

Blacksburg, Virginia,
April 14, 1919.

Mr. Jesse M. Jones, Director,
Blacksburg, Virginia.

Dear Mr. Jones:

The following is a summary of work accomplished by your Agricultural Engineer, M. L. Nichols, from July 1, 1918.

The work has been divided into the following projects.

(1) Drainage, (2) Terracing, (3) Land Clearing, (4) Farm Buildings, (5) Farm Machinery, (6) Power Farming Education, (7) Domestic Engineering, including lighting and water works, (8) Miscellaneous Activities.

ORGANIZATION.

A great deal of time has been spent in getting the work organized to make it as efficient as possible. At the present date, The Department has personnel as follows: M. L. Nichols, Head of Department, who has charge of the general policies of the Department, and direct charge of all work of farm machinery and farm power, and C. E. Seitz, Assistant Agricultural Engineer is in charge of land reclamation work, which includes drainage, terracing and land clearing. Drafting and blue printing has been handled by Prof. H. Gudheim on a jobbing basis, and assisted by hired student labor.

LAND DRAINAGE.

The greatest part of this land drainage was handled by M. L. Nichols during the absence of Mr. Seitz, who was in the Army. During that time, numerous requests for assistance on drainage have been only partly met, due to the lack of time, however, 700 acres have been drained under Department direction. A conservative estimate of this work would be \$20.00 per acre, making a total increase of the production value of land at \$14,000 (The estimate of \$20.00 is based upon extensive research as to the increased value, due to drainage, and conducted by an Association of Canadian Agricultural Colleges, and approved by the American Drainage Engineers). Since these projects are demonstrations, it would seem that the value to the State would be many times this amount.

One particularly satisfactory piece of work was done, at the request of Mr. J. H. Tibbs, County Agent, Fincastle, Virginia, on the farm of Mr. Jas. Twyman. Here the entire piece of land was rendered useless for crops by water until drained. When drained, after one of the hardest known rains, this land was dry enough to work in three days. Wherever desired, maps were furnished.

TERRACING.

Work on terracing has merely been started. About 30 acres have actually been terraced as demonstrations. Approximately two weeks were spent in the counties needing terracing, and preliminary work was done with farmers, which amounted to the planning of work for about 1000 acres of land. In the counties of Halifax, Pittsylvania, Mecklenburg, Lunenburg, Charlotte, Brunswick, Greensville, Southampton, Sussex, Surry, Prince George and Dinwiddie, there are over 3,000,000 acres of land in farms. A conservative estimate would be 5 percent of this land needs terracing. In many counties this percent would run much higher. This indicates that at least 150,000 acres needs terracing, and figuring the improvement conservatively, is valued at \$10.00 per acre. The value of the work to the State would be \$1,500,000.

LAND CLEARING.

There are thousands of acres of fertile land in Virginia which are covered with stumps, and which would be profitable to reclaim. Investigation has been made as to the most economical methods of clearing land, and arrangements made to cooperate with manufacturers of explosives, stump pullers and tractors. This work was started by M. L. Nichols, and has since been turned over entirely to the direction of Associate Mr. Seits, who is carrying on the work with considerable vigor. Great financial benefit should come to the State through its successful continuation.

FARM BUILDINGS.

While farm buildings and their construction have been a secondary matter with the Department, due to lack of having a sufficient force to do justice to this important subject, considerable assistance has been given the farmers of the State in this regard, and much more is planned.

Several hundred blue prints and working specifications of buildings have been sent out to farmers, on their request, including all kinds of farm buildings, such as barns, tool sheds, poultry houses, dairy barns, etc. Several prints have been made for rendering assistance to farmers in this respect in planning their entire farmstead, laying out fields in the most economical manner, and maps have been prepared for several farmers, on which basis the farm was arranged.

Assistance and supervision was given at Euporia in constructing and erecting three silos. In one case, the demonstration included the entire erection of the silo, from the foundation to its filling. About three weeks have been spent on silo work, and a great number of blue prints and specifications have been mailed out. Plans were made with the cooperation of Mr. Ruffner for a model dairy barn, and mailed to several farmers.

In the city of Lynchburg, your engineer, with the cooperation of the Horticultural Department, planned and had made drawings for a city market, which is to be built in the near future.

At Bowling Green, a County Fair building was planned and drawn, and approved by the Board of Supervisors, and is now in the act of being constructed.

A very elaborate set of barns was constructed at Curl's Neck farm, planning of which was largely done by this Department.

Numerous other plans for hog production and cattle production have been made, and plans sent out for their erection. With the blue prints of self feeders sent out by this Department, thousands of feeders have been built, resulting in the saving in this item alone of many times the entire cost of maintenance of the Department of engineering.

Another set of plans drawn by the Department for poultry houses, have found wide use in the State, and while it is impossible to give the exact number of poultry houses made and remodeled according to the plans which were made, on the suggestions of Mr. Treake and Mr. Talcott, it would be conservative to estimate the value to the State by the better housing of its poultry in the thousands of dollars. However, it is to be distinctly understood that in all cases in the erection of farm buildings, that credit should only be given the Engineering Department for the plans for the structures, and credit be given to the respective departments for the introduction and adaptation of buildings to their particular environment.

Records have been kept of the blue prints sent out.

FARM MACHINERY

While the space of time covered by the activities of this Department in farm machinery has been such that its activities have been largely directed toward the preparation of seed beds, demonstrations in the proper use of fitting tools used in connection with sowing of spring crops, and of top working wheat, demonstrations have been given in 25 counties, in fact this grew to such an extent and so rapidly that the Department was unable to fully carry out this program in all cases. Companies cooperating, namely the Oliver Chilled Plow Company and the International Harvester Company, who gave us gratis machines for these demonstrations, found it impossible to keep up with the demand for assistance. While there have been many demonstrations at our suggestion of which we have not received records, there have been approximately 148 demonstrations. It is understood by the writer that there were 20 demonstrations in Wythe county alone, although official information has not yet been received from this county.

Plans have been made in two or three counties for special work with the cultivators, but they have not yet matured.

Considerable work has been done in the storage and care of farm machinery, and numerous plans of farm machinery sheds have been sent out. About 100 members of the Boys' Club were addressed on this subject, and they promised to take care of the machinery.

POWER FARMING.

The advent of the tractor is causing a great upheaval in our Agricultural system. Hundreds of inquiries have been made concerning tractors by farmers, and in every case unprejudiced information has been given by this Department to all desiring it.

Three large demonstrations have been held under the auspices of the Engineering Department. At least 5000 farmers have been afforded the opportunity of comparing the leading makes of tractors sold in Virginia in working under actual field conditions. In this respect the heartiest cooperation has been received from the Implement people, and the Institution has come to receive the good will of these companies. Previous to the undertaking of this work, the Agricultural College was considered rather unfavorably by this great industry, upon which so much of the future of agriculture depends. It is to be hoped that the

by continuance of fair dealing, and clean, clear, unprejudiced action that the Institution will come to the leadership in this great work which it so rightfully deserves.

There is a sad lack of understanding of the fundamentals of power farming among the county agents, and it is earnestly to be desired that all agents be called together and given a week at least of intensive training in the care, operation and selection of tractors.

With the coming of power farming at an ever increasing rate, if the Institution is to maintain its leadership in agricultural affairs, its personnel must be given the opportunity of acquiring the knowledge necessary for that leadership.

A tractor school was held at Roanoke, in which 1000 farmers received instruction on the operation, care and selection of tractors. The Institution went to considerable expense to give this week's training, but it was given to the farmers at considerably less than \$1.00 per individual. At this school, some of the world's greatest tractor authorities talked. At other places, talks were given to farmers, by the Head of the Department in which about 1500 were reached. Numerous articles have been written in the papers which have reached a great many more.

DOMESTIC ENGINEERING.

Domestic Engineering has been largely in the hands of the Department of Domestic Science and Home Economics.

Assistance has been given in installing several water systems. Plans and requests for assistance in lighting and heating have been handled through the office, and a plan prepared for large water works campaign. This work is of the greatest importance and value to the State, and it is to be sincerely regretted that limitations of force renders it impossible for the Department to adequately handle it.

MISCELLANEOUS ACTIVITIES.

The Engineering Department is called upon to perform many tasks which are not in direct line with its projects.

Three weeks of intensive work was spent by the head of the Department in preparing an exhibit for the State Fair at Richmond. Three buildings were fitted and by a force of troops, whose assistance was lent to the Division, included an erection and construction of a large Extension Division building, and the fitting of buildings for exhibiting boys' Club livestock. Several days were spent in preparing a program of work for State Fairs. A week's work was spent with the Committee outlining a complete project book to guide county agents in Extension work.

A bulletin in manual training, with particular reference to wood working for farm boys, was prepared. This is not yet published. A publication by Mr. Seitz and Mr. Talcott was worked over, and prepared for publication by the head of this Department. A number of articles were written for papers. In arranging and classifying material for the office, two weeks were spent. Minor assistance has been rendered to many Departments, in construction of plans for various building devices.

In cooperating with the various agencies which are promoting Agricultural education along the lines of Agricultural Engineering, a week was spent at Danville with the implement dealers. One week was spent at Chicago with the American Society of Agricultural Engineers, of which the head of the Department is a member of the Education committee. One week was spent at Macon, Georgia preparing plans for the conducting of educational demonstrations in the State. At this time plans were talked over with the leading men of the United States in this sort of demonstration. One week was spent cooperating with the conducting of the tractor school at Richmond.

In all cases the heartiest cooperation has been found, and outside of the implement people, the writer wishes to acknowledge the hearty cooperation of Mr. T. Gilbert Wood, of the Norfolk & Western Railroad; and the Roanoke and Lynchburg Chambers of Commerce.

No. Miles travelled by rail	13,354
No miles travelled by auto	300
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Total	13,654

Yours very truly,

AGRICULTURAL ENGINEERING DEPARTMENT.

BY

MLN PS