Impact of Soybean Cyst Nematodes on Pulse Crops in Canada

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Objectives:

Investigation of edible beans was to evaluate experimental and commercial varieties of navy beans and other edible beans for the potential reproduction of Soybean Cyst Nematodes (*Heterodera glycines*) on their roots and determine the impact on soil infestations.

Methods:

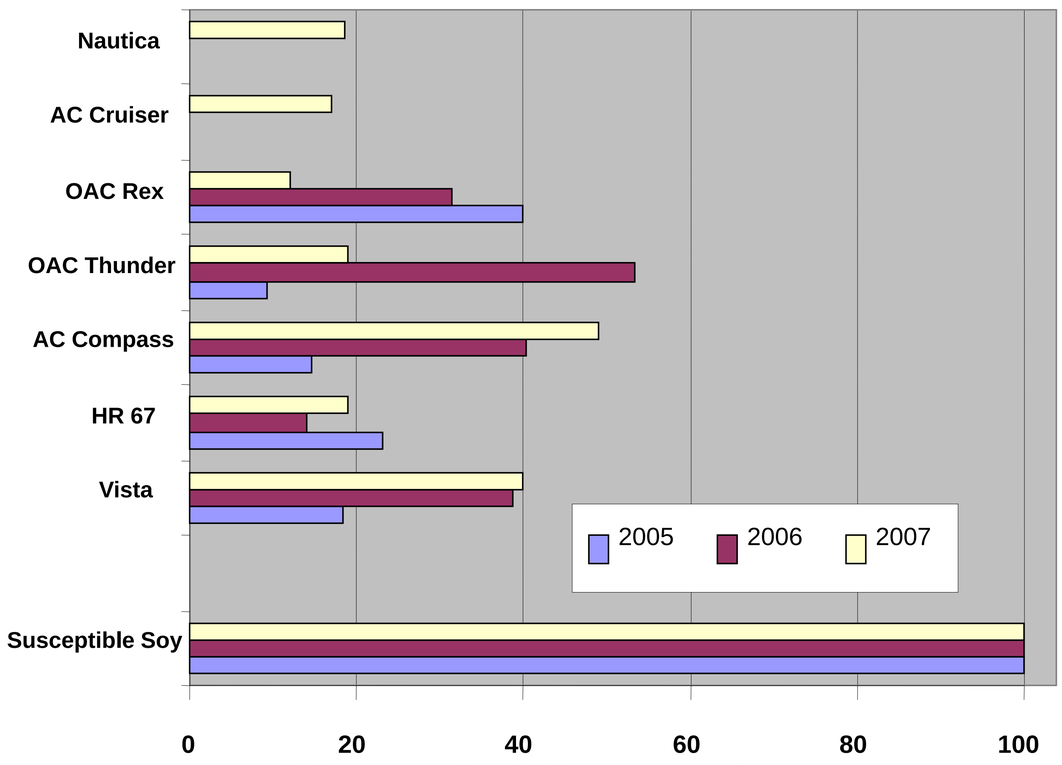
2005 -2007 -- Commercial varieties of navy, kidney, cranberry and other edible beans were planted in SCN infested fields for 3 years with susceptible with resistant SCN soybean checks. Infection of edible beans by SCN was tested in a sandy loam fields with a population of 4-5,000 eggs/100g of soil. Test plots were 2.4 m x 7.0 m with sampling and root harvesting done by hand. The predominant HG Type was HG 2.5.7.

2010-11 -- Edible beans were planted in the same SCN infested fields but the row plots were changed to hill plots with each variety planted in 6 seeded hills to expose the variety root area to more localized SCN populations. Soil type and SCN population were similar to the 2005-07 test. The method of root extraction was changed from manual digging to using a mechanical nursery tree digger (see photo) that operated at a depth of 30 cm and 50 cm wide.

All entries were replicated at least 4 times each year and averaged. Entry roots were washed over screens to collect root cysts and counted under a microscope.

Table: Reproduction of SCN on edible beans rated as a % of the susceptible soybean RCAT Harwich

Variety	Bean Type	2005	2006	2007	Field average	Production of egg/plant
Vista	White	18	39	40	32	1,698
HR 67	White	23	14	19	19	745
AC Compass	White	15	40	49	35	1,970
OAC Thunder	White	9	53	19	27	1,159
OAC Rex	White	40	31	12	28	872
AC Cruiser	White			17	17	1,030
Nautica	White			19	19	2,052
Red Kanner	Light red kidney	35	69	68	57	3,257
Redhawk	Dark red kidney	12	61	55	43	3,662
AC Calmont	Dark red kidney	13	32	67	37	2,384
SVM Taylor Hort	Cranberry	38	78	41	52	3,404
AC Ole	Pinto	20	28		24	321
AC Harblack	Black bean	10	64	20	32	1,704
RCAT Harwich	Susceptible Soy	100	100	100	100	4,790
Sherwin (res)	Resistant Soy	2		25	14	1,263



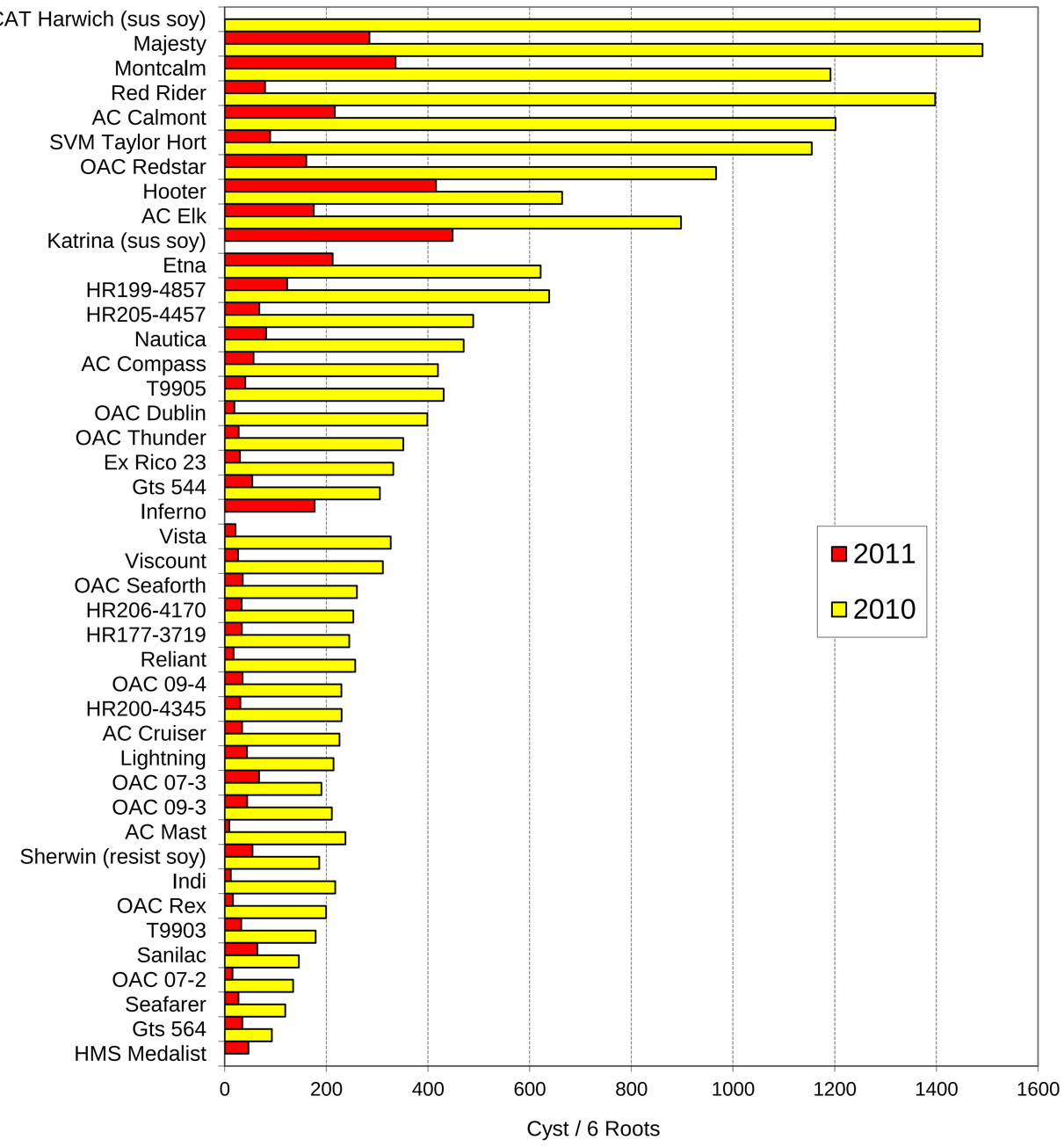
Results:

2005 – 2007 white bean SCN root infection averages were similar for each year when compared to the 3 test year "Field average" column ;

- white beans in general had 10-20 % more SCN root infection than the resistant soybean variety - Sherwin;
- white bean types had 4 varieties with less and 3 varieties with more eggs per plant than the resistant soybean;
- all edible bean types varied considerably in the number of eggs that were produced by each plant;

2010 – 2011 graph below demonstrates a large range of SCN reproduction (number of counted cysts/6 plants) on the roots of a multiple edible bean types;

- 2010 varied significantly for root cyst infections as compared to 2011 and most edible bean types had a proportional range of infections over the 2 test years as compared to the susceptible and resistant checks;
- approximately 50% of the edible beans had similar resistance to SCN as compared to SCN resistant Sherwin soybean in both years;



Summary:

Results from testing commercial and experimental edible beans indicated that some varieties had resistance to Soybean Cyst Nematodes as expressed by reproduction on the roots. Field testing for the 3 and 2 years indicated a specific bean type and variety X bean type reaction to SCN.

Results from all years of field testing indicated that edible beans have the potential to maintain or increase SCN populations in the fields slightly more than resistant soybeans but less than susceptible soybeans.

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