untreated plots for each entry were paired in plots 0.9-m wide and 5.9-m long. One, 3-dichloropropene (1,3-D) Telone II was injected at 56.1 L ha^{-1} through a single chisel in one row per plot and bedded. The other row in each plot was left untreated and served as a control. Ten cores of soil (2.5-cm diameter x 25-cm deep) were collected from each row of each subplot on 9 July, 28 August (data not presented), and 8 October, and nematodes were extracted from a 150-cm^3 subsample for each plot by centrifugal flotation (Jenkins 1964), identified, and recorded.

Results and discussion

Numbers of nematodes in the soil were low on 9 July (2 weeks after the pearl millet was sown) in both treated and untreated plots, but as expected, tended to have lower values in Telone II treated plots (Table 1). Both *M. incognita* and *P. minor* numbers tended to increase at the 8 October sampling (more so in untreated than treated plots, as expected), but significant differences (P = 0.05) were only observed for *M. incognita* between treated and untreated plots of pearl millet hybrid 97-107 x 115. Numbers of *M. incognita* tended to increase more in the soil of plots growing hybrids with 115 as the male parent than those with 117 as the male parent. Plants in the treated plots were taller and greener than those in the untreated plots during the first month after sowing, but the differences gradually disappeared by anthesis. Significant grain yield differences were observed between treated and untreated plots for 9 of the 14 hybrids. Plants in untreated plots of 5 of the 9 hybrids yielded more grain than plants in the treated plots. Telone II treatment did not significantly affect grain yield in 5 of the hybrids. The data indicated differences existed for resistance to *M. incognita* and *P. minor* nematodes among the 14 pearl millet hybrids. The fibrous rooting system of pearl millet probably allows this crop to flourish under certain populations of nematodes as the plants matured, due to increased root branching, but this hypothesis needs further study.

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Population Reproductive Statistics of Millet Head Miner (Lepidoptera: Noctuidae) Reared in a Laboratory in Niger

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Introduction

Millet head miner (*Heliocheilus albipunctella* de Joannis) significantly damages pearl millet [*Pennisetum glaucum* (L.) R. Br] grown in the Sahel. Young larvae cut and feed on flowers and perforate the glumes of pearl millet. Late-instar larvae bore and create tunnels in the kernels on pearl millet panicles (Gahukar et al. 1986). Cultural and chemical management tactics have been used to reduce damage by millet head miners in West Africa, but are impractical and expensive. A life table was used to study cohort development and assess the number of millet head miners surviving or dying in each life stage.

Materials and methods

Life table parameters, including reproduction, development, and survival, were assessed for millet head miners reared using 4 temperatures and 4 diets in a laboratory. Cohorts were reared only on Bio-Serv® 9782 diet or on 3 pearl millet-based diets, i.e., spike parts at early exsertion, mid-flowering, or soft-dough stages. Millet head miner adults (lf:lm) from a laboratory colony were placed with freshly cut pearl millet panicles into oviposition cages. Eggs were counted and kept in a petri dish until they hatched. Each neonate larva was put into a plastic cup containing 15 mL of an artificial or a millet-based diet. Cups were distributed among 4 incubators maintained at 24, 26, 28, or 30 ± 1°C; a photoperiod of 12:12 (L:D) h; and 70% relative humidity (RH). Numbers of surviving and dead larvae were recorded and used to construct life tables. Standard techniques developed by Southwood (1978) and Price (1997) were used to calculate the net reproductive rate of multiplication in terms of females produced per generation ($R_o = al_x m_x$) and cohort-generation time, a period during which offspring were produced ($T_c = al\, m_x x / al_x m_x$).

Results and discussion

The population reproductive statistics estimated from the fecundity and life table data (Kadi Kadi 1999) are summarized in Table 1. When millet head miners were fed Bio-Serv® diets, R_o increased from 3.53 females per female at 24°C to 5.84 females at 30°C. Mean net reproductive rate was 4.09 females per female at the 4 temperatures. T_c ranged from a low of 21.51 days at 28°C to a high of 33.04 days at 30°C. Mean T_c at the 4 temperatures was 25.02 days. When millet head miners were fed early exserted millet panicles, R_o and T_c were greatest at 24°C. R_o at 24°C was 4.33 females per female and T_c was 23.86 days. Mean R_o was 3.64 females and T_c was 22.93 days at the 4 temperatures. When a mid-flowering millet diet was used, R_o and T_c were greatest at 24°C (3.77 females and 24.95 days) but least at 28°C (2.89 females and 16.98 days). Mean R_o was 3.34 females and T_c was 21.44 days at the 4 temperatures. Using soft-dough stage millet as a diet, R_o and T_c generally increased as temperature increased. R_o increased from 3.26 females per female at 24°C to 3.86 at 30°C. Mean R_o of 3.52 females was estimated at the 4 temperatures. Mean T_c was 19.79 days, higher than the T_c values recorded at 24 or 30°C.

In summary, the highest R_o values of 5.84 and 4.33 females per female were estimated when millet head miners were fed the Bio-Serv® diet at 30°C and the early exerted millet diet at 24°C. Overall mean R_o tended to be highest at 24°C (3.72 females) and 30°C (4.35 females). These values were lower than the R_o values of 21.09-71.17 females per female, Srinivasaperumal et al. (1992) reported for immature stages of the noctuid, *Earias vittella* (Fabricius), reared on 3 hosts in a laboratory. Mean T_c values were 20.29-24.86 days at the 4 temperatures when millet head miners were fed the 4 diets. T_c tended to be shortest at 26 and 28°C and was only 16.98 days when millet head miners were fed mid-flowering millet diets at 28°C. Srinivasaperumal et al. (1992) reported T_c values of 34.24-39.22 days when *E. vittella* was reared on three hosts in a laboratory. The T_c of 33.04 days for millet head miners fed the Bio-Serv® diet at 30°C was similar to the 34.24 days Srinivasaperumal et al. (1992) reported for *E. vittella* reared on okra, [*Abelmoschus esculentus* (L.) Moench] at 27°C. T_c was shortest (mean of 19.78 days) when millet head miners were fed soft-dough stage millet diets. The suitability of their food affected millet head miner population abundance and reproductive capability in the laboratory.

Table 1. Net reproductive rates and cohort generation times for pearl millet head miner reared on Bio-Serv® 9782 and three pearl millet-based diets at ICRISAT Sahelian Center, Sadore, Niger, 1996 and 1997.

Diet	Reproductive value	Temperature (°C) 24	26	28	30	Mean
Bio-Serv® 9782	R_0	3.53 ± 0.03	3.49 ± 0.02	3.48 ± 0.02	5.84 ± 0.02	4.09 ± 0.04
	T_c	22.13 ±0.01	23.38 ± 0.02	21.51 ±0.01	33.04 ±0.01	25.02 ± 1.80
Panicle parts at early exsertior	R_0	4.33 ± 0.03	2.98 + 0.01	3.60 ± 0.05	—	3.64 ± 0.24
	T_c	23.86 ±0.04	20.36 ± 0.04	21.58 ±0.02	—	22.93 ± 0.64
Mid-flowering stage panicles	R	3.77 ± 0.07	—	2.89 ± 0.09	3.35 ±0.05	3.34 ± 0.20
	T_c	24.95 ± 0.05	—	16.98 ±0.02	22.40 ±0.10	21.44 ± 1.50
Soft-dough stage panicles	R_0	3.26 ± 0.06	3.23 ± 0.03	3.72 ± 0.02	3.86 ± 0.06	3.52 ± 0.11
	T_c	18.37 ±0.0.4	20.53 ± 0.03	21.10 ±0.05	19.13 ±0.03	19.78 ±0.41
Mean	R_0	3.72 ± 0.20	3.23 ±0.10.	3.42 ±0.12	4.35 ± 0.50	
	T_c	22.33 ± 0.94	21.42 ±0.61	20.29 ± 0.72	24.86 ± 2.70	

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Notes and News

News Items

R Bandyopadhyay Receives Award

Ranajit Bandyopadhyay of the Genetic Resources and Enhancement Program, ICRISAT was presented with an Outstanding Achievement Award by the National Grain Sorghum Producers Board (NGSP) and the Sorghum Improvement Conference of North America (SICNA) during the 21st Biennial Grain Sorghum Research and Utilization Conference, on 22 February 1999 at Tucson, Arizona, USA. The award is presented occasionally to recognize significant contributions towards improvement of sorghum industry in North America. The award is normally given to individuals, but in 1999 it was given to an international team of three scientists for their work on sorghum ergot, a devastating disease that took the sorghum industry in the Americas by surprise. The team consisted of D E Frederickson (University of Zimbabwe, Harare; currently a Visiting Scientist at Texas A & M University, College Station), N W McLaren (Grain Crops Research Institute, Potchefstroom, South Africa) and R Bandyopadhyay. After the arrival of sorghum ergot in the U.S. in 1997, Bandyopadhyay worked for 10 months in 1998 at Texas A & M University (with R A Frederiksen) and the United States Department of Agriculture (USDA) (with J A Dahlberg) on various aspects of the disease. One of the key areas of his work was dissemination of appropriate research information and advice to various sections of the sorghum industry. Bandyopadhyay's posting was covered by a Memorandum of Understanding on collaborative research between Texas A & M University and ICRISAT.

NGSP is the national body representing the interest of sorghum trade in the U.S. and elsewhere. Its membership includes growers, researchers, extentionists, seed companies, and people associated with different facets of sorghum trade. SICNA is an organization of sorghum researchers that prepares a general program of research, education, and developmental activities in the U.S. SICNA is a co-publisher (with ICRISAT) of the International Sorghum and Millets Newsletter.

Previous Outstanding Achievement awardees associated with ICRISAT include H Dogget (1981) and L R House (1993). Other awardees include such sorghum stalwarts such as R A Frederiksen (1995), G L Teetes (1995), D T Rosenow (1993), F R Miller (1989), L W Rooney (1985), J C Stephens (1963) and J R Quinby (1963).