

SUGARCANE PATHOLOGY RESEARCH - 2025

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Our program mainly focus on management of sugarcane diseases, by supporting breeding program efforts, testing for diseases for local growers, and evaluating management strategies in field and greenhouse settings. For the 2025 season, we have conducted studies on the cause of brown stripe disease in Louisiana, investigated possible causes for spring damping off outbreaks in fields cut for seed, tested red rot management under field conditions, tested commercial fields for mosaic, yellow leaf, ratoon stunt disease, and leaf scald, and evaluated the susceptibility of varieties and accessions for the breeding program against leaf scald and smut.

Etiology of brown stripe disease in Louisiana – what is the cause?

Brown stripe symptomatic leaves were collected from affected fields of variety L01-299, brought to the laboratory, surface disinfested and grown in water agar plates. Several culture media were tested to induce pathogen sporulation for morphological identification and fulfillment of Koch's postulates – isolation, inoculation, typical brown stripe symptom expression, reisolation, and confirmation of the species. DNA amplification of three genes (ITS, TEF-1, and GAPDH genes) was performed, and a multilocus phylogeny is being constructed with the help of Dr. Vinson Doyle. Preliminary data indicates that brown stripe in Louisiana is caused by *Bipolaris setariae*. Management strategies to control brown stripe will be tested in the greenhouse in 2026.

Spring damping off outbreaks

In recent years, fields cut for seed cane in August are being afflicted with spring damping off, a condition that impairs regrowth in the spring after the annual winter freezes. In order to better understand this phenomenon that often leads to replanting of fields, our team collected samples and attempted pathogen and nematode isolations in collaboration with Dr. Raj Singh and Dr. Vinson Doyle. We noticed that flooded areas and areas with high nematode infestations and *Phytophthora* sp. presence had severe damping off outbreaks. A greenhouse trial confirmed that the association of lesion nematode (*Pratylenchus* sp.) and *Phytophthora* sp. lead to increased disease severity, and that water saturation and *Phytophthora* sp. presence also lead to high disease severity. DNA sequencing of the COI gene of the *Phytophthora* sp. isolates showed that the prevalent species was *P. personensis*. Further studies are needed to confirm that these soilborne pathogens are the main cause for the damping off outbreaks, but our data suggests that their presence exacerbates damping off-related losses.

Red rot management under field conditions

Every year, our program tests at-planting alternatives to manage red rot. In this trial, most treatments were repeated in whole stalk and billet planting (Table 1). Whole stalk-planted treatments were the highest yielding treatments. Revytek led to increased yields in billet-planting treatments, and no fungicides among whole stalk treatments led to significantly higher yields. In 2026, alternative management approaches will be evaluated, such as the use of salicylic acid at planting.

Breeding Program Support and Disease Survey in Commercial Sugarcane Fields

Seventy-two accessions and varieties nearing release were rated in the 2024-25 season in St Gabriel, LA. Over 66% of the assessed varieties (48 varieties) were rated as resistant or moderately resistant to leaf scald, and over 83% (60 varieties) were rated as resistant to smut, showing that disease resistance is being carried through the breeding program. A survey was conducted to assess the incidence of systemic diseases in commercial sugarcane fields in Louisiana. Our team, in collaboration with Dr. Flasco's team, tested sugarcane samples for leaf scald, ratoon stunt disease, mosaic, and yellow leaf disease. 30 commercial fields were sampled, across 11 sugarcane-producing parishes in Louisiana. Our results indicate that none of the fields were affected by ratoon stunt disease, and only 2 out of the 30 fields (less than 10%) were affected by leaf scald. Yellow leaf disease was widespread in the industry, with only 2 out of the 30 (6.7%) fields not being affected by the disease. Mosaic was present in some fields, with low incidence in only 5 of the 30 fields surveyed. This survey will be repeated this year.

Table 1: Description of treatments and associated abbreviations evaluated during the 2024-2025 sugarcane season in field trials conducted at the Sugar Research Station in Saint Gabriel, Louisiana.

Treatment and rate per acre, if applicable	Abbreviation
Nontreated Control - Billets	NTCBillets
Nontreated Control Whole Stalk	NTCWholeStalk
Platinum 5.7 oz/A + Quilt Xcel 20 oz/A billets	QuiltPlatinumBillets
Quilt Xcel 20 oz/A billets	QuiltXcelBillets
Quilt Xcel 20 oz/A Whole Stalk	QuiltXcelWS
Revytek 12- Whole Stalks	RevytekWS
Revytek 12 - Billets	RevytekBillets
Veltyma 10 - Whole Stalks	VeltymaWS
Veltyma 10 - Billets	VeltymaBillets
Priaxor 9 - Whole Stalks	PriaxorWS
Priaxor 9 - Billets	PriaxorBillets
Revylok 6.5 - Whole Stalks	RevylokWS
Revylok 6.5 - Billets	RevylokBillets

Boxplot of Sugar per Acre by Treatment

