

### Air Pressure Incorporation of Fungicides into Short Stalk Sections of Sugarcane for the Control of Red Rot

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In Louisiana, sugarcane is planted with seed pieces consisting of whole or half stalks ranging in length from 90 to 180 cm. The use of shorter seed pieces (stalk sections 20 to 40 cm long having two or three buds) would allow more advantageous use of mechanical planters and result in reduced cost of seed cane as well as labor. However, short seed pieces deteriorate more rapidly under Louisiana conditions. One of the principal causes of seed piece deterioration is the red rot fungus *Colletotrichum falcatum* Went (2, 3). The red rot fungus may be present as semi-dormant mycelium in the tissue at planting, or as spores on the surface of the seed pieces (3). Since most sugarcane is planted during September and October in Louisiana, seed pieces remain in a more or less inactive condition during the winter and early spring, and if conditions are favorable during this time of year the fungus invades the nodes and internodal tissue killing many of the buds and destroying stored material (3, 4). The most important loss results from low yield due to poor stands which are carried through one plant cane and two stubble crops. This paper describes a method of reducing deterioration of short seed pieces by treating 3-bud sections of sugarcane stalks with fungicides suspended in water under an air pressure of 10 psi for 15 min. Results of a part of this work were presented in an abstract (1).

Seed pieces of Co. 290, very susceptible to red rot, were cut into segments of three buds each, tied into bundles of six segments, and immersed for 15 min in 10 liters of a fungicide suspension or water (for controls) at 0 and 10 psi. The fungicide treatments used

consist of a mixture of Captan (*N*-trichloromethylmercapto-4-cyclohexene-1:2-dicarboximide), and PCNB (pentachloronitrobenzene); and Benlate (methyl 1 [butylcarbamoyl]-2-benzimidazolecarbamate) with Dupont's surfactant F. The pressure tank was made by welding an air inlet valve in place of a pump opening on a stainless steel, 10 liter Hudson sprayer. Seed pieces were allowed to dry for 6-10 hr after treatment before inoculations. The nontreated and fungicide-treated seed pieces were inoculated just prior to planting in field plots each consisting of a row 1 m long. Inoculum consisted of a spore suspension of *C. falcatum* grown on oat agar plates at 25 C for 6-12 days. The spore suspension was adjusted to approximately 30 conidia per 100 times power microscope field.

Inoculations were made by two methods: 1) by pouring 300 ml of inoculum over the seed pieces and soil before planting; and 2) putting 0.5 ml of inoculum into a hole made by removing a plug from the center of two internodes of each seed piece and replacing the plug so that the inoculum was contained within the seed piece. Data were taken at the end of the growing season on weight of mature stalks in each plot. Data of two (Benlate) and six (Captan + PCNB) experiments performed in 2 (Benlate) and 4 (Captan + PCNB) seasons (1966-1969) are combined.

In the first series of tests where inoculum was poured over the seed piece, stalk weight per plot was higher in plots planted with seed pieces treated with Captan (100 ppm)-PCNB (100 ppm) mixture and with 200 and 400 ppm of Benlate under added pressure than comparable treatments at atmospheric pressure (Table 1). The Captan-PCNB mixture was phytotoxic to seed pieces when used at the 200 ppm rate. Benlate was ineffective at the 100 ppm level.

When inoculum was placed within the seed piece without coming in direct contact with the surface-treated area, Captan-PCNB treatments did not appreciably increase stalk weight in any of the tests. However, stalk weight was higher when Benlate was applied under pressure at 100 and 200 ppm and reduced by phytotoxicity at 400 ppm. A yield increase

TABLE 1. Average total stalk weight in lb./plot in plots maintained under 0 or 10 psi for 15 min during treatment

Treatments			No. of test	Average stalk weight in total lb./plot	
Chemicals	psi	ppm		On surface of seed pieces and soil	Inside seed pieces
Captan + PCNB	10	100	6	51	10
		200	5	42	13
	0	100	6	32	14
		200	5	29	11
Benlate	10	100	4	48	21
		200	4	56	28
		400	2	59	2
	0	100	4	16	13
		200	4	36	16
		400	2	37	1
Water	10		6	37	8
	0		6	41	4

was obtained with Benlate at 200 ppm 0-pressure treatments. Since the inoculum was placed within the seed piece and did not come in direct contact with the fungicide on the surface of the stalk immediately after treatment, control by Benlate in the 0-pressure test may be due to systemic action.

Sugarcane seed pieces treated with fungicides under air pressure made normal growth and the fungicides were more effective in controlling red rot when applied under a pressure of 10 psi than under normal atmospheric pressure.

## LITERATURE CITED

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