

THE 1946 BEET HARVEST

P. H. McMaster¹

Twenty three per cent of the sugar beets produced in the Nebraska District in 1946 were harvested mechanically. This compares to six per cent so harvested in 1944, and eleven per cent in 1945, or about a 100 per cent increase each year. While this accomplishment may not be as impressive as reported here today by other areas, I think the record does definitely indicate a progressive trend toward complete mechanization of the beet harvest. It is difficult to anticipate the speed with which mechanization will be accomplished once the manufacturers are able to supply the demand for harvesting machines.

A total of 215 John Deere and International harvesters were used in the Nebraska District in 1946. They harvested a total of 9313 acres, or 137.192 tons. We did not have any other type of harvester.

The average task performance for the season did not come up to early expectations, largely because of the adverse conditions under which most harvesters had to work during most of the harvest season. Furthermore, many machines were in the district for only a short period, after having completed the harvest elsewhere, but more generally, after they were unable to operate in other areas because of soil or climatic conditions. At least twenty machines were purchased after the start of harvest from farmers and dealers in other areas where the machines could not operate under existing conditions. Most of such machines came from Central Nebraska and the Holdrege area where excessive rainfall created a condition that prevented operation of any tractor equipment. Some one described the field conditions as being "belly deep" to a horse.

The International machines were not delivered until the harvest was well along, so they had a low performance. Most of these machines were put into operation only a few days prior to the snow, hence worked mostly under adverse conditions.

All machines averaged 43.3 acres each, which is considerably less than the sixty acres originally expected, but this compares favorably with the 43.15 acres harvested with each machine in 1945. As related above, many machines, both JohnDeere and International, came into the territory late; many growers with 25 to 35 acres purchased machines and they did not care to do custom work after completing the harvest on their home farm; these two factors together with very unfavorable conditions such as muddy and snow covered fields and frozen ground, were the primary causes of low performance.

I think we can expect the average acreage harvested per machine will decrease as the number of machines increase, because the larger growers are the first to buy machines and when they are supplied, growers with the smaller acreages will purchase a larger proportion of the machines. If they

¹ District Manager, The Great Western Sugar Company, Scottsbluff, Nebr.

will not do custom work when they have finished their own contract the average acreage harvested per machine will decline.

Mr. George Sauer, in the Gering district, harvested 94.63 acres with his machine. Edward Meisner, also in the Gering district, harvested 93.93 acres with his machine. Several growers harvested more than 80 acres and quite a number above 70 acres. Mr. Kenneth Bischoff reported two machines as having harvested in excess of 78 acres, one of which has exceeded seventy acres in each of the past three years. Billings reported that an International machine harvested 67 acres in the Hysham area despite the late arrival of the machine and the adverse conditions under which it operated.

The daily task performance was somewhat under expectations, but possibly when operating conditions and all circumstances are considered, the performance is much better than first appears to be the case.

The machines averaged 2.1 acres per day. The average daily performance before the storm was 2.2 acres and after the storm 1.9 acres, or an average of 2.1. This compares to an average of 2.7 acres per machine in 1945.

I believe this lower performance is accounted for by the unusual conditions existing this year, namely:

1. The beet harvest generally did not get well underway until about October 23. Days were getting short by this time, and machines were operated short hours.
2. After the storm of November 7th farmers worked under conditions that reduced efficiency.
 - a. They operated machines in as much as six inches of snow.
 - b. In very muddy ground.
 - c. In frozen ground.
 - d. Shorter days than before the storm.
3. Extraordinarily large beets.
4. Loss of time from breakdowns.

A few farmers averaged better than four acres per day while about twenty growers harvested more than three acres per day during the season. Generally these were growers with previous experience who had started fairly early when conditions were most favorable.

The potato harvest was delayed in our district for the fourth consecutive year by a lack of labor and further delayed this year by excessive precipitation the first week of October, with the result the sugar beet harvest did not get well under way until about October 25. Shorter days reduced the daily task. This condition was further accentuated after field work was resumed following the storm of November 7th. There was a week or ten days when very little work was done in the fields because of the snow and mud.

Farmers were not able to accomplish much more than one-third to one-half of a normal day's work while working in either the snow or mud, and yet the machine was considered as operating and the reduced acreage harvested during this period was reported accordingly. This tended to reduce the statistical performance materially.

The ability of the machines to perform at all in the snow and mud was a revelation to many growers, and ourselves as well. Any performance under the conditions many machines operated was convincing proof to the grower-owners that machine harvesting was to be depended upon under very unfavorable conditions. This fact naturally was for the time being, at least, of more interest to the grower than the acres harvested daily.

The machines operated more satisfactorily on the snow than in the mud. Some farmers were forced to quit trying to work on some of the heavier type soils during the worst mud conditions after the snow melted, largely because of lack of traction for the tractors.

Our stands generally were very light due to the loss of stand from the freeze of May 11th and the poor germination on the 25,000 acres replanted as a result of that freeze. This resulted in an extraordinarily large beet. The beets harvested in the Gering district averaged 33.4 ounces. Some growers harvested beets of an average weight of 54 ounces. Many growers harvested beets averaging more than 40 ounces per beet.

Farmers experienced some difficulty in trying to harvest these beets with machines, especially the John Deere harvester. The knife pushed the beet over on its side and then sliced off the side. The tops were left on many of these beets. This difficulty was most pronounced on the loose sandy soils.

It is inherent that more breakdowns will occur when machinery is subjected to unusual stress and strain such as the harvesters were this year in handling mud, snow and frozen ground. More than ordinary delays occurred while making repairs.

Here are some general observations that have come to me from different people.

1. The 1946 John Deere harvester was much improved over the models of previous years. There are still some weak spots, which are too generally known to need enumerating here.

2. The International Harvester proved very satisfactory under almost all conditions and performed well for the first year that commercial machines were available.

The lack of top handling equipment will prevent general acceptance in our district, even though farmers successfully windrowed tops behind the International with a side delivery rake. Blueprints of this assembly are available.

A side delivery rake device mounted on the tractor itself was designed and tried out in a limited way late in the season. I understand the 1947 machines will be equipped with a top handling unit. 1946 models are also to be supplied this unit.

3. The wide front wheels facilitate guiding the machine, which tends to reduce the breakage of beets. This applies to the John Deere and International alike.

4. Lovell reports the International handled beets with frozen tops better than the John Deere machine.

5. Wheatland reports difficulty in keeping the knife on the John Deere machine sharp because of rocks. The disk knife on the International wore out in about two days and had to be replaced, which increased the cost of operation considerably.

6. Farmers expecting to use mechanical harvesters should plan the layout of their fields in advance. They should either plant twelve to sixteen rows across the field in the headlands, or cross cultivate the lengthwise planted rows so that the headlands can be harvested with the machine instead of by hand.

If the expected tonnage from a row through the field, or a round trip through the field is greater than the capacity of the cart, the grower may want to pull a turn row in the middle of the field. The turn rows in the center of the field should be cross cultivated in the spring to permit pulling with the harvester.

7. Mr. Heldt - Growers feel that repair men sent out by the dealers should be better qualified to help them with their troubles.

8. Mr. Andrews - It is the general opinion that the harvesters could be made to work in muddy fields whenever the tractors could get traction. The latter part of the season many growers used their machines at night or would start early in the morning when the ground was frozen and would hold the machines up.

9. Mr. Andrews - The John Deere machines appeared to do a better job of topping than any other type, but did very unsatisfactory work in weedy fields. The weeds would collect on the knives, consequently produced poor topping. The John Deere machine also had no way of eliminating mud and clods from the beets. However one grower on the Huntley Project put an extra set of clod-breaking slats on the boom of the topper and a set in the John Deere beet loader. From these two additional sets of slats the amount of dirt and clods was reduced greatly. The forepart of the season, before the ground became too wet, these additional slats reduced the amount of clods by 75 to 90 per cent.

10. Mr. Andrews - The International machine did better work in topping weedy fields but the class of topping was not quite as good as the John Deere. The main trouble we had with the International was that growers would tighten the slip clutch so tight it would break the bevel gears. This should be corrected by the manufacturer in another year.

11. Andrews - Since the Kiest machines arrived in the area extremely late we cannot give much information on them.

12. Andrews - An improvement that could be made on the John Deere machines would be some device similar to the program of the International people, in handling clods. The tires on the International cart are too small for the load in muddy fields. This small tire makes such a large rut when the fields are wet that it interferes with the operation of the machine on the return trip. Also, some arrangements should be made on the International machine to better handle the tops. At present much of the value of the tops is lost due to the manner of spreading tops on the field.

13. Bischoff - The principal objection to the John Deere has been the failure of many parts due to weak construction. Some difficulty was experienced with the International along similar lines.

14. Bischoff - The appraisal of our farmers indicates that at least three-fourths of our area should use the International in preference to the John Deere. There is some opinion expressed that the John Deere would be more adaptable with a trailer.

15. Clement - There is no question but that these one row harvesters, under good operating conditions and with an intelligent operator, can easily do three acres per day. However under actual harvest conditions these machines actually operate anywhere from a five to a fifteen hour day. A few of the factors affecting actual operating time are: mechanical delays of harvester; mechanical delays of beet loader or truck; delays at receiving stations; frost, short daylight hours; and personal reasons of growers or operators.

16. Heldt - One grower has suggested that a stop be put on the finder wheels so they cannot drop too far. This grower has installed this improvement on his machine and states that he can top better without danger of finder wheels dropping on topping knife.

17. Heldt - The chain for the top conveyor seems to have excessive wear. Also spring teeth for picking tops cause lots of trouble.

The chain for driving the beet elevator should be stronger.

18. Heldt - It has also been suggested that beets topped with the topper should be planted in 22 inch rows. The tractor tires are too wide for 20 inch rows, causing the tires to loosen the beets in the next row.

19. Heldt - The general comment on the harvester is that it is the salvation of the beet crop - plenty of labor is available for the summer work but the Mexicans from the south are no good in cold weather for fall work.

20. Alex Meter, Jr., Bayard, installed a "V" shaped topping blade which eliminated much of his trouble in topping large beets. This also prevented the knife from clogging with tops. Alex speeded the whole machine and operated in second gear which reduced breakage of beets.

21. Will harvesters control acreage produced? Some feel the harvesters will tend to encourage the 25 to 40 acre grower to grow as nearly as possible the acreage one harvester can handle. Others feel larger acreage growers are apt to reduce their plantings to an acreage that can be handled by one machine.

In the first instance growers should plant the acreage for which they have suitable land at home, and plan to do custom work to the capacity of the machine. The grower with an acreage in excess of the capacity of one machine as normally operated, may increase the capacity by operating longer hours. Many growers operated at night equally as successfully as in daylight this past year.

A properly operated machine should harvest 80 to 100 acres in a normal season and by working sixteen to eighteen hours per day this can be increased approximately 50 per cent.

22. Processors must recognize that more piling machines will be required as the number of harvesters increase. In the "horse and buggy" days, hand workers were assigned to contracts according to the acreage, at the rate of about 8 to 10 acres per worker. Under this system the tonnage delivered by each grower was in direct relationship to the number of workers. But when a mechanical harvester starts operation about the same tonnage is harvested on the 25 to 30 acre contract as on the 50 to 80 acre contract. Therefore additional pilers will be required in those areas where beets are stored.

23. Glassburn Bros., Sunol, Nebraska, used a John Deere harvester on a Model H International tractor.

24. Roy McKeeman mounted a John Deere harvester on an International H in a somewhat different manner.

We have drawings showing the better points of both conversions, together with some ideas of our own engineers.

I have confined this report largely to the operation of harvesters in the Nebraska district, because full detailed information was not available from other districts in which we operate.

Colorado reported 240 machines and harvested a total of 6257 acres prior to the storm of November 2. Mr. Mason reports the acreage harvested after the storm is not available.

Billings used 48 machines that harvested 1294 acres. Mr. Mann points out that machines were received quite late in the season, consequently the acreage harvested per machine is much less than would be expected when its operation extended over a longer period and under more normal conditions.

Lovell had 22 machines operating which harvested 1060 acres and averaged 48.3 acres per machine. The John Deere harvesters averaged 3.3 acres per day and 65.86 acres per machine. This is the best average performance in any of our districts.

Two observations summarize the situation fairly well.

C. F. Mann says - "Even with the extremely bad harvesting conditions, growers are very optimistic about the possibilities of harvesting a crop mechanically, knowing that all seasons will not be like the last one and also that weak parts of the toppers, which showed up during this fall of difficult operations, would be remedied in the future.

Ted Miller, John Deere dealer, Gering, said recently, "I am convinced harvesting sugar beets mechanically is an assured reality now that the young men have returned from the services. Two years ago a majority of the farmers to whom we sold harvesters preferred to use hand labor to using a machine. That is not true today as evidenced by the fact that more than twenty farmers made a deposit when ordering a new machine in October and November 1946 for 1947. While the father was perplexed in trying to operate a complex harvester, the young men are undaunted. They thrive on operating mechanical equipment."

What the North Platte Valley needs for 1947 are more harvesters.