

PATHOLOGY RESEARCH

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Pathology research addresses the important diseases affecting sugarcane in Louisiana. The overall program goal is to provide farmers with practices to minimize losses to diseases in a cost-effective manner. Projects during 2022 included screening for resistance to multiple diseases; association and validation of molecular markers for resistance to leaf scald, mosaic, brown rust, and smut; providing support for healthy seedcane programs to manage systemic diseases; and billet planting. Research results on molecular marker development and billet planting are reported separately.

Evaluating Disease Resistance in the Variety Selection Program

Resistance to smut and leaf scald were evaluated for experimental varieties in the variety selection program in an annual inoculated test at the Sugar Research Station. A range of resistance to smut was detected among the experimental varieties (Table 1). Two of 17 (12%) 2019 series and 6 of 19 (32%) 2020 series experimental varieties were rated as highly susceptible. The leaf scald inoculation resulted in the extensive development of systemic infection symptoms and the assignment of susceptible ratings (Table 2). Twelve of 17 2019 series (71%) and 10 of 19 2020 series experimental varieties were rated as highly susceptible to leaf scald.

Healthy Seedcane Program Support

Disease testing was conducted by the Sugarcane Disease Detection Lab for the 27th year during 2022. Kleentek and SugarTech tissue culture seedcane production was monitored for ratoon stunting disease (RSD), and no disease was detected. A total of 1,800 stalk samples from research farms, variety increase plots, and grower fields were tested for RSD with no positives detected. The Local Quarantine supplied healthy plant material of active experimental varieties from the 2018 series to the two seedcane companies to establish Foundation Stock plants that will provide apical meristems for tissue culture. Limited testing was conducted on commercial farms, and no RSD was detected in 23 sampled fields (Table 2). A total of 8,926 leaf samples were tested for Sugarcane yellow leaf virus as part of the LDAF Sugarcane Seed Certification Program (Table 3). Three fields exceeded the 10% detection limit and failed to certify due to virus infection.

Table 1. Smut resistance ratings determined in an inoculated test for commercial check and experimental sugarcane varieties during 2022.

Variety	Rating (Percent smut)	Variety	Rating
CP 73-351	9 (60)	HoCP 19-949	3 (5)
CP 89-846	4 (1)	HoCP 19-956	6 (29)
HoCP 96-540	2 (1)	HoCP 19-957	3 (8)
L 01-299	7 (31)	HoCP 19-960	9 (59)
HoCP 09-804	3 (6)	HoCP 19-963	2 (2)
L 12-201	1 (0)	HoCP 19-964	5 (17)
Ho 12-615	1 (0)	L 20-27	1 (0)
Ho 13-739	1 (0)	L 20-28	7 (31)
L 14-267	1 (0)	L 20-29	9 (68)
HoCP 14-885	1 (0)	L 20-30	8 (42)
L 15-306	1 (0)	L 20-32	9 (53)
HoL 15-508	1 (0)	L 20-34	1 (0)
HoCP 17-701	2 (2)	L 20-37	1 (0)
Ho 17-738	5 (17)	L 20-40	1 (0)
L 19-006	3 (5)	L 20-46	2 (4)
L 19-021	1 (0)	L 20-49	3 (5)
L 19-486	1 (0)	L 20-52	5 (18)
HoCP 19-900	3 (8)	L 20-55	6 (23)
HoCP 19-903	2 (3)	L 20-57	1 (0)
HoCP 19-907	5 (18)	L 20-59	9 (77)
HoCP 19-915	1 (0)	L 20-61	1 (0)
HoCP 19-929	7 (36)	L 20-62	9 (51)
HoCP 19-932	1 (0)	L 20-63	1 (0)
HoCP 19-938	1 (0)	L 20-65	4 (12)
HoCP 19-947	3 (8)	L 20-68	2 (3)

Resistance ratings assigned on a 1-9 scale in which 1-3 = resistant, 4-6 = moderately susceptible, and 7-9 = highly susceptible.

Table 2. Leaf scald resistance ratings determined in an inoculated test for commercial check and experimental sugarcane varieties during 2022.

Variety	Rating	Variety	Rating
CP 73-351	9	HoCP 19-949	7
CP 89-846	7	HoCP 19-956	9
HoCP 96-540	6	HoCP 19-957	6
L 01-299	8	HoCP 19-960	6
HoCP 09-804	7	HoCP 19-963	8
L 12-201	4	HoCP 19-964	7
Ho 12-615	7	L 20-27	8
Ho 13-739	7	L 20-28	8
L 14-267	5	L 20-29	3
HoCP 14-885	8	L 20-30	8
L 15-306	4	L 20-32	6
HoL 15-508	8	L 20-34	8
HoCP 17-701	8	L 20-37	7
Ho 17-738	8	L 20-40	5
L 19-006	7	L 20-46	9
L 19-021	8	L 20-49	5
L 19-486	3	L 20-52	3
HoCP 19-900	8	L 20-55	6
HoCP 19-903	9	L 20-57	4
HoCP 19-907	7	L 20-59	4
HoCP 19-915	4	L 20-61	8
HoCP 19-929	8	L 20-62	7
HoCP 19-932	3	L 20-63	8
HoCP 19-938	9	L 20-65	8
HoCP 19-947	7	L 20-68	9

Resistance ratings assigned on a 3-9 scale in which 3-4 = resistant, 5-6 = moderately susceptible, and 7-9 = highly susceptible.