, handling, threshing, and drying, and if the moisture content of grains increases during storage. In this study it was observed that, most of the fungi appeared to have come from field infestation. *A. flavus,* and *P. citrinum* have also been recorded in storage. Based on the results of this study, it is suggested that grain is stored either in gunny bags or jute bags rather than in other containers mainly to minimize the damage from *Fusarium* spp., or that mold-tolerant/resistant genotypes are grown during the rainy season. Benomyl-treated grains could be used as seed for the next season's crop.

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S S Navi[1], R Bandyopadhyay[2], T G Nageswara Rao[3], and P W Tooley[4] (1. ICRISAT, Patancheru 502 324, Andhra Pradesh, India; Current address: Department of Plant Pathology, College of Agriculture, Iowa State University, Ames, Iowa 50011-1020, USA; 2. Current address: International Institute of Tropical Agriculture (IITA), PMB 5320, Ibadan, Nigeria; 3. National Research Center for Sorghum, Rajendranagar, Hyderabad 500 030, India; 4. USDA-ARS, 1301 Ditto Avenue Fort Derrick, MD 21 702, USA)

Introduction

Ergot (*Claviceps sorghi* P. Kulkarni et al. and *C. qfricana* Frederickson, Mantle, and de Milliano) of sorghum (*Sorghum bicolor* (L.) Moench) is a serious limiting factor in hybrid seed production, particularly if seed set in male-sterile lines is delayed due to lack of viable pollen caused by non-synchronous flowering in male-sterile and restorer lines. Further, environmental conditions favorable for disease development are not congenial to rapid seed set, thus making spikelets more vulnerable to ergot attack (Bandy opadhy ay 1992). In this paper we report the occurrence of ergot in epidemic form in Maachinenipalli village towards the end of the rainy season (1-8 October 1999) and its further spread in 12 administrative zones of Mahbubnagar and two zones of Ranga Reddy districts in Andhra Pradesh from a survey conducted in 2000.

Materials and methods

A total of 28 farms were surveyed in Andhra Pradesh during an ergot epidemic in the rainy season 2000. The areas represent the major sorghum-growing belt of Mahbubnagar district where sorghum was grown on over 130,000 ha (Source: Associate Director of Research, Regional Agricultural Research Station (RARS), Palem 509 215, Mahbubnagar District). Most of the farmers sow local Yellow Jowar, local White Jowar and ICSV 745 as dual-purpose sorghums during the rainy seasons, and SSG 777 and SSG 878 are exclusively grown for fodder in areas of Kalwakurthy administrative zone all year round.

The incidence and severities of ergot was recorded from each field in an area of approximately 12-m^2 in each of three randomly selected subplots. Based on the number of infected plants and the total plants the incidence (%)

was recorded, and the severity was noted on a 0-100% scale from individual panicles.

Results and discussion

The incidence and severity range of ergot in the epidemic areas surveyed is given in Table 1. ICSV 745 sown in Kalwakurthy and Bhootpur zones remained free from ergot. The survey of 12 administrative zones in Mahbubnagar district representing 22 farmers' fields in 15 villages revealed the occurrence of ergot in epidemic form during September 2000. The incidence of ergot in 15 villages was higher than 50%. In most villages the sorghum crop had high ergot incidence and severity (up to 100%) suggesting that farmers could harvest little grain from these fields. Forage sorghum hybrids SSG 777 and SSG 878 were also highly susceptible to ergot.

When farms in Maachinenipalli village were surveyed during 3-10 September 1999 they had no ergot. However, a month later towards the end of the rainy season (1-8 October 1999) none of the fields was free from ergot. The pathogen infected forage and local sorghums that were sown in late June 1999. In contrast, fields in adjacent Bhootpur administrative zone (within 40-50 km) were free from ergot. During the survey ergot incidence in Maachinenipalli village was 80-100% with 100% severity. In addition, the ergot incidence range in 10 adjacent administrative zones was 10-100% with 50-100% severity (Table 1). In Bhootpur administrative zone the ergot prevalence was similar to that in 1999.

The farmers in Maachinenipalli witnessed epidemics of ergot only during 1999 and 2000. A thorough discussion on sorghum ergot history, the fodder storage

Table 1. Sorghum ergot scenario in Mahbubnagar and Ranga Reddy districts of Andhra Pradesh, India during 2000/1

District/ddministrative zones	Village	Cultivar	Incidence range (%)	Severity range(%)
Ranga Reddy				
Maheswaran!	Tukkuguda	Yellow Jowar	90-100	100
Maheswaram	Mankal	Yellow Jowar	70-80	80-100
Kandakur	Kottur	Yellow Jowar	5-30	80-100
Mahbubnagar				
Amanagal	Kadathal	White Jowar	10-50	100
Amanagal	Ramuntala	White Jowar	10-35	80-100
Amanagal	Amanagal	White Jowar	50-100	100
Veldanda	Velladandi	Yellow Jowar	50-100	100
Veldanda	Tandra	Yellow Jowar	25-50	100
Veldanda	Tandra	White Jowar	50	100
Vangoor	Maachinenipalli	Yellow Jowar	80	100
Vangoor	Maachinenipalli	SSG 878	100	100
Vangoor	Vangoor	Yellow Jowar	25	100
Vangoor	Vangoor	Yellow Jowar	100	100
Kalwakurthy	Kalwakurthy	Yellow Jowar	100	100
Mahbubnagar	Appannapalli	Yellow Jowar	25-40	100
Jadcherla	Nakkalabanda	Yellow Jowar	50	100
Thimmajipet	Timmajipet	White Jowar	80-90	100
Bijinapally	Bijnapalli	White Jowar	75	100
Bijinapally	Palem	SPV 351	90	50-60
Midjil	Ranipet	White Jowar	60-70	100
Midjil	Wadiyal	White Jowar	50	100
Shadnagar	Rayakal	Yellow Jowar	25-50	100
Shadnagar	Rayakal	Bhoojonna	100	100
Shamshabad	Palmakul	Yellow Jowar	30-40	100
Bhootpur	Amisthapur	Yellow Jowar	0	0
Bhootpur	Amisthapur	ICSV 745	0	0

system, and losses due to the disease revealed that farmers take one or more of the following actions to avoid the disease: 1. Select only healthy panicles for food, and feed ergot-infected panicles and stover to animals; 2. Allow infected plants to dry in the field for future use as fodder, or 3. Allow cattle to graze without harvesting or drying the stover.

The possible sources of infection for sorghum ergot spread from an epidemic area of Maachinenipalli in 1999 to other administrative zones in the distriet could be either postharvest-infected panicles stored or dumped in pits, or ergot-contaminated seed movement frorn one village to another. Therefore, based on this information it is assumed that pathogen, might have moved from an area of ergot epidemic in Maachinenipalli to other locations in the district. It appears that the pathogen development was favored by the cloudy weather and high rainfall during flowering (Anahosur and Patil 1982; McLaren and Wehner 1990) and subsequently spread by wind currents (Frederickson et al. 1993). On the contrary, in Amistapur village of Bhootpur administrative zone about 80 km from Maachinenipalli the crop was absolutely free from ergot probably because there was no rain during flowering in 1999 and 2000. Even though the farmers in this village observed ergot in 1996, there was no further spread in the subsequent cropping seasons.

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Prevalence of Ergot of Sorghum in India

S S Navi[2], R Bandyopadhyay[3], V A Tonapi[1], T G Nageshwar Rao[4], P W Tooley[5], R K Reddy[1], S Indira[4], and S Pande[1] (1. International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Patancheru 502 324, Andhra Pradesh, India; 2. Department of Plant Pathology, College of Agriculture, Iowa State University, Ames, Iowa 50011-1020, USA; 3. International Institute of Tropical Agriculture (IITA), PMB 5320, Ibadan, Nigeria; 4. National Research Centre for Sorghum (NRCS), Rajendranagar, Hyderabad 500 030, Andhra Pradesh, India; 5. United States Department of Agriculture-Agricultural Research Service (USDA-ARS), Foreign Disease-Weed Science Research Unit, 1301 Ditto Avenue Fort Detrick, MD 21702, USA)

Introduction

Ergot (*Claviceps sorghi* P. Kulkarni et al.. and *C. africana* Frederickson, Mantle, & de Milliano) is a serious limiting factor, in the production of sorghum [*Sorghum bicolor(L.)* Moench] hybrid seeds. Ergot can also cause widespread damage to cultivars in farmers' fields when environmental conditions favorable to the pathogen prevail at flowering (Kukedia et al. 1982). In this article we report the incidence and severity of ergot, in sorghum-growing areas in the states of Andhra Pradesh, Gujarat, Tamil Nadu, Maharashtra, Karnataka, Rajasthan and Uttar Pradesh in India.

Materials and methods

On-farm sorghum ergot surveys were conducted from August 1999 to February 2000 (Year 1), August 2000 to March 2001 (Year 2) and November 2001 to April 2002 (Year 3). A total of 250 farms in Andhra Pradesh, one in Gujarat, 413 in Maharashtra, 451 in Karnataka, 127 in Tamil Nadu, 3 in Rajasthan, and 10 in Uttar Pradesh were