

CIRCULAR OF INFORMATION NO. 8.

University of the State of Missouri
College of Agriculture and Mechanic Arts.

Agricultural Experiment Station.

Columbia, Mo., December 31, 1898.

Third Biennial Report of the Director of the Missouri
Agricultural Experiment Station on the Enforce-
ment of the Fertilizer Control Law.

COLUMBIA, MO.:
PRESS OF E. W. STEPHENS
1899.

THIRD BIENNIAL REPORT

OF THE

Director of the Missouri Agricultural Experiment Station

On the Enforcement of the Fertilizer Control Law.

To the Fortieth General Assembly of Missouri:

In accordance with the requirements of section 5 of the act of the Thirty-seventh General Assembly, approved March 20, 1893, entitled, an act to regulate the sale of commercial fertilizers and prevent the adulteration of the same, I have the honor to submit herewith the third biennial report of the Director of the Agricultural Experiment Station, containing an itemized statement of the receipts and expenditures under the law, during the two years 1897 and 1898, together with a list of the brands of fertilizers inspected and their composition.

The total receipts of the office from this source are as follows:

For the year ended December 31, 1897.

Fees for analysis of fertilizers.	\$ 80 00
Sale of tags.	199 75
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Total for 1897.	\$ 279 75

For the year ended December 31, 1898.

Fees for analysis of fertilizers.	\$ 150 00
Sale of tags.	227 70
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Total for 1898.	\$ 377 70
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Total for two years.	\$ 657 45

Itemized statement of the receipts and expenditures of the Missouri Agricultural Experiment Station, on account of fertilizer control:

RECEIPTS.

Date Received.	Name and Place of Business of Manufacturers.	Rec'd for Analysis	Rec'd for Tags.
1897.			
March 2	Armour Paeking Co., Kansas City ...	\$ 40 00	
April 2.....	Armour Paeking Co., Kansas City ...		\$ 22 25
April 19	P. B. Mathiason & Co., St. Louis ...	20 00	10 00
June 20.	Swift & Co., Kansas City.....	20 00	22 50
July 30.....	Swift & Co., Kansas City.....		5 00
August 20....	Swift & Co., Kansas City.....		50 00
August 20.....	Armour Paeking Co., Kansas City ...		10 00
August 23. . . .	P. B. Mathiason & Co., St. Louis....		20 00
August 27.....	Armour Paeking Co., Kansas City ..		10 00
September 7...	Armour Paeking Co., Kansas City ...		10 00
September 8...	Armour Paeking Co., Kansas City ...		10 00
September 10..	P. B. Mathiason & Co., St. Louis ...		20 00
September 20..	Armour Paeking Co., Kansas City ...		10 00
Total for the year 1897.....		\$ 80 00	\$ 199 75
1898.			
January 1. . . .	P. B. Mathiason Mfg. Co., St. Louis..	\$ 30 00	\$ 15 00
January 7.....	Armour Paeking Co., Kansas City ...	40 00	
March 24.....	Armour Paeking Co., Kansas City ...		10 00
July 5.....	Swift & Co., Kansas City.....	30 00	30 00
August 1.....	Armour Paeking Co., Kansas City ...		65 00
August 15....	Northwestern Fertilizer Co., Chicago, Ill.	10 00	5 00
September 8 ..	Armour Paeking Co., Kansas City ...		15 00
September 8 ..	Armour Paeking Co., Kansas City ...		10 00
September 16..	Armour Paeking Co., Kansas City ...		25 00
September 22..	P. B. Mathiason Mfg. Co., St. Louis..		11 00
October 15....	Swift & Co., Kansas City.....		20 00
November 10..	Swift & Co., Omaha, Nebraska		5 00
November 15..	Swift & Co., St. Joseph.....		5 00
December 20..	A. B. Mayer Mfg. Co., St. Louis. . . .	40 00	11 70
Total for the year 1898.		\$150 00	\$ 227 70
Total receipts for two years.....			\$ 657 45

EXPENDITURES.

Date Paid.	Items.	Amt. Paid.
1897.		
April 26	E. W. Stephens, printing tags	\$ 16 00
June 2	E. W. Stephens, printing tags	5 00
July 29	E. W. Stephens, printing tags	10 50
October 1	E. W. Stephens, printing tags	80 00
October 27	E. W. Stephens, printing tags	1 50
1898.		
January 26	Betty Washington heirs, rent of land, \$5.00; for fertilizer experiments and corn, \$3.00.	8 00
March 30	E. W. Stephens, printing tags	43 00
June 29	E. W. Stephens, printing tags	20 00
June 29	E. W. Stephens, 500 postal cards	5 00
September 29 . .	E. W. Stephens, printing tags	69 50
November 30 . . .	E. W. Stephens, printing tags	30 00
December 21 . . .	H. J. Waters, Director, salary	104 17
December 21 . . .	P. Schweitzer, Chemist, chemical work	83 33
December 21 . . .	W. B. Cady, Chemist, chemical work	75 00
December 31 . . .	W. B. Cady, Chemist, chemical work	75 00
December 31 . . .	P. Schweitzer, Chemist, chemical work	31 45
Total expenditures		\$ 657 45

ANALYSIS OF COMMERCIAL FERTILIZERS SOLD DURING 1897.

Date.	Name of Manufacturer.	Brand of Fertilizer.	Per cent Moisture.	Per cent Nitrogen.	Per cent Phosphoric Acid.				Per cent Potash.	Estimated Trade value per ton.
					Solu- ble.	Re- verted	Insolu- ble.	Total.		
1897										
Mar. 16	Armour Packing Co., Kansas City	{ High grade blood and bone	7.45	6.18	.....	.....	10.52	10.52	.....	\$24.85
		{ Special	5.61	7.44	.....	.....	9.55	9.55	.....	28.05
		{ Fine ground beef bone ..	4.69	2.88	.....	.....	27.24	27.24	.....	24.98
		{ Raw bone meal	10.19	3.79	.....	.....	22.48	22.48	.....	24.86
Apr. 19	P. B. Mathiason & Co., St. Louis.....	{ Pure bone meal	6.20	3.95	.....	.....	23.38	23.38	.....	25.88
		{ Acidulated bone and potash	3.76	2.57	3.76	7.64	7.68	19.08	2.71	28.38
June 10	Swift & Co., Kansas City ..	{ Pure raw bone meal	6.07	3.93	.....	.....	23.91	23.91	.....	26.14
		{ Pure raw bone meal and potash	6.05	3.37	.....	.....	20.94	20.94	.....	24.68
Aug. 27	A. B. Mayer Mfg. Co., St. Louis.....	{ Anchor brand pure bone meal ..	6.85	3.77	.....	.....	21.25	21.25	.....	24.06
		{ Anchor brand corn and wheat grower	7.72	3.72	2.52	4.65	6.45	13.62	2.34	25.96

TRADE VALUES.

In the last column of the foregoing table is an estimate of the trade or commercial value of each brand of fertilizer licensed in the state during the two years covered by this report.

In 1897 the following schedule of prices for the different valuable ingredients contained in the fertilizers to be offered in Missouri was adopted, from which the trade value per ton was computed:

TRADE VALUES ADOPTED FOR 1897.		Per pound
Phosphoric Acid:		
<i>Insoluble</i> ---In pure bone and tannage.....		\$.03
<i>Available</i> .....		.05½
Nitrogen:		
In fine bone .....		.15
In blood and bone .....		.15
In fine bone and tannage.....		.15
In nitrates. ....		.17
In ammonium salts .....		.18
Potash:		
As a sulphate.....		.06½
As a muriate .....		.05½

The prices fixed for nitrogen, phosphoric acid, and potash in the foregoing schedule are intended to be approximately the average selling prices of these materials delivered to the farmer with freight and agent's commissions paid. They are of value only in indicating what would be a fair price for the fertilizer the farmer has decided to purchase. This trade value should not in any case be confused with the *agricultural value of a fertilizer*. The two terms mean quite different things. It would be more satisfactory to the purchaser to have the Station fix the agricultural instead of the trade value of all fertilizers inspected, but unfortunately the present knowledge of the soil and of fertilizers is too meagre to permit this to be done.

AMOUNT OF COMMERCIAL FERTILIZERS SOLD IN MISSOURI.

In 1897 four manufacturers submitted ten brands for analysis and purchased tags for the same. Owing to the unusually severe drouth of that summer and fall and the consequent reduction of the area sown to wheat, the trade in fertilizers was unusually light.

In 1898 five manufacturers licensed thirteen brands, and report a much better trade than during the previous year.

According to the reports of the licensed dealers doing business in this state, it is estimated that in 1898 the spring sales of fertilizers amounted to approximately 400 tons, compared with 300 tons in 1896, consisting chiefly of blood and bone and complete goods, for use on garden truck, strawberries, orchards, potatoes and corn. The bulk of these fertilizers was purchased by farmers, orchardists and gardeners in the vicinity of our larger cities.

The fall sales are estimated to have reached 2,900 tons compared with 1,700 tons for the corresponding period in 1896, and consisted chiefly of raw and steamed bone goods with more or less blood added to bring up the nitrogen content, and in some cases with potash. Most of these fertilizers were applied to wheat.

Assuming that these fertilizers cost the consumer an average of \$25 per ton, the farmers of Missouri invested in 1898 the sum of \$82,500 for these materials during the year. In 1896 it was estimated that the fertilizer bill of the Missouri farmer was \$50,000. From the inquiries for information on this subject, and reports of many intelligent farmers, it appears that the use of commercial fertilizers is increasing in this state.

While the aggregate sum paid last year for commercial fertilizers by the Missouri farmers may appear to be large, it is insignificant in comparison with the investment for this purpose by the eastern and southern farmers. Conservative estimates place the annual cost for fertilizers in many of the eastern states at from \$3,500,000 to \$5,000,000 each, and the total for the North Atlantic states at \$40,000,000.

Until within recent years little interest has been manifested by the farmers of our state in the use of fertilizers of any kind, and in the preservation of their vast stores of soil fertility, but the increasing number of inquiries for information on these subjects received by the Station point forcibly to the necessity for improved methods of cropping and handling our soils, and for knowledge concerning the rational use of farm manures and commercial fertilizers.

Very respectfully submitted.

H. J. WATERS,
Director.