

# **Tolerant varieties and reduced rate of Telone II for sugar beet cyst nematode management in Idaho-2014**

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Sugar beet cysts nematodes (SBCN) are a common but major pest that can severely limit sugar beet crop production in Idaho. Unfortunately, SBCN has a wide range of host crops (red table beet, broccoli, radish, Brussel sprouts, mustard etc.) and some weeds (chickweed, nightshade and goosefoot) that make it difficult for effective management. Two common practices of management are using tolerant varieties and fumigation. Combining the management types can result in an even higher increase in yield as compared to a single form of management.

In 2014, an experiment to determine the effectiveness of a low rate fumigation of Telone II in combination with a tolerant variety of sugar beet compared to tolerance alone was conducted at the University of Idaho Parma Research and Extension Center, Parma, ID. The study was laid out in a completely randomized design with a total of nine treatments (including one susceptible variety) duplicated in fumigated and non-fumigated strips each with five replications in a silt loam field. Telone II at 12 gal/A was applied on 21 Nov 2013 by broadcast shank to a depth of 12 inches. The pre-plant population density of viable SBCN was measure in the spring 2014 from individual plots and found in the range of 5 to 42 with an average of 20 viable cysts/500cc soil in non-fumigated plots and 11 to 61 with an average of 28 viable cysts/500cc soil in the fumigated plots. Eight tolerant varieties and one susceptible variety were sown on 28 April. Physiological data was collected throughout the growing season. Beets were harvested on 26 Sept from the middle two rows at a length of 20 feet per row. Weights were taken on the day of harvest and sugar percentage was determined later.

Data on beet weight were analyzed and sample means were separated using Duncan multiple range test and pair sample T-test, differences were considered significant when  $P \leq 0.05$ . The sugar beet yield was significantly increased in most tolerant varieties as compared to the commercial susceptible variety in both non-fumigated and fumigated plots. Tolerant varieties perform better in non-fumigated pots with the increase of beet yield in the range of 12 to 157% compared to the commercially susceptible variety. Tolerant varieties increased the beet yield in the range of 9 to 72% in fumigated plots as compared to the commercially susceptible variety in the fumigated plots. Sugar beet yield in commercial susceptible variety was significantly increased by 41% in fumigated plots as compared to non-fumigated plots. Similarly, the beet yield in tolerant varieties was significantly increased by 11 to 42% in fumigated plots as compared to non-fumigated plots. Tolerant varieties alone can increase beet yield compared to a commercial variety, however the addition of low rate Telone II can further increase beet yield.

**Table 1:** Performance of tolerant varieties of sugar beet in Telone II fumigated and non-fumigated plots, 2014. Data are mean value of five replications.

Treatment	Beet Yield (Ton/A)		% increase in Fumigated plots
	Non-Fumigated	Fumigated	
Susceptible Variety	16.8 c <sub>1</sub> B <sub>2</sub>	28.2 ef A	41
Tolerant Variety #2	29.2 b B	35.8 cd A	18
Tolerant Variety #5	43.1 a B	48.6 a A	11
Tolerant Variety #6	18.7 c B	32.2 de A	42
Tolerant Variety #17	38.5 a A	39.0 bc A	1
Tolerant Variety #19	27.5 b B	30.8 e A	11
Tolerant Variety #20	15.9 c B	25.0 f A	37
Tolerant Variety #50	27.2 b B	36.2 cd A	25
Tolerant Variety #58	40.6 a A	42.6 b A	5

<sup>1</sup> The data followed by common small alphabets along the column are not significantly different as per the Duncan multiple range test when P>0.05

<sup>2</sup> The data followed by common capital alphabet along the row are not significantly different as per the pair sample T-test when P>0.05