

SECOND ANNUAL REPORT

OF THE

IOWA

AGRICULTURAL EXPERIMENT STATION

TO THE

GOVERNOR OF IOWA,

FOR THE

YEAR ENDING DECEMBER 31, 1889.

DES MOINES:

G. H. RAGSDALE, STATE PRINTER.

1890.

STATE AGRICULTURAL COLLEGE,
AMES, IOWA, January 1, 1889.

To his Excellency, WILLIAM LARRABEE:

I have the honor to submit herewith the second annual report (January 1 to December 31, 1889), of the Iowa Agricultural Experiment Station, as required by law.

R. P. SPEER, *Director.*

REPORT.

The following is a concise report of the work performed at the Iowa Agricultural College Experiment Station during the year 1889.

Feeding experiments were planned and managed from December 26, 1888, to April 11, 1889, by the Iowa Agricultural Experiment Station and the farm department of the College. The number of steers used in the experiment was 12. The objects aimed at were:

First—To compare the feeding value, in fattening, of timothy hay, corn fodder, corn ensilage and sorghum ensilage, when each is the sole coarse food of the ration, and corn and cob meal the only grain.

Second—To compare a single coarse food, *e. g.*, timothy hay, corn fodder, or ensilage, with a mixture of the two, *e. g.*, corn fodder and timothy, ensilage and timothy, the grain being in all cases the same, *viz.*: corn and cob meal.

Third—To compare corn and cob meal with whole corn, as the grain feed in fattening.

Fourth—To compare the cost of out-door with in-door winter fattening.

Fifth—To compare any and all of the rations named above with a more varied ration containing wheat bran as a part of the grain feed.

For plan, details and results of these experiments, see bulletin 5.

The number of varieties of each of the different kinds of the cereals, peas, grasses, etc., which were sowed on the Experiment Station grounds in March, 1889, were as follows, *viz.*: Wheat 7, oats 15, rye 2, barley 3, field peas 3, tame grasses 6, wild grasses 53, and prickly comfrey and other forage plants 7.

During the latter part of April and the first of May we planted, also, 62 varieties of potatoes, 30 varieties of corn, 10 kinds of sorghum, three kinds of buckwheat and a large assortment of the most promising kinds of garden vegetables.

For methods of culture and the results of the experiments with the different plants named above, see bulletins 6 and 7.

In January and February, 1889, many hundreds of sections of the wood of hardy and tender fruit trees and shrubs were examined under the microscope by Dr. B. D. Halstead, for the purpose of determining whether there were structural differences between hardy and tender trees or not. For results see bulletin 4.

In February and March, 1889, many experiments were made in the Experiment Station propagating houses with ripe and green cuttings of fruit trees and shrubs, and with seeds of different kinds of trees and plants.

In August a sugar house was erected on the Station grounds and the necessary machinery was procured for making sugar from sorghum by the Jennings diffusion process. The results of the sugar experiments in September were reported in bulletin 7.

The Station Chemist has made many analyses of milk, butter, grasses and other forage plants, ensilage, feed stuffs and soils, besides inventing a simple, accurate and rapid process for determining the butter fat in milk.

The twigs of many kinds of tender and hardy fruit trees were analyzed and compared for the purpose of determining whether there were differences in their composition or not. See bulletin 4.

Several hundred stalks of amber cane were analyzed last September, which were produced from seeds of stalks which were unusually rich in crystalizable sugar.

The Entomologist during the past year has given special attention to the following subjects:

First—Parasites upon domestic animals.

Second—Remedies for the codling moth.

Third—Habits of the plum gouger and the plum curculio, and the best remedies.

Fourth—Food habits of the striped squirrel.

Fifth—Comparative effects of the arsenites, Paris green, London purple and white arsenic on different kinds of foliage, when applied in different mixtures and different strengths.

Sixth—Habits and life histories of the cut-worms of the State, in all of their stages of development, and the parasites and artificial remedies useful for their destruction.

Much attention has also been given in a general way to isolated experiments upon many common injurious insects, and valuable results have been obtained which will be reported in the bulletins from time to time.

Due attention has also been given to collecting, mounting and determining specimens for the Station collection.

THE IOWA AGRICULTURAL COLLEGE EXPERIMENT STATION

In account with the United States appropriation.

1880.	RECEIPTS.	
Amount received from United States Treasurer, as per appropriation for the year ending June 30, 1889, under act of Congress approved March 2, 1887....		\$15,000.00
Amount received from the sale of stock and produce belonging to the station....		285.02
Total receipts.....		\$15,285.02
1880.	EXPENDITURES.	
Paid for buildings—		
Improvement of the station building....	\$	750.00
Paid for salaries—		
Director	\$	2,200.00
Director's assistant.....		537.77
Chemist		2,000.00
Botanist		1,575.00
Entomologist		1,000.00
Treasurer.....		250.00
		8,162.77
Paid for labor—		
General field and office work.....	\$	1,223.92
Tiling and ditching.....		48.37
Grubbing timber land.....		60.00
		1,332.29
Paid for apparatus and library—		
Office fixtures.....	\$	17.90
Apparatus for laboratories.....		440.52
Books and periodicals.....		632.15
Heater for office and laboratories.....		923.67
		2,014.24
Paid for equipments—		
Machinery		60.80
Tools.....		32.18
		92.98

Paid for supplies and expenses—

Traveling expenses of director.....	\$ 70.77		
Traveling expenses of director's assistant.....	229.06		
Traveling expenses of botanist.....	44.92		
Mileage and per diem of committee....	306.85		
Feed and care of horses and mules....	241.14		
Seeds, trees, etc.....	128.62		
Supplies for laboratories.....	70.21		
Supplies for field experiments and propagating house.....	176.48		
Supplies for office.....	82.08		
Coal and gasoline.....	77.17		
Rent of land.....	200.00		
Fixing heater and water supply.....	74.91		
Telegrams.....	50		
Express and freight.....	221.33		
		1,924.04	
Paid for bulletins—			
Printing of same.....		1,008.75	
		\$15,285.02	\$15,285.02

I hereby certify that the foregoing statement is a true copy from the books of account of the Iowa State Agricultural College.

HERMAN KNAPP,
Treasurer.

We, the undersigned, auditing committee for the board of trustees, certify that the above is a correct statement of moneys received, labor performed, purchases made and necessary expenses incurred, for the Iowa Agricultural College Experiment Station for the year ending June 30, 1889.

(Signed)

W. I. CHAMBERLAIN,
E. W. STANTON,
Auditing Committee.

I hereby certify that Herman Knapp is the treasurer of the Iowa State Agricultural College, and that the above is his signature.

(Signed)

W. I. CHAMBERLAIN,
President of the State Agricultural College.

TWENTIETH ANNUAL REPORT

OF THE

Auditor of State of the State of Iowa,

ON

INSURANCE

1889.

JAMES A. LYONS,
AUDITOR OF STATE.

Compiled from annual statements, for the year ending December 31, 1888.