Agricultural Engineering at V.P.I.

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HISTORICAL

A curriculum in agricultural engineering, leading to the degree of Bachelor of Science in Agricultural Engineering, was first offered at V.P.I. in 1913. This curriculum was administered under the Agricultural Division, and included courses given by both the agricultural and engineering divisions. However, there was no agricultural engineering department, nor agricultural engineering instructors. Since only three men registered in this curriculum from 1913 to 1919, the new president, Dr. Julian A. Burruss, decided to delete it from the college catalogue.

In 1914, the writer was employed by the Extension Division as extension specialist in land drainage. He was the first agricultural engineer in the state. By 1917, the demand for his services among farmers had developed to the extent that it was necessary to add other extension projects in agricultural engineering. The effectiveness of the extension program also created a demand for resident instruction in agricultural engineering subjects. Fortified with the state-wide interest, the extension specialist was able to convince the College Administration of the need for and advisability of establishing a separate department of agricultural engineering at the College. Such a department was organized in l 920, and the extension specialist was selected to head the new department. Two additional staff members were added, and each of them divided his time equally between resident instruction and extension work. Prior to this time, subjects such as farm structure and land drainage were t aught by the Agronomy Department. The newly created department of agricultural engineering began teaching its own courses in 1920. A four year major in agricultural engineering was offered beginning in 1920.

In the beginning, the department was housed in the Agricultural Hall with space provided for offices, lecture rooms, and a drawing laboratory. A frame building 50' x 160' in size was constructed that year on the site of the present agricultural engineering building. This building was used for the farm machinery laboratory and for other farm equipment of all types. Most of the laboratory equipment was either donated or loaned to the department for instructional purposes. The value of this equipment was about $20,000.

Research work in agricultural engineering was started in 1922. The department head then devoted one-half time to extension, one-fourth to research and one-fourth to resident instruction. The professional curriculum in agricultural engineering, leading to the degree of Bachelor of Science in Agricultural Engineering, was first offered in 1922. Only five other state colleges had professional curriculums in agricultural engineering at that time, namely, Iowa State, Univ. of Nebraska, Kansas State, Univ. of Missouri and Texas State. Virginia Tech was the first college east of the Mississippi to provide an agricultural engineering curriculum. An additional man was added to the department staff for full-time resident instruction, and a graduate student was employed as a fellow- instructor in agricultural engineering.

Agricultural engineering at V.P.I. enjoyed a progressive and a healthy development, from the employment of the first extension specialist in 1914 to the organization of the department in 1920, and from the start of resident instruction, the beginning of research and the adoption of the professional

curriculum in 1922. From the five members in 1922, the staff" has grown to 4-1 active or affiliate members at the beginning of 1950.

The activities of the department are divided into the three main divisions of the agricultural college, namely, resident instruction, research and extension. Chas. E. Seitz, department head, directs the work of the three divisions. A list of the department staff members with their assignments appears at the end of this article.

RESIDENT INSTRUCTION DIVISION

The resident instruction division of the department is responsible for all regularly scheduled class and laboratory instruction. This includes the required agricultural engineering courses in the four-year curriculum leading to the B.S. degree in Agricultural Engineering, and the graduate program leading to the M.S. degree. This division also handles the various service courses offered for students in other curricula.

Until 1949, the curriculum was administered by the Agricultural College. Beginning with the 1949-1950 session, the curriculum was placed under the joint administration of the Engineering and Agricultural College, with degrees granted under the engineering college.

A new agricultural engineering building was completed in 1938 as a W.P.A. project with comparatively small cost to the College. The department staff designed and supervised the erection of this building of fireproof construction. It would probably cost around $600,000 to replace this building at present prices. It provides class rooms, laboratories, and offices, and contains about 51,000 square feet of floor space. All three divisions; resident instruction, research and extension are accommodated in this building. Having all the staff in one building has greatly facilitated the work of all divisions.

Three men were graduated in 1921. Since then, 251 have received the B.S. degree in agricultural engineering, and 34 the M.S. degree. A large percentage of these graduates are actively engaged in agricultural engineering work throughout the U.S. and Canada. Many of them are employed in Virginia. They are rendering outstanding service to the state and nation in agriculture, industry, and Public Service Organizations. A large number of these graduates served their country in the last world war, most of them as officers in the armed forces.

V.P.I. is recognized nationally as a leader in agricultural engineering education. A number of institutions in the East and South have organized their agricultural engineering departments and patterned their work along the lines of the V.P.I. department. In the field of rural electrification, V.P.I. has an international reputation. The first rural electrification courses were organized at V.P.I. and the department has more of its graduates employed in rural electrification than any other similar department in the nation. Representatives of many colleges in other states have visited the department to inspect and secure advice on setting up similar work in rural electrification at their institution. Men from other states and countries have pursued graduate work in rural electrification here at V.P.I.

EXTENSION DIVISION

The extension division of the department is responsible for off campus instruction. The whole state is the class room for Extension activities. The extension work in agricultural engineering is organized by projects, with instruction given by means of short courses, meetings, conferences, on the' farm personal

visits, bulletins, circulars, building plans, and through publicity in newspapers, farm magazines and on the radio.

Agricultural engineering extension specialists give instruction in the field on erosion control, drainage, irrigation, land clearing, farm and home electrical equipment, and on farm structures and rural housing. Thousands of farmers are reached directly each year in this work. The results of agricultural engineering extension are apparent throughout the state. One can see farm buildings constructed from the department plans, erosion control, drainage and irrigation practices put into effect, and rural electric lines with many farm and home uses of electricity developed and recommended by the department.

Through the Extension Service, the work in rural electrification was started in 1924 with the organization of the Virginia Committee in Relation of Electricity to Agriculture. The extension work in rural electrification has been one of the most important agricultural engineering projects since 1924. At that time, there were some 500 Virginia farms getting electric service from high lines. By October 1949, this figure had grown to 146,617 or 84.7 percent of Virginia farms with electric service: The power companies and R.E.A. cooperatives have more than $100,000,000 invested in facilities to 'serve the rural areas. Farmers have at least an equivalent amount invested in wiring and electrical equipment. The extension agricultural engineers played an important part in this program. They helped pioneer and develop the rural electrification movement in Virginia. Their main objective at the present time is to assist farm people in making the most efficient use of the service.

The department started its extension farm building plan service in 1917. This service has developed over the years to where it is one of the most valuable services rendered by extension. Several hundred plans of all types of farm structures have been prepared and are available to farmers in the state. Thousands of these plans are sent to farmers requesting them each year. New designs are constantly being added to this service. Since farm buildings constitute about one-third the value of all farm property, and since the buildings play an important part in the economical operation of the farm, well planned buildings are especially important. The growing demand for the service indicates more farmers are appreciating the need for and value of proper buildings. Little farm building was done in the thirties and through the war years. Farm building activity has increased since the war and the future potential is great. This is true because of the need for replacing and remodeling old buildings and for the construction of new buildings to keep pace with modern agricultural practices.

Extension work in Soil and Water Conservation was begun in 1911, with emphasis on land drainage. By 1917, this activity had been expanded to include terracing and related practices to control erosion. Thousands of drainage surveys have been made for tile drainage systems throughout the state, and several thousand acres of farm land has been drained. The extension engineer had a leading part in establishing the first Soil Conservation District demonstration area in Pittsylvania County in 1934, and in selecting the original Soil Conservation Service Staff. The department has cooperated closely with the Soil Conservation Service since this service was established. The extension engineer also served as a member of the committee which developed the plan for the T.V.A. unit farm demonstration program.

Extension programs in land clearing were started in 1919. Since that time, some 6,000 farmers have removed stumps from about 26,000 acres of land in cooperative extension demonstration projects. In the middle twenties, the department distributed approximately one half million pounds of "Pyrotol", the surplus war explosive. About 1,850 farmers purchased the explosives for land clearing purposes.

Extension work in irrigation was started in the early twenties. Hundreds of farmers have been assisted in the design and installation of irrigation systems.

Another important phase of extension work in agricultural engineering has been in the field of farm power and machinery and home equipment. Starting around 1918, the extension engineers staged a number of tractor demonstrations throughout the state which were continued for several years. These demonstrations were well attended with as many as 14,000 farmers in attendance at a single meeting. Most leading makes of tractors at that time were demonstrated giving farmers an opportunity to compare the characteristics of each. Following the tractor demonstration phase, the extension program resolved into short courses, meetings and exhibits of various farm and home equipment. Surveys and instruction on farm water supply systems has continued through the years and many thousands of farmers have been assisted with water supply problems.

Even though the above projects have constituted the major activities in phases of agricultural engineering, many miscellaneous engineering problems are dealt with each year. Farmers are constantly asking for advice and information on a variety of engineering problems which the extension staff attempts to handle.

RESEARCH DIVISION

Research in Agricultural Engineering was begun in a limited way in 1922 with the department head devoting a portion of his time to research studies. The research division was handicapped for years due to the lack of funds and personnel. In recent years, however, a good start has been made in developing a research program. At the present time, research in agricultural engineering is organized under the following four fields of study: (1) Soil and Water Conservation, (2) Rural Electrification, (3) Household Equipment, (4) Farm Structures and Rural Housing.

Under Soil and Water Conservation, studies are being conducted in a variety of subjects the most important of which are: hydrologic contour furrows for pastures, rates and methods of application of fertilizers in pasture production, stubble mulch tillage in the production of cultivated and small grain crops, land drainage, supplemental irrigation, and farm pond construction methods. These studies are being conducted cooperatively with the Research Division of the Soil Conservation Service and the T.V.A.

The rural electrification studies are concerned mainly with investigations of drying hay and forage crops on the farm, peanut curing, and bright tobacco curing. The principal work now under way in the household equipment studies is the Design and performance testing of a combination Walk-in Refrigerator and freezer. The rural electrification studies are conducted cooperatively by personnel of the Experiment Station and the Bureau of Plant Industry, Soils and Agricultural Engineering of the U.S.D.A.

In the field of farm structures and rural housing, the research program is just getting well under way with studies of low cost housing possibilities, plans for Virginia farm homes, designs for air cured tobacco barns, radiant heating for brooder houses, and a study of apple cold storages. The latter study is cooperative with the U.S.D.A.

Valuable information has been developed from the various research studies that has assisted the extension and resident teaching programs. One example of research being put into use is the adaptation of the slatted floor type of barn hay-drier, developed as a result of the hay-drying studies. This type of

drier is now recommended for Virginia and many other states. The department has been a leader in this particular research. Virginia farms now have more hay-driers installed than have farmers in all the Southern States combined. Visitors from many states and foreign countries have visited the department to get information on the hay-drying work and there has been nation-wide demand for our publications on this subject. The past 36 years in the life of agricultural engineering at V.P.I. has been one of progressive development. With the increasing demands and needs for agricultural engineering services, the staff of the department is confident that the future will see even greater progress and development.

[The cover and 1st-page inset are shown below]