

2008-2010 S.M.A.R.T Canola Project (OSCIA Georgian Regional Soil & Crop Partner Grant)

Purpose:

A 3 year project was conducted to evaluate the benefits of managing canola more intensively with foliar application of boron alone and in combination with fungicide and insecticide on yield and seed quality.

Methods:

A total of 28 trials were conducted over 3 years; 11, 8, & 9 farm sites in 2010, 2009, & 2008 respectively. In each year 2 of the sites were located in northern Ontario. Each site included 2 replications of foliar treatments of boron; fungicide + boron, fungicide + boron + insecticide applied at 10 -30% flower stage. Fungicide and insecticide were applied at recommended labeled rate. Boron was applied with the other products at rate of 0.3 lb/ac (actual). Soil samples were collected prior to planting to measure soil boron. Plant tissue analysis was completed by collecting the uppermost open leaf at the beginning of flowering. The flowering stage of canola was noted prior to fungicide application.

2010 Results:

Growing conditions in 2010 were favorable for canola with cool temperatures and adequate rainfall, resulting in average to phenomenal canola yields. The average yield achieved by co-operators was an incredible 2,770 lb/acre! (3078 kg/ha). Table 1 presents a summary of the treatment response across the sites.

Table 1. 2010 Yield Results from SMART Treatments in Canola

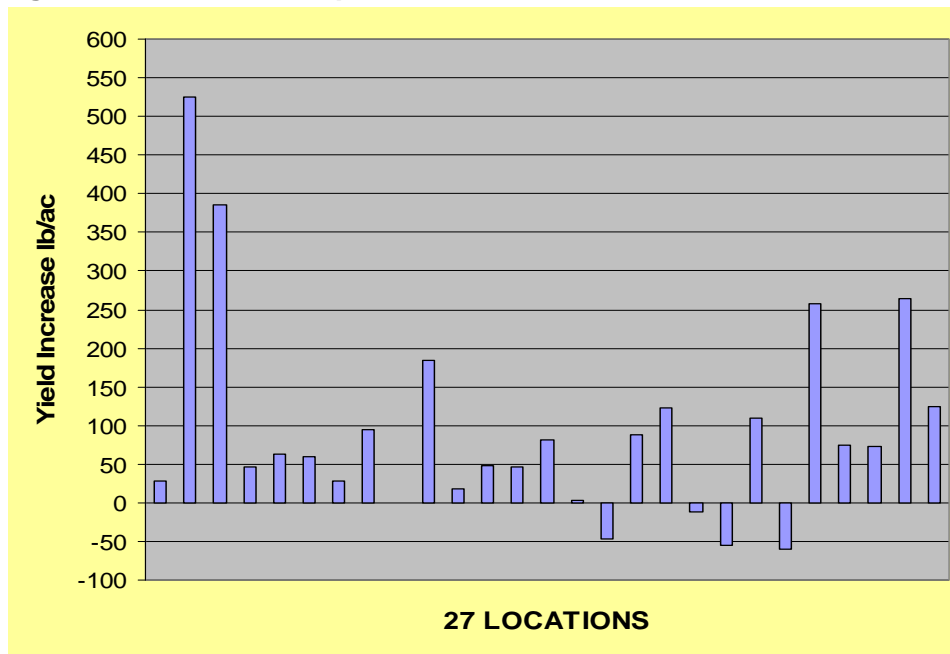
Location	Treatment			
	Check	Boron	Fungicide + Boron	Fungicide + Boron + Matador
	Yield lb/acre			
Temiskiming	2625	2653	2753	2865
New Liskeard	3087	3612	3778	3343
Owen Sound	2708	3092	3308	3314
Owen Sound	2564	2610	2755	2900
Drayton	3021	3084	3099	3236
Shelburne	2119	2178	2166	2356
Shelburne	2454	2482	2494	2556
Grand Valley	2669	2763	2706	2741
Grand Valley	1705	1705	1881	1866
Meaford	3316	3501	3483	3244
Average Yield lb/ac	2627	2768	2842	2842
Yield Increase vs. check		141	215	215
\$ Return over Check ¹		-15	3	-44
1. Return calculated on canola price \$ 430/t, Fungicide \$24/ac, Boron - \$5.25/acre, Insecticide - \$5.00, app - \$10/ac				

2008-2010 Summary:

Small Yield Improvement to Boron

Over the 3 year trial, foliar boron applied at early flower increased yield by 94 lb/ac (3.5%) over the check (Figure 1). Boron improved yields slightly 78% of the time and returns 40% (Cost \$5.50/ac + \$10/acre application). The boron soil test has not been shown to be a reliable indicator for the need for boron. It is interesting to note that in controlled environment greenhouse studies (University of Guelph, 2010), foliar boron helped mitigate seed yield losses from heat stress.

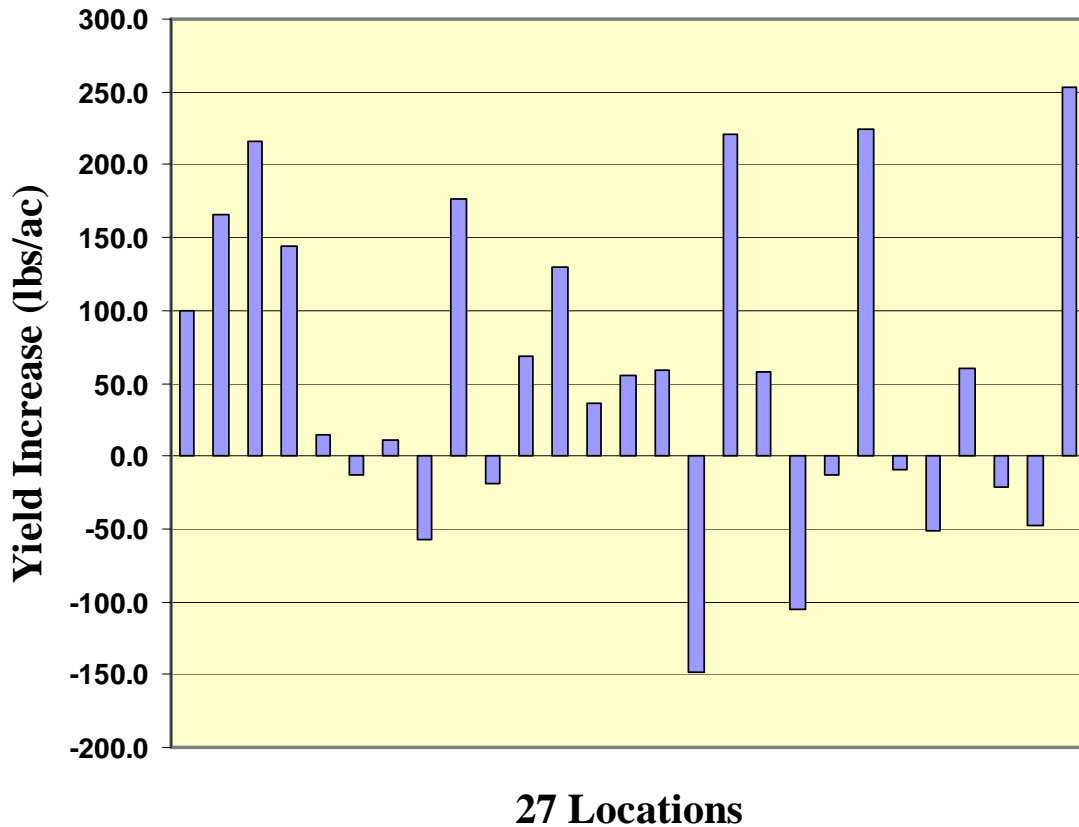
Figure 1: 2008-2010 Response to Boron



Mixed Response to Fungicide (Figure 2)

There was a visual difference in sclerotinia infection between the check treatments and those receiving fungicide. Growers sometimes commented that fungicide treated plots were easier to combine with noticeable differences in stem infection. The visual differences in sclerotinia infection did not translate into a consistent improvement in yields or returns from fungicide application. During the 3 yields of the trials most sites had lush growth and canola yields were excellent. On average over the 3 years, fungicide application improved yield 67% of time, and returns only 15% (canola price \$430/t, fungicide cost \$24/acre + application). Application timing was generally at the 20-30% flower stage but varied between 5%-60% flower. The results of this study do not clearly indicate when or if a protectant fungicide should be applied. Research trials indicate the optimum fungicide timing is at early flowering (20-30% flowers open). Sclerotinia infection is very site specific and difficult to forecast and manage with weather, variety, soil moisture, spray timing, coverage all important factors.

Figure 2: 2008-2010 Response to Fungicide vs. Check



Response to Insecticide

Insect pressure from cabbage seedpod weevil and tarnished plant and lygus bugs was low through the 3 years of trial. Insecticide application did not improve yields or returns. Growers need to rely on scouting and established threshold for these insects in deciding on the need for insecticide application. To minimize the risk of killing bees, insecticide application should only be made during late evening, when bees are not foraging.

Acknowledgements:

Thanks to major sponsors for the project, Georgian Soil & Crop Improvement Assoc, Ontario Canola Growers Assoc. Thanks also to OMAFRA summer students, co-operators, and agronomists, custom applicators for their interest, expertise and time. Appreciation extends to Bayer CropScience, Agri-Food Labs, Alpine Plant Foods (Boron), and Canadian Grains commission for seed quality evaluation.

Project Contacts:

Brian Hall, OMAFRA, Stratford, Email: brian.hall@ontario.ca

Location of Project Final Report:

Brian Hall, OMAFRA, Stratford, Email: brian.hall@ontario.ca