

PROGRESS REPORTS sent to other departments for them to incorporate in their report to J. D. Dodson:

Field Crops

Beasley

Field Crops

Glover

Livestock (A. V. Allen)

Driggers

Poultry (W. C. Mills)

Driggers

Dairy (Marvin Senger)

Driggers

Horticultural Crops (A. A. Banadyga)

Beasley

PROGRESS REPORT, ANNUAL STATE NARRATIVE

FIELD CROPS

Educational work of an engineering nature was carried on in the form of meetings, workshops, field days, equipment demonstrations, and TV and radio programs.

A peanut field day at Lewiston emphasized inverting digger-shaker-windrower equipment, and a demonstration of most available equipment of this type was held. A cotton field day at Clayton emphasized reduced-tillage techniques of production, including no-tillage row and broadcast patterns, strip-tillage row patterns, and narrow-row conventional tillage. Participation in an area Farm Trade Show, exhibiting new or experimental equipment, was coordinated by Extension.

Applied research and on-farm tests were conducted to examine ways of reducing the amount of tillage required to produce cotton and other field crops. Ten on-farm tests in different counties were carried out to demonstrate row-strip tillage and planting techniques for cotton. A 3-year rotation involving cotton, corn, and peanuts grown under 5 different reduced-tillage concepts and a conventional check was initiated in 1971.

A publication was prepared on increasing the efficiency of field machinery.

July 9, 1971

MEMORANDUM TO: Dr. Guy L. Jones
Mr. A. D. Stuart
Mr. Glenn Toomey
Mr. Astor Perry
Dr. W. K. Collins

FROM: John W. Glover

SUBJECT: Field Crops Progress Report for FY 70-71

Attached is the field crops progress report statement for Biological & Agricultural Engineering.

JWG:s
Enc.

Farm Machinery

GENERAL MECHANIZATION OF FIELD CROPS

Educational work of an engineering nature was carried on in the form of meetings, workshops, field days, equipment demonstrations, and TV and radio programs. Participation in an area Farm Trade Show at Lumberton, exhibiting new or experimental equipment, was coordinated by Biological and Agricultural Engineering Extension. A publication was prepared on increasing the efficiency of field machinery. A paper was prepared and presented to the American Society of Agricultural Engineers on the performance of spinner type fertilizer spreaders. These spreaders had been evaluated by Extension Biological and Agricultural Engineering in cooperation with Extension Agronomy.

COTTON

Applied research and on-farm tests were conducted to examine ways of reducing the amount of tillage required to produce cotton and other field crops. Ten on-farm tests in different counties were carried out to demonstrate row-strip tillage and planting techniques for cotton. A 3-year rotation involving cotton, corn, and peanuts grown under 5 different reduced-tillage concepts and a conventional check was initiated in 1971. A cotton field day at Clayton emphasized reduced-tillage techniques of production, including no-tillage row and broadcast patterns, strip-tillage row patterns, and narrow-row conventional tillage.

CORN

Drying high moisture corn continues to be a problem with North Carolina growers. County meetings were conducted on properly drying and storing corn, and an article was prepared for a farm publication on the subject.

PEANUTS

A peanut field day at Lewiston emphasized inverting digger-shaker-windrower equipment, and a demonstration of most available equipment of this type was held.

Peanuts are practically all mechanically cured in North Carolina. Educational efforts were continued to stress proper operation of the curing equipment to maintain peanut quality.

TOBACCO MECHANIZATION

Educational efforts in mechanical harvesting and bulk curing tobacco are proving fruitful.

In 1970 approximately one thousand bulk barns were placed on North Carolina farms. Operational instructions on curing and ordering tobacco in these new facilities have been successful to the point that marketplace discrimination against bulk cured tobacco has all but disappeared. Farm success with these labor saving bulk barns has been such that a greater number of purchases are expected for 1971.

Extension's farm tests of mechanically harvesting tobacco and marketing unaligned leaf have convinced many farmers of the feasibility of mechanical harvesting. Three machinery manufacturers are marketing tobacco "combines" for 1971, and several sales of machines to farmers have been reported.

Extension's efforts in tobacco mechanization in 1970 included innovative farm tests of harvesting tobacco with tobacco combines and marketing this tobacco without aligning the leaves. Six acres of machine harvested tobacco sold for 73.7 cents per pound, and six acres of comparable tobacco harvested by hand sold for 75.1 cents per pound. Extension's educational efforts using these results, coupled with keen farmer interest in mechanization and commercial experimentation with tobacco harvesters, have convinced three manufacturers to market tobacco harvesters in 1971.

July 15, 1971

MEMORANDUM TO: Mr. A. V. Allen

FROM: L. Bynum Driggers

SUBJECT: BAE Extension Contribution to the Livestock Area for the
Progress Report for FY 1970-71

Continued emphasis is placed upon systematized planning of swine buildings and equipment in which labor is minimized, proper environmental conditions provided and waste handled and disposed of properly.

A new method of exhausting ventilating air from the pits under slotted floors shows real promise for reducing odors in swine buildings.

Plans for the 90-sow unit at the Upper Coastal Plains Research Station have been completed, and construction is underway. The structures are designed for near optimum environmental conditions, and results of studies from these facilities will be directly applicable to commercial producers.

Concerted efforts have been directed to animal waste disposal. Information has been provided to producers on the pollution potential and the methods which might be used to acceptably dispose of this material. Much remains to be accomplished in this area, but real interdisciplinary action is underway.

Building plans are being designed for specific functions, and older plans are updated with the results of new research and technology.

As a result of previous studies, intensive production units are installing zone air conditioning in farrowing houses to relieve the heat stress on sows, and many producers are now using fan ventilation.

LBD:s

July 15, 1971

MEMORANDUM TO: Dr. W. C. Mills

FROM: L. Bynum Driggers

SUBJECT: RAE Extension Contribution to the Poultry Area for the
Progress Report for FY 1970-71

On-farm tests with commercial egg producers have been conducted with two flocks in totally enclosed houses. The houses are similar except that one is evaporative cooled in the summer.

During the winter, near optimum environmental conditions can be maintained with steady egg production and feed consumption.

In summer, inside conditions were several degrees above outside during daily peak temperatures, but no detrimental production effects were evident in the mechanically ventilated house with natural air.

In the evaporative cooled house, inside temperatures were as much as 7° F. lower than outside but were accompanied by a relative humidity of 85 percent or more.

For a normal lay period, operating costs for fans is less than 4 cents per bird.

A good comparison of the data is shown in the June issue of the Tar Heel Economist, and complete results of the tests are available from this office.

The results clearly indicate that near optimum environmental conditions must be provided for the birds to optimize genetic and nutrition responses.

Efforts were also extended in the area of waste disposal and management. Attention was drawn to the potential pollution of waterways and air with poultry wastes, and producers were urged to handle the waste to prevent contamination of both the air and water. Much remains to be done in this area, but concerted interdisciplinary action is underway.

LBDS

July 15, 1971

MEMORANDUM TO: Mr. Marvin Senger

FROM: L. Bynum Driggers

SUBJECT: BAE Extension Contribution to the Dairy Area
for the Progress Report for FY 1970-71

Efforts through the SALS Animal Waste Disposal Committee have been directed to the pressing problem of dairy waste disposal. As a result, a proposal has been submitted for funding to study the various methods of disposal and pollution effects.

This specialist has been involved with the Dairymen's Conference and the Fieldmen's and Sanitarians' Conference to discuss disposal methods in addition to county meetings and direct communications with producers and agribusiness personnel.

LBD:s

Sent to Dr. Bandyga
2/9/71

CONTRIBUTION OF EXTENSION BIOLOGICAL AND AGRICULTURAL ENGINEERING
TO THE EXTENSION PROGRESS REPORT - HORTICULTURAL CROPS

By

E. O. Beasley, Extension Specialist
Biological and Agricultural Engineering

Engineering-related Extension work of an educational nature pertaining to many fruit and vegetable crops grown in North Carolina was carried on through meetings, workshops, demonstrations, radio and TV programs and appearances, and applied research either on experiment stations or private farms, in cooperation with appropriate specialists and researchers from other departments.

Two mechanical cucumber harvester demonstrations were conducted. A commercial cabbage harvester was evaluated on a private farm and its performance documented. Trials of a mechanical cucumber harvester in fresh-market cucumbers were held on the research station at Plymouth. Preliminary testing of a device for harvesting green peppers was carried out on the research station at Faison.

In cooperation with Economics and Horticulture extension and research personnel, a study of commercial mechanical blueberry harvesters was conducted in Bladen County with several large growers who had leased equipment. This information will be used as the basis for economic feasibility determinations and management assistance for North Carolina blueberry growers who are mechanizing or are considering mechanization.

Preliminary study and design work on a trellised-tomato harvesting aid was undertaken, and work is progressing toward completion of a prototype machine to be field-tested in 1971, and a set of plans to be made available by which tomato growers in western North Carolina can build their own similar harvesters. No device is currently available commercially which adequately fits the need at a modest price. Multi-functional capability including spraying, tying, and suckering in addition to harvesting is to be attempted.

Development of the multiple-pick mechanical cucumber harvester has moved nearer to the commercialization and implementation stages, with subsequently greater involvement by Extension. Production concepts and cultural practices which conform to machine operating requirements are being perfected and will be promulgated by Extension as an essential part of the transition from hand to mechanical harvesting, for both the multiple-pick and once-over harvesters.

A commercial fresh-market cabbage harvester was brought into the state for performance evaluation. Results indicated the machine was adequate from a functional standpoint; however economic considerations surrounding its "once-over" method of harvesting render its immediate applicability in North Carolina questionable under current circumstances. Labor unavailability or more uniformly maturing cabbage could precipitate early adoption of this mechanical innovation in the state.