NORTH CAROLINA AGRICULTURAL EXTENSION SERVICE

PLAN OF WORK

AGRICULTURAL PRODUCTION, MANAGEMENT, AND NATURAL RESOURCES USE
Title of Project

EXTENSION AGRICULTURAL ENGINEERING
Section

1963 - 1964
~~1962 - 1963~~
Fiscal Year

Name and Title of Worker	Percentage of Time Devoted to Entire Project by Each Worker
H. M. Ellis, In Charge Project Leader	100 %
J. C. Ferguson, Specialist	100 %
John W. Glover, Specialist	100 %
R. M. Ritchie, Jr., Specialist	100 %
Ronald E. Sneed, Specialist	100 %
W. C. Warrick, Specialist	100 %
Rupert W. Watkins, Specialist	100 %
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Signed _____
State Director of Extension

Date Recommended _____

Signed _____
Administrator, Federal Extension Service, U.S. Department of Agriculture

Date Approved _____

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1963 - 1964

PLAN OF WORK FOR THE DEPARTMENT OF EXTENSION

AGRICULTURAL ENGINEERING

III. STATEMENT OF PROBLEMS

To raise the net income of Extension's clientele with present resources through existing and new enterprises and products, the Department of Extension Agricultural Engineering will devote 50% of its time to the following specific problems:

1. Farm Mechanization: Proper farm mechanization is lagging, and the lack of simple maintenance along with inadequate off-season storage add heavily to equipment operational cost. The changing situation with respect to availability of farm labor, and the relative high percentage of small farms complicate problem solution.

2. Crop Processing: Farmers lack understanding of the relationship between various process variables and their effect on the final quality of the processed product. They also lack knowledge and understanding of equipment and machinery operation in controlling these process variables.

3. Farm Service Buildings: With narrowing margins of profit, growers using poultry buildings, swine buildings, and plastic greenhouses need additional information on designs for maximum over-all efficiency, even though they mean a higher initial investment.

4. Irrigation: The slow adoption of irrigation for general crops, improper use of equipment and water stem partially from the lack of basic irrigation research.

5. Housing: Low income families (over 80% of rural non-white) live in sub-standard houses with no plumbing facilities.

6. Rural Civil Defense: The possibility of our population being exposed to excessive radiation is quite real. A "do-nothing" or "do-little" attitude prevails.

7. Safety: Agriculture leads all major industries in the number of accidents.

IV. PLAN OF ACTION

Farm Mechanization - J. C. Ferguson, John W. Glover

Intensified work will be continued in cotton, tobacco, and peanut mechanization. Equipment will be used on the basis of all-practice demonstrations with prime objectives directed toward the reduction of production costs while giving proper consideration to both yield and quality.

Crop Processing - Rupert W. Watkins

In bulk curing of tobacco, there is a higher degree of control of temperature, humidity, and air flow which affords the opportunity to do a better job than was possible before. Recent research discloses advantages in proper manipulation of curing variables which affords advantages for higher quality tobacco for those understanding the process. The educational program will be directed toward teaching farmers who bulk cure proper use of equipment for controlling curing variables to produce best quality.

Research definitely proves that high quality alfalfa hay can be economically produced in North Carolina. Two farm demonstrations will be conducted, employing proper curing procedures. Mechanized production with most modern equipment will be employed. These applied research projects will be cooperatively conducted by all affected subject matter departments.

Farm Buildings - R. M. Ritchie, Jr.

Major program emphasis will be directed toward the design of poultry and swine houses for maximum overall efficiency, and to set up demonstrations in selected counties which will prove the value of the new design. Latest research information will be used in developing new designs which will be field tested with cooperating farmers.

Cooperation with horticulturists on experimental greenhouses on a college farm in an effort to develop improved heating system and frames for supporting plastic covers will continue.

Evaluation of applied research demonstrations will be based on performance or results as the case may be. Evaluation of work on plan revision will be based on requests for plans.

Irrigation - Ronald E. Sneed

The main objective of the irrigation program will be the setting up of an applied research project to be cooperatively conducted with other subject matter specialists on the irrigation of cotton, corn, and peanuts. Other college personnel consisting of an economics specialist and many research workers with representatives from industry will work together in setting up and conducting this demonstration. It is anticipated that the project will run from 1963 to 1965. Stated objectives include whether or not the irrigation of these crops is profitable under present farming practices; and if so, to what extent. Special attention will be given to time and amount of irrigation.

The cooperating farmer has agreed to accept responsibility for normal production work and for keeping sales records.

Housing - W. C. Warrick

Increased income of Negroes and increased credit facilities make for greater opportunities for home improvement for the segment of the population

that has the lowest housing standards. The housing specialist will devote 50% of his time in working with Negro agents on Negro home improvements.

Farmers Home Administration credit coupled with this proposed educational program by Extension seems to offer an almost ideal combination of agencies for attacking the housing problems of this low-income group, particularly those that have been motivated towards improving their living standards.

Training in depth for agents in special schools in cooperation with house furnishing specialists will be conducted. Emphasis will be on Negro agent training.

Rural Civil Defense - H. M. Ellis

Radiation-producing weapons are under the control of those that oppose our way of life. Our citizens must be convinced that survival against radiation is possible, and they must be motivated to take necessary steps for survival. Extension's responsibility is for the educational program and the distribution of Civil Defense publications to those in rural areas and in towns up to 10,000 population. With the addition of a full-time worker expected to be added to this department in the near future, a stepped-up program will be conducted. This program will be in the area of awareness and the need for family protection fallout shelters.

Major emphasis during the coming year will be placed on coordination of efforts of all agencies in teaching awareness. It is too early in the educational program to state definite objectives such as might be undertaken with a crash-type program.

Safety - H. M. Ellis

The specialist will direct the program of the North Carolina Rural Safety Council.

POWER AND MACHINERY

III. STATEMENT OF PROBLEMS

Farm mechanization has progressed rapidly in North Carolina, but considerable contrast still exists between the highly mechanized operations versus the partially equipped farms.

Availability of farm labor and the high cost of a limited supply are major problems in most areas of the state. Further mechanization is one method of off-setting this situation.

The relatively high percentage of small farms also poses many problems concerning acquisition as well as efficient use of modern machinery.

Lack of simple maintenance and inadequate off-season storage add heavily to operational costs.

IV. PLAN OF ACTION

1. Intensified work will be continued in cotton mechanization dealing primarily with machine application in the accomplishment of recommended cultural practices such as chemical weed control, cultivation and insect control. Special emphasis will continue toward further improvement and adaptation of mechanical harvesting techniques.

   Tobacco being the top money crop will receive its share of work dealing with mechanical aspects of transplanting, cultivation, insect and sucker control, and mechanical aids in harvesting. Agricultural Engineering will cooperate with Plant Pathology in applied testing of materials involving machinery for nematodes and disease.

   Peanut mechanization is moving rapidly but still short of desired acceptance in many areas. Educational work through the medium of meetings and field demonstrations will continue as requests indicate

needs. Processors and their many buyer representatives will be contacted in educational meetings to further disseminate information pertinent to the success of newly adopted harvesting and curing procedures.

Horticultural crops, including blueberries, sweet potatoes, cucumbers, etc., will receive attention, the objective being to reduce production costs and improve quality.

Assistance with the Agricultural Engineering 4-H projects (Tractor, Automotive, and Electric) will be rendered as requests indicate needs.

Cooperative effort with our many farm equipment dealers and their suppliers affords a valuable resource to Extension teaching and will be utilized as situations develop.

2. Prime objectives in the field of power and machinery are to reduce production costs, improve both yield and quality through the wise selection and efficient use of modern equipment. This, in turn, affording North Carolina farmers a more satisfying way of life through increased net income.

3. Teaching methods incolve agent training schools and assistance with area or community meetings, along with appropriate field demonstrations as determined by joint consideration. Necessary visual aids along with printed materials will be used. Educational materials must be constantly revised and improved to meet the fast changing situations as now prevail.

4. State staff members involved in promoting and accomplishing the above outlined objectives are J. C. Ferguson and John W. Glover.

5. Various techniques such as statewide or crop area surveys, agent reports along with personal study and careful observation may be used as means of measuring actual accomplishments. Plans for reporting noteworthy accomplishments will be influenced by availability of information, timeliness and urgency of dissemination; however, normal media will usually suffice.

PEANUTS

III. STATEMENT OF PROBLEMS

Approximately 50% of the peanuts are now mechanically harvested and cured. Quality is of major importance, and the price structure at the market does not force the operators to seek proper operational information on their own.

IV. PLAN OF ACTION

2. To further train county Extension agents in depth in both harvesting and curing peanuts.

To conduct educational programs for farm and custom operators on the operation of curing equipment to maintain quality.

3. In depth training meetings will be conducted for agents, and regular Extension methods will be employed for the operators. The peanut manufacturing industry will also aid in the educational efforts.

4. John Glover.

5. Evaluation will be made by field observations, reports from agents and industry.

CROP PROCESSING

III. STATEMENT OF PROBLEMS

The major problems found in crop processing in North Carolina are embodied in the farmer's lack of understanding of the relationship between various process variables at his command and their effect on the final quality of the processed product. The farmer's lack of understanding of equipment and machinery operation in controlling process variables also presents serious problems.

IV. PLAN OF ACTION

Tobacco Bulk Curing

The adoption of bulk curing in North Carolina has brought clearly into focus the farmer's need for a more basic understanding of the curing process. The higher degree of control of temperature, humidity, and air flow gives the operator opportunity to do a better job of curing than ever before. It also enables him to spoil his tobacco during curing much faster than ever before if his judgment is faulty.

Recent research in tobacco curing has brought to light advantages in the proper manipulation of curing variables heretofore unknown. The current need for higher quality tobacco promises greater monetary advantages to farmers with good understanding of the curing process.

The ultimate goal of the educational effort is to educate every farmer who owns a tobacco bulk curer as to the fundamentals of the curing process and the use of the equipment for controlling curing variables. Since county agricultural agents and equipment dealers will be in close contact with farmers, our main effort will be to educate these agents and dealers. Meetings will be held to educate the farmers directly as to curing fundamentals and equipment operation.

The success of educational effort in tobacco bulk curing will be evaluated by:

Equipment dealer and agent interest, understanding, and participation.

Farmer interest, understanding, and adoption of recommended procedures.

Field observation.

Mechanical Hay Drying

Due to rainfall patterns and the time required for field-drying hay, each year North Carolina farmers fail to produce a sufficient quantity of high quality hay to feed the animals of the state. Hay is shipped in from other states at exorbitant prices.

Research has proven that hay can be "housed" on the same day it is cut by employing mechanical drying. Thus, high quality hay can be obtained with less than half the "weather risk" inherent to conventional field drying.

This year two farm demonstrations will be conducted, employing research knowledge and the most modern equipment, to establish the feasibility of mechanical hay drying and to accentuate the advantages. County agricultural agents, college research personnel, and equipment manufacturers as well as farmer demonstrators are participating in this venture.

The success of this education by demonstration effort will be judged by:

(1) Records of production, equipment and operational costs, and revenue returns to be used in later educational efforts.

(2) Farmer interest generated.

(3) Farmer demonstrators' opinions and recommendations as to future applications of the drying process.

Other Activities in Crop Processing

1. Mechanical peanut drying.
2. Corn and small grain drying and storage.
3. Sweet potato curing and pre-sprouting.

4. Tobacco mechanization.

5. Farm electrification.

FARM BUILDINGS

Major opportunities for increasing net income through improved farm buildings exist in the following areas:

(1) Poultry Housing

Poultry buildings represent the largest volume in farm service building construction. Any improvements in poultry building design which would either lower the building cost or increase the efficiency of production would yield correspondingly large increases in income. Present poultry buildings designs are generally near the level of least possible incestment, but with narrower margins of profit, poultrymen are becoming more receptive to information on designs for maximum overall efficiency, even though they may mean a higher initial investment. There has been keen interest in recentinnovations such as insulation, fan ventilation, and improved heating systems for broiler houses; and insulation, ventilation, high density housing, automation, and colony cage houses for layers.

(2) Swine Housing

The swine industry appears to be on the threshold of a revolution as far as systems of housing are concerned. The trend is very much toward larger units, more mechanization, and confinement production. With efforts of other departments and agencies directed toward an expansion in the swine industry, improved building designs at this time would yield large benefits in the near future.

(3) Plastic Greenhouses

Production of flowers, plants, and vegetable crops in plastic greenhouses is a relatively new practice. Horticultural specialists have seen the potential for increasing income through the use of these low-cost structures, and considerable expansion has already taken place. Improvements are needed in the

structural design and heating and ventilating equipment for these structures. The increased income from these enterprises in the immediate future will not be large compared to the overall farm income, but their potential for the future is great. In general, the production from these enterprises will represent "new money" which is not derived from products competing directly with those produced by other North Carolina growers.

There are other areas where farm building improvements need attention; and the farm building specialist works with all other specialists and with all areas of the state in various activities; but the three above have been selected for special emphasis as having greater potential for increasing present and future farm income.

Educational Objectives:

(1) To evaluate information available in the three areas mentioned above, in order to develop recommendations and building plans for North Carolina use.

(2) To distribute information on a mass basis through county agricultural agents and other agricultural agencies, news, radio, television, and other channels.

(3) To set up demonstrations in selected counties which will prove the value of new design where appropriate.

(4) To conduct a program of general information in all areas of farm buildings to the extent determined by agent requests and time available.

Activities

(1) Poultry Buildings

a. Continue to assemble and evaluate research information and field demonstrations on insulation, ventilation, and heating of broiler houses, and distribute this information through agents and other channels.

b. Review and evaluate available research information and farm records on insulation and ventilation of laying houses in our climate. Find cooperators to demonstrate practices which seem feasible, and distribute information through agents and other channels.

c. Develop a colony-cage laying house plan adapted to North Carolina climate. Test this plan in cooperation with interested producers.

d. Revise present poultry house plans to incorporate best information available as developed above.

(2) Swine Buildings

a. Revise present standard plans for crate type farrowing house and developing pens.

b. Evaluate available research information on environmental requirements and develop preliminary plans for farrowing and growing buildings which incorporate indicated methods of environmental control, along with structural and labor efficiency.

c. Find interested producers who will cooperate in building and testing new types of swine buildings which appear to have merit.

d. Work with regional committee for southeastern states in developing design criteria for swine buildings for this region.

(3) Plastic Greenhouses

a. Assist horticultural specialists in conducting training schools for agents and producers.

b. Work with cooperating growers in developing information and cost records on various types of structures and heating systems.

c. Continue work with horticulturists on experimental greenhouses on college farm in an effort to develop improved heating system and frames for supporting plastic covers.

d. Release information through agents and other channels as developed.

(4) Other Farm Building Activities

Approximately 50% of the specialist's time will be devoted to the following activities:

a. Keeping up to date on available information in all areas of farm buildings work.

b. Preparing and distributing information in areas of farm buildings other than those mentioned above.

c. Revision of standard plans other than mentioned above.

d. Assisting agents with county meetings, demonstrations, and farm visits.

e. Assisting with preliminary design of public agricultural buildings such as office buildings, livestock sales barns, fair buildings, fruit and vegetable processing buildings, and community buildings.

f. Conferences with other specialists and workers from other agencies to coordinate activities.

Evaluation

Work will be evaluated by:

(1) Observation of results obtained by cooperators in demonstration buildings.

(2) Performance of plastic greenhouses built on college farm.

(3) Acceptance of information distributed in plan form as indicated by:

a. Observation of buildings built including recommendations.

b. Records of total number of plans requested which will indicate their acceptance.

IRRIGATION

III. STATEMENT OF PROBLEMS

The major problems in irrigation can be described as too little irrigation of all crops, improper equipment use, poor timing of irrigation, and lack of basic irrigation research data on the three so-called marginal crops - corn, cotton, and peanuts.

IV. PLAN OF ACTION

1. Irrigation equipment sales in North Carolina are still directly related to weather cycles. Most farmers are reluctant to purchase equipment until dry weather has already caused them some damage, This is evident by the fact that during May 1962 approximately $1,500,000 was paid for irrigation equipment. Irrigation equipment is still purchased primarily as insurance against dry weather and not as a production tool.

Irrigation of high income, specialized crops such as tobacco, strawberries, blueberries, tomatoes, pole beans, apples, and other such vegetable and fruit crops still totals only a small percentage of the total acreage planted to these crops. Tobacco irrigation pays during an average year, 23% on the investment for a 5-acre allotment and 35% for a 25-acre allotment, yet only 1½% of the acreage is irrigated.

Many farmers are not using their equipment properly. They wait too long before starting to irrigate, and then they apply too much water at one application. This is compounded by the fact that they are using too large sprinklers that apply water faster than the infiltration rate of the soil.

Irrigation of corn, cotton, and peanuts is practically non-existent. We do not have the research data to show that irrigation of these three crops is profitable.

2. a. To try and promote the irrigation of corn, cotton, and peanuts, the irrigation specialist will work with a team of specialists in a 3-year applied research project on a farm in Halifax County. This project will run from 1963 to 1965. The objective of the project is to determine if irrigation of these three crops is profitable. If irrigation proves profitable, it is hopes that many North Carolina farmers will accept it as another method to raise farm income.

b. Irrigation equipment distributors will come together to discuss common problems. The irrigation specialists will lead this discussion. Items to be discussed will include proper use of equipment, new techniques in irrigation, and others. Also the specialist will visit each of the distributors during the year to work with them on individual problems. The objective is to use dealers who sell equipment to teach farmers better use of irrigation. Results will be measured in terms of increased irrigation sales.

3. Other problems the specialist will work on include:

a. Working with county Extension agents on proper use of equipment, use of irrigation on more crops, and new applications of equipment.

b. Assist in farmer meetings on irrigation.

c. Assist in all-practice demonstration.

d. Work on special problems in irrigation.

e. Self-improvement.

WATER SYSTEMS AND RURAL SANITATION

III. STATEMENT OF PROBLEMS

In North Carolina approximately 35% of the rural population does not have a pressure water system. An even more deplorable figure is that better than 75% of the rural Negro population does not have a pressure water system. Running water is a basic necessity of life, and yet a large percentage of our population is without it.

IV. PLAN OF ACTION

1. In 1962-63 an intensive program to promote the installation of water systems, including bathrooms, was started. It was felt that the need was greatest among Negroes, so it was decided to concentrate our efforts with this group. The response was good, but much work needs to be done. Agents need additional training, and their clientele needs additional motivation.

Another problem area is that of mineral and sewage contamination of water. This is a serious problem in that sewage contamination causes many health problems, and mineral contamination is economically costly.

2. To further promote the installation of water systems and bathrooms, a specialist will work with the North Carolina Tarheel Electric Membership cooperatives in their water systems promotion during July, August, and September. He will also continue to provide individual assistance in training county Extension personnel and in dealing with special problems.

3. Other areas to be worked include:

a. Completing the water conditioning bulletin, and training county Extension personnel in water conditioning.

b. Work with power companies on water systems as part of 4-H Club summer camp program.

c. Preparation of demonstration materials.

d. Self-improvement.

RURAL HOUSING

Rural population has increased in North Carolina from 53% in 1950 to 60.4% in 1960.

Rural farm population has dropped from 33.9% in 1950 to 17.7% in 1960.

The migration of rural farm families to rural non-farm communities creates a problem. These communities usually lack public sewage and water, and many of the new houses are built on lots too small, or the soil is such that the installation of a home sewer system is not practical. Houses are sold (par-) ticularly to low income families) with no plumbing facilities. Alamance County reported this as a problem.

Increased income of Negroes and increased credit facilities make for greater opportunities for home improvement for a segment of the population that has the lowest housing standards. Over 80% of rural non-white people live in sub-standard houses.

I plan to spend 50% of my time with Negro agents on Negro home improvement.

Farmers Home Administration credit coupled with an educational program by Extension in housing seems to offer what would appear to be an ideal combination of agencies for curing the housing problems of low income families that are really interested in improving their living standards.

Training schools for agents in subject matter information and Extension teaching methods will be conducted in cooperation with house furnishing specialists. The free plan service will be kept up to date with plans that are popular and include the latest research developments that are practical.

Emphasis will be on Negro agent training.

RURAL CIVIL DEFENSE

III. STATEMENT OF PROBLEM

This plan of work is designed to bring about sufficient public awareness of the importance of rural civil defense as to cause rural people to take positive action to insure survival of themselves, their livestock, and their capacity to produce food.

IV. PLAN OF ACTION

1. Organize at the state level a Rural Civil Defense Committee composed of one representative from each agricultural extension specialist group for the purpose of gaining unity of thought and purpose in regard to rural civil defense, and to coordinate a public awareness and preparedness educational effort with as many people as possible backing that effort.

2. Work with a limited number of communities spaced across the state, each to serve as a demonstration on practical rural civil defense. A set of slides will be made covering the step-by-step cooperative and coordinated actions of the rural civil defense specialist, county extension agents, leaders of the community and of the community group in organizing and carrying on rural civil defense educational meetings and programs, and in constructing and stocking fallout shelters. These slides will be used in "show how" meetings in other communities.

3. Prepare, print, and distribute to all counties a 4-H project and record book for a 4-H Rural Civil Defense project. Also publicize and encourage generous participation in this project.

4. Organize, arrange sponsors for, publicize, and encourage all counties to participate in a 4-H rural civil defense county, district, and state demonstration contest for 1963-1964.

5. Set up a letterhead for, write, and distribute a monthly rural civil defense newsletter to extension agents and other appropriate people.

6. Tape and mail out a bi-weekly or monthly radio program on rural civil defense to 85 North Carolina radio stations.

7. Prepare visual aids for use by rural civil defense specialist and county extension agents on radiation and need for fallout shelters, establishing and maintaining supplies for a fallout shelter, construction of different types of fallout shelters and model shelters.

8. Work closely with the State USDA Civil Defense Board and with the State and County Civil Defense Directors.

9. Give two 2-hour programs to the Negro Farm and Homemakers Annual Meeting at A. & T. College in Greensboro, N. C.

10. Give a 1-hour program for about 2,000 people at the Annaul Eastern North Carolina Negro 4-H Member, Leader, and Parent Day at Jones Lake.

11. Keep the food industry informed concerning their role in an emergency, including plans for coordinated action by the Agricultural Marketing Service, Economic Research Service, and the Agricultural Stabilization and Conservation Service of the U. S. Department of Agriculture.

12. Release much of the same educational information to newspapers in the state that is included in the radio programs and newsletters.

13. Give daily 2-hour programs on rural civil defense to a total of 1,000 4-H Club members attending annual 4-H Week at State Collge, July 22 to 26. A general educational and action program appropriate for 4-H Club members will be given on rural civil defense, and the new 4-H Rural Civil Defense Project and Demonstration Contest will be introduced.

14. Give a 1-hour program at the annual YMW conference at Swannanoa in August.

15. Include educational information in the area of natural disaster in community programs, meetings, newsletters, and radio programs.