

REPORT OF THE AGRICULTURAL ENGINEERING DEPARTMENT  
Extension Division, V.P.I., Blacksburg, Va.  
From July 1, 1919 to June 30, 1920.

A (1) The principle farm and home problems with reference to this project are :

1. Land Drainage
2. Terracing
3. Land Clearing
4. Farm Buildings
5. Farm Machinery
6. Power Farming
7. Domestic Engineering - (including lighting systems, water works and farm sanitation).
8. Miscellaneous activities along engineering lines.

(2) The problems attacked during 1920 were :

1. Land Drainage
- ~~2. Terracing~~
- 2 3. Farm Buildings
- 3 4. Power Farming
- 4 5. Water Works

B 1. Farm Ditching Machine Organisations were developed in the state through which the farmers may get their ditching for tile drainages at a minimum cost. These organisations are :

*omit*  
The Rappahannock Tile Drainage Co., of King George County, Va.  
The Valley Tile Drainage Co., of Botetourt County, Virginia.  
The Tidewater Tile Drainage Co., of Petersburg, Va.  
The Tile Drainage Corporation of Hampton, Va.

Cooperative relationships were established with -

The Tractor and Farm Machinery Companies for the purpose of holding tractor demonstrations.

The Ditching Machine Manufacturers for the purpose of organizing Ditching Machine Companies.

The U.S. Department of Agriculture, Bureau of Drainage, for the purpose of developing drainage districts for the drainage of large areas.

The State Commissioner of Agriculture for the purpose of spreading drainage and agricultural engineering information through his bulletins.

The Agricultural High Schools of the state for the purpose of spreading agricultural engineering information in their communities.

~~The State Commissioner of Roads for better drainage.~~

~~The State Department of Public Health for drainage and sanitation.~~

B. Meetings and Demonstrations were held as follows:

For the purpose of organizing Ditching Machine Companies:

Scott Co.	3 Meetings	Attendance	20 and 25
Calpeper Co.	1 "	"	12
King George Co.	1 "	"	6
Petersburg (City)	1 "	"	9
Hampton	1 "	"	7

For the purpose of drawing up Drainage Laws :

Richmond (City)	1 Meetings	Attendance	15
Martinsville "	1 "	"	100
Norfolk Chamber of Commerce		"	25
Bankers of Norfolk		"	5
State Legislature, House Committee of Laws "			35

Demonstrations:

Ditching Machine Demonstrations -

King George County	Attendance	100
Botetourt County	"	35
Ryanoke County	"	25

Tractor Demonstrations -

Calpeper County	"	3,000
Page County	"	2,500
Montgomery County	"	1,200
Nansemond County	"	5,000
Norfolk County	"	2,000
Botetourt County	"	800

Terracing Demonstrations -

Hanover County	"	12
Halifax County	"	10
Chesterfield County	"	5

- 3 (a) County Agents called for the assistance of the Engineer.
- (b) No organizations were available through which the Engineer could work.  
Ditching Machine organizations were built up to aid Drainage work.
- (c) Cooperative relationships were established with Tractor and Machinery Companies for holding power farming demonstrations.

- 4 Articles relating to the different projects were written for the various county and farm journals. In advertising the Tractor Demonstrations, posters were distributed throughout the territory of the demonstration by the Implement Dealers. Circular letters were sent out from this office. News items were run in the local farm papers advertising the demonstrations. *+ plus print.*  
Bulletins on the various engineering subjects were sent out from this department to the farmers by request.

The County papers were found to be the most effective in advertising demonstrations. *bulletins + circulars the most effective in distributing information.*

- 5 (a) Demonstrators were asked to report on the result of the new methods adopted as compared with the old. Demonstrations such as drainage, terracing and farm buildings speak for themselves. The results are so apparent that all may see.

Tile Drainage Demonstrations are conducted somewhat as follows: A representative farmer who wishes to tile drain is given assistance by the engineer. A drainage survey is made of his wet land and a map prepared showing the location of the tile system, size of tile, grades, etc. After he has secured his tile the engineer goes back to the farm and stakes off the work and instructs the farmer in the proper method of grading the ditches and laying the tile, etc. Sufficient time is spent with the farmer to be assured that the work will be carried out successfully. Other farmers are invited to see how this work is done. The farmers have to report on the results. Demonstration plots are located, as far as possible, near the public roads.

Terracing demonstrations are conducted along the same lines as the drainage demonstrations.

In the farm building project, farm building plans are sent out upon request and in each case the farmer has to report on the cost of erecting the building, changes made in the plans, etc.

*In a few cases assistance was given in the actual construction of the buildings planned by this dept.*

*power firmly piped*

In the water supply project bulletins and plans are sent out upon request recommending water supply systems and giving best methods of installation. In a limited number of cases personal assistance has been given in the installation of Hydraulic Rams, etc.

- (b) Demonstrators and County Agents are asked to advise this department as to the number of acres tilled, buildings erected, etc. as a result of the demonstrations in the community.
- (c) The data is sent direct to this office by the various individuals.

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- (a) 30 County Agents were trained or aided in agricultural engineering problems.
- (b) 40 Counties were visited for the purpose of conducting demonstration work and some of these counties were visited several times.

104 farmers were personally visited by the engineer and given aid of some kind.

- 3 (a) 1. 69 farms conducted drainage demonstrations.
  - 5 " " terracing "
  - 33 " " water supply "
  - 277 " " farm building demonstrations.

- 2. Complete drainage surveys were made and maps prepared on twenty-six different farms, comprising 1,720 acres of land.

Preliminary surveys were made on 43 different projects comprising 7,655 acres of land.

Due to the impossibility to get drain tile during the past year actual construction work was only carried out on 12 farms for which drainage surveys were made comprising 675 acres of land.

23 farm water supply systems were put in by the department.

277 building plans were sent out to farmers upon request and a large proportion of the buildings planned were actually constructed.

- (b) 1. There are now over 3,500 tractors in use on Virginia farms. At the beginning of the year there were only 1900. Tractor dealers state that the tractor demonstrations have resulted in the sale of many tractors in the communities where the demonstrations were held.

It is impossible to get data as to the number of farms or homes adopting instructions as the result of the influence of the various demonstrations, but it is known that the numbers are large.

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2. Over 500,000 feet of tile, or 100 miles, has been laid in Accomac and Northampton Counties alone during the past year as a result of previous demonstrations. This work has been carried on very extensively in every community wherever demonstrations have been held. This is true of all the various projects.
  3. More interest is being shown in tile drainage, power farming, modern farm buildings and home equipment than ever before in the history of the state. It is safe to say that there has been more tile actually used last year than all other previous years, notwithstanding the labor shortage and the high cost of tile.

Considerable time was put in by the engineer in trying to get tile factories established in the state. Locations and clay deposits were inspected at Glasgow, Farmville, Lynchburg, Culpeper, Saverly and Norfolk. It takes considerable capital to start a tile plant but there is every promise of getting at least two plants established in the near future.

C Drainage continues to be the leading project under this department and one under which the most good may be accomplished. Whenever possible ditching machines are placed and operators instructed and given assistance until such time as they can proceed alone with the drainage work.

No work was conducted during the year on the land clearing project as the more important projects took up all the time of the engineer. The only work that was conducted on the farm machinery project was in connection with the tractor demonstrations.

The engineer was unable to put much time on the domestic engineering project due to lack of assistance. Numerous requests were received for information on various farm engineering problems and assistance was given as far as possible by correspondence.

Students assistance was secured the latter part of the year in working up farm building plans. Tracings and blue prints were made of 67 different farm building plans by the student assistants. These men are being trained so that they may be taken on as assistant agricultural engineers in this department after they finish school.

Besides the regular exhibit at the State Fair this Department had charge of all the farm machinery exhibits at the fair. It was conceded by all that the machinery exhibit was the best in the history of the fair and the Fair Association gave this department entire credit for planning this exhibit on such a high plane.

D Probably the most outstanding piece of extension work accomplished during the year was the forming of the Ditching Machine Companies. These machines are making it possible for the farmers of the State to lay thousands of feet of tile. The next few years will un-

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doubtedly see a large increase in the number of these machines. This department was instrumental in placing every machine so far in use in the state.

One of these machines should average 300,000 feet of ditches dug during the year. The five machines now in use should then result in 1,500,000 feet of tile being laid each year. This amount of tile will drain approximately 2,500 acres of land. R Each acre drained is increased in productive value at least \$30.00 per acre, resulting in an increase of \$40,000.00 annually to the state as a result of the work of these machines.

B.

The farmers of the state are adopting better methods of farming and are using more improved machinery and labor saving devices. Farm homes are being supplied with conveniences such as electric lights, running water, etc. and in general the farmers are getting down to a more sound basis of farming. The farmers are taking up new methods and are anxious for help and advice on all their problems which is quite a contrast to the indifference of the farmer to demonstration work a few years ago.

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AGRICULTURAL ENGINEER.

-S\_U\_M\_M\_A\_R\_Y  
July 1919-1920 June 30.

- 44 Counties were visited during the year. Several trips being made into each of these counties.
- 30 County agents were given assistance.
- 104 Farmers were visited and assisted.
- 1720 Acres on 26 different farms were surveyed for complete drainage systems and maps prepared.
- 7655 Acres on 54 different farm-preliminary surveys were made.
- 675 Acres of land surveyed during the year tiled.
- 5 Terracing demonstrations held, and terraces laid out 220 acres.
- 23 water systems installed under department direction.
- 277 Farm buildings constructed from our plans.
- 13 Meetings held with total attendance of 380
- 14,500 Farmers attended six tractor demonstrations given by the department
- 150 Farmers attended three ditching machine demonstrations.
- 1700 Tractors bought by farmers during the year.
- 141 requests for assistance on drainage received.
- 62 farm building plans drawn up.

The cash value of the 1720 acres tiled- in increased production value- \$34,400.

## SUMMARY

- 44 Counties were visited during the year. Several trips being made into most of these counties.
- 30 County agents were given assistance.
- 104 farmers were personally visited and assisted.
- 1720 acres on 26 different farms were surveyed for complete drainage systems and maps were prepared for these systems.
- 7655 acres comprising 45 different farms or projects. (Preliminary surveys made).
- 675 acres of land surveyed during the year has already been tile drained.
- 5 terracing surveys were made and demonstrations held, comprising 220 acres.
- 23 water systems were installed under personal direction of the department.
- 277 farm building plans were sent out upon request.
- 18 meetings were held with total attendance of 380.
- 14,500 farmers attended six tractor demonstrations given by this department.
- 150 farmers attended three ditching machine demonstrations.
- 1700 tractors were bought by the farmers during the year.
- 141 requests for assistance on drainage were received from farmers direct.
- 68 new farm building plans were drawn up during the year.

The cash value of the 1720 acres on which complete drainage surveys were made at \$20.00 increase productive value per acre as a result of drainage equals \$34,400.00.