THE NORTH CAROLINA

AGRICULTURAL EXPERIMENT STATION,

RALEIGH, N. C.

This institution now receives its support from the U. S. Government through the Hatch Act, for the maintenance of experiment stations in every State and Territory. The people of North Carolina are not taxed for its support, through any State tax—and so far as they are concerned the work which is being done by the Experiment Station for the agriculture of the State costs them *nothing*. Recognizing this, it is not to the interest of any one to endeavor to retard its growth, but it should be the desire of all to interest themselves in its work, to combine and assist in its management, and to derive the greatest benefit from its labors. The Station desires and needs the advice and co-operation of every North Carolinian, for without this co-operation, it can do but little effectual and permanent work. It was established for their benefit, has been working for their good, and it is the intention of all to continue to do so in the future. Surely then, it is nothing but right that the very ones who will be thus benefitted should interest themselves in the workings of the Station, and to profit as far as possible by its labors.

OBJECTS OF THE EXPERIMENT STATION.

The Station was established in 1877 to act (1) as a fertilizer control; (2) as an Experiment Station in all the sense of the word. A few words in detail in regard to these two objects may not be amiss.

1. *As a Fertilizer Control.* Before the Station was established, 108 separate brands were on the market, and of such a grade and such a name that no dependence could be put in their future value, whatever might be said of their then present worth. When the law went into effect, 66 of these brands immediately retired from the State. The remaining brands, and the new ones coming in, have continued to improve in grade, until now it is very seldom that any are found to analyze less than their guarantee. Many adulterated chemicals have been detected in the past, but few are found at present, showing the wholesome restraint exercised by the Station. It is very safe to say that if this control were abolished,

[illegible]

[illegible] AGRICULTURAL EXPERIMENT STATION

[illegible], [illegible]

[illegible]

the farmers of the State would lose *a million dollars* yearly by buying bad, adulterated, and worthless fertilizers. The Station receives a portion of the tax on fertilizers for the expenses of this work, as it would be unlawful to carry on fertilizer analyses for the State, and pay for it out of the United States funds.

2. *As an Experiment Station.* The Experiment Station is designed to make experiments in agriculture. What farmer but who has desired to try some new plan, or change some old plan, but who was deterred from doing so on account of the time and the expense, and not knowing whether it would be successful?

The Experiment Station is designed to try these new plans and ascertain if it would be well to advocate their general adoption. These experiments extend into almost every branch of agriculture, and must embody much detailed and expensive work. In doing this, science and practice must combine and both together work for the common end. Scientific work without practical work would be worthless; and none the less true is it that practical work without science would be a failure. "Book farming" methods are the methods which are found by practice, guided by science, to be true, useful, and worthy to be adopted. There must be some change in the plans and purposes of most farmers, for it is certain that they are getting but little richer after all their labor, and very possibly they are becoming poorer, year by year. Reform must begin at home. And the key-note of that reform seems to be, to raise all the bread and meat at home that is needed, keep cattle, save all the manure possible to reduce the cost of commercial fertilizers—and then if you choose put in money crops, and do so economically as possible. How to show how all this can be done safely, quickly, and cheaply, is the main object of the Experiment Station. In this endeavor, the various departments of science and practice are combined. Chemistry, Horticulture, Botany, Entomology, Meteorology, are all combined with agriculture in this work. There are at the Station, in addition to scientific men, men who have had years of field work, and as good as the best—who have become familiar by actual work with the *practical* operations of all branches of agriculture.

Though all mutually dependent on each other, the various Divisions of the Experiment Station are as follows:

1. *Chemical Division*, having the analyses connected with the fertilizer control. Conducts also chemical analyses of chemicals, marls, phosphates, mucks, soils, waters, etc., in samples sent to the Station. In connection with the experimental work, analyzes also fodders, grains, hays, and clovers both for feeding purposes and the estimation of mineral ingredients. Also the analyses of milk and butter. Also analyses of fertilizing ingredients for field tests. In fact. every chemical investigation which may be needed from time to time in the experimental work of the Station.

2. *Agricultural Division*, embraces the experimental work done in the field, stable and dairy. For these purposes the experimental farm was established, and is located near the Agricultural and Mechanical College,

and adjoins the State Fair Grounds. The field work here has been in testing the value of the various fertilizing ingredients, in ascertaining the value of pea-vine manuring for various crops, the different grasses and clovers, and forage plants, etc. Much of the field work in the future will be conducted at the various sub-stations referred to later. The experimental work in the stable has been and will be the investigation of economic feeding for stock, the food value of the various fodders and stock foods, the best methods for the profitable fattening of stock, etc. An improved barn has been built for these purposes, in which are silos for the study of various sorts of ensilage in a feeding point of view. A well arranged dairy-house is built near by, and is equipped with the various dairy implements necessary for experimental work in connection with the dairy industry. Encouragement to the dairy industry means a multiplication of stock, increased quantity of fodders and grassses, larger amount of home-made manure, and a decrease of fertilizer bills.

3. *Division of Co-operative Field Tests.* To reach as many varieties of soils as possible, field tests are conducted in different localities of the State by farmers co-operating with the Station. In 1889, twenty-eight localities were represented, and valuable results were secured. These experiments were mainly to test the question of profitable fertilizing for various crops, the value of the different grasses and forage crops, etc.

4. *Botanical Division.* This division has been mainly engaged in the examination of field and garden seeds as to purity and vitality, and to establish a laboratory standard for this examination. The adulteration of grass and other seed by impure or dead seed, is so easy that the necessity of this work is at once apparent. All plants or grasses sent to the Station are identified, and their value stated. Bulletins have been issued giving a full statement of all noxious weeds, with illustrations showing their appearance, and methods for their eradication. A similar work is now nearly completed describing the best agricultural grasses, the soils best adapted to them, and the methods to be used for their cultivation. Fungous diseases of plants are also receiving attention, and are studied with the view of ascertaining the best plans for treatment to rid our fields, gardens, and orchards of them.

5. *Entomological Division.* Studies the various insect pests which infest field crops, garden vegetables, vineyards, and orchards. The damage by insects to the crops of the State during the year runs, up in the hundreds of thousands of dollars. To lessen this loss by prescribing remedies for the extermination of the insects, is the main object of our entomological work.

6. *Horticultural Division.* Investigates the different varieties of fruits and vegetables, and their adaptability to our soils and climates. Tests the various methods of cultivation and treatment for shipping of fruits, grapes, early and late vegetables to other markets. Also the introduction and originating of new and promising varieties for this State.

7. *Meteorological Division,* under which are embraced the operations of the State Weather Service, co-operating with the United States

Signal Service. Records of the weather are kept by observers scattered over the State, and are permanently preserved in tabulated form. A more thorough knowledge of our climate is thus secured, which will enable us to extend to new localities plants, found useful elsewhere, as well as to present an authentic statement, in point of health, of our unexcelled climates to the world. Telegrams giving the probable state of the weather are sent out 36 hours ahead, giving a forecast of the weather to every telegraph station which will provide suitable facilities for displaying signals. In this way the coming of frosts and cold waves is ascertained, and remedies provided to protect the tobacco, truck, and fruit interests. The effect of the weather on the growing crops is ascertained from numerous reporters, and is embodied in a weekly crop bulletin.

8. *Bureau of Information.* The Station is at all times ready and willing to give any information at its command. It does this cheerfully and promptly. When it is not possible to give the information desired, it is ready to say so. Questions have been asked covering almost every branch of agriculture, both practical and scientific, and are answered by those most competent to do so.

9. *Division of Publications.* In order to reach the people of the State, the Station must print and send out the results of its work. This is done through bulletins and reports, which are sent free to all requesting them. It has been the aim to write in a popular and concise style, and to present it in as pleasing a manner as possible. The bulletins contain matter of a practical nature, while the annual reports and technical bulletins are more scientific in character. The Station has on hand duplicates of most of the bulletins and reports, and can furnish them where especially desired. The following class of publications are issued:

A. BULLETINS.

a. Regular Issue. Which is now sent to somewhat over 13,000 names of farmers, and others.

b. Meteorological Division Bulletin, containing the reports of the meteorological observers and signal display stations throughout the State, and gives an account of the State Weather Service in co-operation with U. S. Signal Service.

c. Weekly Weather Crop Bulletin, issued during the growing season and gives the effect of the weather on the crops as determined by reports from crop correspondents.

d. Technical Bulletins. Include only results of a scientific nature such as would not interest the general reader. These bulletins as well as the weather crop bulletin, and bulletins of the meteorological division are not sent to the general list, but only to those who would be especially interested in those subjects.

e. Weekly Press Bulletins. Furnish to the newspapers for insertion in their columns short, concise reading articles of the operations of the various divisions, announcements of work done or in operation, and in

[illegible] Records of the studies are kept by [illegible] [illegible] [illegible]

short to present to the public statements which will be instructive in their agricultural operations.

B. ANNUAL REPORTS. Contain outlines of work carried on and finished throughout the year. While occasionally they may contain matter of a similar character as the bulletin, yet much of the bulletin matter is not republished in the reports, and to preserve the results, both bulletins and reports should be filed.

10. *Sub-Experiment Stations.* The establishment of these has been found possible because of the marked success attendant upon the co-operative field tests already conducted in the State, and which are fully described in our bulletins. In order to bring the work of the Experiment Station more directly before the farmers of the various localities of the State, and to secure the benefits resulting from experiments on various soils, these sub-stations in about eight or nine representative localities have been decided upon. These points will be three in the section east of Raleigh, three in the central section west of Raleigh, and two in the mountainous section. They will work in connection with the central station at Raleigh in conducting field tests with fertilizers, in testing varieties of grasses, forage crops, fruits, vegetables, etc., in trying improved implements, new agricultural methods, and in the general sense to try experiments in agriculture. Necessarily the beginning will be small, and it is expected that it will be some time before *results* can be pointed to, but success is bound to be reached sooner or later. In the meantime every one should be patient, and be ready to co-operate in the work and give it a helping hand, to take interest in what is being done, and watch the work as it progresses. The bulletins of the Station will contain full reports of operation at the various sub-stations.

The North Carolina Agricultural Experiment Station,

RALEIGH, N. C.,

UNDER THE CONTROL OF THE

BOARD OF TRUSTEES, A. & M. COLLEGE.

OFFICERS OF THE EXPERIMENT STATION.

H. B. BATTLE, PH. D. ..... Director and State Chemist.
F. E. EMERY, B. S. ..... Agriculturist.
GERALD MCCARTHY, B. Sc. ..... Botanist and Acting Entomologist.
W. F. MASSEY, C. E. ..... Horticulturist.
C. F. VON HERRMANN ..... Meteorologist.
B. W. KILGORE, B. S. ..... Assistant Chemist.
F. B. CARPENTER, B. S. ..... Assistant Chemist.
J. R. HARRIS. ..... Assistant Chemist.
J. B. P. MASSEY ..... Assistant Horticulturist.
H. L. HARRIS, B. S. ..... Secretary.

RECENT PUBLICATIONS OF THE EXPERIMENT STATION.

Any of these Bulletins (except 64) are sent free to any address, upon application to Dr. H. B. Battle, Director, Raleigh, N. C.

No. 57. Field Experiments.
No. 58. Field Experiments.
No. 59. Purity and Vitality of Seeds.
No. 60. Lucerne as a Forage Crop.
No. 61. Composts; Formulas and Value.
No. 62. Fertilizer Analyses.
No. 63. Tests of Seeds. Laboratory Notes.
No. 64. Science of Practical Stock Feeding.
No. 65. Co-operative Field Tests.
No. 66. Stock Feeding in N. C. Indian Corn.
No. 67. Seed Tests.
No. 68. Farm and Dairy Buildings.
No. 69. Fertilizer Analyses.
No. 70. Weeds on the Farm. Japan Clover.
No. 71. Field Tests in 1889. Hill-side Ditches.
No. 72. Work in Horticulture. Pea-vine Manuring.
In Progress: The Best Agricultural Grasses.
In Progress: Silos and Ensilage.
In Progress: Cotton Seed Meal and Hulls for Food.

The North Carolina Agricultural Experiment Station