

AGRICULTURAL ENGINEERING

Project No. 10

PLAN OF WORK

By

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State

of

Virginia

1931

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OBJECT: To promote an appreciation of engineering science as applied to agricultural practices, in so far as engineering methods will contribute towards making the farms of the State more productive, efficient and prosperous, and assist in improving the living standards on the farm.

ENGINEERING IN AGRICULTURE: It is generally understood that America's preeminence in industry is largely the result of engineering methods. It is not so generally realized however that engineering principles applied to agriculture have played an important part in the advancement and development of America's agriculture.

The engineer believes that engineering methods properly applied to agricultural practices will do much toward making the agricultural industry more prosperous. Some of the more important engineering methods that are of primary importance in agriculture are:

Better soil drainage to reduce losses from excessive moisture; the irrigation of crops to insure maximum crops in dry years; the clearing of cultivated land of all obstructions that prevent the efficient utilization of the land; the prevention of soil erosion by the construction of terraces and soil saving dams, etc.; the control of floods on agricultural lands; the reduction of production costs on the farm by the intelligent use of improved farm power, machinery and equipment; the improvement of living standards on the farm by the use of electric power, the installation of water systems and other home conveniences; the improvement and protection of health on the farm by proper sanitation; and the construction of better designed farm structures that will reduce labor costs and make the farmstead more attractive.

PROJECTS EMPHASIZED: The following projects will be emphasized during the year:

1. Terracing
2. Farm Structures
3. Farm Water Supply and Sanitation
4. Electricity on the Farm

OTHER PROJECTS: The other projects in Agricultural Engineering, such as drainage, irrigation, land clearing, farm power and machinery and miscellaneous, will be handled mainly through correspondence. Urgent requests for field assistance on these projects will be given when circumstances justify.

SERVICE: The work will be carried on by means of:

- A. Publicity and propaganda
- B. Meetings and short courses
- C. Field projects and demonstrations

Publicity and Propaganda will be obtained through the publication of articles in county papers, farm journals, bulletins and circular letters. Exhibits at fairs, etc. will also be used.

Meetings and short courses will be given when scheduled and will consist of illustrated lectures, moving pictures and practical work.

Field projects and demonstrations will consist of technical information and services to individuals, communities and organizations. Field assistance will be handled with the purpose of instructing on methods and an endeavor will be made to instruct as large a number as possible on each field demonstration.

MEASURE OF RESULTS: The projects to be emphasized are self-advertising, such as terraced fields, new or remodeled farm structures, water systems installed, and electric lines built or water power sites developed. Cost records and records of conditions before and after will be kept when practical in order to show progress made.

Office records will be kept of the volume of correspondence, number and kinds of blue prints, bulletins, circulars and other material sent to farmers, county agents, etc.

Results will be measured by number of farmers reached and number influenced to use the better methods recommended.

PERSONNEL: The extension staff for the year will be as follows:

One Agricultural Engineer
 One Associate Agricultural Engineer
 One Assistant Agricultural Engineer
 One stenographer

CALENDAR: The nature of the services rendered by this department preclude the possibility of following any fixed program for the entire year in advance.

Tentatively the terracing project will be handled during the months of October, November and December. The farm structures and rural electrification and miscellaneous projects will be handled throughout all the year. The farm water supply and sanitation project will be handled from April to September inclusive.

Respectfully submitted,

Agricultural Engineer.

Outlines of the four sub-projects to be emphasized during the year are attached.

AGRICULTURAL ENGINEERING
Sub-Project I.

SOIL EROSION CONTROL

- OBJECT:** To spread the teaching and practice of terracing for the purpose of preventing soil erosion, conservation of soil moisture and improvement of the soils.
- IMPORTANCE:** Soil erosion occurs to some extent in practically every county of the state. In at least 25% of the counties it constitutes a serious problem. Soil erosion results in considerable loss of fertility. Soil scientists say erosion takes 20 times more out of the soil than does the growing of crops. If not checked in time, erosion will necessitate the ultimate abandonment of the land.
- Soil erosion is unquestionably a very basic and serious problem in Virginia. The farmers must be made to realize it and to take steps to prevent it. In preventing soil erosion farmers will save the soil itself as well as plant foods, commercial fertilizer, and moisture. Flood damage by filled up stream beds also can be prevented to a large extent by erosion control. Terracing schools will be held in ten (10) counties this year.
- PLAN OF WORK:** Two days and two nights will be scheduled for each county requesting this service. Two counties can be visited each week. If a county is reached on Monday, there will be night meetings on Monday and Tuesday nights. Tuesday will be given over to work with the terracing level and the demonstration showing the construction of terraces will be on Wednesday. If a county is reached on Wednesday there will be night meetings on Wednesday and Thursday nights. Thursday will be given over to work with the terracing level and the demonstration showing the proper way to construct terraces will be on Friday.
- At the night meetings the subject of soil erosion will be discussed briefly and concisely. Pictures will be shown, models demonstrated, and blue prints showing construction, bill of material, etc., of farm made terracing level and home-made terracer will be distributed. The pictures will be Virginia pictures showing mainly the various steps in terrace construction and in the correct order. The models will be a home-made drag and two commercial terracers. Literature will be passed out.
- At each meeting it will be explained that the ultimate object of these schools is to teach farmers how to terrace and to train local men who will be qualified to do terracing work for other farmers in the community.

Four-H Club work in terracing will be attempted for the first time this year. An effort will be made to work with a total of at least 50 boys in Campbell, Halifax, Mecklenburg, Pittsylvania, and Franklin Counties during the first half of 1931. One week each month for seven months will be devoted to this work. Each county will be visited one day each month. It is hoped that several boys in each county will become proficient and be qualified to lay out and construct terraces.

The plan of having one or more farms in each county used as terrace demonstration farms will be started.

The County Agent will:

1. Be in direct charge of the project in his county, distribute publicity matter, and make all necessary arrangements for the school. Secure good attendance.
2. Assist specialist in selecting suitable farmer cooperator.
3. Assist farmer cooperator to build a terracer as per plans, and directions furnished by specialist.
4. To insist that the farmer cooperator keep his terraces properly built up.
5. At all times stress the importance of saving the soil.

The Specialist will:

1. Assist agent in selecting suitable farmer cooperator about one month prior to school.
2. Furnish all publicity matter--letters for his mailing list, newspaper articles, bulletins, etc. Also, supply him with copy of this plan of work.
3. Attempt to stimulate more interest in this work and otherwise promote the project in every way possible.

GOAL:

To insure for each county, men experienced in terracing who can handle the work in that county, thus relieving the county agent of this personal service work. Results will be measured by the number of men trained to do terracing and the number of acres terraced as a result of the schools and demonstrations.

AGRICULTURAL ENGINEERING
Sub-Project II.

FARM STRUCTURES

- OBJECT:**
1. To enable the farmer to secure the best type and design of farm structure for the money expended.
 2. To promote better farm buildings from an architectural as well as utility standpoint.
- IMPORTANCE:** Farm buildings in the state increased in value from \$268,080,748 in 1920 to \$286,138,184 in 1926. This department's plan service is designed to help the farmer get the most out of the approximately three and one-half million dollars expended annually in farm structures.
- PLAN OF WORK:** The Agricultural Engineering Department will:
1. Prepare new plans for farm structures and building equipment as rapidly as possible.
 2. Cooperate with the Division of Agricultural Engineering, U.S. Department of Agriculture, using all plans designed by that office which are adapted to Virginia conditions.
 3. Revise mimeograph booklet listing available plans.
 4. Prepare an "Information Series" of mimeographed circulars on buildings and equipment, methods of construction and other data supplementing plan service. (Such a series will answer most frequently asked questions in detail, save much correspondence and place definite information in hands of County Agents and those interested.)
 5. Make such field trips as are necessary to insure complete and efficient use of plans prepared, and to study conditions involved in preparation of new plans or remodeling plans.
 6. Cooperate with Dairy & Food Division in design of plans best adapted to needs of Virginia dairymen, with special reference to simplest, most practical and economical plans meeting sanitary requirements of all milk markets of state.
 7. Make contacts with all city milk inspectors and endeavor to line them all up on standard set of plans meeting any and all market requirements.
 8. Make contacts with interested agencies such as building supply dealers, manufacturers, contractors, and architects, advising them of our plan service and offering service to them where it can be profitably used.
 9. Supply county agents with plans, bulletins, specifications, bills of materials and necessary field assistance to make farm structures project a success.
 10. Prepare bulletins on (1) available plans, (2) dairy structures.
 11. Cooperate with Horticultural Department on study and design of "Common Storage for Apples."

12. Cooperate with Dairy Department on study of "Milk Cooling and Refrigeration for Dairy Farms."
13. Cooperate with Dairy Department on milk cooling bulletin.
14. Cooperate with Horticultural Department in preparation of bulletins on (1) common storage, (2) Stationary Spray Plants.

The County Agent will:

1. Use all publicity means at his command to advise people in his county of value and availability of the plan service.
2. Make efficient use of plan booklet sending to the department for plans needed by the farmers.
3. Keep a record of the farm buildings constructed in county, alterations made in plans, costs, etc.

RESULTS:

Results will be measured by number of plans furnished, new buildings constructed, old buildings remodelled, etc.

AGRICULTURAL ENGINEERING
Sub-Project III.

FARM WATER SUPPLY & SANITATION

- OBJECT:**
1. To demonstrate the most practical methods of securing running water and other conveniences in the farm home.
 2. To improve the sanitary conditions around the home and thereby help the health of the whole family.

As the ultimate object of the extension work is to improve the farm home life, this project should be one of the most important in extension work.

- PROCEDURE:**
1. Promote the project in the county by county wide campaigns which will give every farm owner an opportunity to know how, and at what cost, running water can be put in his home.
 2. Teaching farmers the fundamentals of different types of water systems.
 3. Soliciting the enthusiastic support of local leaders.
 4. Instructing local plumbers as to class of work generally put in in such campaigns and ask them to cooperate with the farmers.
 5. Make this a definite and thorough piece of work so that it will continue under its own momentum.

LOCALITY: This project should be carried to practically every Virginia County. There is immediate need for it in about 90% of the farm homes. Campaigns will be held in the following counties this year:

Pulaski
Campbell
Montgomery
Rockbridge
Accomac
Patrick
Henry
Princess Anne
Franklin
Giles

- PLAN OF WORK: A. County and Home Demonstration Agents' Duties:**
1. To make a survey of the county to determine the number of farms having running water in the farm home.
 2. To list hardware dealers, plumbers, well drillers, and other local agencies through which pumping equipment is handled.
 3. To list all county preachers, school principals, bankers, county stores, newspapers, and any other agencies through which the farmers may become informed concerning the campaign.
 4. To give purpose and data of campaign in all talks and interviews.

5. To list requests for assistance on water problems received as result of publicity.
6. To conduct the follow up work and get the record of results.

B. Specialists Duties:

1. Supply all educational and publicity material to agencies willing to give cooperation.
 - (a) Write weekly articles for newspapers.
 - (b) Write agent's letters to farmers on their revised list.
 - (c) Write notices to all preachers, plumbers, dealers, school principals.
 - (d) Write District Extension Agent and School Superintendent, County Supervisors, Advisory Council.
 - (e) Get notices in all county post offices.
 - (f) Write Virginia State Chamber of Commerce (Mr. Nelson, Director of Publicity), Plumbers' Association, National Association of Farm Equipment Manufacturers, Water Supply Department.
 - (g) Get up mimeograph card for agents to keep requests on.
2. Visit all farm homes, from which an inquiry has been received for the purpose of making complete survey of proposed water system.
3. Furnish each farmer having survey made with data taken and a bill of material for installation.

RESULTS: Campaign results will be measured by:

1. Number of water systems installed during 12 months following date of survey.
2. Number of water systems improved during 12 months following date of survey.

As visits are made to farmers requesting this service, data will be taken on nearby ram installations which have been operating for sometime. These data will be used later as the basis of a research problem designed to show the efficiency and kind of service these rams give operating under actual conditions.

AGRICULTURAL ENGINEERING
Sub-Project IV.

ELECTRICITY ON THE FARM

OBJECT: To improve living conditions on the farm by reducing the drudgery and labor of house work and by reducing labor and production costs in the farm business; by improving the quality of products and making possible the more efficient management of the farm business. This objective can be best accomplished by assisting the farmer with his electrical problems, such as:

1. Getting electric service to the farm.
2. Properly wiring farm buildings so the full value of electric service can be realized.
3. Familiarizing the farmer with the proper uses of electrical equipment in his farming operations and aiding him in the selection of suitable equipment.
4. Familiarizing farm women with more efficient operation of household equipment.
5. Cooperating with commercial interests to insure high standards in farm contacts.

IMPORTANCE: Thousands of farms in America are now receiving electric service and in the next few years many thousand additional farms will secure this service. Investigations and research conducted in over twenty states has demonstrated that when intelligently used, electric power will materially aid in reducing labor and production costs, and improve living standards in the farm home. It is of the greatest importance that the results of these studies in electrical uses be presented to the farmer in a way that he can make use of them.

As the ultimate objective of all extension work is the improvement of living standards on the farm and since electricity is an important means towards securing this objective, it is essential that the farmer and other groups concerned be guided, by means of extension education, while rural electrification is still in the pioneer or development stage.

PLAN OF WORK: To present to farmers the results of research and experimental work in electrical principles and uses in agriculture.

METHODS OF PRESENTATION:

1. Annual meetings, schools or conferences for rural service men and others interested from electric light and power companies.
2. Demonstrations in cooperation with county agents, of specific uses on farms, showing practices of outstanding value that are of immediate application, and of community or general interest.

3. Bulletins and circulars on rural electrification.
4. Publicity through local papers, the farm press, radio talks, and talks before community and county agents' meetings.
5. Short courses or schools in cooperation with vocational school instructors both for students and adults.

Specialist's Duties:

1. To work in cooperation with county agricultural agents.
 - (a) By furnishing the agent with complete instructions on methods of handling this project; supply bulletins and other educational matter for distribution, and publicity purposes.
 - (b) By securing cooperation of electrical power and equipment companies.
 - (c) By attending meetings and discussing rural electrification problems.
 - (d) By keeping county agents informed on rural electrification developments, at county agent conferences, meetings, and through correspondence.
 - (e) By assisting in the selection of proper demonstrations on farms in the county.

County Agents' Duties:

1. To arrange with extension specialist for educational work on rural electrification.
 - (a) By selecting farms for demonstrations.
 - (b) By organization of farming communities to receive electric service.
 - (c) By organization of farm clubs on rural electrification.
 - (d) By publishing the results of work in short news items, in local papers.
 - (e) By advertising through newspapers and correspondence all meetings, etc.
 - (f) By assisting in follow up work, in order to check results and measure progress.

Cooperators' Duties:

1. The farmer selected for a demonstration will agree to follow instructions, allow meetings on his farm, keep records, and cooperate generally in making the demonstration worth while.
2. The local power company, will cooperate by furnishing and installing check meters, and assisting in every possible way
3. The equipment dealer or manufacturers will cooperate by advising on the installation and operation of equipment and in special cases, when justified, loan equipment for demonstration purposes.

MEASURING RESULTS: Results of the project will be measured by:

- (a) Number of farms securing electric service.
- (b) Increase in use of current on farms.
- (c) Savings effected by use of electricity over old methods.
- (d) Electrical equipment installed.
- (e) Number of farms reached by specialist.
- (f) Improvement in living standards on the farm.
- (g) Number of educational meetings held.
- (h) Number of people in attendance.
- (i) Results of demonstrations on farms.
- (j) Increased income resulting from use of electricity.
- (k) Improved practices resulting from use of electricity.