

## **Demonstrating the Effects of “Topping” Sweet Corn on Yield and Overall Quality**

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Fresh market sweet corn continues to be one of the most important crops for growers in the Capital District and NYS. New York growers continue to be on the cutting edge of variety selection and cultural methods such as the use of plastic and floating row covers to increase earliness and start harvesting sweet corn for the Fourth of July market. Recently at the 2004 NYS Fruit and Vegetable Expo in Rochester, NY, Gary Sweet, a grower from Ohio presented information in the sweet corn session that caught the attention of quite a few sweet corn growers. Mr. Sweet has for many years been “topping” his sweet corn. Topping according to Mr. Sweet is the removal of the top of the corn plant from just above the silk or top of the ear, after pollen shed and pollination. He listed the advantages of topping his sweet corn as the following: 1.) 2 to 3 days early harvesting compared to un-topped; 2) Improved picking ease; 3) Reduced bird damage and 4) Reduced lodging due to wind.

Mr. Sweet believes that by removing the upper part of the plant, more sunlight is able to penetrate and warm soils quicker therefore improving growth and earliness. His pickers are able to move quicker down rows and are not fumbling around looking for ears thereby decreasing the time it takes to pick his orders. He also describes their mood as being much happier picking in topped fields compared to un-topped fields. Mr. Sweet also believes that birds are in his corn not to destroy the ears themselves, but search for insects that are in the tassels or stalk. Again by removing the top portion of the plant, European corn borer and aphids do not have as easy a time establishing themselves and the birds may go elsewhere. Also, the area in which the birds can hide is reduced and may not be as inviting for them to forage. Mr. Sweet reported that heavy thunderstorms during the season would cause a lot of lodging in his plantings, especially those close to harvest. Since he has been topping, lodging has not been an issue.

Although not discussed, I believe that several other potential advantages may be possible as well including reduced European corn borer and aphid populations. Also, spray coverage could be improved in the ear area if the tops have been removed. If topping allows a grower the ability to gain three days of earliness with sweet corn, it could mean the difference between \$11.00 a bag compared to \$7.00. The earlier a grower can have sweet corn, the greater the potential is to bring in customers and keep them throughout the growing season with quality products. The savings in labor due to potentially decreased picking time could also further improve profits and allow workers to assist in other farm operations and improve overall productivity of your workers. Additional advantages that are not clear yet, could also be possible.

Every year grower’s rate bird damage as one of the major problems they face each year with sweet corn production and we are often asked what more can be done. Unfortunately, our answers are always the same: use scare devices such as cannons or balloons or auditory ones such as BirdGuard, which uses distress and predatory calls. Now, we might be able to include topping as part of a bird control program.

However, there are potential problems that we are concerned about with topping sweet corn, the greatest being a reduction in yield and flavor as well. The removal of the top third of the plant could result in smaller ears, malformed ears or reduce overall flavor quality, all of which would be detrimental to sweet corn marketing. In addition, scalding or sun burning of the ears could be another potential problem during periods of hot, dry conditions like those experienced with main season and late plantings. Taking this into account, we devised a different treatment plan for later plantings that included topped or untopped but, added a high topped where 2-3 leaves were left above the ear and

topped late where plants were topped at the top of the ear and high, but instead of at pollen shed, the topping was completed about a week before harvest.

During the 2004 sweet corn growing season, we completed a controlled study on two farms in the Capital District, funded by the New York State Vegetable Growers Association. Our first cooperator, John Altobelli, grows sugar enhanced (SE's) varieties and uses plastic to enhance earliness. Tim Stanton, the second cooperator, grows supersweet varieties (Sh<sub>2</sub>'s) and uses floating row covers instead of plastic to improve earliness. For early season corn, plots were four rows wide, 20' long, replicated 4 times, and the treatments were topped or un-topped. As the season progressed and earliness became less of a concern for growers, we wondered if topping treatments would have to be done as early and as severely. Later treatments included:

- 1.) **Untopped** – nothing removed from the plant.
- 2.) **Topped early, silk** – removal of upper part of plant starting at the top of ear, after pollination.
- 3.) **Topped early, high**, removal of upper plant except for the 2-3 leaves above the ear after pollination.
- 4.) **Topped late, silk**, removal of the upper part of the plant starting at the top of the ear after silk has dried down (about 5-10) days before harvest.
- 5.) **Topped late, high**, removal of upper part of the plant to leave 2-3 leaves above the ear instead of right at the silk 5-10 days before harvest.

Topping was completed using a handheld gas powered weed wacker with a blade, according to the treatment. Toppings were completed throughout the season at both sites. Data collected included plant stands, marketable yield, ears damaged by birds, ear size (length and diameter), days to harvest and a visual maturity rating.

Altobelli Site Results: The first treatments were completed on July 1, and the first harvest was completed on July 9. In order to reflect the most accurate information, the grower's crew picked these plots. As with many early season harvests, not all the corn was ready on the 9<sup>th</sup> and therefore a second harvest was done on the 13<sup>th</sup> using the same harvest crew. Yields and average ear size are based on un-husked ears and length and widths are based on a 12 ear un-husked sub-sample (Table 1). In the first harvest, topping increased early yield by 12%, but did not affect total yield or ear size. However, in later plantings, the earlier that topping was done at silk level, the greater was the reduction in yields. No reportable yield reduction was found when corn was topped high, either early or late. There were no reportable differences in average ear weight, length or diameter among any treatments. However, a slight maturity difference was noted in plots that were topped at the silk early compared to the other topped and un-topped treatments. Due to a vigorous bird control program including popguns and other means, no bird damage was found in any of the treatments. It should also be noted that the crewmembers harvesting these plots indicated they much preferred picking in any of topped plots compared to un-topped plots.

Stanton Site Results: Unfortunately, due to a miscommunication, no early planted sweet corn results will be presented for this site. Therefore, only later season treatments will be reported on for this site. Yields for the first harvest on August 10 did not significantly differ when looking at total number of ears harvested (Table 2). However, due to intense bird pressure, plots that received any form of topping (early and late or low and high) had higher yields than un-topped plots. Bird damage was significantly reduced, especially when corn was topped early and low. The same could be said for later harvested plots, where bird damage was significantly less and resulted in higher marketable yields. There were no differences in average ear weight, length or diameter. Harvesters also agreed that picking corn in topped plots was more preferable than un-topped plots.

Summary: Although the results on yields are not quite conclusive, there are some interesting trends and results. In the earliest trials, topping did decrease time to maturity by at least 2-3 days without adversely affecting yields. It was also apparent at one of the locations that bird damage was significantly reduced where topping had occurred compared to un-topped plots, which resulted in higher marketable yields. Although we have no data, verbal comments from the pickers told us that they much preferred harvesting in topped plots. This observation could potentially mean that harvesting time and the labor needed could be reduced thereby reducing costs. The one concern still is the reduction in yields seen on later plantings at the Altobelli site where bird damage was not a problem. However, significant inputs of fuel and labor were used to achieve that level of bird control. Topping could have resulted in similar bird control with less expense.

If you have any questions or comments, please do not hesitate to contact Chuck Bornt 518-859-6213 or Ted Blomgren 518-859-5341. We would also like to thank our host growers and the NYS Vegetable Growers Association for funding this research.

**Table 1: Yields of topped and un-topped sweet corn at Altobelli, Altobelli Family Farms, Kinderhook, Columbia County.**

Treatment Date	Harvest Date	Variety	Treatment	# Mkt. Ears	Mkt. Ear Weight (lbs)	Avg. Ear Weight (lbs)	Avg. Ear Length (in) <sup>1</sup>	Avg. Ear Diameter (in) <sup>1</sup>
7/1/04	7/9/04	Temptation	Untopped	45	32.3	0.72	6.3	2.1
			Topped early, silk	58	40.2	0.70	7.2	2.1
7/1/04	7/13/04	Temptation	Untopped	45	32.1	0.71	7.2	2.0
			Topped early, silk	31	21.6	0.70	7.0	2.0
<b>Summary</b>			<b>Untopped</b>	<b>45</b>	<b>32.2</b>	<b>0.71</b>	<b>6.7</b>	<b>2.0</b>
			<b>Topped early, silk</b>	<b>44</b>	<b>30.9</b>	<b>0.70</b>	<b>7.1</b>	<b>2.1</b>
7/13/04	7/23/04	Absolute	Untopped	63	61.3	0.98	8.4	2.3
			Topped early, silk	57	53.2	0.93	8.2	2.4
7/29/04	8/16/04	Absolute	Untopped	78	82.9	1.07	7.7	2.5
7/29/04	8/16/04	Absolute	Topped early, silk	57	58.0	1.02	7.5	2.5
7/29/04	8/16/04	Absolute	Topped early, high	77	82.0	1.06	7.6	2.4
8/5/04	8/16/04	Absolute	Topped late silk	67	70.2	1.04	7.7	2.4
8/5/04	8/16/04	Absolute	Topped late, high	78	84.3	1.08	7.5	2.4

**Table 2: Cooperator: Yields of topped and un-topped sweet corn at Feura Bush Farm, Feura Bush, Albany County.**

Treatment Date	Harvest Date	Variety	Treatment	# Mkt. Ears	Mkt. Ear Weight (lbs)	# Bird Damaged Ears	Weight Bird Damaged Ears (lbs)	Avg. Ear Weight (lbs)	Avg. Ear Length (in) <sup>1</sup>	Avg. Ear Diameter (in) <sup>1</sup>
7/29/04	8/10/04	277A	Untopped	31	22.2	37	27.6	0.72	7.1	2.1
7/29/04	8/10/04	277A	Topped early, silk	54	36.8	14	10.1	0.68	7.2	2.0
7/29/04	8/10/04	277A	Topped early, high	44	32.6	23	16.5	0.73	7.1	2.0
8/5/04	8/10/04	277A	Topped late silk	48	36.1	26	20.1	0.76	7.1	2.1
8/5/04	8/10/04	277A	Topped late, high	36	27.1	23	17.9	0.75	7.2	2.0
7/29/04	8/18/04	Obsession	Untopped	43	38.9	10	8.6	0.91	8.4	2.2
7/29/04	8/18/04	Obsession	Topped early, silk	40	36.4	0	0.0	0.92	8.3	2.2
7/29/04	8/18/04	Obsession	Topped early, high	46	41.0	2	1.6	0.90	8.1	2.2
8/5/04	8/18/04	Obsession	Topped late silk	41	36.8	3	2.5	0.90	8.0	2.2
8/5/04	8/18/04	Obsession	Topped late, high	40	35.9	1	0.5	0.89	8.1	2.2