

August 6, 1970

MEMORANDUM TO: Mr. J. D. Dodson

FROM: George J. Kris, In Charge, Extension  
Biological & Agricultural Engineering

SUBJECT: Progress Report for FY 1969-70

Enclosed is the progress report for Fiscal Year 1969-70 from Biological & Agricultural Engineering Extension, as well as four success stories.

Information concerning work done by the BAE specialists in the commodity areas was sent to Dr. Mills for the Poultry area, Dr. Banadyga for the Horticultural area, Mr. Allen for the Livestock area, Mr. Dixon for the 4-H area, Mr. Toomey for the Cotton area, and Dr. Collins for the Flue Cured Tobacco area.

If any additional information is needed, please contact me.

GJK:a

CC: Dr. T. Carlton Blalock  
Assistant Director  
Ricks Hall  
Campus

Sent to Mr. Dodson  
8/6/70

PROGRESS REPORT FOR FISCAL YEAR 1969-70

Biological and Agricultural Engineering Extension

A cooperative program in land forming involving the Agricultural Extension Service, the Soil Conservation Service, the Biological and Agricultural Engineering and Soil Science Departments at North Carolina State University, the Agricultural Research Service, and Reynolds Research & Manufacturing Co., McAllen, Texas, was continued so that irrigation and drainage programs could be coordinated and complement each other in a total water management program. Land forming is the shaping of a field to uniform or non-uniform row and cross row slope to remove shallow field depressions and to facilitate the rapid removal of excess surface water to prevent crop damage and at the same time slowly enough to allow adequate infiltration of water into the soil. Approximately 800 people attended the 12 demonstrations held in FY 1969-70. Research initiated concurrently with the start of the program in FY 1968-69 is continuing on yield response versus fertility studies on several different soil types in both field and greenhouse studies. New methods of land forming design and determining cuts and fills have been developed and are applicable for both irregular and regular shaped fields. A computer program that incorporates these features has been developed. Approximately 15 farm equipment dealers are now selling land forming equipment, and several have rental equipment available. Individual land owners have purchased at least 30 pans and 25 land planes, and at least five contractors are currently in the land forming business. Most of the 40 Coastal Plains counties have ACP cost sharing for land forming included in their 1970 program. The average cost of land forming in North Carolina is approximately \$35.00 an acre, based on 15¢ per cubic yard of earth moved. As the practice of land forming increases, a large portion of the average of approximately \$45,000,000 per year lost to farmers because of inadequate drainage will be eliminated. In addition, irrigation will grow because of good drainage, and thus the nearly \$183,000,000 per

year loss to North Carolina farmers can be greatly reduced. Four states have contacted the Department of Biological and Agricultural Engineering concerning the best method to use in developing a land forming program in their respective states. A one-hour special television program entitled "Irrigation in the Seventies" helped stimulate a considerable interest in irrigation and water management in North Carolina.

Performance evaluations with particular respect to uniformity of spread pattern have been conducted on several makes of bulk fertilizer spreaders in cooperation with the manufacturers of the equipment and fertilizer dealers. Results from tests conducted on several spreaders in use by fertilizer custom applicators showed that the spread pattern was very poor. Tests conducted on new spreaders also gave poor spread patterns. A computer program was developed to evaluate the spread pattern so that the results of one pass through the field could be converted to a final spread pattern at various swath widths, and the effect of driver errors could also be studied. Tests conducted after making adjustments on the spreaders used in the previous tests still gave poor patterns for both lime and fertilizer. New designs resulting from work with a manufacturer greatly improved the spread pattern for lime and fertilizer. The new design is far superior to the old and is now being offered for sale.