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MECHANICAL  
TOMATO HARVESTERS  
IN  
NEW YORK

Darwin P. Snyder

Department of Agricultural Economics  
New York State College of Agriculture  
A Statutory College of the State University  
Cornell University, Ithaca, New York

## MECHANICAL TOMATO HARVESTERS IN NEW YORK

One notable event that concerned the New York processing tomato industry in 1965 was the advent of the mechanical harvester. In that year one vegetable grower in Western New York took the initiative to obtain a tomato harvester to use in picking processing tomatoes. He continued to make use of his machine in 1966 and three other growers joined him by using a harvester for the first time. Two makes of harvesters were in use: There were three of one make and one of another. Three of the four machines were purchased by the grower; the fourth machine was rented. The farmers had large vegetable or vegetable and fruit businesses and each grower had a sizable acreage of processing tomatoes, ranging from 90 to 123 acres.

How did they make out? What was their experience in using the new machine? Certain difficulties can be expected when a new piece of equipment is introduced --- problems in becoming acquainted with the operation of the machine and learning its capabilities and limitations under the conditions in which it must operate. To learn of their experience with the machine, each of the four growers was interviewed.

None of the growers harvested as many acres of tomatoes with his machine as he had originally intended. Mechanically harvested acreages ranged from 4.5 acres to 28 acres per grower (Table 1). At the time of the interview, only one grower planned to harvest more acres with his machine this year.

Table 1. MECHANICAL TOMATO HARVESTERS -  
HARVESTED ACREAGES AND CAPACITIES  
4 Farms, New York, 1966

Farm no.	Acres of tomatoes grown	Acres harvested mechanically	Harvester capacity*		
			Tons per hour	Acres per hour	Man hours per ton
1	123	4.5	1.2***	0.3	10.5
2	100	11.0	2.5	0.3	4.8
3	100	28.0	2.2***	0.2	7.3
4	90	7.0**	2.6	0.2	5.0

\*No major breakdown time is included

\*\*This grower expected to harvest 18 more acres by machine

\*\*\*About two-thirds of machine harvested acres had been hand picked once

In two cases some hand picking preceded the mechanical operation. On Farm #1, three of the 4.5 acres harvested by machine yielded an estimated 10 tons per acre from a first picking by hand. Also, 17 acres on Farm #3 were hand picked and yielded three tons per acre before the machine was used. There was no hand picking on the "machine harvested" acres on the other two farms.

In operation the growers used a crew of 10 to 14 people on the harvesters. It was necessary that the driver have mechanical ability and understand the operation of the machine. The balance of the crew was composed of migrant workers used as sorters. In addition to this crew an overall supervisor (usually the grower) was nearly always present to coordinate activities and aid the driver in keeping the machine running. Also, additional help was used with the trailer carrying the boxes into which the tomatoes were elevated.

Harvesting capacities as operated ranged from 1.2 to 2.6 tons of tomatoes harvested per hour. Harvesters covered from 0.2 to 0.3 acres per hour under the conditions on these farms this year (Table 1).

These outputs were much below the capacity claimed by the manufacturers. To be specific, the farmer on Farm #1 harvested 4.5 acres yielding a total of 21 tons of tomatoes (after one hand picking) in 17 hours; the operator on Farm #2 estimated that he harvested 11 acres by machine in 40 hours of actual operating time during three and a half weeks devoted to the mechanical harvesting of his tomatoes; for Farm #3 it was estimated that two and a half acres yielding 10 to 11 tons per acre were harvested in a 12 hour day; and on Farm #4 it took about five hours to harvest one acre with a yield of 13 tons per acre. These estimates included minor but no major breakdown periods in the field. Major breakdown time ranged as high as 50 percent of the total time spent with the machine.

Growers cited several reasons for the breakdowns and low capacity of their machines. All agreed that the harvester was not designed for New York soil conditions. They felt that the design was too lightweight, making many adjustments and repairs necessary. Several noted that a considerable amount of time was spent keeping various belts and chains in place and intact. Stones were a serious problem causing major damage to the salvage conveyor chain.

Another problem mentioned by most of the growers was the high percentage of fruit that came loose in the pick-up process and therefore had to be sorted at the front of the machine. As a result, more sorters were needed at the front than on each side of the shaker at the rear of the machine. The lack of enough fruit sorting space to handle the large quantities of loose fruit at the front of the machine made it necessary to travel slower, thus reducing the capacity of the machine.

A third factor that affected mechanical harvesting of tomatoes was the weather. Frequent rains during the harvest season resulted in generally wet soil conditions for harvesting. The flights in the conveyor chains on the harvesters were spaced so that loose, dry dirt would sift through, but under wet conditions mud accumulated that bridged the openings. This hindered the sorting process and made periodic removal of mud necessary.

Some of the growers indicated that they felt the yields would have been higher if the tomatoes had been hand picked, because fewer marketable tomatoes would have been left in the field. They also observed that, especially in the field, down time became expensive because sorters on hourly pay were idle but still had to be paid. The harvesting cost per ton was increased accordingly.

The quality of the fruit as it came from the harvester was generally good. In two cases the tomatoes harvested by machine were said to grade somewhat better than those picked by hand this year. This was attributed to the extra sorting done on the machine resulting in holding culls to about 3 percent. On the other hand, a third grower stated that hand-picked tomatoes graded better than "machine picked" fruit where culls ran as high as 10 to 15 percent. The fourth grower had a special market for his tomatoes and a comparison of grades was not made.

Each of the four growers registered disappointment and discouragement with the mechanical harvester. The experience of these operators in 1966 clearly indicates that some significant changes will be made before the harvester will make a positive contribution to the processing tomato industry in New York.