"BENLATE" Control of Sclerotinia Stem Rot in Canola

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Stem rot is caused by the fungal pathogen Sclerotinia sclerotiorum and can cause a dramatic reduction in yield, seed quality and marketability of Canola.

The fungus overwinters in the soil in hard, black, grain-sized bodies called sclerotia which can infect plants in two ways. They can germinate to produce a mycelium that spreads across moist soil and can infect neighboring plants if they are only a short distance away. Infection then begins at the base of the plant and moves upward.

More commonly, the sclerotia may germinate to produce sexual structures - the apothecia which contain millions of spores. These apothecia tend to be formed later in the season from late June to mid July - usually at the time of flowering in rapeseed. At maturity, the mushroom shaped apothecia explode and release spores into the plant canopy which are disseminated by wind, pollen or insects to host plants. Infection is most likely to occur in a lush, dense canopy under warm moist growing conditions when the fungus invades the leaf axils. Soon, the axils take on a bleached or haloed discoloration until the entire stem becomes bleached and frayed.

Diseased plants can be readily identified in the field because of the straw colored appearance of the pods. These tend to be extremely brittle and shatter easily on swathing. Often the pods contain no seed which accounts for the yield reduction induced by the disease.

The sclerotia are formed in the stems of infected plants. During combining they are either harvested with the seed in which case they become dockage or they are thrashed out the back of the combine in which case they provide innoculum in the soil for further infection.

Prior test work co-ordinated by Dr. John Dueck of CDA Saskatoon, generated data to permit registration of "BENLATE" for use on Canola. 1981 marked the first season of large scale grower evaluation.

In the summer of 1981, Alberta Agriculture and Du Pont Canada were co-participants in large scale field trials in which "BENLATE" was aerially applied at 1 kg product/ha onto Canola. Each site was at least five acres in size and selected on the basis of the following critieria:

1) Whether the field had a past history of the disease.

2) Whether apothecia were present.

3) The existence of a lush dense crop canopy that is likely to be high yielding.

4) Whether environmental conditions were moist prior to flowering.

All sites were to be sprayed at the 20% bloom stage of the crop. However, the Altex sites were sprayed mostly at the 20-30% bloom stage while the Candle sites were sprayed closer to the 30-50% bloom stage.

The following tables summarize the results.

Table 1

Sclerotinia Stem Rot Control; Altex

Alberta 1981

	% PLANTS DISEASED		YIELD BU/ACRE		YIELD
	Benlate	Untreated	Benlate	Untreated	Increase
Neerlandia	6	72	40	14	26
New Norway	3	56	54	29	25
Legal	3	29	38	35	3
Pibrock	7	70	29	18	11
Westlock	11	75	37	20	17
Wetaskiwin	7	27	51	43	8

Table 2

Sclerotinia Stem Rot Control; Candle

Alberta 1981

	% PLANTS DISEASED		YIELD BU/ACRE	
	Benlate	Untreated	Benlate	Untreated
Westlock	2	18	36	40
Blackfalds	4	23	32	35
Thorsby	0.4	15	26	32
Stoney Plain	3.5	22	36	36

In Table 1, application of "BENLATE" at 1 kg/ha dramatically reduced the disease levels in Altex rapeseed. Untreated plants showed disease levels ranging from 29-75% while treated plants demonstrated low levels of infection, between 3 and 11%. The yield response was equally remarkable. All "BENLATE" treatments increased yield from 3 bu/acre at Legal, where the disease incidence was low to 26 bu/acre at Neerlandia where the disease level was relatively high. The average yield increase over all the locations was 15 bu/acre.

Candle rapeseed did not respond in the same way to "BENLATE" application as did Altex (Table 2). Whereas "BENLATE" did control the disease incidence in Candle fields, the control was not associated with a yield response. Certain sites demonstrated a slight yield reduction where "BENLATE" was applied. This result is statistically non-significant and should not be seen as a measure of phytoxicity on the part of "BENLATE". This somewhat anomalous result cannot be explained at this time. Observations made by the aerial applicator indicate that Candle was in a more advanced flowering and growth stage than was Altex, suggesting the ideal time for treatment of Candle had been missed. More work needs to be done to resolve this question. However, it is important to note that the disease levels in Candle were very low when compared to Altex. For that reason, the data suggests that a threshold exists where higher disease levels may be required before a yield response is obtained. Nevertheless, "BENLATE" application does reduce the severity of Sclerotinia Stem Rot in Canola and hence, prevent the formation of additional innoculum which would propagate the disease in successive years.