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COLLEGE OF AGRICULTURE

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TESTING FERTILIZERS

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L. D. HAIGH, Chemist

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Testing Fertilizers; Spring, 1929

L. D. HAIGH, Chemist

The Missouri Agricultural Experiment Station has conducted the usual inspection of fertilizer distributed during the shipping season from January to June, 1929. This report will show the results of chemical analysis on these samples collected. They include field, garden, lawn and small package fertilizer sold for potted plants and flowers.

The usual tabulation is used to set forth these results. Under each manufacturer are given all the samples obtained in the inspection, showing the dealer from whom collected, and the composition as found on analysis, as compared with the guarantee on the label and as registered.

The figures for dollars and cents under the column marked "Value per ton" will indicate the extent of excess or deficiency in plant food in the particular sample according as the amount to the right is higher or lower than the amount in the left hand column. All figures representing a deficiency are shown in bold faced type.

The values referred to above are obtained by assigning a unit value to each plant food constituent in the fertilizer. Following are these values which represent approximately the value of one per cent contained in each ton of fertilizer.

Total Nitrogen.....	\$4.25
Total Phosphoric Acid from bone.....	1.00
Insoluble Phosphoric acid from bone (when amount is guaranteed by manufacturer)....	0.80
Available Phosphoric acid (all sources).....	1.40
Potash (water soluble).....	1.05

The usual tests were applied for nitrogen activity on all nitrogen carrying samples collected. A full description of these methods has been given in the previous reports and need not be discussed here. The water-soluble portion represents the major portion of the available nitrogen in high grade mixed fertilizer for field use, and this has been indicated for each sample in the third column in the table under the heading "Nitrogen."

The activity of nitrogen by these tests cannot be expressed by a definite figure or percentage. The samples are simply classed as "satisfactory" or "inferior" on the basis of these tests. The following samples are classified as containing inferior nitrogen on the basis of the results obtained:—Numbers 6-84, 6-85, 6-86, 6-87, 6-90. (See accompanying tables.)

Commercial fertilizers belong mostly to the class known as concentrated fertilizer materials, that is, they can be used in small applications of a few hundred pounds to the acre. Such fertilizers must have their nitrogen in a highly available form to produce satisfactory results when used.

There are other nitrogen carrying materials which can be used for fertilizing purposes, but must be used in larger quantities, that is, from one to five tons per acre. These cannot be classified as concentrated, as their nitrogen is not in an available form. By the activity tests these classify as inferior. Such materials as straw, manure, septic tank sludge, and waste organic productions from manufacturing operations, as for example hulls from cottonseed and other seeds, and pomace from fruits, etc. would come under this classification. Therefore when any of the above kinds of materials, are largely used as the source of nitrogen in concentrated fertilizers, the nitrogen will test out as inferior.

FERTILIZER INFORMATION OF INTEREST TO DEALER AND BUYER

Dealers and buyers very often have a misapprehension about the workings of the fertilizer law. The law does not compel the manufacturer to prepare his goods by any special rule, but does prescribe that full information be given the buyer. It is therefore the duty of the buyer to see that this information is furnished with his goods. The information required to be given is the brand name of the fertilizer, its guaranteed analysis, and name and address of the manufacturer,—all being stated on the label. Also the fact of registration is shown by a green tag reading "Registered 1929" and bearing a legend corresponding to the weight of fertilizer in the sack.

In brief then the buyer should read his label carefully for the above information and observe if the sack or package carries the registration tag. If any of these are missing he can protect himself by refusing to purchase, until information is furnished.

Buyers frequently inquire of the dealer what fertilizer should be used for certain crops. This information is set forth in circular 221 "How to Choose a Commercial Fertilizer". This circular may be had on application to the Missouri Agricultural Experiment Station.

Dealers must occasionally resack fertilizer as the old sacks become so torn that the stock cannot be handled. The following points should be observed. The new sacks used should bear the same label as the old sacks. The registration tags on the old sacks must be tied upon the new sacks as they are filled. Care must be taken that brands of different composition are not mixed together on resacking. This will cause the

composition to be "off" as compared with the statement on the label. Buyers of resacked fertilizer need not fear a deterioration in value because the stock is old. There is however the possibility that the composition of the fertilizer may have been disturbed by being unintentionally mixed with a brand of another composition.

Factors which may affect the quality of old fertilizer stocks are exposure to fire and to flowing water or rain. Fertilizer in a burning warehouse which has been wet down by the firemen's hose is likely to be deficient in composition.

In conclusion we would state that the object of this report is to show how the composition of goods put out agrees with the information furnished with the goods, also when there has been a failure to meet the requirements in any respect. This will enable any buyer to judge the quality of the goods and the reliability of the statements furnished.

FOOTNOTES

1. Without labels
2. Without registration tags
3. Resacked fertilizer
4. Wrong guaranteed analysis
5. Wrong registration tags
6. Incomplete labels
7. Not registered

TABLE 1.—FERTILIZER ANALYSIS AND GUARANTEES; SPRING 1929

Lab. No.	Manufacturer and Brands	Dealer	Nitrogen			Phosphoric Acid P ₂ O ₅						Water Soluble Potash K ₂ O		Value Per Ton	
			Total G'td	Total F'nd	Water Soluble to Total	Total		Insoluble		Available		G'td	F'nd	G'td	F'nd
						G'td	F'nd	G'td	F'nd	G'td	F'nd				
			Per Cent	Per Cent	Per Cent	Per Cent	Per Cent	Per Cent	Per Cent	Per Cent	Per Cent	Per Cent	Per Cent		
6-1	Abner Hood Chemical Co., Kansas City, Missouri Nitrate of Soda ¹	Abner Hood Chemical Co., Kansas City		15.54											
	American Agricultural Chemical Co. St. Louis, Mo. A. A. Brands														
6-2	16 per cent Superphosphate	Farmers Supply Co., Lebanon				18.51	0.50	2.18	16.00	16.33				22.40	22.86
6-3	16 per cent Superphosphate	Marshfield Supply Co., Marshfield				18.14	0.50	1.79	16.00	16.35				22.40	22.89
6-4	16 per cent Superphosphate	Mo. Marketing Assn., St. Joseph				18.14	0.50	1.76	16.00	16.38				22.40	22.93
6-5	16 per cent Superphosphate	Silex Grain Co., Silex				18.36	0.50	1.47	16.00	16.89				22.40	23.65
6-6	20 per cent Superphosphate	Marshfield Supply Co., Marshfield				23.36	0.50	2.89	20.00	20.47				28.00	28.66
6-7	20 per cent Superphosphate	Mo. Marketing Assn., St. Joseph				23.57	0.50	1.61	20.00	21.96				28.00	30.74
6-8	20 per cent Superphosphate ³	Milbank-Scampton Mllg. Co., Moberly				22.67	0.50	2.41	20.00	20.26				28.00	28.36
6-9	"Agrico" for Grain	Goodwin and Co., Doniphan	2.00	1.87	94.65	13.45	0.50	0.70	12.00	12.75	4.00	3.96	29.50	29.96	
6-10	"Agrico" for Grain	Mo. Marketing Assn., St. Joseph	2.00	2.04	93.14	13.91	0.50	1.19	12.00	12.72	4.00	4.32	29.50	31.02	
6-11	"Agrico" for Grain	Silex Grain Co., Silex	2.00	2.03	91.63	13.15	0.50	1.08	12.00	12.07	4.00	4.13	29.50	29.87	
6-12	"Agrico" for Grain	Troy Mills, Troy	2.00	2.08	89.42	13.65	0.50	1.00	12.00	12.65	4.00	4.34	29.50	31.11	
6-13	"Agrico" for Truck ²	P. Klass Commission Co., Columbia	5.00	5.15	96.50	10.64	0.50	0.29	10.00	10.35	5.00	5.65	40.50	42.31	
6-14	Antler Fertilizer	Marshfield Supply Co., Marshfield	2.00	2.02	87.13	13.53	0.50	1.64	12.00	11.89	6.00	6.83	31.60	32.41	
6-15	Apex Mixture ^{2 4}	Boone Co., Mllg. and Elev. Co., Columbia				15.75	0.50	1.48	14.00	14.27	4.00	15.20	23.80	35.94	
6-16	Atlas Mixture	Mo. Marketing Assn., St. Joseph				14.58	0.50	1.97	12.00	12.61	6.00	6.42	23.10	24.20	
6-17	Big Boll Fertilizer	Goodwin Co., Donphan	2.00	1.87	95.72	14.01	0.50	1.37	12.00	12.64	2.00	2.43	27.40	28.60	
6-18	Gilt Edge Fertilizer ²	T. M. Renfrow, West Plains	2.00	2.02	93.56	18.72	0.50	1.79	16.00	16.93	2.00	2.20	33.00	34.39	
6-19	Paramount Fertilizer	Farm Supply Co., Lebanon	3.00	3.09	94.17	9.88	0.50	0.97	8.00	8.91	6.00	6.49	30.25	32.41	

TABLE I (CONTINUED). FERTILIZER ANALYSIS AND GUARANTEES; SPRING 1929

6-20	Red Dragon Fertilizer	Silex Grain Co., Silex	2.00	2.00	91.50	13.66	0.50	1.30	12.00	12.36	2.00	2.16	27.40	28.07
6-21	Red Dragon Fertilizer	Troy Mills, Troy	2.00	2.08	91.35	14.44	0.50	1.13	12.00	13.31	2.00	2.00	27.40	29.57
6-22	Red Dragon Fertilizer	Farm Supply Co., Lebanon	2.00	2.00	93.50	13.18	0.50	1.29	12.00	11.89	2.00	2.54	27.40	27.82
6-23	Steam Bone Meal ²	Mo. Marketing Assn., St. Joseph	1.00	1.14	33.33	29.00	32.44						33.25	37.29
6-24	Steam Bone Meal	Palmer Seed Co., St. Louis	1.00	1.03	20.39	29.00	32.59						33.25	36.97
American Trona Corporation New York City, N. Y.														
6-25	Muriate of Potash ^{1 2}	Thompson Hayward Chemical Co., Kansas City										59.34		
Armour Fertilizer Works Chicago, Illinois Big Crop Brands														
6-26	16 per cent Superphosphate	Goodwin Co., Doniphan				17.47	0.50	0.68	16.00	16.79			22.40	23.51
6-27	16 per cent Superphosphate	Star Mfg. Co., Mt. Grove				20.20	0.50	2.41	16.00	17.79			22.40	24.91
6-28	20 per cent Superphosphate	James Young, Paris				21.95	0.50	0.62	20.00	21.33			28.00	29.86
6-29	2-12-2 Fertilizer	Goodwin Co., Doniphan	2.00	1.91	85.86	13.37	0.50	0.57	12.00	12.80	2.00	2.31	27.40	28.47
6-30	2-12-2 Fertilizer	Star Mfg. Co., Mt. Grove	2.00	2.56	94.92	15.84	0.50	3.55	12.00	12.29	2.00	2.76	27.40	30.99
6-31	2-12-2 Fertilizer ⁵	L. C. Gregory, Norwood	2.00	2.18	94.04	15.55	0.50	3.24	12.00	12.31	2.00	2.19	27.40	28.80
6-32	2-12-2 Fertilizer	Farmers Elev. Co., Purdy	2.00	2.08	94.23	12.96	0.50	0.36	12.00	12.60	2.00	2.67	27.40	29.28
6-33	2-12-2 Fertilizer	James Young, Paris	2.00	2.00	91.50	13.01	0.50	0.55	12.00	12.46	2.00	2.22	27.40	28.27
6-34	2-12-6 Fertilizer	Farmers Elev. Co., Purdy	2.00	2.10	92.38	12.95	0.50	0.51	12.00	12.44	6.00	6.11	31.60	32.77
6-35	4-16-4 Fertilizer	Goodwin Co., Doniphan	4.00	3.90	94.36	17.35	0.50	0.78	16.00	16.57	4.00	4.35	43.60	44.35
6-36	4-16-4 Fertilizer	L. C. Gregory, Norwood	4.00	3.99	97.49	17.81	0.50	1.19	16.00	16.62	4.00	4.42	43.60	44.87
Armour Brands														
6-37	N. P. K. 9-27-9 Fertilizer ⁵	Graves-Pettigrew Co., Cabool	9.00	8.89	98.20	28.62	0.50	1.21	27.00	27.41	9.00	9.30	85.50	85.92
Barada and Page Importers Kansas City, Missouri														
6-38	Nitrate of Soda ²	Barada and Page, Kansas City	14.87	15.34										
Crocker Packing Co. Joplin, Missouri Interstate Brands														
6-39	16 per cent Superphosphate ²	C. L. Spencer, Reeds				17.03	0.50	0.69	16.00	16.34			22.40	22.88
6-40	20 per cent Superphosphate	Farmers Elev., Purdy				20.51	0.50	0.34	20.00	20.17			28.00	28.24
6-41	2-8-5 ²	C. L. Spencer, Reeds	2.00	1.81	53.04	10.40	0.50	0.53	8.00	9.87	5.00	4.05	24.95	25.76

TABLE I (CONTINUED). FERTILIZER ANALYSIS AND GUARANTEES; SPRING 1929

Lab. No.	Manufacturer and Brands	Dealer	Nitrogen			Phosphoric Acid P ₂ O ₅						Water Soluble Potash K ₂ O		Value Per Ton	
			Total G'td	Total F'nd	Water Soluble to Total	Total		Insoluble		Available		G'td	F'nd	G'td	F'nd
						G'td	F'nd	G'td	F'nd	G'td	F'nd				
			Per Cent	Per Cent	Per Cent	Per Cent	Per Cent	Per Cent	Per Cent	Per Cent	Per Cent	Per Cent	Per Cent	Per Cent	Per Cent
6-42	2-12-2 ² -----	C. L. Spencer, Reeds-----	2.00	1.93	53.37	-----	12.78	0.50	0.58	12.00	12.20	2.00	2.38	27.40	27.78
6-43	Lawn, Vegetable and Flower Grower, 6-8-4-----	Farmers Exchange, Carthage-----	6.00	4.09	68.70	-----	10.80	0.50	0.31	8.00	10.49	4.00	4.02	40.90	36.29
	Cudahy Packing Co. Chicago, Illinois Big Win Brands														
6-44	Half and Half-----	Farmers Exchange, Lockwood-----	1.23	1.38	41.30	-----	21.90	7.00	5.62	13.00	16.28	-----	-----	29.03	33.16
	Darling and Co. Chicago, Illinois Darling's Brands														
6-45	16 per cent Superphosphate ² -----	Farmers Elev. and Supply Co., Troy-----	-----	-----	-----	-----	17.51	-----	0.90	16.00	16.61	-----	-----	22.40	23.25
6-46	20 per cent Superphosphate-----	Roy Carter, Jasper-----	-----	-----	-----	-----	21.63	-----	0.65	20.00	20.98	-----	-----	28.00	29.37
6-47	20 per cent Superphosphate-----	Farmers Elev. and Supply Co., Troy-----	-----	-----	-----	-----	21.00	-----	0.77	20.00	20.23	-----	-----	28.00	28.32
6-48	Big Harvest-----	Roy Carter, Jasper-----	2.00	1.80	85.56	-----	13.05	0.50	0.53	12.00	12.52	2.00	2.33	27.40	27.63
6-49	Big Harvest-----	Farmers Elev. and Supply Co., Troy-----	2.00	1.95	88.21	-----	13.15	0.50	0.63	12.00	12.52	2.00	2.15	27.40	28.08
6-50	Bumper Crop-----	T. M. Renfrow, West Plains-----	2.00	2.02	91.09	-----	18.12	0.50	0.82	16.00	17.30	2.00	3.24	33.00	36.21
6-51	Farmers Favorite-----	T. M. Renfrow, West Plains-----	3.00	3.02	92.72	-----	9.13	0.50	0.54	8.00	8.59	6.00	6.70	30.25	31.91
6-52	General Crop-----	Farmers Elev. and Supply Co., Troy-----	2.00	1.94	89.69	-----	16.88	0.50	0.88	16.00	16.00	6.00	7.01	37.20	38.01
	Federal Chemical Co. Louisville, Kentucky Daybreak Brands														
6-53	20 per cent Superphosphate-----	Farmers Produce Ex., Norwood-----	-----	-----	-----	-----	22.25	-----	1.78	20.00	20.47	-----	-----	28.00	28.66

TABLE I (CONTINUED). FERTILIZER ANALYSIS AND GUARANTEES; SPRING 1929

6-113	Fertilspray Co. Los Angeles, California Fertilspray Concentrated Plant Food.....	Stuppy Floral Co., St. Joseph.....	17.30	17.41	99.66	9.60	1.85	0.51	8.00	9.09	8.00	9.19	93.13	96.37
	Floyd Plant Food Co. St. Louis, Missouri													
	Floyd's Money Maker Brands													
6-54	Sulphate of Ammonia.....	J. G. Colley, Doniphan.....	20.50	21.03										
6-55	Garden Fertilizer, 4-4-1 ²	Producers Exchange, Truesdale.....	4.00	3.23	85.14	7.75	0.10	0.83	4.00	6.92	1.00	1.84	23.65	25.35
6-56	Garden Fertilizer, 4-6-2.....	Producers Exchange, Truesdale.....	4.00	3.31	86.71	7.89	0.10	0.49	6.00	7.40	2.00	1.93	27.50	26.46
6-57	4-8-6 Goods.....	Columbia Coop. Warehouse Assn., Columbia.....	4.00	3.69	91.87	9.64	0.25	0.59	8.00	9.05	6.00	6.24	34.50	34.90
	M. F. A. Brands													
6-58	16 per cent Super Phosphate	Farmers Exchange, Cabool.....				19.41	0.25	1.66	16.00	17.75			22.40	24.85
6-59	16 per cent Super Phosphate	Farmers Exchange, Mt. Grove.....				19.71	0.25	0.99	16.00	18.72			22.40	26.21
6-60	16 per cent Super Phosphate ⁵	Farmers Exchange, Lebanon.....				17.43	0.25	1.31	16.00	16.12			22.40	22.57
6-61	18 per cent Super Phosphate	Columbia Coop. Warehouse Assn., Columbia.....											25.20	28.00
6-62	20 per cent Super Phosphate	Farmers Exchange, Cabool.....				20.84	0.25	0.84	18.00	20.00			28.00	29.06
6-63	20 per cent Super Phosphate ⁵	Farmers Exchange, Lebanon.....				22.67	0.10	1.59	20.00	21.08			28.00	29.51
6-64	2-8-2 Goods ⁵	Farmers Exchange, Lebanon.....	2.00	1.84	75.54	10.35	0.25	1.27	8.00	9.08	2.00	2.78	21.80	23.45
6-65	2-12-2 Goods.....	Farmers Exchange, Cabool.....	2.00	1.70	81.18	13.89	0.25	1.48	12.00	12.41	2.00	2.14	27.40	26.85
6-66	2-12-2 Goods.....	Farmers Exchange, Mt. Grove.....	2.00	1.40	81.43	14.01	0.25	1.52	12.00	12.49	2.00	1.41	27.40	24.92
6-67	2-12-2 Goods.....	Farmers Produce Co., Norwood.....	2.00	1.54	88.96	12.99	0.25	0.76	12.00	12.23	2.00	1.50	27.40	25.25
6-68	2-12-2 Goods ⁵	Farmers Exchange, Lebanon.....	2.00	2.01	90.55	14.38	0.25	1.49	12.00	12.89	2.00	2.57	27.40	29.39
6-69	2-12-2 Goods.....	Columbia Coop. Warehouse Assn., Co- lumbia.....	2.00	1.82	79.12	12.33	0.25	0.65	12.00	11.68	2.00	1.84	27.40	26.02
6-70	2-16-2 Goods.....	Farmers Exchange, Jasper.....	2.00	1.14	86.84	17.65	0.25	2.09	16.00	15.56	2.00	2.01	33.00	28.74
6-71	3-12-4 Goods.....	Farmers Exchange, Jasper.....	3.00	2.24	91.52	14.55	0.25	1.68	12.00	12.87	4.00	3.59	33.75	31.31
	M. F. B. F Brands⁶													
6-72	20 per cent Super Phosphate	J. G. Colley, Doniphan.....				21.87		1.11	20.00	20.76			28.00	29.06
6-73	20 per cent Super Phosphate	Monroe Co. Farm Bureau, Paris.....				22.76		1.64	20.00	21.12			28.00	29.57
6-74	20 per cent Super Phosphate	P. G. Eubank, Cairo.....				23.15		1.65	20.00	21.50			28.00	30.10
6-75	2-12-2.....	J. G. Colley, Doniphan.....	2.00	2.29	91.27	14.19	0.25	0.92	12.00	13.27	2.00	2.15	27.40	30.57
6-76	2-12-2.....	Monroe Co. Farm Bureau, Paris.....	2.00	1.56	80.13	13.36	0.25	1.49	12.00	11.87	2.00	2.75	27.40	26.14
6-77	3-12-4.....	Monroe Co. Farm Bureau, Paris.....	3.00	1.71	83.63	14.18	0.25	1.90	12.00	12.28	4.00	3.34	33.75	27.97

TABLE I (CONTINUED). FERTILIZER ANALYSIS AND GUARANTEES; SPRING 1929

Lab. No.	Manufacturer and Brands	Dealer	Nitrogen			Phosphoric Acid P ₂ O ₅						Water Soluble Potash K ₂ O		Vaue Per Ton	
			Total G'td	Total F'nd	Water Solu-ble to Total	Total		Insoluble		Available		G'td	F'nd	G'td	F'nd
						G'td	F'nd	G'td	F'nd	G'td	F'nd				
6-78	Grasselli Chemical Co. Cleveland, Ohio Grasselli Odorless Plant Food	Standard Seed Co., Kansas City-----	4.12	4.37	97.25	15.68	2.00	1.69	13.00	13.99	4.00	4.04	39.91	42.40	
6-79	Jax Plant Food Co. St. Louis, Mo. Jax Triple Strength Plant Food 17-33-17 (Powder)	St. Louis Seed Co., St. Louis-----	17.00	17.19	98.25	33.86		0.09	33.00	33.77	17.00	17.93	136.30	139.17	
6-80	Jax Triple Strength Plant Food 17-33-17 (Tablets)	St. Louis Seed Co., St. Louis -----	17.00	17.05	99.53	35.03		0.07	33.00	34.96	17.00	17.46	136.30	139.73	
6-81	Lyman Carrier Granger, Indiana Lecco Complete Grass Food ²	Palmer Seed Co., St. Louis-----	7.50	7.12	45.93	6.16		0.53	5.00	5.63	2.00	1.06	40.98	39.25	
6-82	Nitragin Company Milwaukee, Wisconsin Feedem ²	Palmer Seed Co., St. Louis-----	14.00	15.88	99.50	12.20		0.02	10.00	12.18	12.00	11.79	86.10	96.92	
6-83	Nitrate Agencies Company New Orleans, La. Nitrate of Soda ^{1 2}	Thompson Hayward Chem. Co., Kansas City-----	15.25	15.04											
6-84	Pacific Manure and Fertilizer Co. San Francisco, California Groz-it Sheep Manure ^{2 7}	Palmer Seed Co., St. Louis-----	1.50	1.55	27.10	1.12		0.26	0.75	0.86	3.00	3.39	10.58	11.35	

TABLE I (CONTINUED). FERTILIZER ANALYSIS AND GUARANTEES; SPRING 1929

Lab. No.	Manufacturer and Brands	Dealer	Nitrogen			Phosphoric Acid P ₂ O ₅						Water Soluble Potash K ₂ O		Value Per Ton	
			Total G'td	Total F'nd	Water Soluble to Total	Total		Insoluble		Available		G'td	F'nd	G'td	F'nd
						G'td	F'nd	G'td	F'nd	G'td	F'nd				
			Per Cent	Per Cent	Per Cent	Per Cent	Per Cent	Per Cent	Per Cent	Per Cent	Per Cent	Per Cent	Per Cent	Per Cent	Per Cent
6-94	Red Steer 16 per cent Superphosphate (Acid Phosphate) Fertilizer.....	Farmers Exchange, Mt. Grove.....					18.04		0.81	16.00	17.23			22.40	24.12
6-95	Red Steer 16 per cent Superphosphate (Acid Phosphate) Fertilizer.....	Farmers Elev., Silex.....					17.39		0.43	16.00	16.96			22.40	23.74
6-96	Red Steer 20 per cent Superphosphate (Acid Phosphate) Fertilizer.....	Goodwin Co., Doniphan.....					21.43		0.51	20.00	20.92			28.00	29.29
6-97	Red Steer 1-12-4.....	Omer Webb, Jasper.....	1.00	1.23	82.11	12.95	0.50	0.41	12.00	12.54	4.00	4.60	25.25	27.62	
6-98	Red Steer 2-12-2.....	Goodwin Co., Doniphan.....	2.00	2.18	79.82	13.14	1.00	0.92	12.00	12.22	2.00	2.42	27.40	28.92	
6-99	Red Steer 2-12-2.....	Home Mllg. Co., Mt. Grove.....	2.00	2.13	80.75	13.04	1.00	1.03	12.00	12.01	2.00	2.33	27.40	28.31	
6-100	Red Steer 2-12-2.....	Farmers Elev. and Sup. Co., Moscow.....	2.00	2.30	81.30	12.93	1.00	0.70	12.00	12.23	2.00	2.31	27.40	29.33	
6-101	Red Steer 2-12-6.....	Omer Webb, Jasper.....	2.00	2.04	87.75	12.90	1.00	0.18	12.00	12.72	6.00	6.32	31.60	33.12	
6-102	Red Steer 2-16-2.....	T. M. Renfrow, West Plains.....	2.00	2.23	84.75	17.89	1.00	1.12	16.00	16.77	2.00	2.27	33.00	35.34	
6-103	Red Steer 3-8-6.....	Farmers Exchange, West Plains.....	3.00	3.19	88.71	8.67	1.00	0.13	8.00	8.54	6.00	6.43	30.25	32.27	
6-104	Red Steer 3-8-6.....	Farmers Elevator, Silex.....	3.00	2.94	88.10	9.19	1.00	0.14	8.00	9.05	6.00	6.23	30.25	31.71	
6-105	Red Steer 4-16-4.....	L. C. Gregory, Norwood.....	4.00	4.22	97.87	17.30	1.00	1.07	16.00	16.23	4.00	4.30	43.60	45.18	
6-106	Steamed Bone Meal.....	St. Louis Seed Co., St. Louis.....	1.00	1.80	22.22	29.00	30.42							33.25	38.07
6-107	Steamed Bone Meal ²	Tucker Seed House, Carthage.....	1.03	1.53	16.34	29.00	31.09							33.38	37.59
6-108	Vigoro.....	Tucker Seed House, Carthage.....	4.00	4.21	90.74	13.35		0.62	12.00	12.73	4.00	4.30	38.00	40.23	
6-109	Vigoro.....	Palmer Seed Co., St. Louis.....	4.00	4.01	90.02	12.86		0.80	12.00	12.06	4.00	4.66	38.00	38.81	
6-111	Tennessee Copper and Chemical Corp. Lockland, Cincinnati, Ohio Loma.....	Peppard Seed Co., Kansas City.....	4.93	4.75	92.21	10.65	0.65	0.55	10.00	10.10	4.00	4.36	39.15	38.91	
6-112	Virginia-Carolina Chemical Corp. Memphis, Tennessee Steamed Bone Meal, 1-29.....	Graves Pettigrew, Cabool.....	1.00	1.65	25.45	29.00	29.85							33.25	36.86