

Management of Clubroot (*Plasmodiophora brassicae*) with Non-Traditional Products

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Objective: To determine the effect of non-traditional products alone and in combination to manage clubroot on canola.

Methods: The following non-traditional products (OR-079-B, OR 009-A, OR-369-A and OR-329-H) were tested alone and in combination in a randomized complete block design (RCBD) with six replications under field conditions. The field had a natural soil population of *P. brassicae* of 5.5 million resting spores/g of soil. Treatments of non-traditional products and the fungicide Ranman® were applied in-furrow as soil drenches just before planting at the rate listed in Figure 1. A susceptible canola cultivar to clubroot ‘InVigor L233P’ was planted at a depth of one-half inch. The trial was planted the first week of June and was evaluated in the first week of August (exactly 60 days after planting) at growth stage BBCH-65. The trial was hand harvested the last week of August and yield data was calculated in lbs/a at 13.5% moisture.

Rating scale: A clubroot rating scale: 0 = no galling, 1 = a few small galls (small galls on less than 1/3 of roots), 2 = moderate galling (small to medium-sized galls on 1/3 to 2/3 of roots), 3 = severe galling (medium to large-sized galls on more than 2/3 of roots) was used for disease rating of incidence and severity. A Clubroot Disease Severity Index (DSI) has been calculated using the incidence and severity data of clubroot obtained.

Soil sampling to determine pH and resting spores: Soil samples were collected from all of the plots before application of soil treatments and on the day of clubroot evaluations to determine the effect of unit change in pH and their impact on clubroot control. Also to determine the resting spore population per gram of soil in the assigned treatment area.

Figure 1: Means of the Clubroot disease variables that were tested and their effect on the yield observed in various treatments of non-traditional products.

Treatment	Rate	Clubroot		Resting	Yield
		Incidence %	DSI %	spores (g/soil)	(lbs/A)
Non-Treated	Check	58.5	62	183,083	906
OR-079-B	4 pts/a	59.67	60	781,083	647
OR-079-B + OR-329-H	4 pts/a	57.67	60	306,666	1212
OR 009-A	4 pts/a	65.17	66	544,083	1023
OR-369-A	4 pts/a	84.8	62	190,333	569
RANMAN	20 fl. oz/a	50.67	53.3	532,500	807
	Mean	58	60.5	343,083	861
	P-Value(0.05)	NS	NS	NS	NS

Results: Statistically no significant differences were observed among the treatments for clubroot disease incidence, severity, DSI, resting spores per gram of soil or yield. Likewise, there were no differences observed in the soil pH (data not shown) from samples collected before application of treatments to those collected 60 days after application.

Acknowledgments: Funding from ORO Agri and the Northern Canola Growers Association. Thanks to all the product suppliers. Special thanks to Interns Jacob Kram (NDSU), Parker Rime, Brock Freer, Larissa Jennings and Iverson Peltier.