

# Tachigaren Trial

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**Introduction:** Tachigaren is used as a seed treatment to control *Aphanomyces* on all of the sugar beet acres at Southern Minnesota Beet Sugar Cooperative. However, Tachigaren is known to have a negative impact on seed safety, especially with smaller seed sizes. It has been the policy of SMBSC to use a higher rate of Tachigaren which has excluded the use of mini pellets.

**Objective:** To evaluate the effect of different levels of Tachigaren seed treatment on sugar beet plant stand and yield in regard to seed safety and *Aphanomyces* control. To meet the objective, two types of trial were established. Yield trials were established at two locations with *Aphanomyces* potential, and a trial was established on the SMBSC *Aphanomyces* nursery to obtain more intensive stand count data in an environment of very high *Aphanomyces* disease potential.

**Materials and Methods for Yield Trials:** Identical yield trials were conducted as randomized complete block with six replications at the Official Variety Trial sites near Hector and Lake Lillian. This trial evaluated the effect of different levels of Tachigaren seed treatment on plant stand and yield. The Hector location was planted on May 7 and the Lake Lillian location was planted on May 6. Both trials were planted using Beta 9780. All seed treatments were applied to regular pellet sized seed. Each plot consisted of four rows that were 40ft in length. Normal practices were used to keep the trials weed and disease free throughout the growing season. The center two rows of each four row plot were harvested on October 27 at Lake Lillian and September 26 at Hector using a four row defoliator and a two row research lifter. The beets harvested from the center two rows were weighed on the harvester and a sample of those beets were used for a quality analysis at the tare lab. The data was analyzed for significance using SAS version 9.4.

## Results:

Treatment	Percent		Percent	Extractable	Extractable	Percent Purity	75% Stand	28DAP Stand	PreHarvest Stand
	Sugar	Tons/Acre	Extractable Sucrose	Sugar per Ton (lbs.)	Sugar per Acre (lbs.)		Beets per 100ft Row	Beets per 100ft Row	Beets per 100ft Row
0 g Tach	16.6	34.3	14.3	286.6	9795.3	92.3	186.7	209.3	203.0
20 g Tach	16.9	34.3	14.7	293.2	10022.3	92.6	175.7	204.0	202.2
30 g Tach	16.8	34.5	14.5	290.2	10005.7	92.4	168.0	197.7	196.3
45 g Tach	16.6	33.6	14.1	282.9	9487.8	91.5	169.3	196.7	193.0
Mean	16.7	34.2	14.4	288.3	9829.2	92.2	174.9	201.9	198.6
CV	2.1	2.6	2.7	2.7	4.1	0.9	8.9	6.9	7.7
Pr>F	0.3944	0.2706	0.1599	0.1599	0.1241	0.1859	0.1875	0.3879	0.6344
LSD (0.05)	NS	NS	NS	NS	NS	NS	NS	NS	NS

**Table 1:** Yield parameter results and stand counts for the yield trial at the Lake Lillian location.

Treatment	Percent		Percent	Extractable	Extractable	Percent	75% Stand	28DAP Stand	PreHarvest Stand
	Sugar	Tons/Acre	Extractable	Sugar per	Sugar per		Beets per	Beets per	Beets per
			Sucrose	Ton (lbs.)	Acre (lbs.)	Purity	100ft Row	100ft Row	100ft Row
<b>0 g Tach</b>	15.8 b	31.3	13.7 ab	273.0 ab	8555.2	92.7	174.7	200.3	198.7
<b>20 g Tach</b>	15.8 b	31.2	13.6 ab	272.7 ab	8495.2	92.7	157.0	195.7	197.5
<b>30 g Tach</b>	15.9 b	31.3	13.8 b	276.8 b	8636.7	92.9	176.7	204.7	194.7
<b>45 g Tach</b>	15.6 a	28.9	13.4 a	268.2 a	7767.9	92.4	170.0	201.0	183.2
<b>Mean</b>	15.8	30.7	13.6	272.7	8378.4	92.7	169.6	200.4	193.5
<b>CV</b>	1.0	8.6	1.6	1.6	8.7	0.8	10.5	5.1	10.1
<b>Pr&gt;F</b>	0.0069	0.4422	0.0279	0.0279	0.2709	0.7005	0.259	0.5221	0.5163
<b>LSD (0.05)</b>	0.19	NS	0.27	5.3	NS	NS	NS	NS	NS

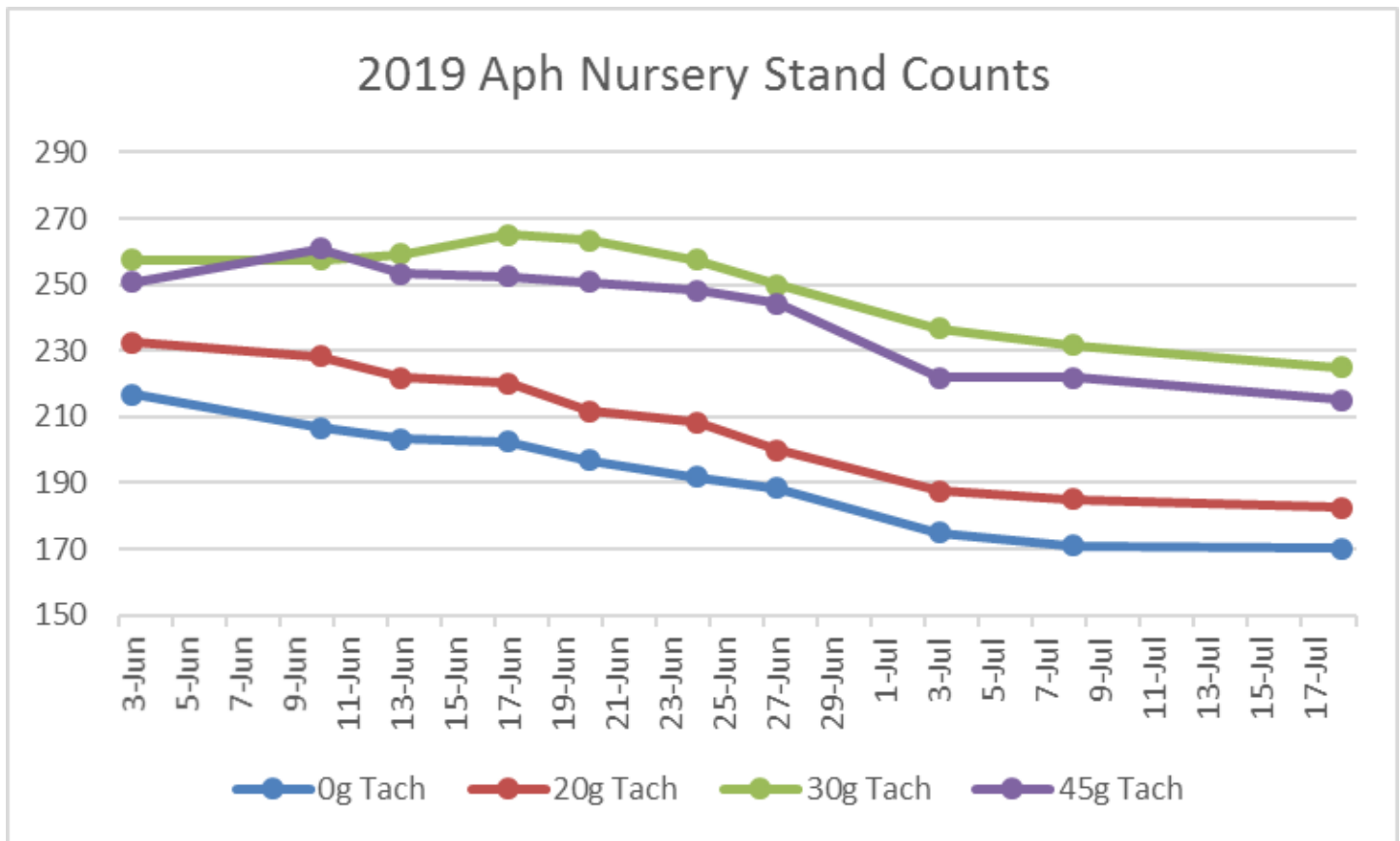
**Table 2:** Yield parameter results and stand counts for the yield trial at the Hector location.

**Materials and Methods for SMBSC Aphanomyces Nursery Trial:** The trial was planted at the SMBSC Aphanomyces nursery in Renville on May 30. The trial was planted to Beta 9780 regular pellet sized seed with the same four Tachigaren rates as the Lake Lillian and Hector trials. Plots were two rows wide by 10' long with six replications. Stand counts were taken beginning June 3 and continued once to twice per week until July 18. Stand counts were taken per 20' of row and converted to sugar beets per 100' of row for the analysis. Table 3 contain the stand counts as converted to beets per 100' of row. Figure 1 shows a graph of the stand counts found in Table 3.

**Results:**

<u>Treatment</u>	<u>3-Jun</u>	<u>10-Jun</u>	<u>13-Jun</u>	<u>17-Jun</u>	<u>20-Jun</u>	<u>24-Jun</u>	<u>27-Jun</u>	<u>3-Jul</u>	<u>8-Jul</u>	<u>18-Jul</u>
<b>0g Tach</b>	217	207	203	203	197	192	188	175	171	170
<b>20g Tach</b>	233	228	222	220	212	208	200	188	185	183
<b>30g Tach</b>	258	258	259	265	263	258	250	237	232	225
<b>45g Tach</b>	251	261	253	253	251	248	244	222	222	215
<b>Mean</b>	239	238	234	235	231	226	221	205	202	198
<b>CV</b>	11.9	13.6	13.8	14.6	14.3	13.9	15.1	16.3	17.0	16.6
<b>Pr&gt;F</b>	0.09	0.03	0.03	0.02	0.01	0.01	0.01	0.02	0.02	0.03
<b>LSD (0.05)</b>	N/S	39.8	39.7	42.2	40.6	38.8	41.0	41.1	42.3	40.5

**Table 3:** SMBSC Aphanomyces nursery stand count data. (Beets per 100' of row)



**Figure 1:** Stand counts per 100' of row from SMBSC Aphanomyces Nursery.

**Conclusion:** Tachigaren is a seed treatment to help reduce the early season effects of Aphanomyces root rot. In the yield trials at Lake Lillian and Hector, it appears the early season Aphanomyces pressure was low. At the Lake Lillian site, there were no statistically significant differences in stand or yield. At the Hector site, there was a statistical difference in sugar, extractable sugar percent, and extractable sugar per ton. All other parameters were non-significant.

The SMBSC Aphanomyces nursery is managed for maximum early season Aphanomyces disease pressure. The trial is planted into warm and moist soils which favor disease development. In this environment, statistically significant differences in stand counts were seen. The 0 gram and 20 gram Tachigaren treatments had lower stand counts than the 30 gram and 45 gram treatments throughout the season. The Aphanomyces nursery trial area is not set up to be taken to yield, and thus we do not have data to distinguish if the stand count differences would equate to yield differences later in the season.