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Organization, work already performed, future work of the station

R. P. Speer
Iowa Agricultural College

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ORGANIZATION.

During the first part of the present century so many fields had become impoverished by unskillful tillage, in Europe, that Germany, France and other Nations were compelled to establish large numbers of Agricultural Colleges and Experiment Stations, to prevent further deterioration of the soil, and serious suffering from want of food. Since the establishment of such Colleges and Experiment Stations the productiveness of the soil (i.e., in Germany), has increased steadily under the influence of improved methods of agriculture. In all of the oldest sections of this country the average crop of wheat, corn, cotton, etc., have declined so steadily and rapidly that agriculture is no longer considered a desirable pursuit. In fact, there are thousands of farms in the Southern States, which were productive less than half a century ago, that have been abandoned as worthless. A few years ago it was not difficult to pay for a good farm in the interior of Iowa with two or three crops of wheat, but on account of the rapid deterioration of the soil we are now obliged to buy our wheat, for home consumption, from Minnesota and Dakota. Although there is nothing to encourage farmers who intend to follow the old methods of tilling the soil, yet they have less to complain of than the horticulturists, as the winter of 1884-5, and the severe droughts of 1886 and 1887 furnished the proof that there is not a single American variety of the apple, pear or cherry, which is adapted to Iowa. Peaches, and many varieties of the apple which were grown successfully in Central New York forty years ago, are tender and unprofitable there now. The cutting down of the forests in New York, and other States, has caused droughts and extreme changes in the weather to be much more common than formerly. And where large areas of the West have been brought under cultivation similar changes have taken place. On account of such soil and climatic troubles, Congress was induced to pass the Hatch Law, authorizing the establishment of an Agricultural Station in each of the States and Territories, and its maintenance at Government expense.

In February, 1888, the Legislature of Iowa accepted the grants of moneys authorized by the law to which I have just referred, upon the terms, and for the uses named in said law, and placed the organization and management of the Agricultural Experiment Station for Iowa under the control of the Board of Trustees of the Iowa Agricultural College.
On February 17th the Board of Trustees elected Captain R. P. Speer Director, and Herman Knapp Treasurer, of the Iowa Agricultural Experiment Station, and appointed Trustees J. W. Garner, Joseph Dysart and C. M. Dunbar, a Standing Committee to act for the Board in organizing and managing the Station. At a meeting of the Committee on Experiment Station, with Director Speer and President W. T. Chamberlain, on March 14th, it was determined that the work of the College and the work of the Experiment Station should be kept as distinct as possible. It was also determined that a chemist, a botanist and entomologist should be employed for Experiment Station work exclusively, and that the positions be given to the men who would furnish the most satisfactory letters of reference. At the above meeting it was also determined that a suitable building should be erected on the College grounds by the 30th day of next June, for chemical, botanical and entomological laboratories, station library and director's office, and that a propagating house, twenty-two by thirty feet, should be erected on the east side of the laboratory building by the 30th day of next September. At the above meeting 120 acres of land, situated on the west side of the College farm, was assigned to the Station for experiment purposes, at the rate of $300.00 per year. The Director was authorized to employ a competent assistant and other necessary help, and purchase teams, agricultural implements, seeds, plants and other equipments necessary for properly performing the different kinds of experiment station work.

At a meeting of the Committee on Experiment Station, on April 11th, Director Speer presented the names of nine applicants for the position of Station chemist, seven applicants for the position of Station botanist and five applicants for the position of Station entomologist. A large number of letters of reference, accompanying the applications referred to above, were also submitted to said Committee. After a careful examination of the applications and letters of reference, G. E. Patrick was elected Station Chemist, A. A. Crozier was elected Station Botanist, and C. P. Gillette was elected Station Entomologist. Director Speer was authorized to employ Professors Halsted, Bennett and Osborne to perform special work during the College vacations, whenever their services can be used judiciously to advance Experiment Station work. The Professors of Agriculture and Horticulture will also conduct experiments in special lines of work. An arrangement was made with Dr. M. Stalker, which will enable him to investigate the causes, and determine as far as possible, the best methods of treatment of new or extraordinary diseases of the domestic animals. At said meeting the Committee on Experiment Station authorized the purchase of $3,000.00 worth of scientific books for the Station library, $2,000.00 worth of chemical apparatus and $500.00 worth of chemical supplies.
Work Already Performed.

Director Speer took charge of the Experiment Station work, on the College farm, March 10th.

A large share of that part of the farm which was assigned to the Experiment Station was found to be in very unsuitable condition for any kind of crop.

One part of it was a large, old orchard, covered with a heavy blue-grass sod, which was partly cleared up and plowed late last fall. Another part of it was an old pasture field, which was also plowed so late last fall that it was impossible to prepare it properly for crops this season. Other parts of it were naturally very wet, and had been tile drained, many years ago, in the wettest places; but as the drains had not been properly graded we found the tiles choked with mud in many places, and useless. We have grubbed out all the trees in the old orchard. and after cutting the unrotted sod as much as possible, with a disc harrow, it was seeded with oats. Where the old tile drains were defective they have been taken up and replaced properly. We have also put in three hundred and fifty rods of new tile drains. We have planted an experimental orchard of the fruits which have proved most promising in Iowa.

Most of them have been grown successfully for ages in the vicinity of Moscow, in Russia, or in Northwestern China, where the climate is more unfavorable to fruit culture, in every respect, than here. Of the varieties of the fruits planted in the new orchard 61 are apples, 22 pears, 36 are cherries and 39 are plums, and there are four trees of each variety of the different kinds of fruit.

Last spring the Director planted an experimental orchard at Cedar Falls, Iowa, with one hundred kinds of the most promising new apples, eleven kinds of cherries, and thirteen varieties of plums, which will receive good care, but principally at his own expense.

On the experimental grounds, at Ames, we have planted the following numbers of the most promising grains, grasses, vegetables, etc.: spring wheat, 12; oats, 13; rye, 5; barley, 3; annual grasses, 12; perennial grasses, 40; other forage plants, 14; field corn, 40; sweet corn, 5; sorghum, 5; potatoes, 51; mangolds, 14; carrots, 5; besides from five to ten kinds each of squashes, cabbages, tomatoes, peas, melons, rutabagas, beans, etc. We have also seeded six acres with alfalfa, and four acres with amber cane for ensilage.
From the remarkable improvements which have been made within a few years in flowers, ornamental foliage plants and garden vegetables, by breeding them skillfully, I am convinced that equally rapid progress can be made in the production of valuable hardy fruits, grasses, etc., by cross-fertilization and careful selection. Within the last ten days we have carefully pollenized 500 plum blossoms and 2,600 apple blossoms. In most instances we have used the native DeSoto plum as the mother stock, and pollen from such plums as the Damson, Lombard and Canada Egg. In making crosses of the apple we have generally used pollen of such apples as Janeton, Rawle's Genet, Wythe, Grimes' Golden, Rome Beauty, Autumn Strawberry and Golden Sweet upon extremely hardy varieties like Recumbent. Silken Leaf, Cross, Antonovka and Soulard Crab.

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FUTURE WORK OF THE STATION.

As the per cent. of sucrose, or crystallizable sugar, in sugar beets has been greatly increased, within a few years, in Germany and France, by careful selection and skillful crossing, we will endeavor by the same methods to increase the sucrose in the amber cane. Most of our cereals and imported grasses are much better adapted to moist climates, like those of England and our Atlantic Coast States, than to Iowa, where the summers are frequently very hot and dry. The native trees and herbaceous plants of countries where the summers are very hot and dry, have much thicker leaves generally, than where the climate is cold and moist. Such leaves have usually two or more layers of empty cells on their upper sides, to protect the working cells under them from injury by the heat of the sun; while in cool and moist climates, where there is much cloudy weather, the working cells of leaves and blades of grass are nearer their upper sides, to enable them to receive sufficient light and heat from the sun. As many varieties of the cereals and grasses are injured very often in Iowa by heat, drouth or other unfavorable climatic conditions, we will give special attention to the collection of promising native grasses in Iowa and the new States and Territories farther west, and of the cereals from other parts of the world, where the climate is similar to ours. We will also endeavor to improve the best of the old varieties of the cereals and grasses, by making careful selections and by cross-fertilization.

We will also try to determine, by careful experiments, to what extent drainage, subsoiling and green-manuring are beneficial, and what gains should result from a proper rotation of crops. We will give special attention to such
experiments as will be most likely to benefit the dairy interests, as we believe that Iowa is well adapted to the dairy business, and should lead all of the other States in a short time, in the manufacture of butter and cheese.

Mr. John Craig will visit the Yellowstone Valley, Northern Idaho and other new sections of the West, next August, for the purpose of collecting seeds of the most promising native grasses for the Iowa Experiment Station. Mr. A. A. Crozier, Station Botanist, will also visit Northwestern Iowa and parts of Minnesota and Dakota, during the latter part of the coming summer, for a like purpose.

We expect to analyze many new, or not well known plants, for the purpose of learning whether they are valuable or not. But we do not expect to give much attention to analyzing water of wells or springs, commercial fertilizers, or the old feed stuffs which have been analyzed many times in this country and Europe; yet we will publish the results of such work at other Experiment Stations, in our bulletins. Nor will we promise many experiments in breeding, or in feeding the domestic animals, because thousands of skillful breeders and feeders are conducting such experiments in all parts of the West.

We expect to be disappointed very often in the results of our experiments, but hope to strike a lead once in awhile which will advance the agricultural interests of the State.

Experiment Station bulletins will be published quarterly, and sent to all applicants, who are farmers or gardeners, and residents of the State, postage free.

R. P. SPEER.
The following is as much of the law, under which the Iowa Agricultural Experiment Station was organized, as would be of interest to the public, to-wit:

*Be it enacted, by the Senate and House of Representatives of the United States of America, in Congress assembled,* That in order to aid in acquiring and diffusing among the people of the United States, useful and practical information on subjects connected with agriculture, and to promote scientific investigation and experiment respecting the principles and applications of agricultural science, there shall be established, under direction of the college or colleges or agricultural department of colleges in each State or Territory established, or which may hereafter be established, in accordance with the provisions of an act approved July second, eighteen hundred and sixty-two, entitled, "An act donating public lands to the several States and Territories which may provide colleges for the benefit of agriculture and the mechanic arts," or any of the supplements to said act, a department to be known and designated as an "agricultural experiment station."

SEC. 2. That it shall be the object and duty of said experiment stations to conduct original researches or verify experiments on the physiology of plants and animals; the diseases to which they are severally subject, with the remedies for the same; the chemical composition of useful plants at their different stages of growth; the comparative advantages of rotative cropping as pursued under a varying series of crops; the capacity of new plants or trees for acclimation; the analysis of soils and water; the chemical composition of manures, natural or artificial, with experiments designed to test their comparative effects on crops of different kinds; the adaptation and value of grasses and forage plants; the composition and digestibility of the different kinds of foods for domestic animals; the scientific and economic questions involved in the production of butter and cheese; and such other researches or experiments bearing directly on the agricultural industry of the United States as may in each case be deemed advisable, having due regard to the varying conditions and needs of the respective States or Territories.

SEC. 3. That in order to secure, as far as practicable, uniformity of methods and results in the work of said stations, it shall be the duty of the United States Commissioner of Agriculture to furnish forms, as far as practicable, for the tabulation of results of investigation or experiments; to indicate, from time to time, such lines of inquiry as to him shall seem most important; and, in general, to furnish such advice and assistance as will best promote the pur-
poses of this act. It shall be the duty of each of said stations, annually, on or
before the first day of February, to make to the Governor of the State or Ter-
ritory in which it is located a full and detailed report of its operations, includ-
ing a statement of receipts and expenditures, a copy of which report shall be
sent to each of said stations, to the said Commissioner of Agriculture, and to-
the Secretary of the Treasury of the United States.

Sec. 4. That bulletins or reports of progress shall be published at said
stations at least once in three months, one copy of which shall be sent to
each newspaper in the States or Territories in which they are respectively lo-
cated, and to such individuals actually engaged in farming as may request the
same, and as far as the means of the station will permit. Such bulletins or
reports and the annual reports of said stations shall be transmitted in the
mails of the United States free of charge for postage, under such regulations
as the Postmaster-General may from time to time prescribe.

Sec. 5. That for the purpose of paying the necessary expenses of con-
ducting investigations and experiments and printing and distributing the re-
sults as hereinbefore prescribed, the sum of fifteen thousand dollars per an-
um is hereby appropriated to each State, to be specially provided for by Con-
gress in the appropriations from year to year, and to each Territory entitled
under the provisions of section eight of this act, to be paid in equal quarterly
payments, on the first day of January, April, July and October in each year,
to the treasurer or other officer duly appointed by the governing boards of
said colleges to receive the same; Provided, however, That out of the first
annual appropriation so received by any station an amount not exceeding one-
fifth may be expended in the erection, enlargement or repair of a building or
buildings necessary for carrying on the work of such station; and thereafter
an amount not exceeding five per centum of such annual appropriation may be
so expended.

Sec. 9. That the grants of moneys authorized by this act are made subject
to the legislative assent of the several States and Territories to the purposes of
said grants.

Sec. 10. Nothing in this act shall be held or construed as binding the
United States to continue any payments from the Treasury to any or all the
States or institutions mentioned in this act, but Congress may at any time
amend, suspend or repeal any or all the provisions of this act.

Approved, March 2, 1887.