

Assessment of Losses due to Wilt (*Cephalosporium sacchari* Butler) in Sugarcane

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ABSTRACT

An experiment was conducted for consecutive two years with nine sugarcane clones, namely, Isd. 1/53, Isd. 16, Isd.17, L.Jaba-C, Co.1148, Nagarbari, Isd. 18, Isd.19 and I.41/75 to quantify losses due to wilt disease. All the nine clones showed reductions in germination, millable canes and weight of canes ranging from 3.4 to 24.4%, 5.8 to 55.2% and 3.5 to 53.6% while mean reductions were 12.8, 19.0 and 23.0 percent respectively. The clone Isd-18 resulted the highest reduction in all the yield contributing factors like germination, number of millable canes and weight of millable canes.

INTRODUCTION

Wilt caused by *Cephalosporium sacchari* Butler is considered as one of the major and the most damaging disease of sugarcane particularly in the late season in Bangladesh. The disease is mainly seed piece transmissible but the fungus can survive in the soil for 27-31 months (Ganguly and Chand, 1963). Sugarcane wilt was first reported from India by Butler and Khan in 1913. Since then the disease has been reported from several countries like Bangladesh, Pakistan, Philippines, Uganda, South Africa, West Indies, Mexico, U.S.A. and some South American countries (Ganguly, 1964). There is hardly an area in Bangladesh free from wilt disease (Malek, et al., 1982). In epiphytotic areas, wilt is often associated with red rot (Butler and Khan, 1913; Martin-Leake, 1944; Singh *et al* 1965). Recently wilt incidence associated with red rot has been increased in the flood victim sugarcane cultivated areas in Bangladesh where 100 percent losses is not uncommon (personal observation). In wilt, the losses are generally computed on the basis of quantum of dried and dead canes found in the field after harvest which may vary from 2 to 10 tonnes/ha (Parthasarathy, 1972). The germination is adversely affected when the seed is taken from a crop having early stages of infection or incipient infection (Kirtikar *et al.*, 1972). This results in gappy crop stand and necessitates replanting entailing extra expenditure in terms of both seed and labour. During the monsoon period, there is considerable mortality of young shoots in a wilt affected crop. At times, all shoots in a clump dry out. Sarma (1976) reported that depending on the incidence of wilt, the yield reduction may go as high as 65%. Ratoons generally record higher damage than the plant crop. The wilt disease not only reduces yield but also impairs juice quality (Anon., 1959). Gupta and Gupta (1976) reported reduction in juice extraction by 14.6 to 25.8% and in sugar recovery by 3 to 29% respectively in wilted canes of Co. 1148.

Considering the above cases an experiment was undertaken to assess the extent of losses due to wilt in some varieties by artificial inoculation under Bangladesh environmental conditions.

MATERIALS AND METHODS

Nine cultivars, viz. Isd. 1/53, Isd.16, Isd.17, L.Jaba-C, Co. 1148, Nagarbari, Isd.18, Isd.19 and I.41/75 were selected for this study. The experiment was conducted for consecutive two years. In the first year (1987) two-budded thirty setts, and in the second year (1988) fifty setts were used both for healthy and diseased canes for each clone. In both the years to ensure diseased setts, 15 days old sporulated culture of *Cephalosporium sacchari*, the wilt organism was inoculated in the middle of 2-budded setts before planting in the field. Healthy setts were also planted in the same day without inoculation. Healthy and diseased setts of each clone were planted in a separate single row of 15 and 25 meters in the first and second year respectively. Variety to variety, and sett to sett distances were 100 cm and 50 cm respectively. Data were collected on germination, millable canes, and weight of canes. Final germination count was recorded 60 days after planting. Harvesting was done on December 4, 1987 and January 18, 1989 for the 1st and 2nd year respectively. In case of germination, average of two years and total millable canes and weight of canes of two years have been shown in the Table 1.

RESULTS AND DISCUSSION

It is observed from Table 1 that in all the clones germination percentages, number of millable canes and yield of canes were higher in healthy canes than in diseased (inoculated) canes. Isd. 1/53, Isd.16, Isd.17, L.Jaba-C, Co. 1148, Nagarbari, Isd.18, I.41/75, and Isd.19 showed 14.3, 8.8, 8.8, 13.2, 17.5, 3.4, 24.4, 6.9 and 18.1% reductions in germination respectively due to wilt disease. This result has the conformity with Kirtikar *et al.* (1972) who reported that the germination is adversely affected when the seed is taken from a crop having early stages of infection or incipient infection. Number of millable canes were reduced to 11.6, 31.6, 5.8, 20.0, 21.8, 13.6, 55.2, 7.0, and 9.7% due to wilt in the clones Isd. 1/53, Isd.16, Isd. 17, L.Jaba-C, Co.1148, Nagarbari, Isd.18, I. 41/75 and Isd.19 respectively. The respective yield reductions were 22.0, 41.0, 7.4, 25.4, 31.8, 12.6, 53.6, 3.5 and 12.7% in all the clones. This result agrees with that of Sarma (1976) who reported that depending in the incidence of wilt, the yield reduction may go as high as 65%. Mean reductions of all the nine clones in germination, number of millable canes and weight of canes were 12.8, 19.9 and 23.0% respectively. Further it may be noted that the highest reduction in germination (24.4%), millable canes (55.2%) and yield of canes (53.6%) were found in the clone Isd. 18. The lowest reduction in germination (3.4%), millable canes (5.8%) and yield of canes (3.5%) were found in the clones Nagarbari, Isd.17 and I.41/75 respectively. So, it may be concluded that wilt disease caused by *Cephalosporium sacchari* Butler reduces germination, number of millable canes and yield of sugarcane.

Table 1. Effect of wilt disease on germination, millable canes and yield.

Variety/ strain	Treatment	Average germination of 2 years		Total millable canes of 2 years		Total weight of canes of 2 years	
	H=Healthy D=Diseased	Germina- tion(%)	reduction due to wilt (%)	No. of millable canes per row of 40 m	Reduc- tion due to wilt (%)	Yield of millable canes (kg) per row of 40 m	Reduction in yield due to wilt (%)
Isd 1/53	H	45.6		380		189.0	
	D	31.3	14.3	336	11.6	154.9	22.0
Isd.16	H	41.9		269		217.4	
	D	33.1	8.8	184	31.6	128.3	41.0
Isd.17	H	61.9		363		261.0	
	D	53.1	8.8	342	5.8	241.7	7.4
L.Jaba-C	H	41.3		255		196.1	
	D	28.1	13.2	204	20.0	146.2	25.4
Co. 1148	H	51.9		385		329.7	
	D	34.4	17.5	301	21.8	225.0	31.8
Nagarbari	H	40.0		279		192.7	
	D	36.6	3.4	241	13.6	168.5	12.6
Isd.18	H	45.0		286		204.2	
	D	20.6	24.4	128	55.2	94.8	53.6
I.41/75	H	47.5		285		229.7	
	D	40.6	6.9	265	7.0	221.7	3.5
Isd. 19	H	54.4		278		189.9	
	D	36.3	18.1	251	9.7	165.8	12.7
Mean (9 clones)	H	47.7		308.9		223.3	
	D	34.9	12.8	250.2	19.0	171.9	23.0

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