

MANAGING BROWN RUST IN SUGARCANE

Grow Resistant Varieties

This is the primary brown rust disease control measure. However, some current varieties are susceptible, so it may be difficult to cultivate only resistant varieties. The resistance ratings of the current varieties are as follows:

Brown rust ratings for Louisiana sugarcane varieties

Variety	Brown Rust Rating
HoCP 96-540	Highly susceptible
HoCP 00-950	Moderately resistant
L 01-283	Highly susceptible
L 01-299	Resistant
HoCP 04-838	Resistant
Ho 07-613	Moderately resistant
HoCP 09-804	Susceptible
L 11-183	Moderately susceptible
L 12-201	Moderately resistant
Ho 12-615	Resistant
Ho 13-739	Moderately susceptible
L 14-267	Resistant
HoCP 14-885	Resistant

Diversify Varieties Under Cultivation

Extensive cultivation of rust-susceptible varieties leads to more severe rust outbreaks and can adversely affect the durability of the resistant varieties. The adaptability of the brown rust pathogen that allows it to overcome varietal resistance makes this disease difficult to control. Growing a mix of varieties on the farm may increase the longevity of the resistant varieties.

Avoid Excess Fertility

Do not exceed recommended nitrogen, phosphorus, and sulfur fertilization rates. High levels of these nutrients contribute to more severe brown rust disease development. Fertilization should be based on soil test results. Brown rust occurs first in the most-advanced, vigorously growing cane during the spring. Rust usually develops first in plant cane of susceptible varieties. Disease severity tends to be higher in cane growing on light-textured soils.

Remove Above-ground Green Leaf Material During Winter

Shredding during winter to remove green leaf material will act like a freeze and destroy rust overwintering in the living leaf tissue. However, it also can reduce crop growth potential. Rust spores can be spread by wind from neighboring fields to initiate disease, so shredding single fields may not delay rust development long. Cane should not be shredded during winter unless

the growing point of shoots has been killed by a freeze. Shredding during spring is never recommended.

Apply Fungicide to Manage Brown Rust

Brown rust can reduce cane yield by 3-8 tons, depending on the length of time rust is affecting the cane. Well-timed applications of fungicide can prevent this loss. During 2021, six fungicides, Headline, Priaxor, Revytek, Veltyma, Quilt Xcel, and Trivapro, will be available for brown rust control. All options contain a strobilurin, the fungicide type that generally provides the best control of brown rust. Headline is a strobilurin fungicide, whereas the others contain multiple fungicides with different modes of action. Priaxor also contains a carboxamide fungicide; Quilt Xcel and Veltyma also contain a triazole fungicide; and Revytek and Trivapro also contain both a carboxamide and a triazole. The fungicide mixtures will provide good control with less chance of resistance build-up in the pathogen. The available options and suggested rates are shown in the table below. All can be expected provide good brown rust control. The manufacturers have recommended applying the products at the low end of the rate range. In experiments conducted in Louisiana, the lowest rate of Headline has been effective. Priaxor and Quilt Xcel have more often been applied at higher rates. When brown rust does not appear until the end of April or the beginning of May, a single banded application may be all that is needed. In this case, using a higher rate will provide better control and a longer residual. Using a higher rate can be cost effective in this situation. It is important to know when to apply a fungicide. Conditions under which fungicide should be applied to minimize yield loss due to brown rust are provided in the next section below.

Fungicide options recommended for brown rust management during 2021.

Fungicide	Rate range (oz. formulated product per acre)
Headline (BASF)	9-12
Priaxor (BASF)	5-7.5
Revytek (BASF)	8-12
Veltyma (BASF)	7-10
Quilt Xcel (Syngenta) or generic	16-20
Trivapro (Syngenta)	13.7

Conditions Likely to Result in a Brown Rust Outbreak Requiring Fungicide Application

- Susceptible or highly susceptible variety is under cultivation.
- Various factors result in early, vigorous plant growth.
 - Plant cane (develops rust before stubble crops)
 - Light-textured soil
 - High fertility
 - Lack of freezes during preceding winter sufficient to kill all above-ground growth
- Rust infection is evident on older leaves and beginning on younger leaves of plants with most advanced growth. These plants may be along a tree line or ditch bank.
- Rust infection becomes evident from late March until early June. Infection will not become severe until night temperatures reach the mid-60s. The earlier the disease begins

during the season and longer it lasts, the more yield loss it will cause, and the more economic benefit will result from fungicide application.

Fungicide Application Recommendations

It is important to consult the label for each product when making an application. During spring, application of fungicide on a 36-inch band will protect the young leaves and provide good rust control with reduced cost. Once the crop canopy extends to the row middle, a broadcast application will be needed. Fungicide should be applied in at least 15 gallons of water per acre with a surfactant for good coverage of leaves. Good coverage is essential. The labeled fungicides will work best when applied before extensive development of severe rust symptoms on young leaves. Fungicide will only protect against brown rust infection for 3-4 weeks. Therefore, rust epidemics beginning during March and April may require two fungicide applications. Brown rust severity diminishes naturally during summer, so application after early to mid-June will probably not provide a positive economic return.

General Brown Rust Information

Brown rust of sugarcane is caused by a fungus, *Puccinia melanocephala*. Severe disease can occur during spring and early summer in Louisiana. Windblown spores of the pathogen infect leaves. After the fungus colonizes the leaf tissues, reddish-brown lesions develop. Pustules containing reddish-brown spores erupt from the underside of leaves. The newly produced spores are then dispersed to cause more infection. Spores of the brown rust pathogen are not long-lived, and the organism can only live in green leaf tissue. Severe winters can therefore reduce rust severity during the following growing season. Mild winters and warm spring temperatures will result in severe epidemics in susceptible sugarcane varieties. Extensive brown rust development on young leaves will reduce photosynthesis and plant growth. The amount of yield loss is related to the length of time extensive rust is present on the young leaves. During this stage of the disease, affected fields appear reddish-brown when viewed from a distance.