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Screening of Cane Genotypes Under Sprinkler Irrigation at Early Selection Stage for Tolerance to Sugarcane Streak Mosaic Virus (SCSMV) at Ferké Sugar Estates in Ivory Coast

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Abstract— Sugarcane streak mosaic virus (SCSMV) became the major endemic disease of economic importance in Ivorian sugar estates almost two years ago, which spreads very fast across plantations and varieties. The study aimed to determine resistant sugarcane genotypes against SCSMV in Ferké sugar estates. It involved five experiments conducted at first selection stage under sprinkler irrigation, following a randomized complete block design (RCBD) with 20 to 30 different genotypes, two check varieties included, all in 4 replicates. Experiments were planted in October or December 2018, and expected to be harvested in November or December 2019 and 2020 as plant cane and first ratoon, respectively. Disease incidence and severity across all experiments were determined at 3 to 4 months, i.e. at early formative growth stage where symptoms due to SCSMV can be easily observed and recognized in the field. Highly significant differences in disease incidence and severity within cane genotypes tested were observed which shows their genetic diversity regarding crop resistance or susceptibility to SCSMV. Fifty percent of genotypes tested were found tolerant that disease, 23% moderately resistant as well as susceptible, 4% highly susceptible and 5% asymptomatic or supposed to be highly resistant. At the end of the current selection stage under way, i.e. after harvest of first ratoon, only the best yielding genotypes among the resistant ones will undergo the advanced selection stage.

Keywords— disease susceptibility, varietal resistance, growth stage, insect vector, yield loss, disease epidemiology, prophylactic measure.

1. Introduction

Sugarcane is one of the important cash crops grown in Ivory Coast, covering approximately 35,500 ha of land surface with an average yield of 70-75 t of cane/ha irrigated and rainfed crops combined. Sugarcane is mostly cultivated under irrigated conditions contributing to around 90% of Ivorian sugar production, i.e. about 200,000 t/year provided from 4 different factories.

Sugarcane streak mosaic virus (SCSMV) is a newly emerging disease in the country which has been infecting that crop since 2017. The virus was known about fifteen years ago in Asian and Latino American sugarcane producing countries where it was first reported in 2004 and 2005 respectively in Brazil [1-5] and Java, Indonesia [6-7]. It was reported that at least two strains of SCSMV were infecting sugarcane in Asia [8]. SCSMV is a Poacevirus from the Potyviridae family which is easily transmitted through plant extracts and vertically though sugarcane cuttings. It infects a limited species of Poaceae family such as sugarcane, sorghum, maize, Dacttyloctenium aegyptium, Pennisetum glaucum, Digitaria delilis as reported by several investigators [9-12]. However, no insect vector of the pathogen was reported so far [8,13]. Several species of aphids have been tested including Aphis cracivora, Rhopalosiphum maidis and Ceratovacuna lanigera and it was reported that they could not transmit the virus [9,11-12]. However, it was reported that SCSMV could be detected using RT-PCR on sugarcane aphid colony (Melanaphis indosacchari), and still the mechanism of virus transmission needs to be studied so as to develop an integrated pest management strategy [14].

Across Ivorian sugar estates, except for a limited number of varieties like M2593/92, M1400/86, SP70-1143 and R91-2021, all main varieties cultivated were found moderately or highly susceptible to the disease. It is the case of varieties like FR80-69, R579, SP70-1006, SP71-1406, SP71-8210, SP81-3250, R573, R570, Co997 and R575. Cane and sugar yield losses due to SCSMV occurred in Zuénoula sugar estate in central Ivory Coast where the disease broke out in 2017 on variety R575 were estimated to 20 to 30% over the last two cropping seasons (2017-18 and 2018-19). The disease expansion was so fast in Zuénoula plantations that 20% of land under cultivation with moderately or highly susceptible varieties were replanted every year instead of 10% as usual [15]. The disease broke out in Ferké sugar estates of northern Ivory Coast in June 2018 on variety FR80-69, a highly susceptible one, and within 12 months, it has spread to all major varieties cultivated like R579, SP71-1406, SP70-1006 and SP71-8210, with a severity score of 2 or 3, 4 being the highest symptom level. Total cropped land concerned is estimated to 2000 ha, i.e. about 25%. The threat on sugar production is so crucial that a replantation strategy is planned to be implemented over the next three or four years.

The study aimed to determine under irrigation resistant sugarcane genotypes of Reunion and Ivorian origin against SCSMV.

2. Materials and Strategies

2.1 Site characteristics

The study was carried out on four sugarcane plantations (B3-13, B3-24, V4-43, V8-01) and an experimental station (P3-61), at Ferké 1 and Ferké 2 sugar estates, in northern Ivory Coast (9°20’ – 9°60’ N, 5°22’ – 5°40’ O, 325 m a.s.l.). The prevailing climate is tropical dry with two seasons: one, starting from November to April, is dry and the other, from May to October, is wet. The dry season is marked by the northern trade wind which blows over mid-November to late January. The rainfall pattern is unimodal and centered on August and September which total amount of rainfall reaches almost half of the average annual rainfall (1200 mm) with an average daily temperature of 27 °C. Average maximum and minimum daily air temperatures are 32.5 and 21 °C, respectively. To meet sugarcane crop water requirements, the total amount of irrigation water required reaches 700 mm/year [16-17]. Both Ferké sugar mill plantations cover around 15 500 ha with 10 000 ha under irrigation and 3 500 ha of rainfed village plantations, lie mainly on shallow or moderately deep soils built up on granites. Main soil units encountered are ferralsols and temporally waterlogged soils in valley bottoms of Bandama and Lokpoho river basins with a sandy-clay texture.

2.2 Experimental design

All experiments were carried out over 12 months as plant cane following a randomized complete block design (RCBD) with 20 to 30 cane genotypes and two commercial varieties as control (M2593/92 and R579), in 3 replicates. Each sugar estate was equipped with a weather station where parameters required to determine crop ET0 like solar radiation, average daily air temperature, relative air moisture, and wind speed were measured. Rainfall data were recorded from different rain gauges L1-105, but also P3-61, V4-15 and V8-32 located close to Ferké 1 and Ferké 2 experiments, respectively. Ferké 1 experiments were planted on October 25 and December 11, 2018 were expected to be harvested 11 or 12 months later, i.e. in November or December 2019 and 2020, respectively, as plant cane and first ratoon. Those of Ferké 2 were planted on October 12, December 20 and 29, 2018 and expected to be harvested in November or December 2019 and 2020, respectively. Each plot was composed of 5 dual rows of 5 m long with 0.50 m and 1.90 m of row spacings. Field management in terms of fertilizer and herbicide applications were done according to usual practices in commercial plantations. NKP fertilizer (16-8.5-23) was applied mechanically at the routine rates of 500 kg/ha in rainfed plant cane. Pre-emergence chemical weeding based on pendimethalin combined with clorimuron-ethyl (3.5 l/ha) was achieved mechanically two days after planting.

2.3 Genotype infections investigated

Three to four months after planting, all genotypes being tested were observed for symptom detection of SCMV (sugarcane streak mosaic Virus) under natural conditions. Ratings recorded were based on symptoms observed on sugarcane leaves. Four different levels of SCSM disease symptoms were as follows: (1) mild streak, (2) moderately streak, (3) high streak and (4) very high streak.

Figure 1. Severity scale of SCSMV infection in sugarcane. Leaf 0 is asymptomatic and Leaf 4 very highly infected. Variety R579 leaves collected in Ferké. Scale adapted from Putra et al [18].

Disease incidence (Inc) is defined as the percentage of infected tillers, no matter the severity, over the total number of tillers observed within two central micro-plots made of one dual row of 5 m long with respect to each genotype and replication.

Inc (%) = (Nb of Infected tillers / Total Nb of tillers) x 100

Disease severity (Sev) is defined as the average score or rating of infected tillers with respect to their severity over the total number of tillers observed within two central micro-plots made of one dual row of 5 m long (9.5 m²) with respect to each genotype and replication.

$$Sev\ (-) = (N_0x0 + N_1x1 + N_2x2 + N_3x3 + N_4x4)/(N_0+N_1+N_2+N_3+N_4) = (N_1x1 + N_2x2 + N_3x3 + N_4x4)/(N_0+N_1+N_2+N_3+N_4)$$

Where N_0: Nb of asymptomatic tillers; N_1: Nb of mild streak tillers, N_2: Nb of moderately streak tillers, N_3: Nb of higly streak tillers, N_4: Nb of very highly streak tillers.

2.4 Statistical analyses

Three to four months after planting, all genotypes being tested were observed for symptom detection of SCMV The quantitative data recorded in this study were subjected to the analysis of variance using statistical procedures described by Gomez and Gomez [19] and reported by Shitahum et al [20] with the assistance of R software package version 3.5.2. Differences between means of treatments were determined from HSD's test.

3. Results and discussion

3.1. Climatic conditions over plant crop

As expected, both experimental sites presented a similar rainfall patterns with a per-humid season taking place from June to September where weather conditions used to be favorable for planting of rainfed sugarcane or its formative growth stage. The dry season taking place two or three months after planting of rainfed sugarcane tends to be suitable for stem borer infestations due to crop water stress. In contrast, the later dry season was beneficial for crop ripening before harvest.

In Ferké 1 experiments, total rainfall and reference evapotranspiration (ETo) recorded across crop cycle gave 1912 and 2188 mm, respectively. Total rainfall deficit over crop growing season from November 2017 to May 2018 gave 764 mm and the average daily temperature across crop cycle varied from 25.2 to 34.5 °C.
In Ferké 2 experiments, total precipitation and reference evapotranspiration (ETo) recorded across crop cycle gave 2071 and 2197 mm, respectively. Total rainfall deficit obtained over crop growing season from October 2017 to May 2018 gave 613 mm whereas the average daily temperature across crop cycle varied from 25.3 to 30.1 °C.

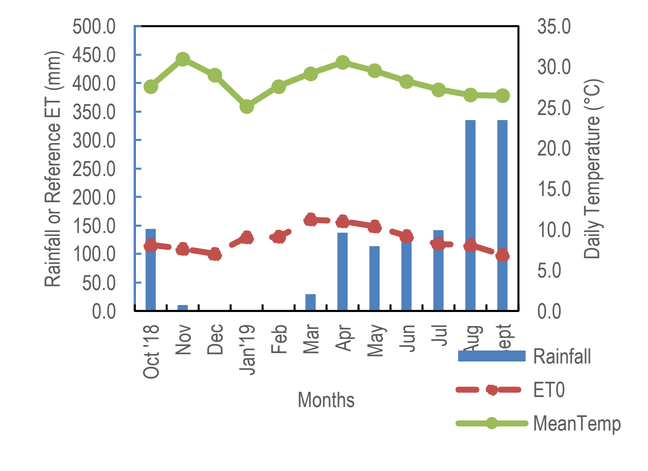

Figure 1a. Climate on Ferké 1 experimental sites (B3-13/24).

Figure 1b. Climate on Ferké 2 experimental site of P3-61.

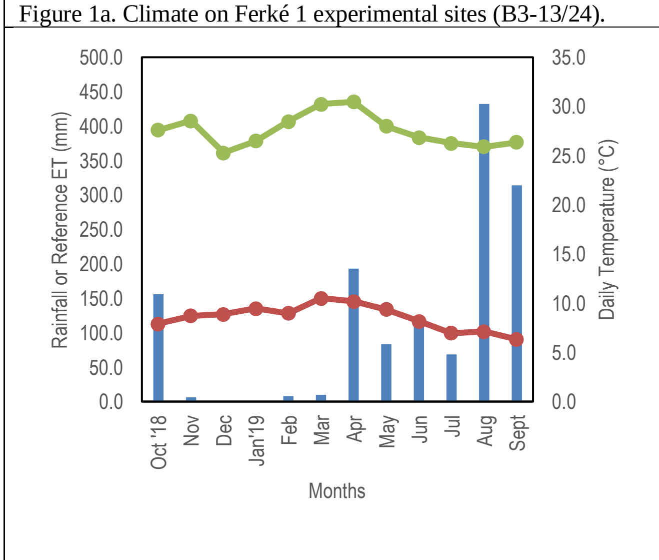

Figure 1c. Climate on Ferké 2 experimental site of V4-43.

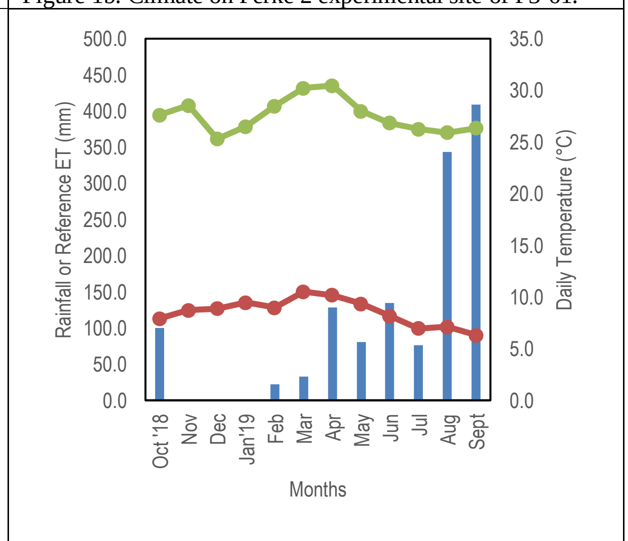

Figure 1d. Climate on Ferké 2 experimental site of V8-01

Figure 1. Prevailing climate on Ferké 1 and Ferké 2 experimental sites, Ivory Coast

3.2 Cane genotypes as affected by SCSM disease in Ferké 1 experiments

In contrast of the B3-24 experiment, highly significant differences ($P<0.1$) in disease incidence and severity within cane genotypes were observed in B3-13 experiment (Table 1). However, genotypes in B3-24 experiment were much less infected with average values of incidence and severity of 12.5% and 0.1 (-) compared to 22.6% and 0.3 for B3-13 experiment, respectively. Moreover, one of them, namely RCI12/1116, remained absolutely asymptomatic, in contrast of B3-13 experiment.

High values of coefficient of variation determined in both experiments (87-103%) could be explained by natural infection of disease, although that one became highly endemic the last two years in Ferké sugar estates.

Similar values were reported in survey on major endemic diseases conducted in the same agro-ecology [15,21].

Table 1. SCSM disease incidence and severity on cane genotypes at 3 months regarding Ferké 1 experiments, Ivory Coast.

Ferké 1 Trial B3-13			Ferké 1 Trail B3-24		
Genotypes	% Incidence	Severity	Genotypes	% Incidence	Severity
M2593-92	30.9 bcd	0.6 b	M2593/92	21.0	0.2
RCI10/164	8.1 d	0.1 c	RCI11/1110	10.7	0.1
RCI11/163	7.5 d	0.1 c	RCI11/1111	10.4	0.1
RCI11/167	23.1 bcd	0.2 bc	RCI11/1112	24.6	0.3
RCI11/168	28.4 bcd	0.3 bc	RCI11/1113	13.9	0.1
RCI11/169	17.8 bcd	0.3 bc	RCI11/1114	10.0	0.1
RCI11/170	2.4 d	0.0 c	RCI12/1115	10.5	0.1
RCI13/172	44.8 bc	0.5 bc	RCI12/1116	0.0	0.0
RCI13/175	15.5 cd	0.3 bc	RCI13/1117	9.3	0.1
RCI13/176	34.3 bcd	0.4 bc	RCI13/1118	21.2	0.2
RCI13/178	70.7 a	1.1 a	RCI13/1119	7.1	0.1
RCI13/181	18.6 bcd	0.2 bc	RCI13/1120	14.6	0.2
RCI13/182	48.5 b	0.6 b	RCI13/1121	1.8	0.0
RCI13/183	4.6 d	0.1 c	RCI13/1122	21.9	0.2
RCI13/184	6.1 d	0.1 c	RCI13/1123	3.7	0.0
RCI13/185	26.7 bcd	0.4 bc	RCI13/1124	5.9	0.1
RCI13/186	30.5 bcd	0.4 bc	RCI13/197	7.2	0.1
RCI14/158	2.8 d	0.1 c	RCI13/198	18.9	0.2
RCI14/160	23.1 bcd	0.4 bc	RCI14/1100	14.3	0.1
RCI14/161	8.1 d	0.1 c	RCI14/1101	3.4	0.1
			RCI14/1102	17.7	0.2
			RCI14/1103	28.2	0.3
			RCI14/1104	14.5	0.2
			RCI14/1105	3.3	0.0
			RCI14/1106	16.1	0.2
			RCI14/1107	9.4	0.1
			RCI14/1108	9.2	0.1
			RCI14/1109	2.8	0.0
			RCI14/1125	34.4	0.3
			RCI14/199	10.3	0.1
Replications	ns	ns		**	**
Genotypes	***	***		ns	ns
Mean	22.6	0.3		12.5	0.1
CV (%)	87.2	91.6		102.9	101.6
SD	19.7	0.3		12.9	0.1

3.3 Cane genotypes as affected by SCSM disease at three months in Ferké 2 experiments

Highly significant differences (P<0.1) in disease incidence and severity within cane genotypes were observed in all three Ferké 2 experiments (Table 2). However, genotypes in P3-61 and V4-43 experiments were much less infected with average values of incidence of 12.1 and 9.9% compared to 16% in V8-01 experiment, respectively. Moreover, five of them, namely RCI13/145, RCI14/157, RCI12/192, RCI13/187 and RCI14/159 remained absolutely asymptomatic, in contrast of V8-01 experiment.

Similarly, to both Ferké 1 experiments, high values of coefficient of variation determined in both experiments (95-132%) could be explained by natural infection of disease, although that one became highly endemic the last two years in Ferké sugar estates.

Table 2. SCSM disease incidence and severity on cane genotypes at 3 months regarding Ferké 2 experiments, Ivory Coast.

Ferké 2 Trial P3-61			Ferké 2 Trial V4-43			Ferké 2 Trial V8-01		
Genotypes	Incid.(%)	Severity	Genotypes	Incid.(%)	Severity	Genotypes	Incid.(%)	Severity
M2593/92	6.5 b	0.1 ab	M2593/92	15.8bcde	0.3 abc	R579	14.6 bc	0.2 ab
RCI12/149	20.5 ab	0.3 ab	RCI11/112	7.2 cde	0.1 c	RCI11/1128	23.8 bc	0.2 ab
RCI13/138	7.4 b	0.1 ab	RCI11/134	9.6 cde	0.2 bc	RCI11/1129	13.4 bc	0.2 ab
RCI13/140	13.6 ab	0.3 ab	RCI11/135	3.3 e	0.0 c	RCI11/1146	17.9 bc	0.2 ab
RCI13/141	17.2 ab	0.3 ab	RCI11/162	5.9 cde	0.1 c	RCI12/1130	21.7 bc	0.2 ab
RCI13/142	8.9 ab	0.1 ab	RCI11/165	26.2abcd	0.4 abc	RCI13/1131	23.2 bc	0.2 ab
RCI13/143	22.7 ab	0.4 ab	RCI11/166	11.3 cde	0.2 bc	RCI13/1132	1.9 c	0.0 b
RCI13/144	5.8 b	0.1 ab	RCI11/190	26.5 abc	0.4 abc	RCI13/1133	52.6 a	0.5 a
RCI13/145	0.0 ab	0.0 b	RCI12/191	7.4 cde	0.1 c	RCI13/1134	20.4 bc	0.2 ab
RCI13/150	22.4 ab	0.3 ab	RCI12/192	0.0 e	0.0 c	RCI13/1135	41.3 ab	0.4 ab
RCI13/151	3.9 b	0.0 b	RCI13/110	5.2 cde	0.1 c	RCI13/1136	1.8 c	0.0 b
RCI13/152	13.1 ab	0.2 ab	RCI13/13	1.2 e	0.0 c	RCI13/1148	17.5 bc	0.2 ab
RCI13/153	1.8 b	0.0 b	RCI13/139	2.0 e	0.0 c	RCI14/1126	34.1 abc	0.4 ab
RCI14/146	36.0 a	0.6 ab	RCI13/16	3.3 e	0.0 c	RCI14/1127	10.4 bc	0.1 b
RCI14/147	1.7 b	0.0 b	RCI13/173	2.1 e	0.0 c	RCI14/1137	7.9 c	0.0 b
RCI14/148	29.6 ab	0.4 ab	RCI13/174	13.4 cde	0.1 c	RCI14/1138	7.0 c	0.1 b
RCI14/154	5.3 b	0.1 ab	RCI13/177	35.6 a	0.5 a	RCI14/1139	5.3 c	0.1 b
RCI14/155	18.7 ab	0.4 ab	RCI13/179	33.1 ab	0.6 a	RCI14/1140	4.2 c	0.0 b
RCI14/156	7.0 b	0.1 ab	RCI13/180	26.7 abc	0.6 a	RCI14/1141	5.2 c	0.1 b
RCI14/157	0.0 b	0.0 b	RCI13/187	0.0 e	0.0 c	RCI14/1142	5.8 c	0.1 b
			RCI13/193	5.5 cde	0.1 c	RCI14/1143	16.0 bc	0.2 ab
			RCI13/194	2.0 e	0.0 c	RCI14/1144	21.3 bc	0.4 ab
			RCI13/195	7.8 cde	0.1 c	RCI14/1145	8.4 c	0.1 b
			RCI13/196	9.8 cde	0.2 bc	RCI14/1147	9.6 bc	0.1 b
			RCI14/111	9.2 cde	0.2 bc			
			RCI14/128	0.9 e	0.0 c			
			RCI14/159	0.0 e	0.0 c			
			RCI14/171	13.4 cde	0.2 bc			
			RCI14/188	4.1 de	0.0 c			
			RCI14/189	8.7 cde	0.1 c			
Replications	ns	ns		ns	ns		ns	ns
Genotypes	**	*		***	***		***	***
Mean	12.1	0.2		9.9	0.2		16.0	0.2
CV (%)	107.3	117.4		118.5	131.8		95.5	95.0
SD	13.0	0.2		11.7	0.2		15.3	0.2

3.4 Cane genotypes resistance or susceptibility to SCSM disease at three months

Higher percentage of disease resistant genotypes were observed in V4-43 and P3-61 experiments conducted in Ferké 2 with 72 and 52%, respectively (Fig. 2). The lowest percentage of resistant genotypes was observed in B3-13 experiment conducted in Ferké 1, with 37%. Highly susceptible genotypes were observed in B3-13 and V8-01 experiments carried out in Ferké 1 and Ferké 2, respectively, with 16 and 9% of genotypes tested. Among all genotypes tested (N=119), 50.4% were resistant, 22.7% moderately resistant, 22.7% susceptible and 4.2% highly susceptible (Fig. 3). About 5% of genotypes were absolutely asymptomatic and therefore supposed to be highly resistant, namely RCI12/1116, RCI13/145, RCI14/157, RCI12/192, RCI13/187 and RCI14/159 (Table 3). Their agronomic performances will be carefully checked across the selection process, as resistance to SCSMV became recently a top-ranking criterion followed by sugar yield in Ferké sugar estates agro-ecology. Five genotypes, namely RCI13/172, RCI13/182, RCI13/178 RCI13/1135 and RCI13/1133, found highly susceptible alongside with susceptible and moderately resistant ones will therefore be eliminated in first ratoon after harvest for the advanced selection stage irrespective of their sugar yield performances and other agro-morphological traits like erect and self-defoliating stalks for easy mechanized green harvesting.

Symptom observations in this study were made at three or four months, therefore at early grand growth stage of sugarcane where infection could be recognized visually without any virus detection equipment like ELISA test or RT-PCR (Reverse Transcription - Polymerase Chain Reaction). However, observations made later at that growth stage (5-9 months) and the formative growth stage (10-12 months) showed much higher values of disease severity ranging from 2 to 3 (-) on susceptible genotypes compared with 0.1 to 0.5 (-) determined at early grand growth stage. That is why our suggestion would be to make observations at 5-7 months, where sugarcane fields are still accessible for growth measurements and disease control.

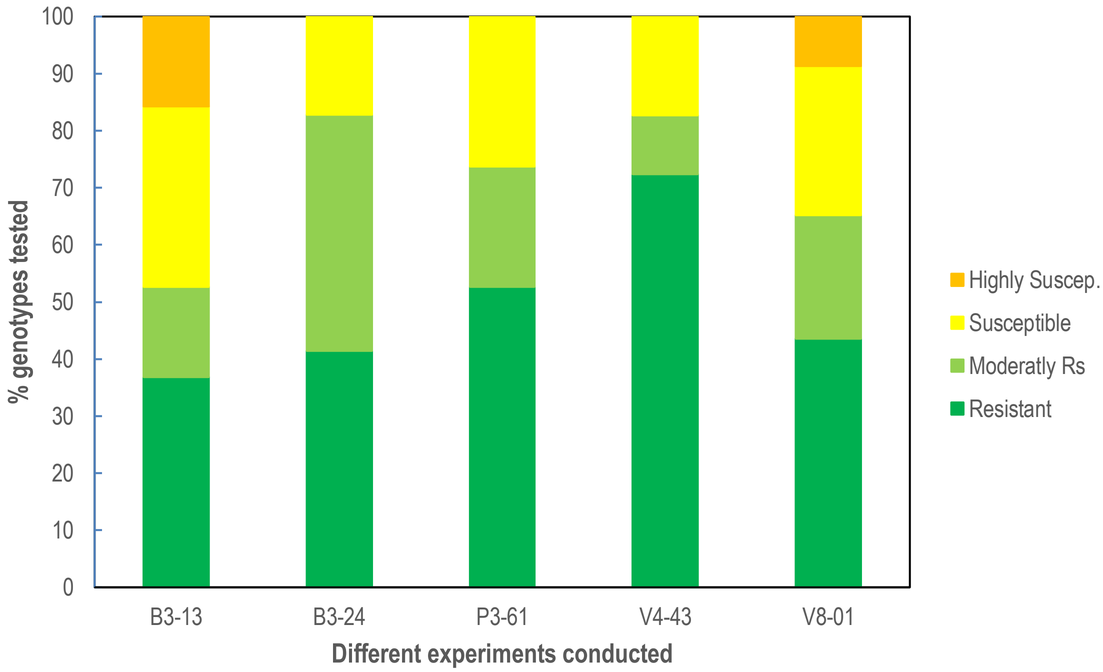

Figure 2. Sugarcane genotype resistance or susceptibility to SCSM disease at 3-4 months across experiments carried out in plant crop at Ferké Sugar estates, Ivory Coast.

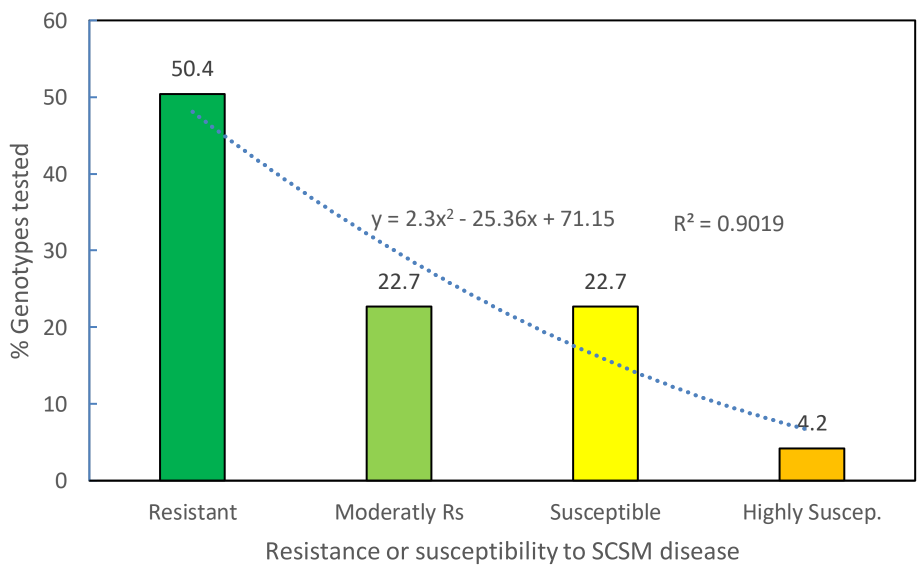

Figure 3. Percentage of genotype resistance or susceptibility to SCSM disease at early selection stage at Ferké sugar estates, Ivory Coast.

Table 3. Resistant and highly susceptible cane genotypes to natural infection of SCSM disease at Ferké sugar estates, Ivory Coast.

Field experiments	Cane genotypes	
	Resistant	Highly susceptible
B3-13/Ferké 1	RCI11/170 ; RCI14/158 RCI13/183 ; RCI13/184 RCI11/163 ; RCI14/161 ; RCI10/164	RCI13/172 ; RCI13/182 ; RCI13/178
B3-24/Ferké 1	RCI12/1116* ; RCI13/1121 RCI14/1109 ; RCI14/1105 ; RCI14/1101 ; RCI13/1123 ; RCI13/1124 ; RCI13/1119 ; RCI13/197 ; RCI14/1108 ; RCI13/1117 ; RCI14/1107	-
P3-61/Ferké 2	RCI13/145* ; RCI14/157* ; RCI14/147 ; RCI13/153 ; RCI13/151 ; RCI14/154 ; RCI13/144 ; RCI14/156 ; RCI13/138 ; RCI13/142	-
V4-43/Ferké 2	RCI12/192* ; RCI13/187* ; RCI14/159*; RCI14/128 ; RCI13/13 ; RCI13/194 ; RCI13/139 ; RCI13/173 ; RCI11/135 - RCI13/16 ; RCI14/188 ; RCI13/110 ; RCI13/193 ; RCI11/162 ; RCI11/112 ; RCI12/191 ; RCI13/195 ; RCI14/189 ; RCI14/111 ; RCI11/134 ; RCI13/196	-
V8-01/Ferké 2	RCI13/1136 ; RCI13/1132 ; RCI14/1140 ; RCI14/1141 ; RCI14/1139 ; RCI14/1142 ; RCI14/1138 ; RCI14/1137 ; RCI14/1145 ; RCI14/1147	RCI13/1135 ; RCI13/1133

* : asymptomatic genotypes (n=6)

3.5 Disease epidemiology

Some weed species like *Rottboellia exaltata* L, *Dactyloctenium aegyptium*, *Imperata cilyndrica, Pennisetum pupureum, Paspalum* spp., *Bracharia moliniformis* and *Panucum repens*, as well as cereal crops like maize (*Zea mays* L) and sorghum (*Sorghum bicolor*) are respectively highly endemic and commonly cultivated across Ivorian sugar estates. Several investigators reported that they are host plants for SCSMV [12,22].

Although investigations were made on suspected insect vectors of the disease like *Ceratovacum lanigera* Zeh., *Rhopalosiphum maydis*, *Saccharicocus sacchari* Cock. and *Melanaphis sacchari* Zeh. (a sugarcane aphid) [11,21,23-24], no evidence of disease transmission from a vector was made to our knowledge.

Under Ivorian filed conditions, two insect species (*Locris rubra* and L. *maculate*) were suspected as possible SCSMV vectors. They were frequently observed on susceptible varieties namely R579, SP81-3250, and R570.

Beside them, numerous possible vectors used to be observed on leaves of susceptible varieties such as *Zonecerus variegatus*, *Paracinema tricolor*, *Stenohippus aequus*, *Oxya hyla* and *Conocephalus longipennis*. In addition to the fact SCSMV is spread very fast, similarly to the case of rice yellow mottle virus, it could be hypothesized that a complex biocenosis of pests could be possible vectors of the disease.

SCSMV constitutes a great challenge for geneticists, breeders, pathologists, agronomists as well as cane growers, which is not eliminated by hot water treatment (HWT), in contrast of most economically important diseases in sugarcane frequent in sub-Saharan Africa and elsewhere like leaf scald (*Xanthomonas albinineans*), smut (*Sporisorium scitamineum*), yellow leaf disease (SCYLD), orange rust (*Puccinia kuehnii*), RSD (*Leifsonia xyli* subsp. Xyli), and brown rust (*Puccinia melanocephala*). Other challenges lie in the fact that no insect vector of SCSMV is formally identified yet, its transmission mechanism from vector to crop being still unknown and it spreads very fast across sugarcane fields and varieties, with significant yield reduction as reported in Brazil, Indonesia and Ivory Coast [3,15,25]. Prophylactic measures based on agricultural practices regarding sanitation of planting and harvesting tools or machinery as well as search for resistant cane varieties must be given a top priority. In this regard, sugarcane selection starting from true seed under way since 2014-15 in Ivory Coast, and much earlier in Senegal and Central African countries Cameroon, Tchad and Congo in collaboration with R&D institutes like eRcane (Reunion Island) and MSIRI (Mauritius) constitutes a great opportunity to broaden the genetic diversity of plant material to be tested in line of SCSMV thread.

4. Conclusions

Highly significant differences in disease incidence and severity within cane genotypes tested were observed which shows their genetic diversity regarding crop resistance or susceptibility to SCSMV. Fifty percent of genotypes tested were found tolerant to that disease, 23% moderately resistant as well as susceptible, 4% highly susceptible and 5% asymptomatic or supposed to be highly resistant. At the end of the current selection stage under way, i.e. after first ratoon harvest, only the best yielding genotypes among the resistant ones will undergo the advanced selection stage.

5. References

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