

SUMMARY REPORT OF AGRICULTURAL ENGINEERING FOR  
THE THREE CALENDAR YEARS, 1916-1917-1918.

The Extension work in Agricultural Engineering consisted only of the land drainage project in the years, 1916 and 1917. At the beginning of 1918, the work was enlarged, due to popular demands, in the following projects: (1) Land Drainage, (2) Terracing, (3) Land Clearing, (4) Farm Buildings, (5) Farm Machinery, (6) Power Farming, (7) Domestic Engineering, including lighting, water works and farm sanitation, and (8) Miscellaneous activities along engineering lines.

The Engineering Department was without the services of an engineer six months of the year 1916, and six months of the year 1917. The engineer being on leave of absence during this time, serving with the United States Army on the Mexican border. Three months of the year 1917 were spent by the engineer in studying along special lines of Agricultural Engineer at Iowa State College.

LAND DRAINAGE PAYS.

During the three years requests for assistance on drainage were so numerous that they could be only partly met, due to lack of sufficient force. The policy has been to place the work throughout different sections of the State rather than to conduct a large number of demonstrations in one section. Where work has been done, there is a large demand for more aid.

In the three years complete drainage surveys were made on about 85 representative farms comprising approximately 3375 acres. Preliminary examination and advice was given on 76 other farms comprising approximately 4,000 acres. The total number of acres drained was 7,375 acres. It is conservatively estimated by the National Drainage Association and Association of Canadian Agricultural Colleges that the average increase in the productive value on tile drained land is \$20 per acre per annum, therefore, the productive value of farm lands drained under Extension directions would be \$147,500 annual increase. As a result of these demonstrations, many more thousands of acres have been drained so that the value

to the State has been increased manifold.

Tile Plants - Trip to Ohio. Ditching Machines.

During the three years two tile plants were started, and three Power Traction ditching machines costing \$2500 each were placed, on the recommendation of the Department. These machines have been a wonderful incentive to drainage work as they have solved the labor problems in ditching. On the Eastern Shore, one of these machines made the laying possible of more than 400,000 feet of tile in 1918. Every one of the farmers who tile drained has just written that the systems paid for themselves the first year. Three years ago there was not a foot of tile on the Shore.

Thousands of letters were written answering questions and giving advice on drainage. Numerous articles were written for farm papers and bulletins on "Farm Drainage in Virginia" and "Home Water Works" were published. Talks were given on drainage at numerous farmers' meetings. Drainage exhibits were shown at several county fairs and at the Virginia State Fair.

TERRACING BADLY NEEDED.

In the counties of Halifax, Pittsylvania, Mecklenburg, Lunenburg, Charlotte, Greenville, Surry, Sussex, Prince George, and Dinwiddie, there are over three million acres of land in farms, at least 5 per cent or 150,000 acres of which need terracing. Their value would be increased \$10 per acre. The value of the work in these counties alone would be worth \$1,500,000 to the State.

Terracing was first started in the fall of 1918, with about 2000 acres having been made under demonstration since that time. The work has been done with farmers which amounted to about 1700 acres. Extensive plans have been made for demonstrations in the fall of 1919.

COMPETITION IN LAND CLEARING.

Extensive plans have been made for carrying on land clearing demonstrations in cooperation with manufacturers of explosives, stump pullers and tractors. Plans have been made to hold these demonstrations in seven counties during May of 1919. There are thousands of acres of fertile land in Virginia covered with stumps which would be profitable to reclaim.

PROPER FARM BUILDINGS ERECTED.

While farm buildings and their construction is a most important Agricultural Engineering project, it has been given a secondary consideration, due to lack of sufficient force to handle the problems. However, much assistance has been given to farmers and much more is planned. The following blue prints have been drawn up by the Department.

Hog Houses.

A-shaped movable hog house with doors hinged at side.  
A-shaped movable hog house with doors hinged at top.  
Gable roof movable hog house.  
Community hog houses - one-half Monitor roof type for 12 sows.  
Sunlit hog house for 20 sows.

Self-feeders.

Small one way self-feeder for hogs.  
Large two-way self-feeder for hogs.

Concrete Plans.

Concrete feeding floor for hogs.  
Concrete hog wallow and dip.  
Concrete feeding and watering trough.

Poultry Houses.

Farm Poultry house - shed roof type 10 X 20 feet.  
Movable Colony Poultry House - 6 X 8 feet.  
Laying House - combination roof type.  
Treakle Poultry House.

### Barn Plans.

Plank Barn frame 36 feet wide, braced rafter construction.  
Plank Barn frame 36 feet wide - Truss construction.  
Combination horse barn, corn crib and tool shed.

### Dairy Plans.

Open Dairy Barns.  
Open Dairy Barn for 28 cows.

### Silos.

Wooden Hoop Silo with specifications.  
Stave Silo with specifications.  
Concrete Silo.

### Machine Sheds

Work Shop and Implement Sheds.  
Machine Shop.

### Fair Buildings.

County Fair building plans.

### Poultry plans.

*Bulletin*  
Poultry House construction, containing Poultry House plans.

Several hundred blue prints and working specifications, including all these several plans, have been sent, free of charge, to farmers on their requests, and buildings constructed. Over 1,000 plans of the self-feeder alone have been sent out and the county agents report that thousands have been built from them. Assistance and supervision have been given on erecting silos, city market building for Lynchburg and county fair buildings for Caroline and Chesterfield counties. County Agricultural High Schools have been furnished plans for a work shop in which to train students taking Smith-Hughes vocational education.

### FARM MACHINERY.

In the spring of 1919, 148 demonstrations were given in 25 counties to show the proper use of soil fitting tools in connection with sowing of spring crops and of top working wheat. Companies manufacturing the cultipacker have

cooperated with the Department in putting on many of these demonstrations.

#### POWER FARMING.

Hundreds of inquiries have been received from farmers in regard to type of tractors best suited for their needs and in every case, unprejudiced information has been given by this Department. Three large demonstrations have been held and at least 12,000 farmers have been afforded the opportunity of comparing the leading makes of tractors sold in Virginia, working under actual field conditions.

#### Tractor School.

A Tractor School was held at Roanoke in which 1,000 farmers received instructions and practical experience on the operation, care and selection of tractors.

#### List of Subjects Studied.

The Institution went to considerable expense to give this week's training, but it was given to the farmers at less than \$1.00 cost per individual. The \_\_\_\_\_ tractor companies cooperating stated that it was one of the most successful schools they had attended.

#### DOMESTIC ENGINEERING.

Assistance and advice have been given in installing several water supply systems. Many requests for information on this subject have been answered and a bulletin prepared on "Running Water in the Farm Home," which has been sent to 1,000 farmers on request. It is planned to put on a State-wide Water Works Campaign in the near future.

#### BULLETINS PUBLISHED BY DEPARTMENT.

Farm Drainage in Virginia.  
Running Water in the Farm Home.  
The Farm Poultry House.