



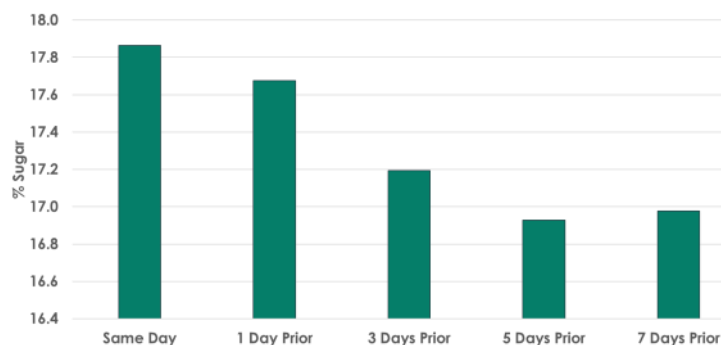
Keep It Close, Keep It Sweet

In the wise words of Mike Metzger: “Keep your enemies close and your toppers closer.” That saying is a favorite at harvest, and for good reason — it’s been proven to be one of the best ways to preserve the quality of your sugarbeets.

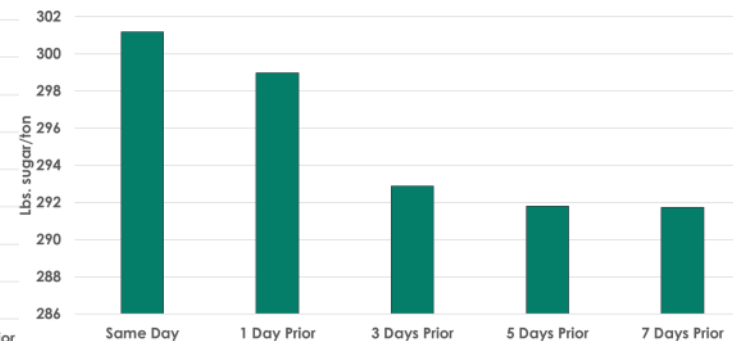
The Minn-Dak research team conducted a defoliation timing study in 2021, 2022, and 2023. The purpose of the study was to determine the effect that “topping ahead” had on sugarbeet quality and yield. The plots were treated the same all season long, with the only difference being the day that the plots were defoliated. The same result was seen each year — the quality decreased as the time between defoliation and harvest increased. Across the three-year run of the study, there was an average decrease in % sugar of 0.2, which translated to an average loss of 65 pounds of recoverable sugar per acre just by defoliating 24 hours ahead of the harvester.

Hawes District Agriculturist Paul Moffet incorporated the trial results with some real-life economics. There was a decrease in revenue of an average of \$15 per acre per day for the first 5 days that the sugarbeets were defoliated ahead of the harvest date. This was based on the initial crop payment of \$0.22/pound of extractable sugar. **A loss of \$15/acre/day topped ahead of the lifter is almost \$2,325 per day across an entire quarter.** Hypothetically, at that rate you would break even paying your “topper guy” \$97/hour to defoliate directly in front of the lifter.

% Sugar (2021-2023)



Recoverable Sugar per Ton (2021-2023)



A couple results from the three-year run of the defoliation timing study. Each defoliation timing was replicated six times per year. The results were statistically significant, which means we are extremely confident that the results will be the same year after year.

Defoliation Timing Study



Same day as harvested



1 day prior to harvest



3 days prior to harvest



5 days prior to harvest



7 days prior to harvest

These photos are from the Minn-Dak defoliation timing study that was conducted from 2021-2023. As the days defoliated ahead of the harvest date increases, more regrowth can be seen. Regrowth comes at the expense of storing sugar in the root; the sugarbeet is tapping into its energy reserves (stored sugar) in order to regrow leaves.



Sugarbeet Leaves = Solar Panels
The longer the leaves are left on the sugarbeet, the longer they have to “charge up” the sugar content

Slow and Steady Wins the Race



Although flail type, condition, and configuration play a major role in the defoliator’s performance, operational ground speed continues to be the most overlooked aspect of this implement’s operation. Year in and year out, revenue per acre can be dramatically decreased due to growers topping faster than the recommended 2-3 mph. Research conducted by Dr. Larry Smith indicates significant incremental losses in recoverable sugar as defoliator ground speed increases. As a rule of thumb, for each 1 mph increase in speed between 2 and 5 mph, approximately 7 pounds of recoverable sugar per ton is lost – assuming a 30 TPA crop, that’s roughly \$46 per acre lost for every 1 mph above the recommended operational ground speed. With that in mind, make sure that your defoliator crew, and not just your truck drivers, understands that speed is a dangerous thing.

Harvest Loss Appraisal — Find Out What's Really Going On

The harvest loss appraisal technique was developed as a tool for both the grower and agriculturist to use as a method of evaluating what tonnage is actually being left out in the field. This quick analysis can (and has) saved Minn-Dak growers thousands of dollars by measuring tonnage not going into the truck and allowing for corrective action. It doesn't take much harvest loss to add up to big dollars - keep in mind that just one lost two-pound beet per 10' of row equates to a 2.4 ton per acre loss!

Conducting a Harvest Loss Appraisal:

1. Pick a random spot in the field behind the last round of the harvester.
2. For 22" Rows mark out 110 square feet. This equates to:
 - 6 Row Lifter - 6 rows wide X 10 foot length
 - 8 Row Lifter - 8 rows wide X 7 ½ foot length
 - 12 Row Lifter - 12 rows wide X 5 foot length
3. Glean the area, picking up any small pieces which have been broken off of the beet due to the harvester or defoliator, down to the diameter of a dime. Dig down the rows looking for broken tails remaining in the ground.
4. Weigh up the collected pieces (A pocket fish scale works very well).
5. Subtract the weight of the bucket from the weight of bucket and beets.
6. Take the weight of the beets and divide it by 5. The result will equate ton per acre loss.

What is Considered an Acceptable Harvest Loss?

LOW
0 to 1/2 Ton Per Acre

ACCEPTABLE
1/2 to 1 Ton Per Acre

HIGH
> 1 Ton Per Acre
Adjustments Recommended

Example: A beet weight of 3.75 lbs. divided by 5 = **0.75 tons per acre of Harvest Loss**

Setting Lifter Wheel Pinch Points

22" Rows - 150 to 175 Beets / 100'	Avg Beet Wt. <i>Lbs.</i>	Pinch Point Setting <i>Inches</i>
18 to 22 ton	0.9 to 1.2	1 1/2 to 1 3/4
22 to 26 ton	1.1 to 1.5	1 3/4 to 1 7/8
26 to 30 ton	1.3 to 1.7	1 7/8 to 2

Getting the beet out of the ground intact and without damage can be a big challenge as harvest conditions change from season to season, from field to field, and even within the same field. Although each brand of harvester has multiple settings, one adjustment that remains constant between all lifter types and brands is each machine's pinch points. Pinch point settings should be adjusted to represent the average individual beet weight that is being harvested. **The 5-yr average beet weight for Minn-Dak is 1.64 lbs.** According to the chart, most of the

pinch points in this area should be set at 1 7/8" to 2" for most digging conditions. Wider points generally load more mud and snap beets while narrower points will load less mud and typically slice beets. It is recommended that your pinch points be checked every year measured at the tightest point of the wheel with the lugs together.

Since consistency from row to row is vital in maximizing the harvester's extraction performance, take note to make sure each wheel is running true and is not bent or worn - also make sure that the unit's strut is not bent or twisted. While a 1/4" wobble in each wheel might not seem like a big deal, keep in mind that your pinch point on that row set for 1 7/8" will be running anywhere from 1 5/8" to 2 1/8" - if both wheels are bent then your point could be running from 1 3/8" to 2 3/8"! Adjusting harvester pinch points is done simply by adding or removing shims. These shims are typically 1/8" thick and you should always have the same amount of shims in all the wheels. An odd combination of shims is usually a sign of one of the problems listed above.



Before measuring your pinch points, take the time to spin the wheels and check for bent wheels and bad/loose bearings. If you find a problem, make sure you correct it before taking your measurements.