

Historical Document
Kansas Agricultural Experiment Station

EXPERIMENT STATION

OF THE

KANSAS STATE

Agricultural College.

REPORT FOR 1895,

CONSISTING OF THE

EIGHTH ANNUAL REPORT

AND

BULLETINS 49 TO 56

MANHATTAN, KANSAS

1896.



KANSAS STATE AGRICULTURAL COLLEGE.

BOARD OF REGENTS.

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I. D. GRAHAM, Assistant Secretary, Manhattan.

*Term Expires.

STATION STAFF.

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- J. T. WILLARD, M. Sc. ... Chemistry.
FRED A. MARLATT, B. Sc., ... Entomology.
F. C. BURTIS, M. Sc., ... Agriculture.
D. H. OTIS, B. Sc., ... Agriculture.
J. B. S. NORTON, ... Botany.
F. C. SEARS, B. Sc., ... Horticulture.
F. W. DUNN, B. Sc., Until Dec. 31, 1895 ... Irrigation.

Historical Document
Kansas Agricultural Experiment Station

KANSAS STATE AGRICULTURAL COLLEGE.
MANHATTAN, KAN., January 31, 1896.

To His Excellency, Governor E. N. Morrill:

DEAR SIR:—I herewith transmit, as required by act of Congress approved March 7, 1887, the eighth annual report of the Experiment Station of the Kansas State Agricultural College, for the year 1895, including the financial statement to June 30, 1895.

Respectfully yours,

GEO. T. FAIRCHILD,
Secretary Board of Regents.



EXPERIMENT STATION
OF THE
KANSAS STATE AGRICULTURAL COLLEGE,
M A N H A T T A N .

EIGHTH ANNUAL REPORT-FOR THE YEAR 1895.

FINANCIAL STATEMENT.

REPORT OF THE TREASURER.

To the Board of Regents of the Kansas State Agricultural College:
GENTLEMEN —Herewith is submitted my report of receipts and expenditures on account of the Experiment Station for the period between July 1, 1894, and March 31, 1895:
Received from the treasurer of the United States\$11,250 00
Paid approved vouchers, Nos. 1 to 202 10,003 31
Balance paid to C. B. Hoffman, Treasurer elect 1,246 69

ED. SECREST, *Treasurer.*

To the Board of Regents of the Kansas State Agricultural College:
GENTLEMEN —Herewith please find a report of my expenditures and receipts on account of the Experiment Station for the period between April 1 and June 30, 1895:
Received of Ed. Secrest, ex-Treasurer. \$1,246 69
Received from the treasurer of the United States 3,750 00
Total 4,996 69
Paid approved vouchers, Nos. 203 to 318. 4,996 69

C. B. HOFFMAN, *Treasurer.*

REPORT OF THE SECRETARY.

To the Board of Regents of the Kansas State Agricultural College:
GENTLEMEN—Herewith is submitted the following report of the financial affairs of the Experiment Station of the Kansas State Agricultural College for the year ending June 30, 1895, as prepared under directions from the U. S. Department of Agriculture. The several items of this account are covered by vouchers approved by the disbursing officer, certified by the Secretary, and allowed by the President and Board of Regents.



EXPERIMENT STATION.
KANSAS STATE AGRICULTURAL COLLEGE
 IN ACCOUNT WITH
THE UNITED STATES APPROPRIATION, 1894-5.

Dr.		
To Receipts from the Treasurer of the United States as per appropriation for fiscal year ending June 30, 1895, as per Act of Congress approved March 2, 1887		\$15,000 00
Cr.		
By Salaries	\$10,296	75
Labor	1,839	02
Publications	687	45
Postage and stationery	39	04
Freight and express	59	65
Heat, light, and water	6	50
Chemical supplies	29	30
Seeds, plants, and sundry supplies	480	59
Fer-tilizers	14	78
Feeding stuffs	104	18
Library	125	02
Tools, implements, and machinery	267	77
Furniture and fixtures		
Scientific apparatus	100	58
Live stock	54	50
Traveling expenses	114	87
Contingent expenses	10	00
Building and repairs	750	00
Balance		
TOTALS	\$15,000	00
		\$15,000 00

We, the undersigned, duly appointed Auditors of the Corporation, do hereby certify that we have examined the books and accounts of the Experiment Station, Kansas State Agricultural College for the fiscal year ending June 30, 1895; that we have found the same well kept and classified as above, and that the receipts for the year from the Treasurer of the United States are shown to have been \$15,000, and the corresponding disbursements \$15,000; for all of



which proper vouchers are on file and have been by us examined and found correct, thus leaving no balance.

And we further certify that the expenditures have been solely for the purposes set forth in the Act of Congress approved March 2, 1887.

SIGNED:

[SEAL.]

C. E. GOODYEAR,
C. B. DAUGHTERS, } *Auditors.*
HARRISON KELLEY, }

ATTEST:

GEO. T. FAIRCHILD. *Custodian.*

SUPPLEMENTARY STATEMENT.

DR.

To receipts from other sources thru the United States for the year ending June 30, 1895.

Farm and garden products.	\$435 06
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CR.

Labor	\$175 13
Contingent expenses.	100
Building and repairs.	258 93

Totals	\$435 05	\$435 06
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The accounts covering the Station fund are kept in a separate set of books, as provided in the act of Congress under which the Station was organized, and duplicate vouchers covering every item of expenditure made during the year are on file in the office of the Secretary.

All correspondence of this office concerning the issue of bulletins is on record. Nearly 7000 copies of each bulletin have been distributed upon the revised lists of the year, 1000 of each being retained for binding with the annual report for future needs. The total number of copies of all publications distributed during the past year is nearly 70,000.

Respectfully submitted,

I. D. GRAHAM, *Secretary.*

REPORT OF THE COUNCIL.—1895.

To the Board of Regents of the Kansas State Agricultural College:

GENTLEMEN—We present herewith outline the work of the Station for the calender year ending December 30, 1895. The season has been a fair one, and the results of experiments with crops have been such as to make the bulletins of service in comparison of varieties and methods, as well as a record of growth. Eight bulletins have been published, covering more than that number of subjects, as shown in the following:

OUTLINE OF BULLETINS.

BULLETIN No. 49. May, 1895. Veterinary Department.

Cattle poisoning by potassium nitrate [pp. 3-11]: Giving an account of cattle poisoning from feeding corn fodder grown on rich soil, the corn fodder containing sufficient potassium nitrate (salt petre) to poison cattle. Experiments were also made to determine the quantity of potassium nitrate necessary to cause death and the manner of its action.

Mastitis, [pp. 12-18]: An account of the kinds, causes, symptoms and treatment of mastitis (garget) in cattle, and experiments made to determine the presence of germs in the milk of affected animals.

BULLETIN No. 50. June 1895 Botanical Department.

First report on Kansas weeds.—The Seedling, [pp. 19-51, pl. i-ix]: Containing preliminary remarks on the seed, germination, the seedling; descriptions of the seedlings of our common weeds: a key to our common weeds based upon characters of the seedlings: nine plates with one hundred and forty-five figures illustrating seedlings of weeds.

BULLETIN No. 51. June, 1895. Farm Department.

Steer feeding experiment, V. [pp. 55-85, pl. i-xx]: Containing comparative results of feeding six shorthorns and six scrubs, showing, for each lot, monthly weights and gains during two summers on prairie pasture and one winter on fodder: weekly account of weight, gain, feed eaten, cost of grain, during six months in the feed lot: amount of feed eaten per pound of gain at various dates: block test and detail slaughter weights. It also show the amount of feed passing through the steers undigested, and hence the amount available for hogs placed after them.

Experiment in feeding hogs [pp. 78-79]: Containing results with four hogs placed behind each lot of steers, records being kept of their weights, gains, and extra feed eaten.

BULLETIN No. 52. September, 1895. Botanical Department.

Second report on Kansas weeds.—Preliminary circular on distribution [pp. 87-102]: Corn taining a request for information concerning Kansas weeds, especially distribution, with a blank to receive this information and to be returned to the Botanical Department: a list of Kansas weeds with their distribution by counties as shown by specimens in the College herbarium.

BULLETIN No. 53. October, 1895. Farm Department.

Pig-feeding experiments with corn, wheat, Kaffir corn, and cotton seed meal [pp. 103-114]: Containing three series of experiments in this line:

Series I. With twelve pigs divided into three lots of four pigs each, fed on Kaffir corn

meal, corn meal, and ground wheat, for 77 days, showing the amount of each of these kinds of feed required to make a pound of pork.

Series II. With four lots of pigs, fed corn meal, ground wheat, and cotton seed meal, and mixtures of these. The plan was to ascertain to what extent cotton seed meal could be fed to pigs without affecting them injuriously and how this feed compared with other feeds named. The results are given.

Series III. With two lots of three pigs each, fed on various mixtures of cotton seed meal and corn meal.

BULLETIN No. 54. December, 1895. Farm Department.

Experiments with oats [pp. 115-125]: during the years 1894 and 1895, in the following lines:

Oats on land full plowed, spring plowed, and not plowed; various times of seeding; treating with hot water for smut; varieties of seed; methods of seeding; different amounts of seed to the acre; time of harvesting; variety tests.

BULLETIN No. 55. December, 1895. Horticultural Department.

Small fruit culture by irrigation: Part I.— Water supply, storage and irrigation [pp. 127-136]: Containing a discussion of the sources of water supply, as wells, streams, ponds, stored storm water, and hillside springs; methods of constructing reservoirs; laying out of ditches.

Part II. Strawberries [pp. 137-148]: Describing the mode of propagation of the strawberry, the character of the flowers: arrangement of varieties with respect to perfect and imperfect flowers; planting, culture, mulching, gathering and handling crop; renewal of beds: a table of twenty varieties most successfully covering the season, in order of ripening.

BULLETIN No. 56 December, 1895. Farm Department.

Part I. Experiments with corn [pp. 149-160]: Detailing results of the following experiments: Time of planting; frequency of cultivation: amount of cultivation: methods of culture: subsoiling; butt, middle and tip kernels for seed; comparison with Red Kaffir corn: varieties.

Part II. Experiments with Kaffir corn [pp. 161-168]: Continuing statements of comparative production of Red and White Kaffir corn during several years; distance of planting; feeding value; culture.

OTHER WORK.

CHEMICAL DEPARTMENT.—The work in testing the effect of fertilizers upon the sugar content of sorghum has been continued; the fertilizers employed being lime, superphosphate, potash sulphate, Chili saltpeter, common salt, gypsum, and a complete fertilizer made up of superphosphate, Chili saltpeter and potash sulphate. As in previous years, little effect was observed from the use of these fertilizers. The selection of seed from analyses of stalks in efforts to improve the quality of sorghum has been continued, the cane being grown from seed selected in the same way in previous years. The results of these experiments, continued through several years, show the possibility of very materially changing the composition of plants by proper selection. The varieties used the present year in these trials were Early Amber, Folger's Early, Medium Orange, Kansas Orange, Collier (Unendebule), Coleman (cross of Amber and Orange), McLean, "Nearly Seedless", "8X." Seed from the selections of these various sorts has been preserved for distribution.

Reference has been made in previous publications of this Station to smuts of sorghum. One kind, the head smut, (*Ustilago Reiliana*,) was first observed in 1890 on a single stalk. No further attacks of this smut have been observed until the present year, although the same ground has been cropped continuously with sorghum. This year a number of stalks of several varieties were attacked by this head smut.

A study of soil moisture was undertaken in the spring of 1895. Daily samples of soil were taken at Garden City from several plats. Later in the season culture experiments on the conservation of moisture were undertaken. All of these gave interesting results, which will be published with those of another season, when it is planned to very materially extend this work.

Sugar beets have been grown both by irrigation and without. While a heavy yield has been secured, the beets were only of medium quality as to sugar content.

ENTOMOLOGICAL DEPARTMENT: — Several lines of special inquiry have been carried along, with the result of the accumulation of important material to be published, in proper connection, in the near future. Of these studies the more complete are the following:

The habits and development of the horn fly of cattle, with experiments in the composition and use of various repellent washes and sprays for the protection of animals from its attacks. Similar experiments in protecting horses from the common stable fly. The development of the eggs of the horse botfly, with trials of various washes to prevent the hatching of the eggs. The life-histories of some little known insect enemies of forest and ornamental trees, especially those of the poplar family. The more destructive enemies of the apple, especially the apple root louse or woolly aphis, and the effect of cultivation in restricting its injurious increase. The insects attacking the native plum and its cultivated varieties, especially those injuring the fruit. Trials of advertised insecticides with injurious garden insects.

FARM DEPARTMENT: — Besides the work published, the following experiments are in progress, and will be reported upon in due time:

A feeding experiment with twenty steers divided into four lots, five steers in each lot, fed as follows: Lot I, on a balanced ration consisting of corn meal, oil meal and bran, with corn fodder and alfalfa for roughness; Lot II, on corn meal and corn fodder, Lot III, on ear corn and corn fodder. These three lots are fed in the barn. Lot IV, is fed on ear corn and corn fodder in the yard.

A feeding experiment with heifers, in which Red Kaffir corn is compared with corn, fed to three Aberdeen-Angus heifers.

A feeding experiment with pigs, in which the object is to test the comparative value of Red Kaffir corn, corn meal, and soy bean meal as feeds for pigs. The experiment comprises twelve pigs divided into four lots of three pigs each. Lot I, is fed on Red Kaffir corn meal; Lot II, on two-third's Kaffir corn meal

and one third soy bean meal; Lot III, on corn meal; and Lot IV, on two-thirds corn meal and one-third soy bean meal.

An experiment in preserving green corn as ensilage in a stack. Thirty tons of green corn were put in a stack and the mass pressed together by means of cables and levers; the object being to see if it could be preserved in this manner.

An experiment in seeding "winter oats" in the fall.

Experiments with wheat, 1895-96, in the following lines: Time of seeding, wheat on early and late plowed land; wheat on subsoiled and plowed land compared; seeding different quantities per acre; methods of seeding: grading seed wheat; pasturing wheat test of varieties.

VETERINARY DEPARTMENT. — The following subjects have been studied, with various experiments made; but the results have not been published, either because the experiments are not yet completed or satisfactory conclusions have not been reached:—An apparently infectious chronic lung disease of cattle. The injurious effects of cotton seed meal when fed to cattle and hogs. A peculiar disease of horses characterized by large abscesses, usually in the muscles of the breast. Serious outbreaks of Texas fever in cattle and hog cholera in swine have been visited and studied for future reference. Investigation of the so-called "corn-stalk disease" has been made, and the results will be published soon.

BOTANICAL DEPARTMENT: — *Weeds*— The observations and experiments mentioned in the Annual Report of 1894 have been continued through the present year. Two bulletins have been published, and as much more matter is nearly ready for publication

Corn Smut.—The results obtained from experiments during the year will be embodied in a bulletin which will be published the coming year. It has seemed advisable to enlarge the scope of the work so as to include other smuts, especially the smuts of sorghum.

HORTICULTURAL DEPARTMENT: — The line of experiments in propagating apple trees with various lengths of stock and cion has been continued during the past year. Measurements of growth and photographs of the roots at various stages, will aid in the solution of some of these problems when a full series is completed. Experiments in the use of peach and Mariana plum stocks for varieties of cultivated plums are in progress, as is also a line of experiments in budding peaches at various season from June to September.

Observations upon the merits of many varieties of orchard and small fruits have been carefully kept; also upon the growth made, and comparative hardness of the various species of trees in the forestry and ornamental plantations.

In vegetable gardening fewer varieties have been grown, and more attention has been given to methods of culture. Plats of ground, subsoiled and with ordinary plowing, irrigated and unirrigated, planted to similar lines of vege-

tables, have given interesting results; but it will need the experiments of several seasons to show their true value.

Two years ago seed was obtained of as many varieties of asparagus as were offered in our catalogues, and a well prepared bed is now under way. Whether any of these varieties possess distinctive characters when all are grown under similar conditions is the question to be determined. Small experiments in forcing asparagus, lettuce and tomatoes under glass will be made the basis of more extensive trials another year.

IRRIGATION.

GARDEN CITY.— The report of 1894 details the plan for experiments upon a ten acre plat leased for the purpose. The experiments have been carried forward during the past season with limited results. The well has still given trouble, in spite of various devices, from the presence of fine sand in the water-bearing stratum. The reservoir has been thoroughly reconstructed and puddled to prevent seepage, and a full line of the annual crops planned for has been cultivated. Quite abundant rains during a part of the summer made the conditions unusual. The water supply was not, nevertheless, sufficient for satisfactory tests of full irrigation, and the data are preserved for future comparisons. The crops successfully cultivated are the following: Sweet potatoes, cabbage, parsnips, onions, peas, beans, melons, Irish potatoes, broom corn—five varieties, Kaffir corn, field corn, Jerusalem corn, black rice corn, brown dhoura, sorghum, pumpkins, alfalfa, navy beans, cow peas.

Mr. F. W. Dunn, assistant in irrigation, has faithfully done the work assigned him, in caring for the crops and maintaining records of observations, but the expense of the work in comparison with the meagerness of results at present have made it seem unwise that he should be retained another year. He has, in accord with the action of the Board, been relieved from duty after December 31, 1895.

OBERLIN.— On account of lack of funds, little has been done at Oberlin. Efforts have been made to complete the well with only partial success, on account of lack of facilities. The reservoir has been completed ready for use when the water supply is secured. All has been under direction of Hon. W. D. Street, President of the Board of Regents.

What should be the future of these experiments is a problem worthy of further study by the Board. The expenditures, even when limited to the least possible, make a serious draft upon the Station fund given by Congress for the maintenance of a central station, where accurate and continuous work can be done. A few substations can easily dissipate the fund and give but crude results. The State Legislature at its last session, not only refused the aid asked for such special experiments, but in the act for promotion of irrigation prohibited all expenditure for experiments in agriculture by irrigation. The Department of Agriculture of the United States earnestly urges the concentration of funds and energy upon the work of central stations in every state. The

repute of the Kansas Station, so excellent already, is likely to suffer in the multiplication of separate undertakings, remote from direct oversight of the Council and the Board. The public demand, so far, is rather for proof that water can be raised for garden irrigation than for full and accurate tests of irrigation methods and results. The former is provided for by the State Board of Irrigation.

THE STAFF.

No changes have been made during the past year in any of the departments of the Station. All the force has been effectively and constantly employed.

GENERAL MATTERS.

As in past years, all the correspondence has been in charge of the Secretary, with reference of special questions to the several heads of departments interested. The accounts have been kept as directed by the Secretary of Agriculture at Washington, the usual vouchers in duplicate being filed in the Secretary's office.

Plans for 1896 include a continuation of lines of experiments already reported upon, with the addition of tests of soil moisture and variations in crop raising and feeding. Respectfully submitted.

GEO. T. FAIRCHILD.
GEO. H. FAILYER,
E. A. POPENOE,
C. C. GEORGESON,
N. S. MAYO,
A. S. HITCHCOCK
S. C. MASON.

SUMMARY OF INVENTORY—JUNE 30, 1895.

CHEMICAL DEPARTMENT.

Absorption Apparatus.....	\$ 15 40
Beakers.....	9 70
Bell jars.....	3 50
Beet pulper.....	2 25
Beet press.....	6 40
Bellows and Blower.....	11 00
Bottles:	
Copper oxide.....	1 80
Reagent.....	23 40
Salt mouth.....	40 75
Specific Gravity.....	4 25
Weighing.....	5 75
Burners.....	21 40
Combustion tubes.....	9 80
Condensers.....	44 85
Crucibles, porcelain.....	8 20
Desiccators.....	6 00
Evaporating dishes:	
Porcelain.....	21 00
Glass.....	1 00
Agate ware.....	7 20
Nickel.....	2 25
Extraction apparatus.....	106 64
Filters and filter paper.....	15 15
Filter pumps.....	5 20
Flasks:	
Copper.....	12 25
Balloon.....	11 05
Erlenmeyer.....	9 80
Digestion.....	7 00
Filtering.....	4 95
Ordinary.....	12 70
Specific gravity.....	3 60
Washing.....	3 20
Fodder mill.....	50 00
Funnels and funnel tubes.....	8 40
Gas generator.....	5 00
Gas regulators.....	6 25
Glass tubing and rods.....	4 00



DECEMBER, 1865.] INVENTORY. XV

Graduated apparatus.		
Burettes.....	16 45	
Cylinders.....	6 55	
Flasks.....	9 05	
Nesslerizing jars.....	9 00	
Pipettes.....	9 70	
Tubes.....	5 40	
Hydrometers and jars.....		11 40
Mortar, agate.....	12 00	
Porcelain.....	2 40	
Ovens, drying.....	17 50	
Platinum ware.....	392 70	
Rubber stoppers and tubing.....	19 00	
Scale, Troemmer's solution.....	20 00	
Sieves.....	4 30	
Spatulas.....	1 70	
Supports for apparatus.....	34 15	
Thermometers.....	12 75	
Tongs.....	1 60	
Water baths.....	17 00	
Watch glasses.....	3 10	
Weights.....	11 20	
Miscellaneous apparatus.....	34 35	
Chemicals.....	72 40	
Books.....	30 85	
Office furniture.....	11 85	
Total.....	\$1,288 95	

ENTOMOLOGICAL DEPARTMENT.

Office furniture.....	\$233 82
Microscopes and accessories.....	557 40
Microscope supplies.....	30 00
Spraying apparatus.....	31 42
Apiary.....	29 70
Miscellaneous.....	178 57
Total.....	\$1,060 91

FARM DEPARTMENT.

Buildings:	
Piggery (interior).....	\$200 00
Silos.....	275 00
Seed and storerooms.....	135 00
Cattle sheds.....	75 00
Water system.....	100 00
Work horses.....	350 00
Machines and implements:	
Belle City root cutter.....	40 00
Wagon.....	70 00
Iron harrow.....	11 00

<i>Machines and implements—Concluded:</i>	
Mowing machine.....	85 00
Surface cultivator	15 00
Planet, jr., cultivator.....	8 00
Tower's cultivator.....	20 00
Steel-beam plow.....	15 00
15-horse-power boiler	300 00
Flue cleaner	25 00
J. I. Case lister	40 00
Test churn	45 00
Buckeye grain drill	18 00
Babcock milk tester.....	10 00
Planet, jr., seed drill	8 00
Corn-cutting machine.....	25 00
Hand cart	9 00
Cultivator shield.....	2 00
Fanning-mill screen	27 00
Hay racks	20 00
Spades, shovels, hoes, etc.....	23 45
Platform and counter scales	25 00
Test bottles, thermometers, lactometer.....	50 00
Buckets, baskets and measures.....	6 25
Office furniture and books	201 15
Harness, halters, etc.....	46 75
Seed and storeroom	20 00
Hay caps and weights.....	77 74
Feed boxes	7 75
Labels, plat stakes, etc.....	75 00
Exhibition trays	5 81
Miscellaneous	13 83
Total	<u>2,324 24</u>

VETERINARY DEPARTMENT.

General office and laboratory furniture.....	\$ 226 30
Zinc lined culture room.....	165 00
Zeiss microscope and accessories	394 75
Dissecting microscope and accessories	33 21
Stains and mounting media	15 00
Slips, cover glasses, etc	11 05
Sterilizing and incubating ovens	92 25
Flasks, beakers, bell jars and damp chambers	36 45
Bottles, test tubes, etc	23 05
Drugs and chemicals	15 00
Microtome and imbedding accessories	52 70
Hæmacytometer and stains	8 40
Balances and weights	10 00
Surgical instruments	26 00
Post mortem case	12 00
Gas machine and burners	127 00



DECEMBER, 1895.] INVENTORY. xvii

Books	43 08
Stalls and pens	77 77
Live stock	12 00
Miscellaneous	97 16
Total	\$1,540 19

BOTANICAL DEPARTMENT.

Office furniture	84 50
Cases and shelves	10 20
Microscope and accessories, including 10 eyepieces and 10 objectives	630 00
Other microscopical and microtomic apparatus	85 51
Bacteriological apparatus	119 35
Photographic apparatus	36 00
Drawing tools	27 55
Bell jars	117 40
Bottles, beakers and other glassware	71 77
Spraying pumps	26 00
Pots and germinating pans	18 45
Hand thrashing machine	11 85
Balances and weights	30 58
Fascicles of fungi	28 00
Chemicals and Reagents	90 54
Library—421 bound volumes and numerous pamphlets	967 02
Miscellaneous	90 09
Total	\$2,445 61

HORTICULTURAL DEPARTMENT.

Office building and three propagating pits	\$2,068 65
Office furniture and fixtures	70 39
Books	8 55
Drawing tools	10 52
Thermometers	41 32
Scales and balances	54 50
Vineyard Herbarium	100 00
Exhibit of Garden peas	100 00
Geneva germinating pans	32 00
Engravings and electros	37 75
Horse and hand tools:	
Wagon	60 00
Plows and cultivators	38 00
Hand and barrel cart, combined	7 50
Garden hand tools	11 50
Pruning tools	12 95
Miscellaneous tools	22 90
Spraying apparatus	66 60
Garden hose and nozzles	77 15
Irrigation pipe lines and water meter	248 82



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Supplies:	
Garden stakes	50 00
Storage boxes	44 10
Plant pots.....	50 00
Miscellaneous supplies	61 45
Nursery stock on hand	250 00
Total	<u>89,513 14</u>

GENERAL DEPARTMENT.

Card catalogue case, in library.....	\$ 17 00
Bulletin case and drawers, in secretary's office	99 65
Autograph stamps.....	5 75
Pamphlet cases.....	18 48
Ink stand, rubber stamps, etc.....	2 55
Records and mailing lists.....	18 50
File boxes	6 05
General library, 241 bound volumes	271 25
Total.....	<u>849 23</u>

GENERAL SUMMARY.

Chemical department	\$1,268 15
Entomological department	1,060 91
Farm department.....	2,324 24
Veterinary department.....	1,540 17
Botanical department	2,445 51
Horticultural department.....	3,513 14
General department.....	430 23
Total.....	<u>\$12,612 16</u>

LIST OF DONATIONS.

1895.

FARM DEPARTMENT.

University of California, Berkeley, California:

Sample seed of Canalgre.

Sample seed of Australian salt bush.

Sample seed of Saghalin Polygonum.

J. C. Suffern, Voorhees, Ill.:

Seven packages of corn.

Three packages of oats.

H. W. Buckbee, Rockford, Ill.:

One package of corn.

One sample of oats.

J. C. Little, Louisville, Georgia

Sample, of cow peas.

J. C. Towler & Brother, Mendota, Ill.:

One Towler's cultivator.

The Z. Breed Weeder Co., Boston, Mass.:

One No. 4 Breed Weeder.

John Deer Plow Co., Kansas City, Mo.:

One "Secretary" Plow.

HORTICULTURAL DEPARTMENT.

However & Moore, Antlers, Colo.:

One package tomato seed.

Henry A. Doer, Philadelphia, Pa.:

Eight packages vegetable seed.

W. A. Burfee & Co.:

Twenty-five packages vegetable seed.

Seven packages flower seed.