

## SUCCESS STORY - 1970-71

### MECHANIZATION OF CABBAGE HARVESTING PROBABLE

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North Carolina produces about 6500 acres of cabbage annually, with a value of \$2,500,000. Harvesting of this crop, as well as most of the other production tasks, has remained essentially a hand operation. Heads are cut selectively at 2½ to 3 pounds each, tossed into a trailer and hauled to a packing area for placement into 50-pound crates or bags for marketing. Some producers carry the crates or bags into the field and pack directly into them as the cabbage is cut, then load the filled containers on a truck for delivery to market.

Labor requirements for harvesting this crop are high, averaging 40 or more man-hours per acre for a ten-ton yield. Cutting alone requires about 20 man hours per acre. Hauling, packing, and stacking require an additional 20 man hours. The work is strenuous and unpleasant, particularly the cutting and crate-handling. Many growers are experiencing difficulty in securing a dependable labor force.

Recently considerable work has been done in various areas of the country on mechanizing the field-cutting of cabbage. Several machines have been developed and used with varying degrees of success.

The harvesting of cabbage for processing has been mechanized more successfully and to a greater extent than fresh-market cabbage, because of less stringent appearance and mechanical-injury considerations.

A machine developed commercially in Ohio and used for the past two or three years to harvest processing cabbage is currently being offered in slightly modified form for use in harvesting fresh-market cabbage. Development and evaluation are still underway on this harvester, but tests in North Carolina by Extension Biological & Agricultural Engineering and Horticultural Science personnel indicate that it does an acceptable job of cutting cabbage for the fresh market. Some additional trimming

over hand-cut cabbage was necessary, and a few heads were damaged beyond use, but over 50% of the heads could be packed just as they came off the machine, and an additional 30% could be packed with some further trimming. Only about 2% of the machine-harvested heads needed to have the butt cut squared, and only 3% were broken or smashed. Approximately 13% of the heads were cut too high (trimmed too close); however this loss could be reduced to little or nothing by adjusting the machine to cut lower. More heads would then require additional trimming, presumably.

Labor requirements for cutting and catching cabbage in a bulk trailer can be reduced from about 22 to 8 man hours per acre by use of the machine. Packing would require equal or greater time for machine-harvested than for hand-harvested cabbage. Improved packing procedures in conjunction with mechanized cutting offer an opportunity to further reduce total labor requirements for harvesting.

One problem which must be confronted is the non-uniformity with which cabbage tend to reach marketable size. The mechanical harvester cuts everything as it goes; heads too small to market are wasted.

The economic feasibility of mechanization may hinge on whether production practices can be devised which will insure that a high percentage of the heads reach marketable size at the same time. Applied research to develop these production techniques and to improve the overall efficiency and ease of harvesting will be undertaken by extension and research personnel of the Biological & Agricultural Engineering and Horticultural Science Departments.