

SUCCESS STORY
BIOLOGICAL AND AGRICULTURAL ENGINEERING EXTENSION

CUCUMBER HARVESTER GOES COMMERCIAL

by

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About seven years ago research was begun in the Biological and Agricultural Engineering Department which led in due course to the development of a device capable of nondestructive multiple harvesting of cucumbers. In order for it to operate acceptably, highly critical specifications had to be imposed on the mature field of cucumbers which could not be reliably met using conventional cultural practices. A first attempt at commercialization of the machine failed due in part to inadequacies in the techniques and equipment for land preparation, planting and cultivation necessary to insure fields and crops suitable for machine harvest. These shortcomings were satisfactorily resolved in 1970 with the adaptation and use of precision bed-forming equipment prior to planting and powered rotary tillers for cultivation to build and maintain a precision working surface for the harvester, plus the establishment of minimum plant populations to provide the proper amount of vine material to suit the harvester.

With the development of such a "prescription" for growing cucumbers for the harvester and additional refinements in the harvester itself, mechanical multiple-pick harvesting achieved a potential of profitability and reliability which gave it a high probability of success in commercial use provided the user fully understood and conscientiously followed the necessary production practices. A manufacturer who was briefed on the status of the project decided to obtain a license and go into production of the harvester beginning with two pilot models in 1972.

One of the pilot machines was operated in North Carolina on 2.2 acres of spring cucumbers. BAE Research and Extension personnel were in charge of the production

and harvesting of the crop. The purposes were twofold: (1) to demonstrate the feasibility and the techniques of multiple-pick mechanical harvesting, and to document the case study with data, pictures, movies, slides, etc., for educational efforts to be undertaken subsequently; and (2) to make refinements in the pilot machine for incorporation into the production model. The effort was quite successful in all respects. Eight harvests of the field produced an average yield of 208 bushels per acre of No. 1, 2, and 3 cucumbers with a market value of about \$320. Cost of harvest was estimated at \$80 to \$100, leaving a gross return over harvesting costs of \$220 to \$240 per acre. This compares very favorably with the average gross return over harvesting costs when hand labor is used, and production costs are not greatly different. Thus although the machine harvests fewer cucumbers than are obtained by hand harvesting, the profit to the grower should be about as high, and he has virtually eliminated his dependence on labor since only two people are required to run the machine.

While it is difficult to visualize how the adoption of mechanical multiple-pick harvesting can measurably increase the net profit per acre of cucumber growers in North Carolina, it does provide a means of expanding total income of some growers by increasing acreage. It may enable some growers who would otherwise be forced to discontinue production for lack of labor to stay in production, and it will enable those family farmers whose family labor is growing up and moving away to mechanize and maintain income.