

MDM  
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Subject Thesis toward M.S.

Name F. A. Cornia

9682

The Organization of State Institution Farms, with  
a Plan for the Reorganization of the Farm in Con-  
nection with the School for Feeble Minded at Fair-  
bault.

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A thesis submitted to the faculty of the Graduate  
school of the University of Minnesota by Francis A.  
Cornica in partial fulfillment of the requirements  
for the degree of Master of Science in Agriculture.

June 1914.

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April 29th, 1914.

Dean Guy Stanton Ford,  
Graduate School.

Dear Sir:-

The Committee appointed to read and pass upon the thesis of Mr. Francis A. Corniea, candidate for the degree of Master of Science, beg to report that the thesis has been carefully examined. The committee regard the thesis as satisfactory and a creditable piece of work and recommend that it be accepted in partial fulfillment for the above named degree.

Signed

*A. K. Storm*

*J. D. Wood*

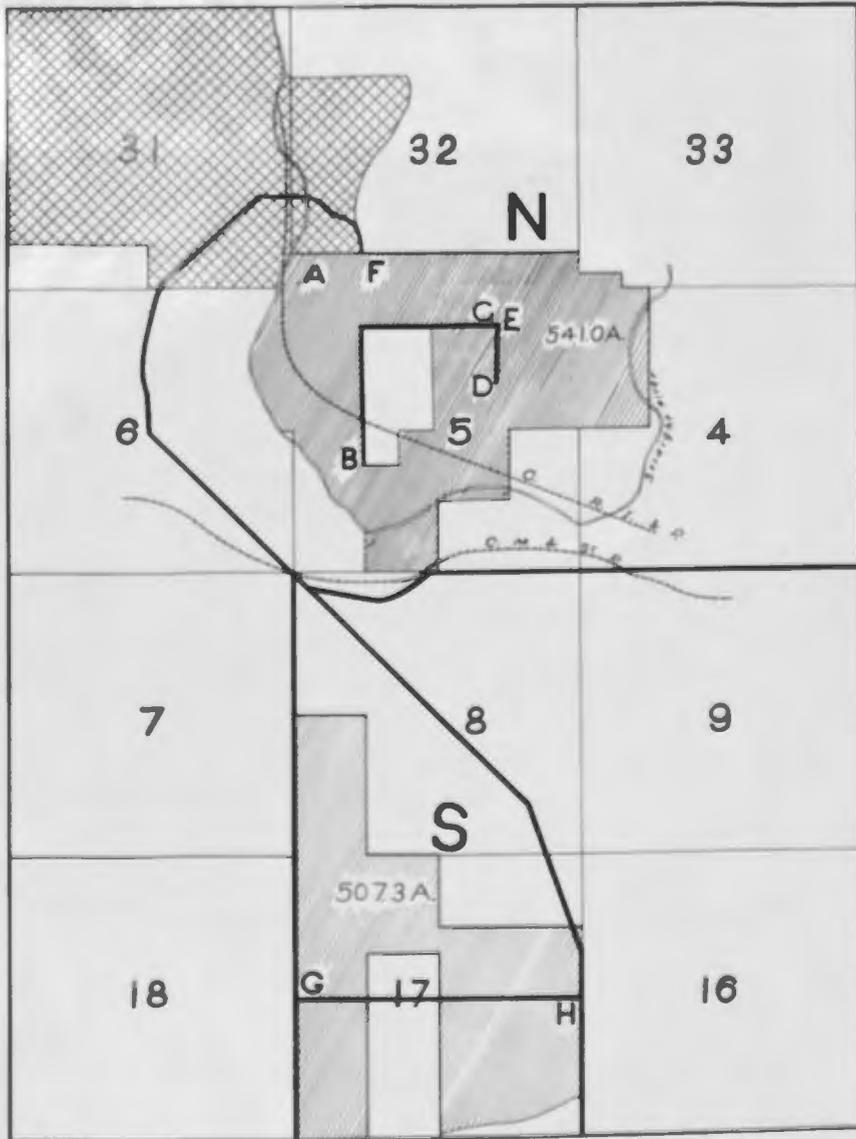
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## INTRODUCTION.

In the fall of 1912 a request came from Dr: A. C. Rogers, Superintendent of School for Feeble Minded at Faribault, for assistance in establishing a permanent system of management for the farm connected with the school for Feeble Minded. About the same time the suggestion was made that all farms connected with charitable and penal institutions of the state should be brought into closer co-operation with each other and with the University. A very complete and comprehensive study of the Faribault farm was undertaken during the college year of 1912 - 1913. The study of this farm showed very clearly the inadequacy of the present system of management of the farms connected with some of the state institutions, and that more competent management is needed to bring these farms to their highest efficiency. The following thesis will give a description of the Faribault farm as it is managed at the present time. This will be followed by a plan of re-organization for the farm and finally a plan for state management of all farms connected with institutions of this kind.

# PLATE I.



## LEGEND

- |   |                   |                    |
|---|-------------------|--------------------|
|  | STATE FARM.       | A-MAIN CAMPUS      |
|  | SURROUNDING LAND. | B-DAIRY BARN       |
|  | CITY OF FARIBAULT | C-HORSE BARN       |
|  | ROADS             | D-HOB HOUSE        |
|  | RAILROADS         | E-MACHINE SHED     |
|  | RIVER             | F-POULTRY HOUSE    |
|  | SCALE OF MILES    | G-UNUSED FARMSTEAD |
|   |                   | H-FARMSTEAD        |

RELATIVE SIZE AND POSITION  
NORTH AND SOUTH FARM

Part 1.

THE FARM OF THE SCHOOL FOR FEEBLE MINDED.

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Location:

The farm in connection with the school for Feeble Minded at Faribault, Minnesota, contains one thousand forty-eight and seven tenths (1048.7) acres. It is divided into two parts which, for convenience, will be called N & S. The relative position of N and S and the number of acres in each is shown in Plate 1. Most of the farm is in Walcott township except a small strip along the north which is in Cannon City township. Walcott and Cannon City townships are respectively, townships number one hundred nine (109) and one hundred ten (110) North, in Range twenty (20) West. Both N and S are very irregular in outline due to the fact that the land was bought in small parcels at different times as needed by the growing institution.

Although the farm lines are only one half mile apart, the farmsteads and buildings of each farm are much farther apart because there is no direct connection between. The heavy black line

(Plate 1) shows the shortest route between the two <sup>farms</sup> roads and farmsteads with the present arrangement of roads. In going from H, the main farmstead of S, to B, the dairy barn, a distance of about four and seven tenths (4.7) miles is traveled. The river, river bottom, and bluffs along the river prevent more direct connection between the two farms. It would be expensive to bridge the river, grade a road through the river bottom, and cut down the bluff so as not to make too steep a grade. A great deal of extra time and traveling could be saved by building such a road, however, as much hauling is done between the two farms, but up to the present time the expense has seemed too great.

### Topography and Soil:

The land in part N is all very rolling and some of it hilly. Much of it is too hilly to be cultivated and must be kept in permanent pasture or meadow. There are one or two fields along the river bottom that can be cultivated and a strip along the north side that is now being used as garden. Some of the land would be improved by drainage, which could be easily provided as the river affords a good outlet.

The land in S is heavily rolling, but all can be cultivated. Some of the fields would wash badly if kept in cultivated crops for a number of years, but enough vegetable matter can be kept in the soil by proper management and rotations to prevent excessive washing. The land now in permanent meadow is practically all in need of drainage to become useful for crop growing. There is enough slope so that it could be easily drained. Before any systematic rotation of crops can be followed, drainage must be provided.

The soil in both N and S is a heavy black loam underlaid by a clay subsoil. According to the United States soil survey made in 1909, most of S is Carrington loam. Practically all the upland in

N is Carrington loam, while the river bottoms are classified as "meadow".

Relation of the Farm to the Institution:

It is <sup>the</sup><sub>A</sub> common opinion that farms in connection with institutions of this kind are run for the purpose of making the institution self supporting. That, of course, would be desirable, but is not the first or most important reason for having a farm. The farm must be considered as a part of the institution which is maintained for the benefit of the inmates. The state has a difficult problem on its hands in taking care of its defective people, especially of the feeble minded. They are all mentally weak and many are physically weak and deformed, necessitating constant care and attention on the part of those in charge. The average mental age of the inmates who are used upon the farm work is six and nine tenths (6.9) years. Many of them are strong and well developed physically and must have some way of exercising and something to keep their minds occupied. If they are kept in idleness they very often resort to vices of various kinds and become sulky and unmanageable. Some of them have

enough mental power to realize to a certain extent the nature of the institution in which they are kept and resent being confined and told what to do. The problem is then to keep their minds busy along some line and to give them plenty of physical exercise. Farm work seems to be especially desirable as it gives them healthful out of door exercise. As a result most institutions of this kind have farms on which the inmates are kept busy and at the same time contribute toward their own support. Many of the inmates develop a fondness for farm animals and derive much pleasure and satisfaction from working with them and taking care of them. The welfare of the inmates is the first consideration in developing the farm of any similar institution. If an institution farm can be made self-supporting it will mean a great saving to the state, but this should be a matter of secondary importance.

The demand for large quantities of certain farm products as food for the inmates makes it necessary to build up the farm around a few basic or fundamental enterprises. The need for a large amount of milk and cream gives rise to the dairy industry. The large amount of potatoes consumed yearly makes it necessary to grow potatoes on a fairly large scale. The demand for vegetables ne-

cessitates a large garden, swine must be raised for pork, and the poultry kept for the eggs. All produce is grown primarily for home consumption and not for market. At the present time there are in the institution over fifteen hundred (1500) inmates and two hundred fifty (250) attendants, making a total population of nearly eighteen hundred (1800). Produce to supply the needs of these must be grown in fairly large quantities.

#### The Management of Inmate Labor:

A big problem and one hard to meet is the management of the inmates in the field. They cannot be sent out to do any work without having someone to go with them to show them how to do it, and to see that the work is properly done. This necessitates a large corps of salaried attendants, as during the summer there may, at times, be as many as six or seven groups working in different places. The cost of doing the farm work, is, therefore, more than it is generally supposed to be even though most of it is done by the inmates. The amount and quality of work done by people whose mental age is seven (7) years is far below that done by normal people. They are

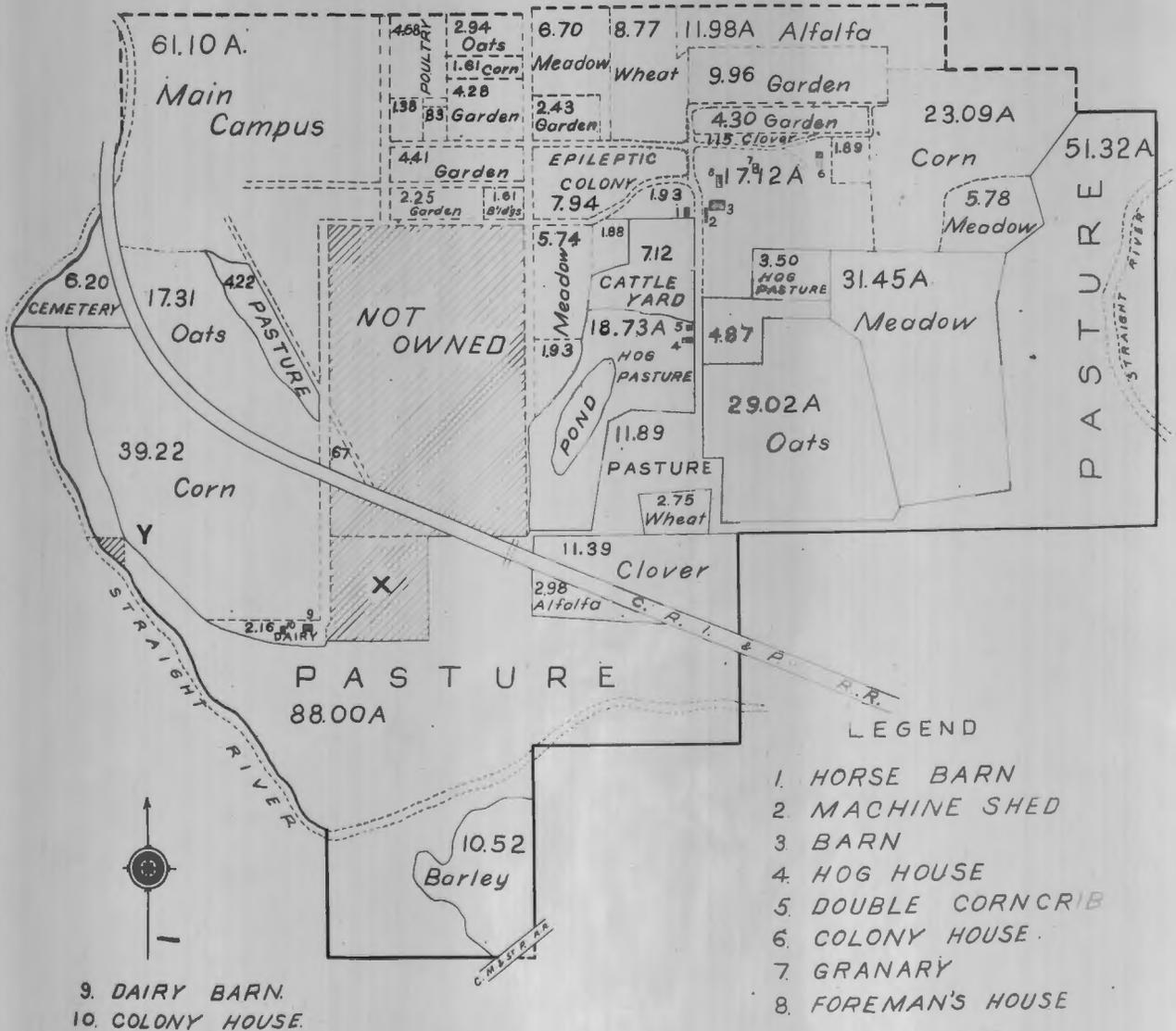
irresponsible in every way and are in need of constant supervision, but all people are not competent to supervise them. The best results are obtained by a person who understands them and who is willing to work with them so as to keep them good natured and satisfied with their lot. As before stated, some know enough to realize to a certain extent the <sup>nature</sup> ~~max~~ of the institution in which they are kept and resent the confinement to a marked degree. It is sometimes hard to find a man who has the faculty of being a good farm foreman and who also knows how to handle inmates of this type. It is better to have a man who knows how to handle this class of help even though he falls below the requirements for a good farm manager; the welfare of the inmates should be the first consideration.

Another factor which has an important bearing on the farm labor problem is the so called "colony system" of keeping inmates. The system is exactly what the name implies; cottages are built at different places on the farm and in each one of these is put a group of comparatively high grade inmates and in which they eat, sleep, and live. Plate 11 shows the location of the colony houses. Each building is put in charge of a man and his wife with the help necessary to get the work done. This system results in having the

inmates distributed over the farm. One good feature of the system from the farm labor view point is that the help is generally near at hand, thus saving time in going to and from work. A bad feature is that it has a tendency to distribute the farm enterprises as well as the inmates and thus greatly increase the cost of supervision as each enterprise is taken care of by a separate colony. This makes it necessary for the farm foreman to spend much of his time in traveling from place to place and gives him very little time for actual direction.

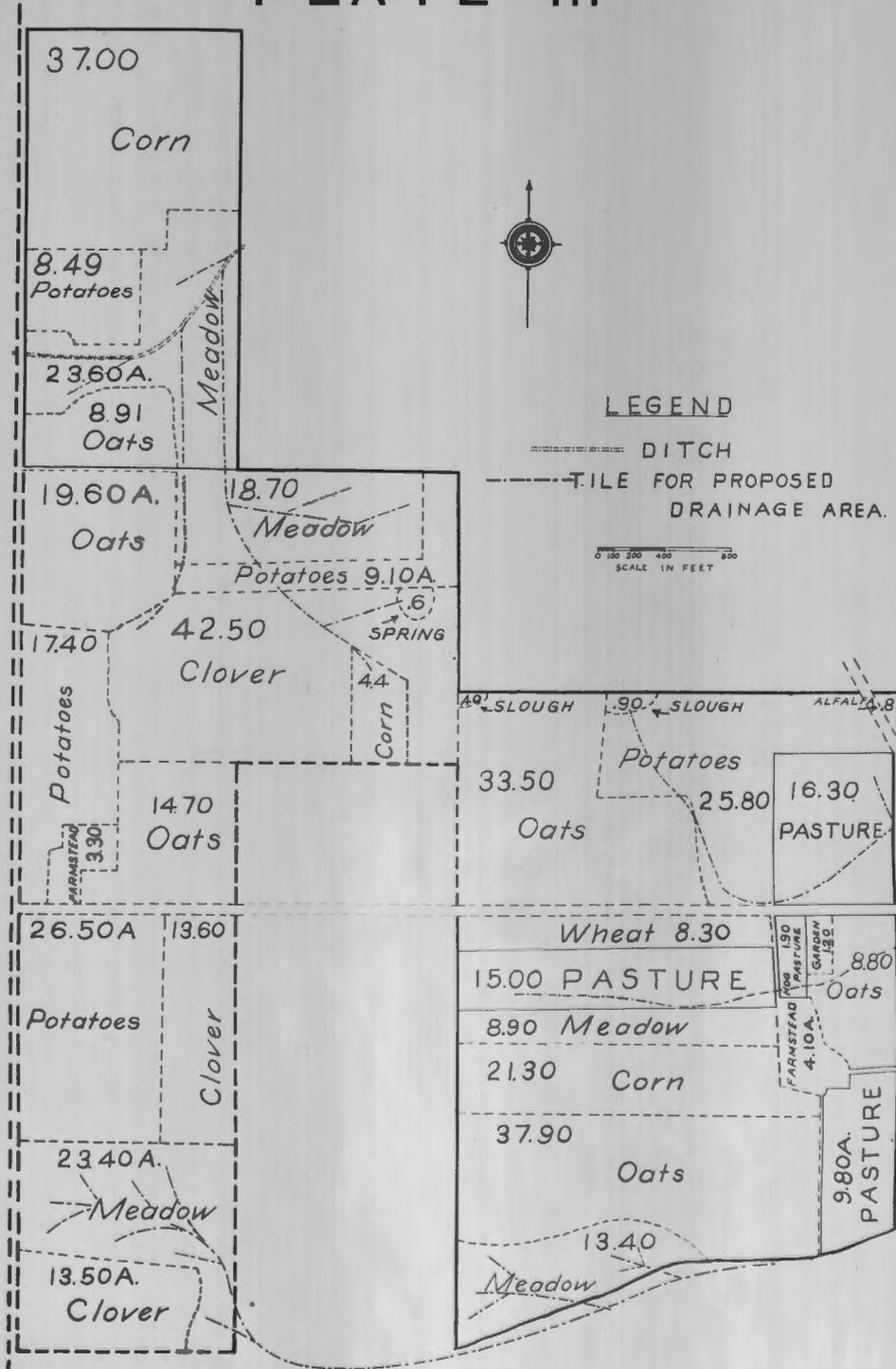
In summing up the relation the farm bears to the institution it is evident that the main purpose for operating the farm is not to make the institution self supporting, but to furnish work, diversion, and recreation for the inmates, and must be considered as a necessary item in the equipment of the institution whether it pays financially or not. It can at the same time, however, be made a large factor in making the institution self supporting.

# PLATE II.



# NORTH FARM

# PLATE III



# SOUTH FARM

### The Executive Management of the Institution.

The management of the farm is directly under the control of Dr. A. C. Rogers, who also has complete charge of the school. He is in active charge of everything connected with the institution. At present he has two farm foremen; one on N and one on S. The farm foreman on N has charge of all farm work except the garden and the poultry enterprises. Each of these has a separate manager and is run as a separate enterprise. By referring to Plates ll and lll, the location of these enterprises, as well as the field divisions, can be seen.

The poultry enterprise was started with the idea of making it an outdoor industry for the girls. It is located near the main campus and close to the girls' quarters and has been in charge of a lady who also acts as an attendant for the girls. The garden is in charge of a head gardener. Most of the work in the garden is done by the epileptic males, whose colony is conveniently located for that purpose. Groups of children are often taken from the main campus and school, to help in weeding, picking beans, peas, berries, and doing other light work. They are taken out in charge of an attendant who directs them in their work.

Practically all of the potatoes are raised on S as well as most of the feed. Very little stock is kept in S except during the summer months when some of the young stock and dry cows are kept there. A few pigs and chickens are kept to consume waste and garbage. The field divisions, location of farmsteads, and crops grown on S during the summer of 1913 are shown on plate 111.

#### The Dairy Enterprise.

On April 1st, 1913, there were ninety six (96) cows in the dairy herd. Some of these are registered Holsteins, but most of them are grade Holsteins. Two registered Holstein bulls are kept for breeding purposes. An attempt is being made to build up the herd for large milk production, but unfortunately the record keeping has been such that individual production is not known. The milk is weighed at every milking and the weights recorded on a milk sheet. The sheets are large enough to receive the records of all the cows for a week, two milkings a day. The figures have never been summarized, however, and some of the sheets have been mislaid and lost. Consequently the actual production of the cows is

not known, although those who do the milking, know in a general way which cows are the heaviest producers. The total production of the herd is known because the milk is weighed in bulk by the steward when it is delivered to him. No test is made for butter fat content as the purpose of keeping the herd is to supply milk and cream to the inmates. Butter making may be started in the future if more milk and cream are produced than is needed.

The milking is done by about a dozen inmates, each one of whom milks a certain number of cows, always in the same order. These inmates are sometimes taken out to work in the fields through the day during the busy season, but most of their time is spent in the barn. The feeding must all be done by citizen labor as the inmates cannot be trusted to feed. No attempt is made to feed rations conforming to the work which the cows are doing, but the cows are fed alike without regard to weight or production. During the winter when the cows are kept in the barn, their feed consists wholly of corn silage, bran, and clover hay. During the summer when the cows are on pasture they are given a little silage and bran to induce them to come into the barn.

The breeding of the cows is left in charge of the head

dairy man. His form of record keeping, however, is poor and often results in mistakes. The only record he has is a small pocket memorandum book which he carries with him wherever he goes. The records are therefore incomplete and cannot be followed back very far so that it is practically impossible for any one to learn the dam or the sire of many of the cows and young stock on hand at the present time. There is no good record of the disposal of calves. The institution books show whenever a cash sale is made, either for veal or breeding, and when a calf is butchered and used as veal, but they do not show how many calves are raised and how many are killed at birth. By actually counting the calves in the pens and yards and going over the institution books, only about three-fourths of the calves that should have been produced were accounted for. On inquiring of the head dairyman what had become of the rest of them he said that they were killed at birth as it didn't pay to raise them. His word had to be taken as there was no other way of checking up to see what had been done with them.

It is impossible to tell how much feed was consumed by the dairy during the year as there are no feed records kept. The books of the institution show how much feed was bought during the year

and how much was produced on the farm, but show nothing about the distribution of the feed. It is impossible to tell how much of any feed went to cows, how much to horses, how much to hogs and to poultry.

The following statement taken from the institution books gives the income from the herd for the year ending August 1, 1913.

666,851 lbs.milk valued at 1.47¢	\$9852.87
611 lbs.veal " " .10¢	61.10
Cash sales of milk and cream	93.65
Cash sales of calves (26)	220.00
Cows, steers and condemned cattle	371.04
Hides	<u>12.24</u>
	\$10610.90

Some of the cows were condemned because they reacted to the tuberculin test which was made during the winter of 1912-1913.

#### The Farm Crops.

Closely connected with the dairy enterprise is the work of growing the general farm crops which are used for feeding the livestock. The location of fields, pastures, and the acreage of

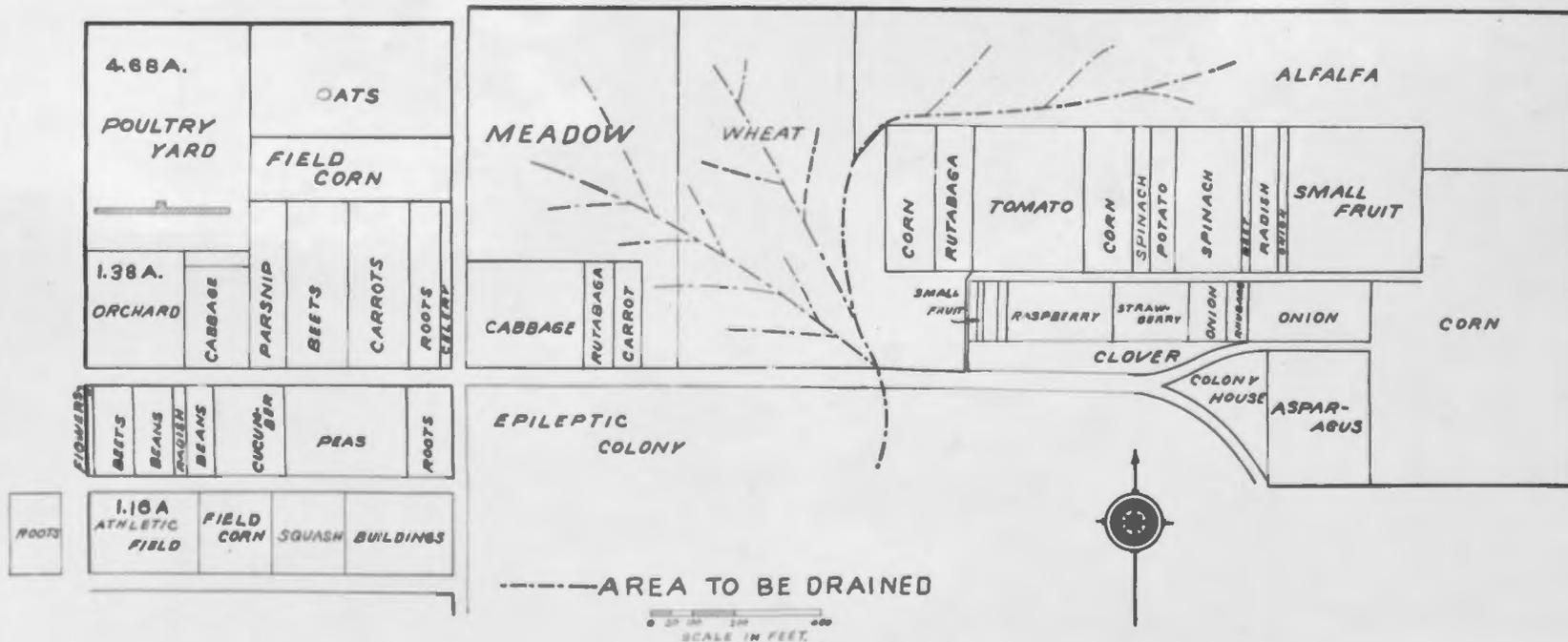
each is shown in Plate II. The head dairyman is also foreman so he has the general farm work under his personal supervision. He has two men under him who give all their time to direct and work with the inmates in the field. A third man, whose chief duty is to take active charge of the barn, helps in the field during busy seasons.

The Swine Enterprise:

The swine enterprise is also under the direct management of the farm foreman, but so far has not been very well developed. An attempt is made to keep enough hogs to consume the kitchen refuse and the garbage from the dining rooms, but there are times when much of this goes to waste. No corn or grain is ever fed to the hogs as they get all the feed they can use from the garbage. Enough pork is produced every year to supply the needs of the institution and generally a few carloads of fattened hogs are sold. Some sows are bred and young pigs raised, but many pigs are bought and fattened for market. The garbage is collected and hauled out twice a day to the hog yard where it is often

dumped on to the ground and the pigs get what they can out of it. There is a hog house which is sometimes used for feeding and also an outside cement trough, but these are inadequate for the present requirements. There is no good supply of water for the hogs at any time. They have free access at all times to a pond of water into which empties a septic tank and which is kept supplied by a near by spring. From the time it freezes up in the fall to the time it thaws in the spring, the only water the hogs get is from the garbage and the snow and ice. No one seems to be directly responsible for the hogs but they are left largely to shift for themselves. The farm foreman has active charge but he is so busy seeing to other details of management that he does not have the time to give close attention to the hogs. He sees to it that the garbage is collected daily and hauled out to the yard, but there are many days when he does not even go to the hog house. During the breeding season a boar is turned loose with the sows to be bred and left with them until they are all bred. No record is kept of the date the sows are bred and consequently the time of farrowing is not known and can only be approximated within a few weeks.

# PLATE IV.



## PRESENT GARDEN PLAN.

### The Garden:

The garden is another basic enterprise of the farm, but does not come under the supervision and management of the farm foreman. There is a man known as the gardener, who does all the planning for the garden. The location of the different garden plots, and number of acres in each, can be seen by referring to Plate IV, which is a detailed plan of the garden crops grown during the summer of 1913. Whenever any of the garden crops are ready for use the gardener notifies the dietitian and she in turn tells him when and how much of it to deliver to the steward. A part of the produce is measured by weight, and some ~~is measured~~ by volume or by count.

The following list gives the amount of vegetables and small fruit delivered to the steward by the gardener from August 1912 to August 1913.

Apples	153 bu.
Asparagus	68 bu.
Beans	131.5 bu.
Beets	521 bu.
Cabbage	7905 heads
Carrots	377 bu.
Cauliflower	121 heads
Celery	2276 bunches
Sweet corn	4 65-1/2 bu.
Cucumber	634 bu.
Egg plant	32 heads

Lettuce	342.75 bunches (dozen in a bunch)
Onions	949.5 bu.
Parsley	36 bunches
Parsnips	245 bu.
Green peas	62.25 bu.
Peppers	6 doz.
Pie Plant	265.75 bu.
Pumpkins	174
Radishes	5112 doz.
Sauerkraut	5-1/2 bu.
Spinach	297 bu.
Squash	854
Tomatoes	651 bu.
Turnips	6 75 bu.

Miscellaneous Fruits:

Raspberries	367 qts.
Plums	3-1/2 bu.
Grapes	2 bu.
Strawberries	188 qts.
Gooseberries	170 qts.
Currants	661 qts.

### The Poultry:

The poultry enterprise is another one not coming under the supervision of the farm foreman. The purpose in view in establishing a poultry plant was to have it as an outdoor industry for girls. The poultry managers have always been women who have also acted as attendants. The poultry enterprise has never been sufficiently developed to supply the needs of the institution. Last year the institution used thirteen thousand eight hundred thirty seven (13,837) dozen eggs and of this number only two thousand seven hundred thirty-two (2,732) dozen were furnished by the poultry ranch. The poultry plant also furnished meat from time to time, amounting to two thousand two hundred one (2201) pounds during the year. The following table gives the number of eggs and the amount of meat furnished to the institution by months for the year ending August 1st, 1913. The value placed on the eggs and meat was the prevailing market price at the time of delivery. The table shows the inadequacy of the present plant and also the impossibility of supplying eggs at the right time unless facilities for storage are provided, regardless of the number of eggs produced. During certain months there is a heavy production which falls off during

other months when there would be a shortage unless some had been previously stored.

Poultry receipts from August 1, 1912 to August 1, 1913:

	Doz. eggs	Value	Lbs. Meat	Value
August	222	\$38.08	231	\$34.74
September	136	27.52	230-1/4	34.13
October	43	10.06	211-1/4	31.51
November	22.5	6.72	16-1/4	2.11
December	190.5	46.68	210-1/2	25.41
January	198	46.14		4.96
February	204	48.42	214-1/4	32.98
March	456	76.50	79 1/2	12.72
April	412.5	63.10	21.1/2	3.33
May	408	69.34	283-1/2	45.61
June	289.5	49.70	116-1/2	19.62
July	150	22.20	582	80.00
<b>Total</b>	<b>2732</b>	<b>504.46</b>	<b>2201-1/4</b>	<b>327.12</b>

The poultry receipts for the year amount to \$331.58.

It was possible in the case of the poultry enterprise to find out something about the expense of running it. Records were kept of the amount and value of the different feeds and all cash paid out for supplies and equipment. It was impossible to find out whether there was any gain or loss in inventory. The following is a list of the kinds, amounts, and values of the feeds used during the year:

Bran	10,300 lbs.	\$117.20
Wheat	115 bu.	93.70
Oats	142 bu.	43.55
Cracked corn	5,000 lbs.	71.00
Corn	286-1/4 bu.	165.25
Middlings	3,400 lbs.	34.00
Oil Meal	800 lbs.	16.00
Carrots	2 bu.	.50
Barley	6-1/2 bu.	2.73
Chick Food	1,500 lbs.	25.50
Oyster Shells	300 lbs.	2.55
Pearl grit	200 lbs.	<u>1.70</u>
Total for Feed - - -		<u>\$563.68</u>

Following is a list of cash expenses during the year  
for supplies:

Kerosene	20 gals.	\$1.40
Mustard	2 lbs.	.26
Straw	1 load	1.50
Matches	1 package	.34
11 Water crocks		.95
1 dish pan		.75
1 spray pump		3.60
4 mouse traps		.20
	Total	<u>\$9.00</u>

In the spring of the year a number of roosters for breeding purposes were bought at a cost of \$26.00. The total cost for feed, supplies, and breeding stock for the year amounts to \$598.68, leaving a net income of \$232.90. Out of this yet must come wages for help, interest on investment and insurance. The poultry business for the year apparently was not particularly profitable.

It was impossible to find out anything about incubation. There were no records to show when eggs were put in the incubators, how many were put in, or what per cent. of the eggs hatched out live chicks. Likewise the number of mature or of young chickens on hand at any time was not known.

### The South Farm:

The South Farm is all under one manager and devoted almost entirely to general farming. There is only one colony of inmates on the place and they are under the supervision of the farm foreman and his wife. The farm foreman has two salaried helpers to work with the inmates and to direct them in the fields. The colony house is built to accommodate fifteen inmates, but there usually are four or five more on the place.

The field divisions and acreages of each crop during the summer of 1913 are shown on Plate III. Potatoes form one of the main crops as the supply for the whole institution is grown on this farm. Very little attention is given to seed selection or seed treating before planting.

The potatoes are stored in root cellars built for that purpose and taken out as needed.

The other crops grown on this farm are for feed. Nearly all the work is done by the inmates on the place except in busy seasons when help is brought over from the other farm. When the potatoes are dug the inmates from the main campus are taken out by the wagon load to help pick the potatoes behind the digger. It

forms an outing and a trip outside for them and they really have an all day picnic out of it.

Very little live stock is kept, so most of the feed has to be hauled to the dairy on N. A few dry cows and some young stock are pastured during the summer and only enough cows kept at any time to furnish the milk and cream used on the place. Enough horses are kept to do the farm work and haul feed and straw to the dairy during the winter. Very little straw is kept on the place and consequently there is very little manure to be hauled or spread at any time. Every field sown to grain last spring was also sown to clover and there was a good catch in all the fields. The following table gives the acreage, yield per acre, and total yield of crops on S for the year 1913.

The term "meadow" is used to indicate those fields which are not drained and too low to be used for ordinary farm crops and so are kept in permanent meadow.

Crop	Acreage	Yield per acre	Total yield
Potatoes	87+	113+ bu	9,913 bu.
Corn	62.7	61.4 bu.	3,853 bu.
Oats	123.4	51.8+ "	6,400 "
Meadow	88	1.4 Tons	127 T
Clover	69.6	1.8 "	126 T
Wheat	8.3	32.+ bu	266 bu

Thirteen and five-tenths (13.5) bushels clover seed was threshed for use in spring of 1914.

Financial Statement:

The following tables taken from the books of the Board of Control show the farm charges and farm credits for the year ending August 1, 1913, and also the inventory at the beginning and the end of the year. Some idea can be derived as to the income from the farm as a whole, although there is no separate account for any enterprise.

CASH EXPENSES FOR FARM FOR YEAR ENDING Aug.1,1913,  
BY MONTHS:

	Citizens labor	Inmate labor	Feed	Harness, Blankets, Robes	Seeds, Plants, Fertil- izers	Live stock
August	\$485.00	434.34	117.56	3.10		
September	489.53	442.89	7.50	6.30		
October	479.70	443.46	548.25	3.10		
November	479.97	325.13	84.00	63.70		
December	452.10	407.83	507.00	.70	37.00	
January	371.00	384.18	113.75	1.35		748.56
February	448.00	334.30	105.60		289.40	26.00
March	479.00	285.57	681.63	6.50	49.83	125.00
April	401.13	360.64	56.35	2.87	219.96	
May	469.10	460.56	8.10	5.10	31.97	
June	501.74	384.75	79.53	.53	3.90	
July	443.47	566.58	923.65	4.75	.35	

CASH EXPENSES -- continued --

	Machinery and Vehicles	Tools and Implements	Blacksmith shop supplies	Building Repairs	Fenc- ing	Miscel- laneous
August	\$257.42	\$ 2.75	\$27.57			\$40.36
September	56.50		6.04	80.00		8.56
October	83.74	11.40		97.00		18.32
November	173.35	3.46	94.68			8.82
December	38.54	13.70	9.19	30.70		8.10
January	864.39	11.62	26.79	2.75		45.97
February	16.81	7.62	21.32	.50		97.67
March	.50	53.55	17.76		4.31	29.27
April	24.49	102.83	8.08	.12	47.78	62.75
May	68.00	10.00	61.10			21.56
June	80.42	19.80	4.50			22.16
July	55.44					108.38

FARM RECEIPTS FOR YEAR ENDING AUGUST 1, 1913,

BY MONTHS:

	Milk	Butter and eggs:	Dressed meats	Fruits and veget- ables:	Live stock	Black- smith shop:	Hides and tallow	Misc.
Aug.	743.10	38.40	34.77	1246.56	953.04	78.25		233.04
Sept.	782.10	35.03	48.33	1208.47	5.00	80.60		170.00
Oct.	890.48	20.05	19.61	612.52	15.00	78.25		297.58
Nov.	854.70	8.93	21.83	437.68	25.00	106.05		280.04
Dec.	764.03	28.05	218.87	549.73		96.10		223.24
Jan.	786.63	66.93	286.32	531.65	177.07	106.15		348.16
Feb.	810.32	47.10	46.65	491.73	123.03	89.80		1620.30
March	846.45	64.29	206.02	575.60		98.85	9.79	338.19
April	747.87	94.86	22.22	365.60		86.55		170.00
May	842.37	53.56	72.00	643.42	10.00	87.80		170.00
June	930.61	37.80	68.20	789.53	168.05	91.25	2.50	170.00
July	854.01	41.77	127.02	1000.57	40.00	11.20		449.20

CHARGES AND CREDITS BY MONTHS FOR YEAR

ENDING AUGUST 1st, 1913:

	Charges	Credits
Inventory August 1, 1912	22641.30	
August	1368.10	3327.16
September	1097.32	2329.53
October	1684.97	1933.49
November	1233.11	1734.23
December	1504.86	1880.02
January	2570.36	2302.91
February	1347.22	3229.13
March	1732.92	2139.19
April	1239.22	1487.10
May	1183.27	1879.15
June	1097.33	2257.94
July	2102.62	2523.77
Inventory	<u>40802.60</u>	<u>23109.90</u>
Gain - - - - -	<u>9330.92</u>	<u>50133.52</u>
	50133.52	50133.52

Part 11.

PROPOSED PLAN OF REORGANIZATION.

Any plan of reorganization should be based on the food requirements of the inmates, the possibility of producing the food on the farm, and the quantity and character of labor available. The following table shows the amount of farm products needed by the institution annually to feed a population of two thousand (2000) people. The table was compiled from figures given by the dietitian and from figures taken from the institution books, which showed the amount of farm products used during the year ending August 1st, 1913.

	<u>Product</u>	<u>Rate of Using</u>	<u>Total per year</u>
DAIRY	Butter	800 lbs, per week	41,600 lbs.
	Buttermilk	6000 " "	312,000 "
	Cream	300 " " day	109,500 "
	Milk	2000 " " "	730,000 "
	Veal	400 " " meal - 1 meal a week-	20,800 "
GARDEN	Beans- green	20 bu.a meal- 2 meals . a week for 8 weeks	320 bu.
	Beans - Dry and ripe	10 bu. a week	520 bu.
	Cabbage	325 head a meal- 1 meal a week	16,900 head

GARDEN - Continued - -

	<u>Product</u>	<u>Rate of Using</u>	<u>Total Per Year</u>
	Cucumber	Average 2 bu. a day	730 bu.
	Onions		450 "
	Peas	20 bu. a meal - 2 meals a week for 8 weeks	320 "
	Potatoes	30 bu .a day	10, 950 "
	Roots	11 bu. a day	4, 015 "
	Small fruit	10 qts. a piece fbr 2000 people	20,000 qts. 16,000 lbs.
	Squash		
	Sweet corn	2000 ears a meal - 1 meal a day for 3 weeks	42,000 ears
	Tomatoes	20 bu. a meal - 4 meals a week for 7 weeks	560 bu.
POULTRY	Eggs	300 doz. per week	15,600 doz.
	Meat	900 lbs.-1 meal once a month	10,800 lbs.
SWINE	Pork	400 lbs. a meal - 1 meal a week	20,800 lbs.

### THE DAIRY:

The number of cows to be kept in the dairy will depend upon the amount of products needed by the institution and the average yearly production of each cow. The table of food requirements for the inmates shows that eight hundred thirty nine thousand five hundred (839,500) pounds of milk and cream are required annually for a population of two thousand people. It would take, at least, one hundred twelve (112) cows, averaging seven thousand five hundred (7,500) pounds, to furnish this amount. Since the population is below two thousand (2000), one hundred twelve (112) cows is enough for a few years to come, at least. It is impossible with the present equipment and the present farm to make the butter needed by the institution, but by increasing the size of the herd and the average individual production more butter fat may be produced than is needed. It may be possible as well as profitable to make this into butter, but a better plan would be to sell the surplus butter fat to the Co-operative Creamery in Faribault.

One of the first steps in reorganizing the dairy is to work up a complete set of records. It is necessary to know what is

being done by each cow if the herd is to be improved. Unless the individual performance of each cow is known, it is impossible to make a scientific selection of breeding stock for her improvement. To know the individual performance of each cow it is necessary to keep a breeding and a production record. The production record should show the pounds of butter fat produced as well as the pounds of milk, as the value of a cow is determined largely by the number of pounds of butter fat she produces annually. The bull calves from the highest producers, especially of the registered cows, could be sold at a big profit for breeding purposes if the production of their dams could be shown. In a herd of nearly a hundred cows whose average milk production is nearly seven thousand pounds, there must be some cows of unusual merit. The bull calves from the registered cows of highest production would bring from seventy five to one hundred dollars a piece if sold for breeding purposes. At the present time these calves are being sold for about eight dollars apiece.

In the keeping of production records it will not be necessary to weigh at every milking as is done at present, nor will it be necessary to test more than once a month, but both should be done at

regular intervals. In order to distribute the work of testing and not have all of it come at one time, the cows could be divided into four groups, each group to be tested once a month. This will give some testing to be done each week, but not enough to take up any very large amount of time. A good plan to follow in weighing the milk is to weigh each milking for three consecutive days each month and take a composite sample of the six milkings for making a butter fat test. This plan will not give as accurate results as weighing at every milking, but will be accurate enough for purposes of comparison in selecting breeding stock for the future herd. If this plan of weighing is followed, the testing will necessarily all come during the week when the weighing is done as it will be less work to take samples at that time than at any other.

A uniform system of record should be kept for each cow and strictly followed if the work is to be of any value. The system should be simple, easy to follow and easily summarized at the end of each year or each month. Regular printed sheets should be made out and kept at hand where the weighing and testing is to be done. The following form is a convenient one to use when milk is weighed three consecutive days a month and a test is made of a composite sample of the six milkings.

M O N T H.

Cow No.		1	2	3	4
1st Day	Morning				
	Evening				
2nd Day	Morning				
	Evening				
3rd Day	Morning				
	Evening				
Total for 3 Days					
Average Daily					
Percent Butter Fat					
Lbs. Butter Fat					

This form could be printed on sheets long enough to give room for all of the cows in one group. Whenever any weighing or testing is done entries could be made in their proper places and the figuring left to be done at a more convenient time. One sheet a month for each group would be required and these could be filed in some convenient safe place until the end of the year when they

could be summarized to show what each cow's production had been per month and for the year. Each cow then should have a place where her yearly record by months could be entered and kept by itself. The following is a convenient one to use for that purpose.

COW NO.	MONTH		
	Lbs. Milk	% Fat	Lbs. Fat
January			
February			
March			
April			
May			
June			
July			
August			
September			
October			
November			
December			
Total			

If this form is printed on index cards, the cards may be conveniently filed and kept as yearly records. They are easy to handle and <sup>keep</sup>~~kept~~ clean and convenient for reference. The cards can be filled out at the end of the year from the twelve monthly sheets, or entries can be made at the end of each month. As soon as the individual cow cards are filled out the large monthly sheets may be destroyed as they will be of no more value. The cards should be kept on file in some place accessible at all times to those interested in the records of the cows.

Another record which should be kept is one of breeding. There is no complete record on the place at the present time and consequently it is not always possible to find out just when a cow was bred or to what bull. The institution demand for milk is practically the same for each month of the year and if the dairy is to serve its purpose in supplying this demand it should furnish a uniform quantity of milk for each month. In order to do this the individual production of each cow should be known and care taken to breed her at the right time. A part of the herd should be bred every month. If the breeding is not done in this way there will be an overproduction at certain time and then a shortage. There are

other reasons for keeping a breeding record. It should be possible to tell by what bull any calf is sired, in order to trace its ancestry. Likewise the welfare of the cow herself demands that she receive better and different treatment for some time previous to calving. She should be dry, at least six or eight weeks before calving so as to produce a good vigorous calf and have her own body in good condition. She should be separated from the rest of the herd for some time before calving and put in good surroundings for giving birth to the young calf. Unless the date of breeding is known, from which the date of calving can be figured nearly to the day, these things cannot be attended to.

The following form is a convenient one to use in keeping a breeding record of each cow:

Cow number  
Date bred  
Rebred  
Bull  
Due to Calf  
Date Calved  
Sex of Calf  
Disposal of Calf  
Remarks

This form will give all the necessary information and is easily filled out and kept. Under the heading "Remarks" can be

put anything regarding condition of cow or calf at birth or at breeding time, and anything directly concerned with the animals in question. This form likewise is printed on a card and the cards are kept in a file. To avoid having two cards for each cow, the forms can be printed on the same card, one on each side, or the cards can be made large enough to have both forms on one side. The yearly performance of each cow could then be seen by looking over her card. The following form is used where both the production and the breeding record is kept on the same card.

YEAR \_\_\_\_\_

Cow No. _____		YEAR _____			
Dam	Sire	Production Record			Breeding Record
		Lbs. Milk	% Fat	Lbs. Fat	
January					Date Bred
February					Rebred
March					Bull
April					Due to Calf
May					Date Calved
June					Sex of Calf
July					Disposal of Calf
August					Remarks
September					
October					
November					
December					
<b>Total</b>					

By keeping records such as these for a few years it would be possible to weed out of the herd the unprofitable cows and to keep only the best ones. In selecting heifer calves for use in the future herd only those from the heaviest producers need be kept and thus the standard of the herd will gradually be raised. Unusually good opportunities are offered in a herd of this kind to produce strains or families of very high production by mating the best cows with good bulls and gradually weeding out the poorest individuals.

It is desirable in the line of record keeping to name or number each animal so that its ancestry can be conveniently traced. It is very important to be able to trace back the ancestry of any individual in the herd especially if any of the young stock is to be sold to farmers for breeding purposes. The simplest way to keep record of the cows is merely to number them. For example, supposing there are one hundred cows in the herd, the first calf produced and raised would be number one hundred and one, the second, one hundred and two, etc., without regard to the cow from which it came. The calves sold or butchered for veal need not be numbered as they will never become part of the herd. Each calf kept would

have a breeding card showing from what cow it came and also from what bull. By referring to the form showing a cow's yearly performance, the manner of keeping this can be seen. In the upper left hand corner arrangements have been made to enter also the dam and the sire of the cow. In this way any animal's ancestry and their performance can be found by looking over the cards. In time it may be possible to have all the cows in the herd registered, but until then some system should be followed by which any animal can be traced back and the production of its ancestors be known as this is what determines to a large extent the value of any animal for breeding purposes.

The largest change in reorganization of the dairy industry will be in the manner of feeding. At the present time the cows are all fed alike, regardless of size or amount of milk given. During the winter of 1912-1913 and the early part of 1913-1914, the cows were each getting daily 60 lbs. corn silage, 20 lbs. clover hay and 9 lbs. wheat bran, making 89 lbs. of feed daily. It seems hardly possible for a cow to consume that much feed daily, but the figures were given by the head dairyman who plans the feeding. Besides being a heavy feed, there is not enough variety to make it

palatable. According to analyses used in Haecker's feeding standard, each cow was getting the following amounts of nutrients:

	Pro.	C.H.	Fat
60 lbs. corn silage	.75	8.52	.42
20 " clover hay	1.42	7.56	.36
9 " wheat bran	1.071	3.78	.225
Total---	<u>3.241</u>	<u>19.86</u>	<u>1.005</u>

It is impossible to figure exactly what each cow should get as neither the weights of the animals nor the per cent fat in the milk is known, but very liberal estimates would place the average cow in the herd as weighing 1350 lbs. and giving daily about 25 lbs. of 3.5% milk. These estimates were made by Professor Haecker and Professor Major and are regarded as high. Referring again to Haecker's feeding standard, the average cow in the herd is found to require daily the following:

	Pro.	C. H.	Fat
For Maintenance	.945	9.45	.13
For 25 lbs. of 3.5% Milk	1.230	5.52	.472
Total	<u>2.175</u>	<u>14.97</u>	<u>.602</u>

If more feed is given to a cow than she needs it is wasted because the body will take only what it can use and the rest will be passed off. In this case the cows are getting considerably more

than they need, consequently there is a heavy loss. The difference between what the average cow is getting and what she needs is 1.066 pro., 4.99 C.H. and .403 lbs. fat. This much digestible feed wasted every day by each cow makes a big loss on a herd of nearly one hundred cows. It is possible to figure a ration for the cows that will supply just what they need or just a little in excess of what they need to allow for a little increase in milk production or putting on of flesh. In figuring a ration it is always well to use at least two or three kinds of grains to make the feed more palatable, as the continued heavy feeding of one kind of grain often results in the loss of appetite. By feeding a mixture of grains the appetite is always sharp, the cows are kept contented, and there is more apt to be an increase in production, Besides this the continued over feeding of protein often has bad effects on the health of the animal.

The following ration, made up entirely of feeds grown on the farm, furnishes the cows with all the nourishment necessary at a much reduced cost:

	Pro.	C.H.	Fat
40 lbs. silage	.5	5.68	.28
14 " clover	.994	5.29	.252
5 " oats	.535	2.51	.190
2 " corn	.159	1.33	.086
	<u>2.187</u>	<u>14.81</u>	<u>.808</u>

The foregoing ration is slightly deficient in C H, but this deficiency is made up by the excess of fat in the ration. All the requirements are met by feeding only those feeds grown on the farm and using only 61 lbs. of feed daily for each cow. This ration would be much less expensive than the one now fed and would also be more palatable. Some years, however, the price of oats or of corn would be so high as to make this ration rather expensive.

The following ration in which the oats has been replaced by bran furnishes all the nutriment necessary.

	Pro.	C H	Fat
40 lbs. corn silage	.5	5.68	.28
14 lbs. clover	.994	5.29	.252
3 lbs. corn	.237	2.01	.129
4 lbs. bran	.476	1.68	.1
	<u>2.207</u>	<u>14.66</u>	<u>.761</u>

This ration is also short in C H but the excess of fat satisfies the requirements. The following ration has three grain feeds and undoubtedly would be slightly more palatable than the other two:

	Pro.	C H	Fat
40 lbs. corn silage	.5	5.68	.28
14 lbs. clover	.994	5.29	.252
2 lbs. corn	.158	1.33	.086
2 lbs. barley	.168	1.31	.032
2 lbs. bran	.238	.84	.05
	<u>2.058</u>	<u>14.45</u>	<u>.7</u>

A number of other rations could be figured out which would supply the nutrients required by the cows. The ration fed at any particular time, however, will depend on the feeds grown on the farm and the relative market value of those feeds.

The relative cost of the previous rations can be calculated for any time if the market value of the different feeds is known for that time. On December 2, 1913, the farm prices for feeds of different kinds at Faribault were as follows:

	Market price	Cost per lb.
Bran	\$18.00 per T.in car lots	.9¢
Clover hay	7.50 " "	.375¢
Shelled corn	.54 per bu.	.982¢
Oats	.29 " "	.9¢
Barley	.44 " "	.916¢
Silage	3.00 per ton	.15¢

The value of silage is considered to be about a third of timothy hay, which was \$9.00 per ton at that time.

The cost per day of feeding each cow then was as follows:

60 lbs. silage	.9¢
20 lbs. clover hay	7.5¢
9 lbs. bran	8.1¢
	<u>24.6¢</u>

Each cow was getting daily 24.6¢ worth of feed, under the feeding practiced in the fall of 1913. The cost of ration number

two would be as follows:

40 lbs. silage	.6¢
14 lbs. clover	5.25¢
5 lbs. oats	4.5¢
2 lbs. corn	1.964¢
Total -	<u>17.714¢</u>

This ration would be nearly seven cents per day cheaper than the one now being fed. Ration number three would cost:

40 lbs. silage	.6¢
14 lbs. clover hay	5.25¢
3 lbs. corn	2.946¢
4 lbs. bran	3.6¢
	<u>17.796¢</u>

This ration costs slightly more than number two, due to feeding a little more corn. The fourth ration in which there are three grain feeds would cost as follows:

40 lbs. silage	.6¢
14 lbs. clover hay	5.25¢
2 lbs. corn	1.964¢
2 lbs. barley	1.832¢
2 lbs. bran	1.8¢
	<u>16.846¢</u>

This last ration is the cheapest one and furnishes all the nutriment necessary for almost eight cents a day per cow cheaper than the one being fed at present. On a herd of approximately one hundred cows the saving would be about eight dollars per day. With the present price of feeds there is not much choice as they are

nearly all the same price per pound, but there are times when a substantial saving can be made by a slight change in ration, due to the fact that the feeds are not always the same price per pound. Of course, most of the feeds will be raised on the farm and be fed regardless of price unless there should be a big enough spread to sell that which is raised and buy some other just as good for less money. One fact remains clear, however, and that is, that the cows are being fed entirely too heavy a ration at the present time and not enough attention is paid to feeding in proportion to production.

The actual labor of feeding, according to production, would not be much more than is required under the present system, but those who do the feeding would have to be more careful. After the testing has started and the amount of butter fat produced is known, as well as the amount of milk, tables can be worked out showing the number of pounds of grain and of roughage to be fed for every pound of milk produced. After a cow has once reached her regular flow of milk after calving, her ration would not need to be changed more than once a month and in some cases not that often. Of course, any great variation in amount of milk given or in butter fat content should be followed by a corresponding change in the ration, but a cow's pro-

duction remains fairly constant so there would not be many changes. The people who do the feeding should know what each cow produces in order to know how much to feed her. This can be fixed by having small cards at the head of each stall showing how much milk the cow is producing, and from the tables made for that purpose, could easily be figured the pounds of grain and of roughage to be given for each pound of milk. The man employed at present to do the feeding is not competent to do the work, as he can neither read nor write. At present he is feeding all cows alike regardless of production. He cannot do the weighing and so has no idea of how the cows should be fed.

The question naturally comes up at this point as to who shall be responsible for the carrying out of these plans. The present help is not competent and some one who has better training along dairy lines should be hired. The inmates cannot do any weighing, testing, record keeping, figuring rations, or feeding. All of this work will have to be done by citizen labor as the inmates cannot do anything which requires any brain power or in which there is any responsibility. Two competent men will be needed to do the work in the dairy, one of whom, at least, should have some special training in dairying. The other should serve as his assistant. During

the summer when the cows are out on pasture and there is very little barn feeding to be done, one of them could put in considerable of his time in the field, but during the winter months the services of both will be required in the barn.

Just how the work could be best apportioned between the two men will have to be learned by experience. One of them could take charge of the milk and do such work as weighing, testing, separating, keeping records, and figuring rations. The other could be known as the herdsman and have active charge of the barn and of the animals themselves. His work would consist of feeding calves, bulls, and young stock, breeding the cows, and seeing that the inmates keep the barn clean and do the milking properly. Both of the men probably would be required to do the feeding as it would take one man alone too long to do the feeding and the cows would become very restless and nervous while waiting for their turn to be fed.

#### Reorganizing the Hog Enterprise:

In reorganizing the hog enterprise a suitable location for the hog house and yards should be found as the present one is very unsatisfactory, being too far from any of the colonies of inmates and too close to the stagnant pond of water. Preference should be

given to a place where conditions are more healthful and which is more accessible to the help. One reason for placing the hog house so far away from the other enterprises is because garbage is fed and is very disagreeable when allowed to collect in any quantity and decay. Negotiations are under way at the present time to buy the ten acre tract marked X on Plate 11. This would form a good place on which to locate the hog enterprise as the northeast corner is high and well drained and would form a good site for the hog house. There would also be plenty of room for pasture if any was desired. Besides this it would be fairly near the dairy barn and the main campus, and help could be quickly brought to the place at any time. This ten acre tract should be bought as soon as possible, because from its location it will eventually become a part of the farm, and never will be any cheaper than it is at present. If this cannot be secured for the hog enterprise, the next best place is at the point marked Y on Plate 11. This, however, is not nearly so desirable on account of poorer drainage, and of breaking up the field now used annually for the growing of silage, but it is more desirable than the present location.

The type of hog grown at the present time is the lard type

running strong to Poland China, but this type is unsatisfactory in a great many ways. Hogs are grown primarily to produce meat for the inmates, but as many of the inmates are children under fifteen years of age, meat containing much fat is not eaten by them. When any fat is put on the tables, even though well cooked and prepared, much of it is left and thrown in the garbage and hauled out to the hogs again. If a type of hog could be raised having a higher per cent. of lean to fat, more of it would be eaten and less of it wasted. Undoubtedly the method of butchering and cutting up the carcasses has much to do with the amount of loss, but a bacon type would have less loss than the lard type in any way of cutting. It would be advisable, therefore, to grow a bacon type of hog, such as the Yorkshire. They are very prolific, are good rustlers, and will make a pound of gain with as little feed as any other breed. The only ones sold for market are the ones that remain after the institution needs have been supplied, enough hogs being kept all time to consume all the garbage and waste from the kitchen and dining rooms.

The amount of garbage from the institution is nearly the same day after day, regardless of seasons, although there may be a little more in summer when vegetables are plentiful. According to observa-

tions made last August, enough garbage is produced daily to feed about twenty thousand (20,000) pounds of live hogs. It is impossible to so regulate the hog enterprise as to have just enough hogs on hand at all times to consume the garbage. To be sure to have all the garbage consumed, it will be necessary at times to have more on hand than the garbage will feed. As the pigs grow in size they require individually more feed and something besides garbage must be given them to keep them growing or to fatten them.

The following plan of operation could be safely and profitably followed on this farm. About twenty (20) sows could be kept for breeding purposes, raise two litters in one year and then be fattened and disposed of. The sows at one year of age would weigh about two hundred fifty (250) pounds a piece. The first litters would come, from about the first to the fifteenth of March. The hog house on the place is large enough for eighteen (18) sows and has a boiler in a room in one end of it. By installing a few pipes around the pens, the house could be made warm and comfortable enough to have young pigs come in the first part of March. One or two cots could be built for use in an emergency of any kind. These pigs should be about six weeks old at weaning time and would probably weigh about eighteen (18) pounds a piece at that time. Figuring

that these pigs will gain on an average .8 of a pound a piece per day it will take to about the first of September before all of the garbage will be consumed by the sows and the young pigs, which should weigh about 114 pounds a piece at that time. About this time a bunch of them could be separated from the rest and put in a separate feed lot where they could be given corn in addition to what garbage is left after the main herd is fed. From time to time a few could be killed for home use, or if enough were on hand a carload could be sold. As soon as possible after weaning, which will be about the middle to the end of April, the sows should be rebred. They will come in heat in about two weeks after the young pigs have been taken away from them and should all be rebred by the middle of May. In this way they will produce their second litters before the middle of September and the young pigs will have a good start before the winter comes on. After the second litter has been weaned the sows should be turned into the feed lot and fattened for disposal. In some cases an exceptionally good sow could be rebred a third and possibly a fourth time, but an old sow usually gets too heavy to handle easily. After this plan has been in operation for some time there will always be on hand a large herd to consume the bulk of the

garbage. Besides, there will generally be some in the feed lot, being fattened for home consumption or for sale. From time to time old sows and young pigs will be taken from the main herd and put in the feed lot, but by proper management there will always be enough hogs on hand to consume the garbage as fast as it is produced and none of it will be wasted. Young sows could be selected for breeding purposes as fast as the old ones were put in the feed lot, the aim being at all times to have about twenty sows farrow during the first part of March and again about the first to the middle of September.

For the breeding of these sows one boar will be sufficient if he is handled in the right manner. The boar should not be turned loose with the bunch of sows to be bred, but should always be kept by himself. Whenever a sow came in heat she should receive one good service from the boar and then be taken away. In this way the boar could give good service to a larger number of sows than when allowed to run loose with them. As a sow remains in heat for about three days and can be bred at any time during those three days, it will very seldom be necessary for the boar to serve more than two sows a day at the most and still the twenty sows could be bred in

the required time. A new boar would have to be purchased every year to prevent inbreeding. The same principles of selection should be followed as in the buying of bulls. A pure bred sire should always be used and the different ones used from year to year should be of the same type and breed. In this way a high class grade of pigs could be built up in a few years.

In the feeding of garbage, floors or platforms should be built. Not much is known as to which is the best kind of floor to build, but the general opinion of those who have fed garbage is that wooden floors are best. Cement floors are too cold in winter and freezing takes place so quickly that most of the garbage is frozen before it can be eaten. The floor should be so constructed that it can be washed clean of everything and thus kept in a sanitary condition. Any coarse solid matter which the hogs do not eat should be piled up and hauled away to prevent any accumulation of decomposing matter in the hog yards. The floor should be built off the ground and made so it could be moved easily when the ground around and beneath it is wet and soggy. By moving it from place to place the surroundings can always be kept clean and sanitary. The condition of the garbage likewise is an essential thing to consider. Care should be taken to keep out all washing powders and sodas as they

are very injurious and when present in any quantity may kill the hogs. Dry garbage, likewise, is much better than that which is soggy and wet. It is impossible to have dry garbage, but care should be taken to keep out dish-water and other slops as they contain very little food material and hasten the decay of the other garbage. The garbage should be collected twice a day, at least, during the summer time so that it will be strictly fresh at all times and not be injurious to the hogs.

If the hog enterprise is run in the preceding manner more meat will be produced annually than has been done in the past; more will be consumed by the inmates because they will be getting a kind they will eat. In this way less of other kinds of meat will have to be bought. In time it would be possible to develop a plant for the curing and preserving of all the ham and bacon used on the place. There is always a good use for bacon and more of it would be used if they had it. The table of food requirements shows that 20,800 lbs. of pork could be used annually. If the preceding plan of operation is followed, two hundred eighty (280) pigs will be available every year for food or for sale. They probably would weigh about two hundred twenty five (225) pounds at the time of butchering and according to Henry's "Feeds and Feeding" should dress out about seventy five (75) per cent. This would give 4 7,250 lbs of pork, or about twice as much as is needed.

POULTRY:

The institution uses annually fifteen thousand six hundred (15,600) dozen eggs, for the production of which it will be necessary to keep a flock of approximately twenty two hundred (2200) laying hens. The successful management of as large a poultry plant as this will require the service of some one who has had special training and experience in handling poultry and one who can command a higher salary than is being paid at the present time. If such a manager can be hired at a salary sufficiently high to be an inducement to stay for several years undoubtedly the poultry enterprise can be made to supply the institution needs at a profit.

The poultry enterprise was started to give the girl inmates an industry in which they could get outdoor exercise and recreation, but up to the present time only about six girls have been employed in the poultry. A plan which would give more of the girls an opportunity to get outdoor exercise would be to have the hens in flocks of about one hundred; each flock to be tended by a separate group of inmates in care of an attendant. It would be the duty of the poultry manager to give to the attendants the instructions necessary to keep each flock in the proper condition for egg production. He would

figure rations, plan improvements or changes in buildings, and yards, and tend to the breeding flock and the incubators. The chicks also could be divided into flocks which would be put in charge of groups of girls.

In addition to eggs the poultry would furnish meat to the institution as there would be annually about two thousand hens and two thousand cockerels to be disposed of. An average Plymouth rock hen or cockerel should weigh about five pounds dressed, making twenty thousand pounds of meat from the four thousand birds. The dietitian reports that they should have at least one meal of poultry per month, but that more would be very desirable if the meat could be supplied. The previous plan of operation would give a little over twenty two meals during the year, almost two meals for each month.

The institution uses practically the same number of eggs each month of the year, but the amount produced by the poultry will not be the same. There will be a period of high production during the months of April and May and a period of low production in the late summer. There should be some method of preserving eggs so that the institution will be supplied with a uniform quantity throughout the year. The cheapest and probably best method is to preserve the eggs in a water glass solution, one pint of water

glass to nine or ten pints of water. Popular Bulletin No.54 of the Washington Agricultural Experiment Station, reads: "The general opinion of those who have used the water glass method is that eggs properly preserved will serve one's needs nearly, if not as well, as fresh ones and unquestionably better than the average cold storage product sold upon the market".

It is very desirable to have a complete set of records in managing the poultry enterprise. The following form is a convenient one for keeping the incubator record:

INCUBATOR RECORD

Date eggs put in \_\_\_\_\_

Number eggs put in \_\_\_\_\_

Date eggs hatched \_\_\_\_\_

No. live chicks \_\_\_\_\_

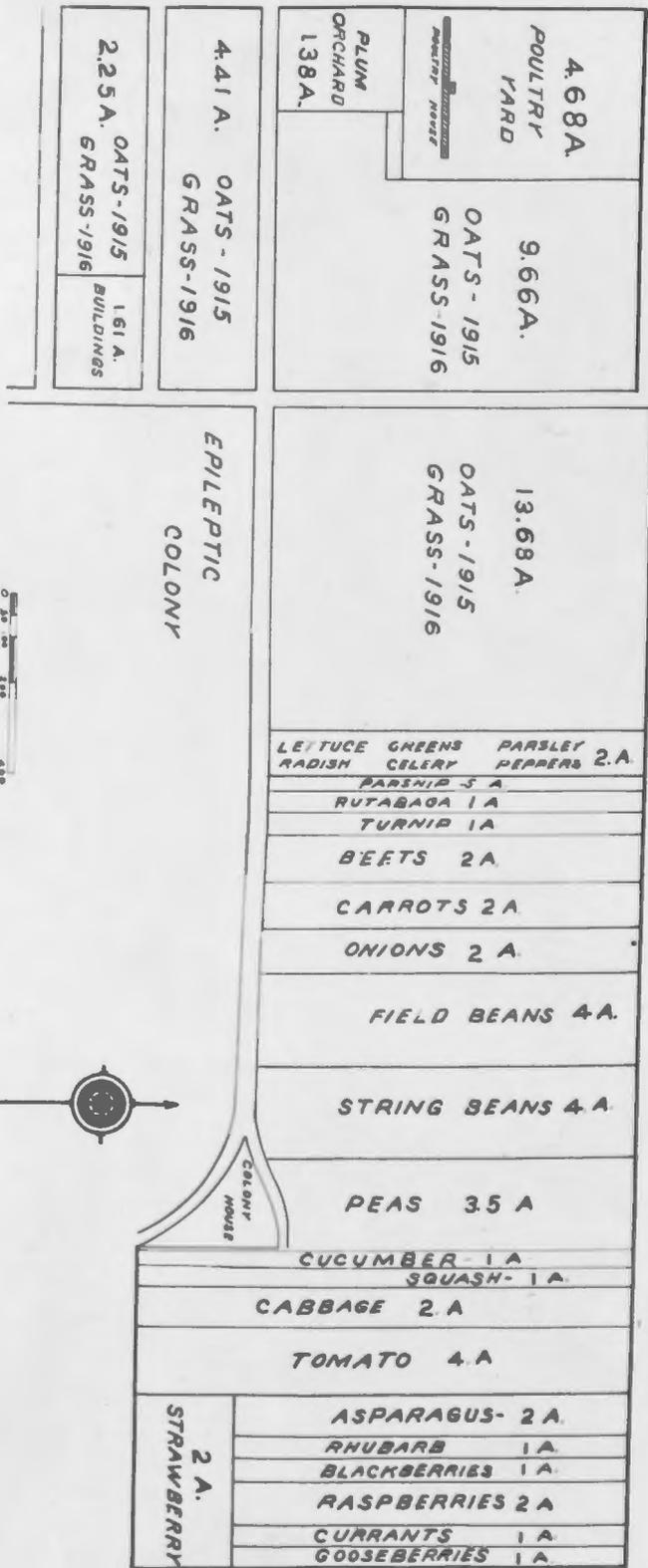
If successive hatchings are made from the same incubator , or if more than one incubator is used, the same form can be used by means of column headings.

The form below is a convenient one to use in keeping record of the amount of feed consumed by the poultry and the eggs or meat produced by them. One sheet per month will be necessary.

Month - January

<u>Day</u>		<u>Dollars cents</u>	<u>Dollars cents</u>
1	50 bu.oats at .50	2 50	
	10 doz.eggs valued at .20		2 00
2	2000 lbs.bran at \$18 per T	18 00	
	9-1/2 doz.eggs at .20		1 90
	1000 lbs.meat at .10		100 00

# PLATE V



# REVISED GARDEN PLAN

### THE GARDEN:

A glance at the garden plan, Plate IV, showing the garden as it was during the summer of 1913, shows a large number of small irregular fields. There seems to be no system in planning as there is no definite place for any one vegetable. The root crops are scattered over the whole garden in little patches; the small fruit is not all in one place; the beans are in several places as is nearly every other vegetable. The garden as a whole has not been rotated for the reason that it has taken up practically all the available land. The fields used for alfalfa, wheat, and meadow need to be tilled before they can be used for garden purposes. The areas needing drainage are indicated on Plate IV. If these areas were drained a simple rotation could be worked out as this would give enough available land to practice a garden rotation. It would give two thirty acre fields which could be cropped as follows: Garden - garden - grain with clover - clover. This would make a four year rotation. Besides these two thirty acre fields, there would be ten acres on the west side for permanent small fruit. Plate V shows the revised garden plan with a detailed cropping scheme for one of the thirty acre fields and for the ten

acres of small fruit. The revised plan gives much more small fruit than the original, but more is needed. The planting should be done in rows the long way of the field and all cultivation, spraying, etc., can be done by team. The same is true of the garden; the long rows will allow team work and much less hand work will have to be done. Each vegetable is put in a place by itself and is not scattered over the garden in several small patches. The scheme of planting can be varied each year so as not to have any vegetable growing in the same place two years in succession. After the garden has been growing in the east thirty acre field for two years it should be put on the west thirty acre field and the four year rotation followed.

The following table gives the estimated yield of vegetables and small fruit under this system of cropping.

Strawberries	2 acres	6000 qts.
Gooseberries	1 "	3200 "
Currants	1 "	3200 "
Raspberries	2 "	4800 "
Blackberries	1 "	2400 "
Rhubarb	1 "	5 tons
Asparagus	2 "	5 "
Tomatoes	4 "	32 "
Cabbage	2 "	18000 heads
Squash	1 "	8 tons
Cucumbers	1 "	750 bu.
Peas	3-1/2 "	350 bu. green in pod

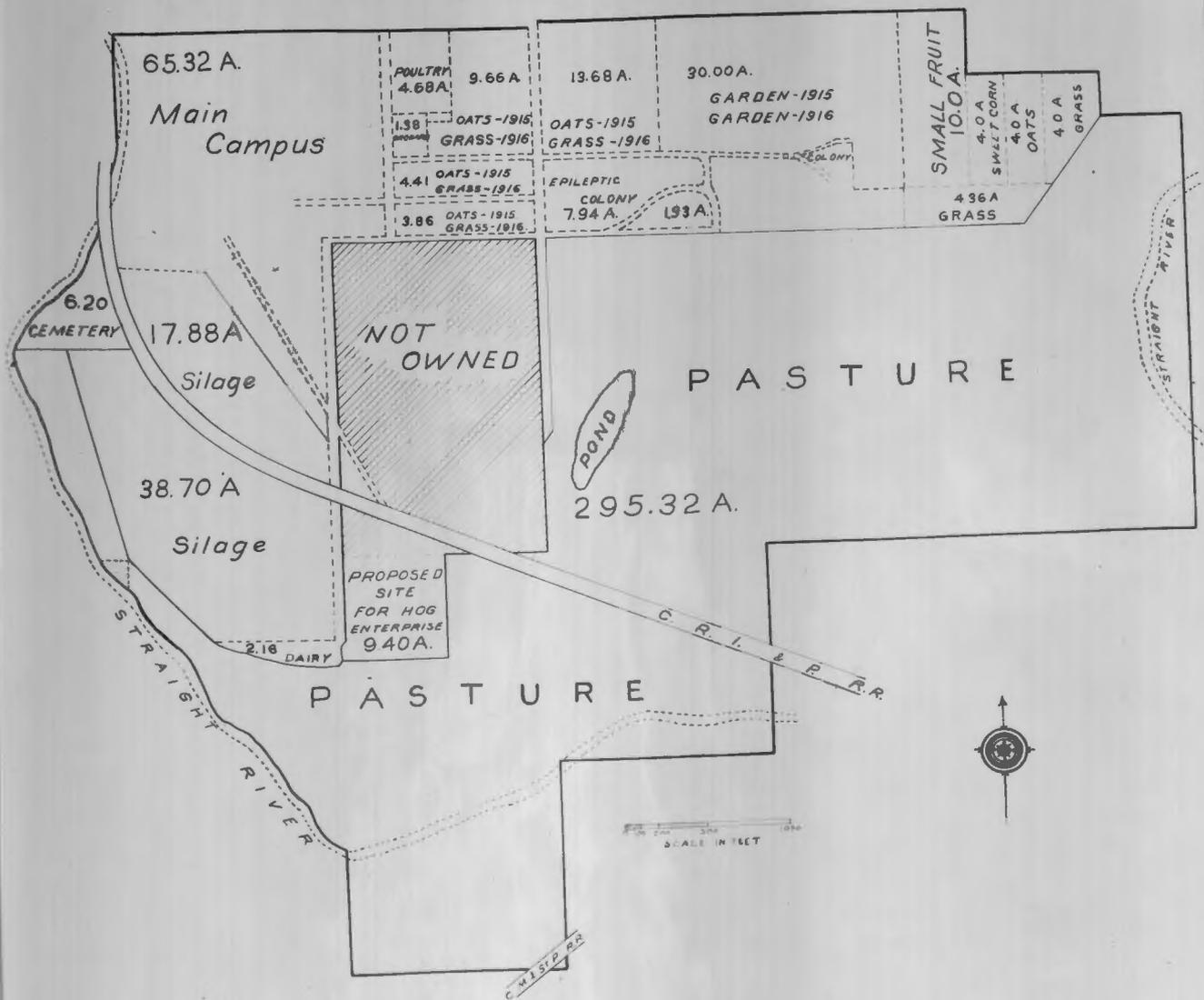
String Beans	4 acres	400 bu.
Field Beans	4 "	32 "
Onions - green	1/2 "	261,360 onions
Onions- bulb	1-1/2"	350 bu.
Carrots	2 acres	1000 "
Beets	2 "	1000 "
Turnips	1 "	800 "
Rutabagas	1 "	800 "
Parsnips	1/2 "	650 "
Miscellaneous	2 "	Radish - Lettuce Salsify- Parsley Peppers- Greens, etc.

This garden plan makes no provision for sweet corn, however, but just east of the small fruit is a sixteen acre field that can be used for this purpose. Four acres of sweet corn is enough to keep the institution supplied for three weeks one meal a day and still have enough left for seed. One acre of early can be planted, two acres of medium, and one of late. A small four year rotation can be worked out on the sixteen acre field as follows: Sweet corn - oats with grass - grass - grass.

The present method of measuring vegetables and garden products is very unsatisfactory, as the system is not uniform for the different vegetables; some are measured by weight, others by volume, some by the plant and still others by bunches. It would be possible and more satisfactory to give all yields by weight, as there would

be a basis for comparison and a uniform system for all vegetables.  
The system has been put in practice in New York and found very satisfactory.

# PLATE VI



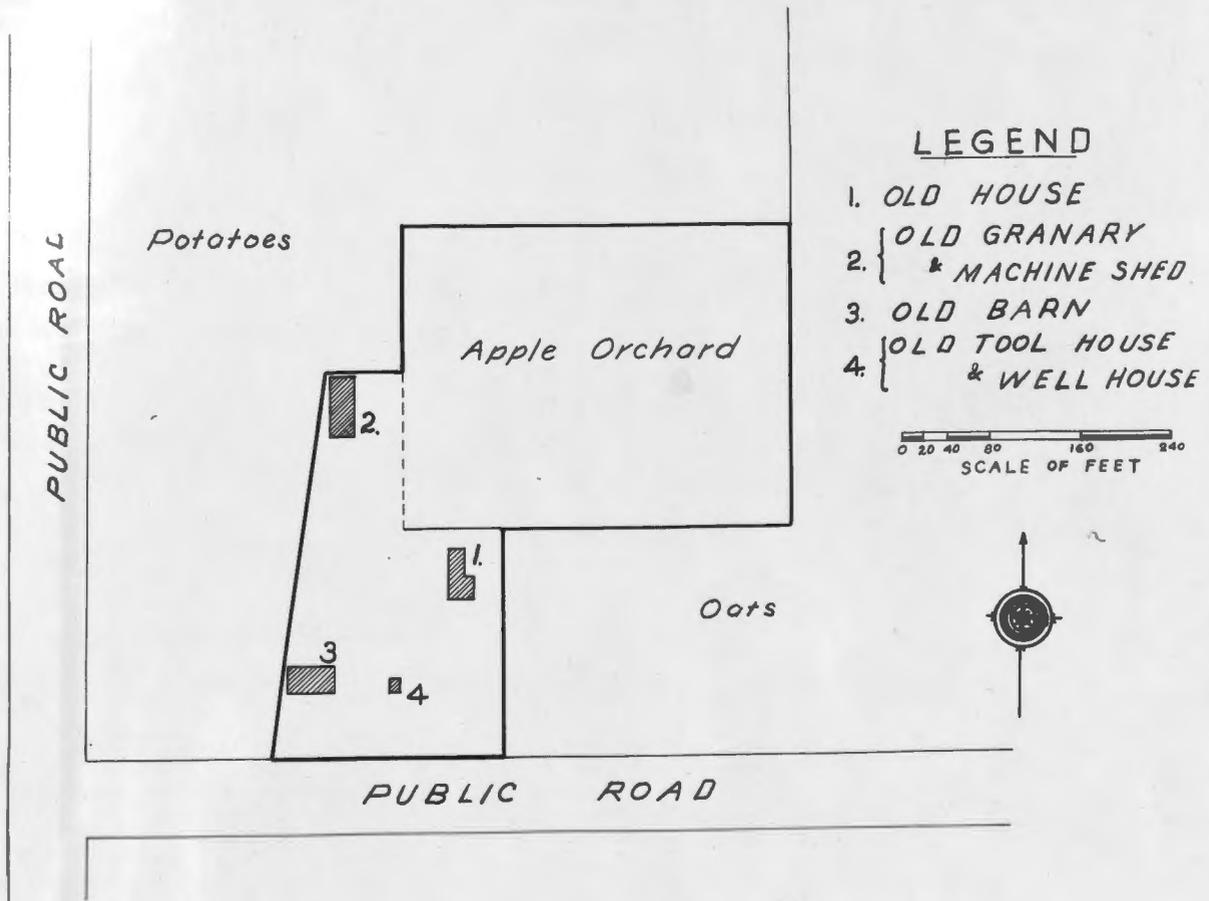
COMPLETE REVISED PLAN  
OF  
NORTH FARM.

The complete revised plan of the North farm is shown in Plate VI. The noticeable feature of this plan is the large amount of land put into permanent pasture but this much pasture is needed. Practically all of the land in the proposed pasture is too rough to be good for anything but meadow or pasture and much of it makes poor pasture so that at least two acres is required per cow in an average season. During a season drier or wetter than the average more than two acres will be required as the lowlands will be flooded or the hilltops be bare. The one hundred twelve cows with the young stock will need all the pasture afforded by this plan. There will be about fifty-six acres of land just north of the dairy barn available for growing silage corn every year.

# PLATE VII.



# PLATE VIII.



FARMSTEAD  
AT  
G

The South farm:

At the present time H (Plate 1) is used as the main farmstead from which all work on the South farm is directed. For a detailed plan of H see Plate VII. There is another old unused farmstead on the South farm at G (Plate 1), for a detailed plan of which see Plate VIII. The only building used on this place is the granary and machine shed, but even this is too old to be of much value. A large modern colony house is now being built just east of this farmstead, for the housing of another colony of inmates. This should be made the main farmstead from which the work on the farm could be directed. It is near to the other farm, the main campus, and also more centrally located for working the South Farm. As much traveling is done between the two farms, there would be a big saving of time by having this the main farmstead. The big saving of time would come, though, in the actual working of the farm, since much less time would be taken up in going to and from the different fields. No field would be much more than a mile away as compared to nearly two miles which is the distance of the farthest field from H. By actually timing the teams going from H to cultivate corn in the

north end of the farm during the summer of 1913, it was found that a little over two hours each day was spent in going to and from work. Much of this time could be profitably used by having G the central farmstead.

Another point in favor of G is the topography or lay of the land. G is comparatively level with just enough slope to drain well, while H is at the foot of a steep slope. Going straight north from the root cellar to the corn crib, is a steep grade; too steep to allow passage up or down with machinery or vehicle of any kind. South of the farmstead the land is too low for good drainage. The present buildings are built just at the foot of the steep grade and close up to it. There is good protection from the west winds, but there is not much room for expansion in any direction without a great deal of grading. Any hauling about the farmstead is also very difficult because of the steep grades.

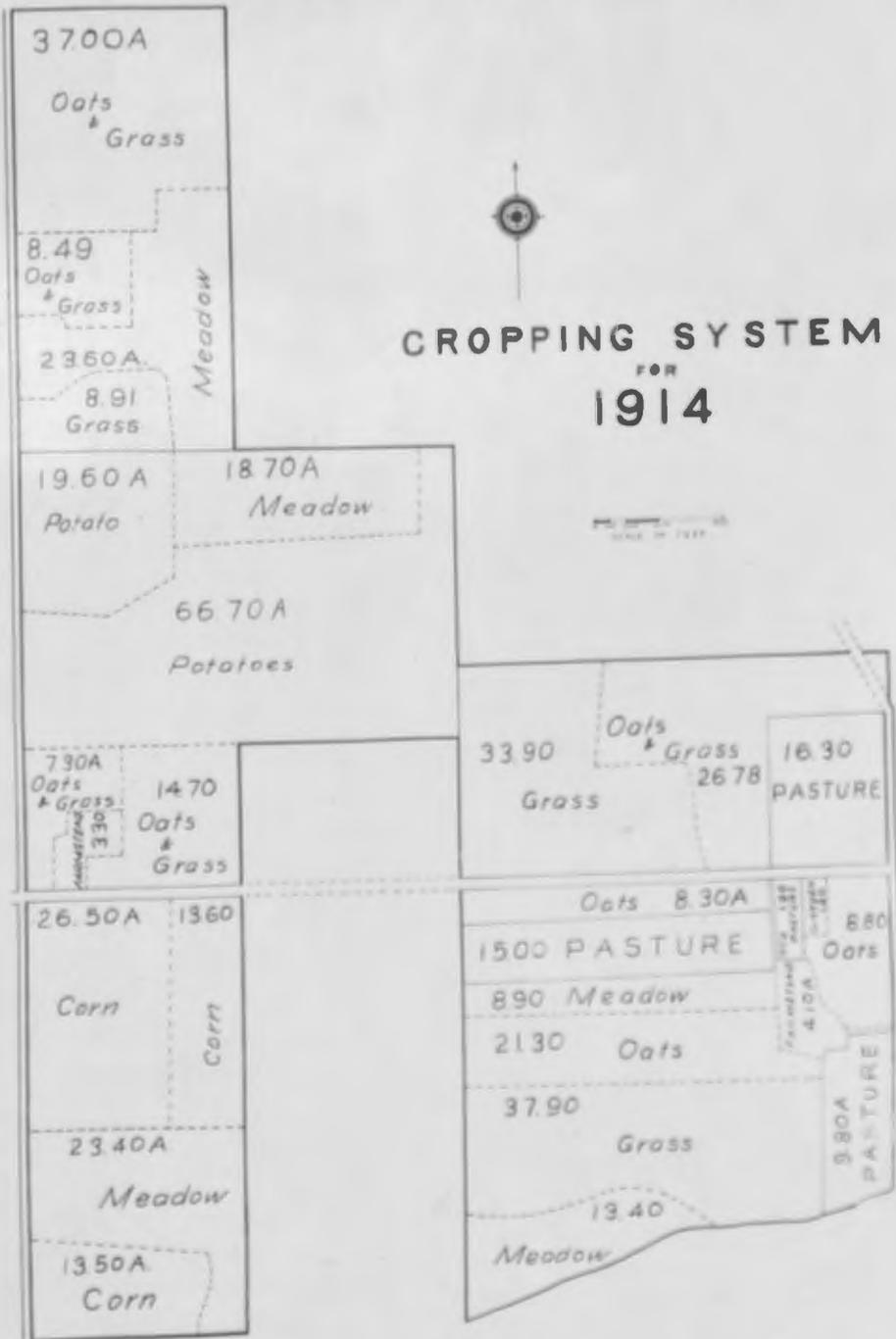
There are buildings on H at the present time, but the only one in good condition is the cottage, which was remodeled and enlarged a few years ago. The other buildings are all old and badly in need of repairing. The plan at present, see Plate V, is to move 3 to the north side of 4 and take down the south wing of 4, which is now used as granary and chicken house. This would be very

expensive and at the end would give only an old patched up barn, poorly planned and very unsatisfactory. The other buildings on the place are all in poor condition and will have to be rebuilt in several years from now if present plans are carried out. Besides the fact that the present buildings are old and in need of repair, they are much too close together for convenience in working about the farmstead, or for protection in case of fire. Taking these things into consideration, the logical place to locate and develop the farmstead is at G. There is nothing in the way of beginning on an entirely new plan and putting up a farmstead, model in every way. An institution of this kind is a permanent one and undoubtedly will be in existence three or four generations from now, and all planning and building should be done with the future in mind. The change from H to G need not be made at once, but can be done gradually. When any building on H will need to be replaced, an entirely new one can be built on F and the old one on H can be taken down.

After deciding on a place for the farmstead the next problem is to work out a cropping scheme or a system of rotation that will supply as nearly as possible the feed needed by the institution. Practically all of the farm is tillable and can be worked into a rotation with a little drainage. The areas to be drained can be seen

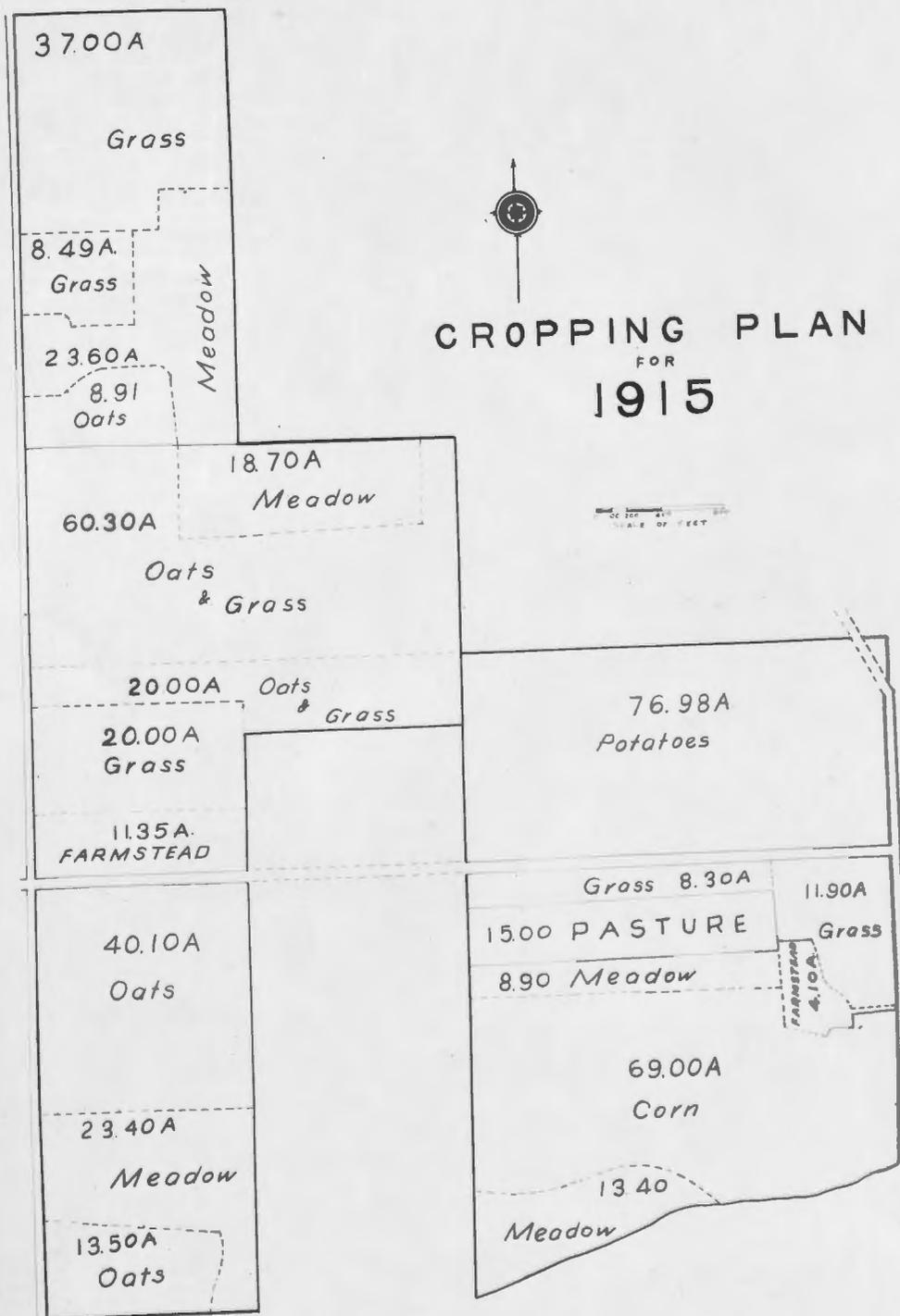
by referring to Plate III. All the fields which have been kept in meadow are too low and wet to cultivate without draining, but they can all be easily tiled and have good outlets. The neighbors are willing to co-operate in the drainage so there will be no trouble from them. In fact, the neighbor on the north has already asked the state to co-operate with him in putting in a system of tile that will drain both farms. Besides the meadows there are a number of other single lines of tile to put in where ditches have gradually washed out. Some of these will require much filling, but it should be done at once because they will become worse every year and require more filling. By putting in tile as indicated the whole farm becomes cultivable and a complete revised cropping system can be worked out as in Plate XIV.

# PLATE IX.



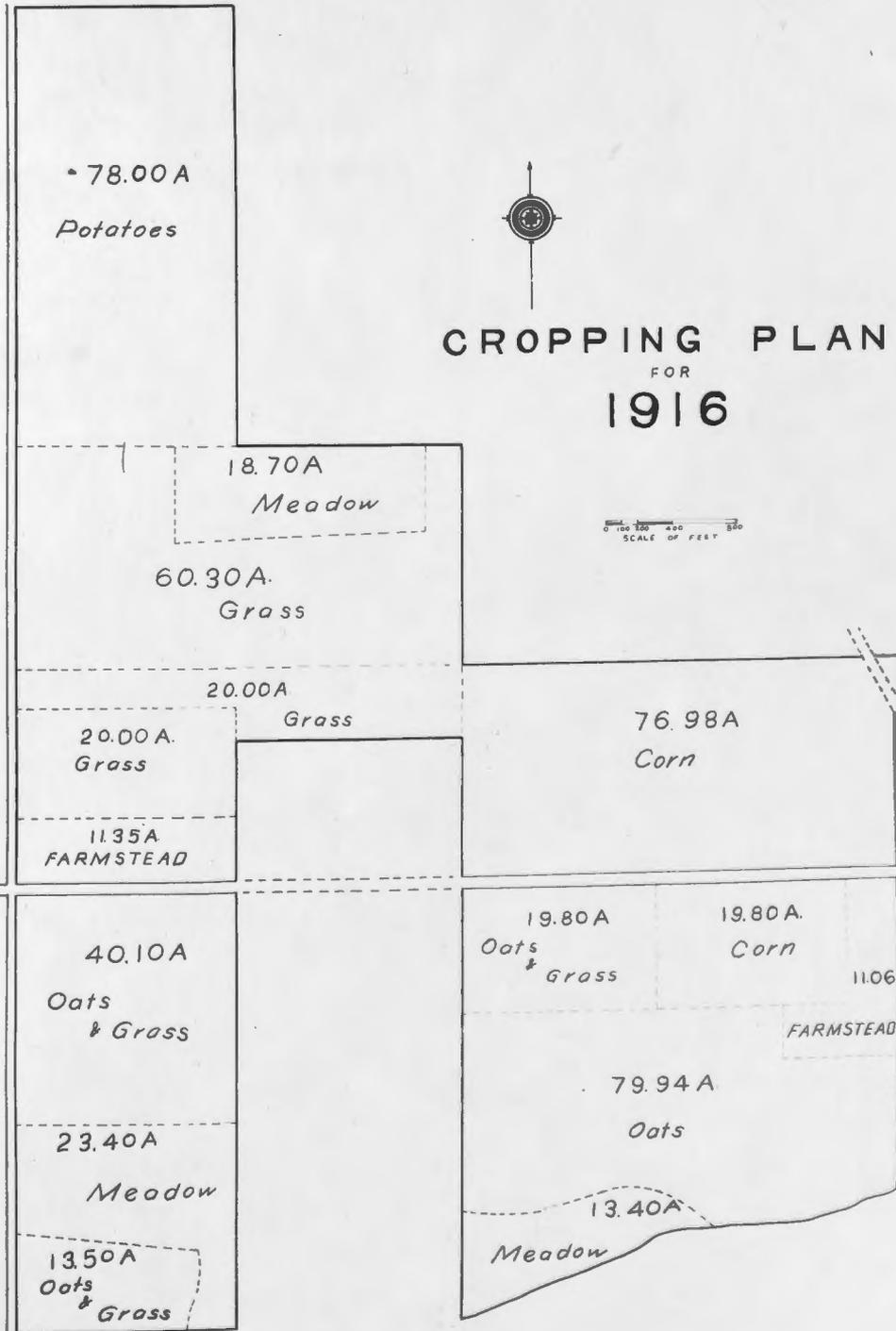
# SOUTH FARM

# PLATE X



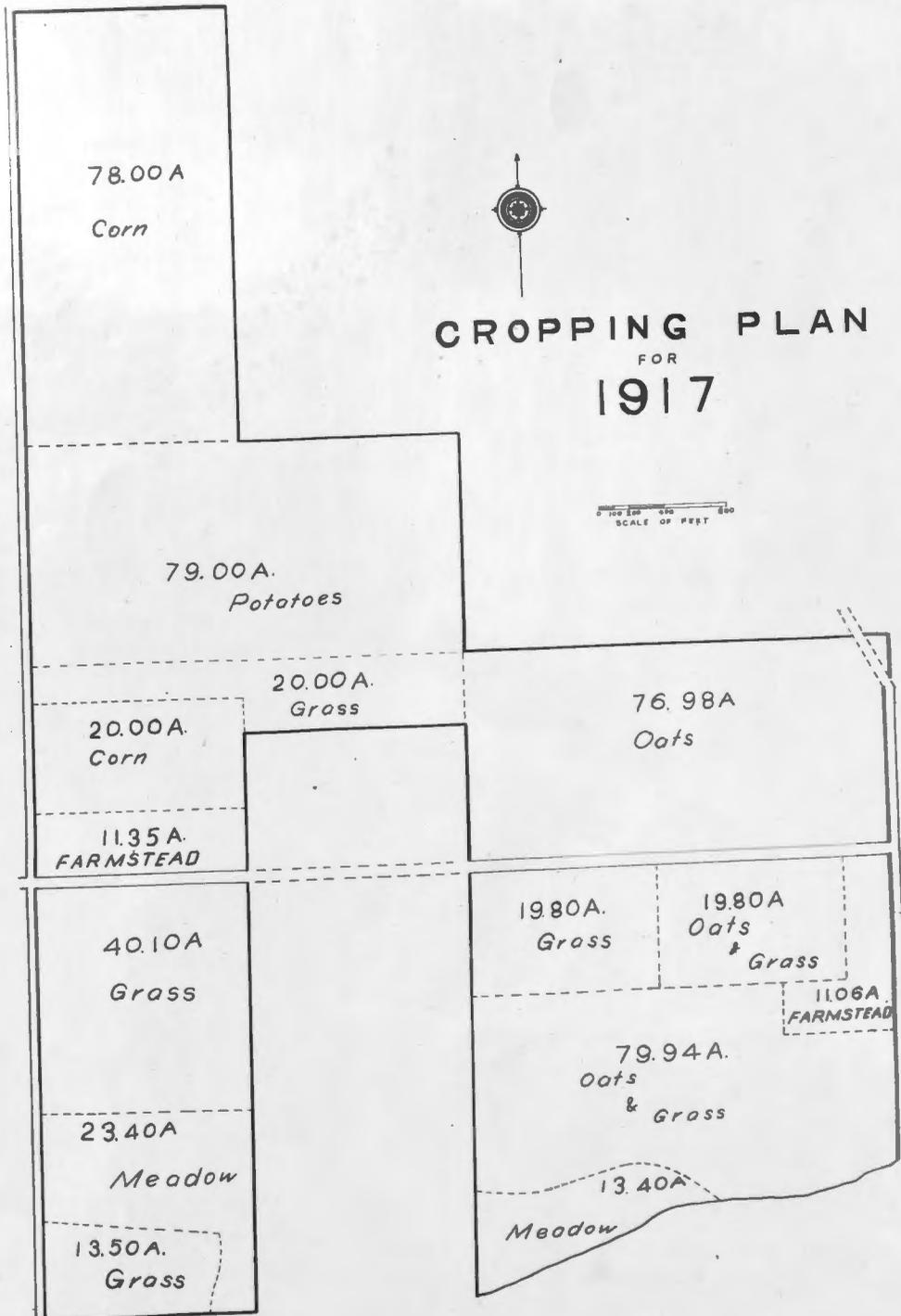
# SOUTH FARM

# PLATE XI



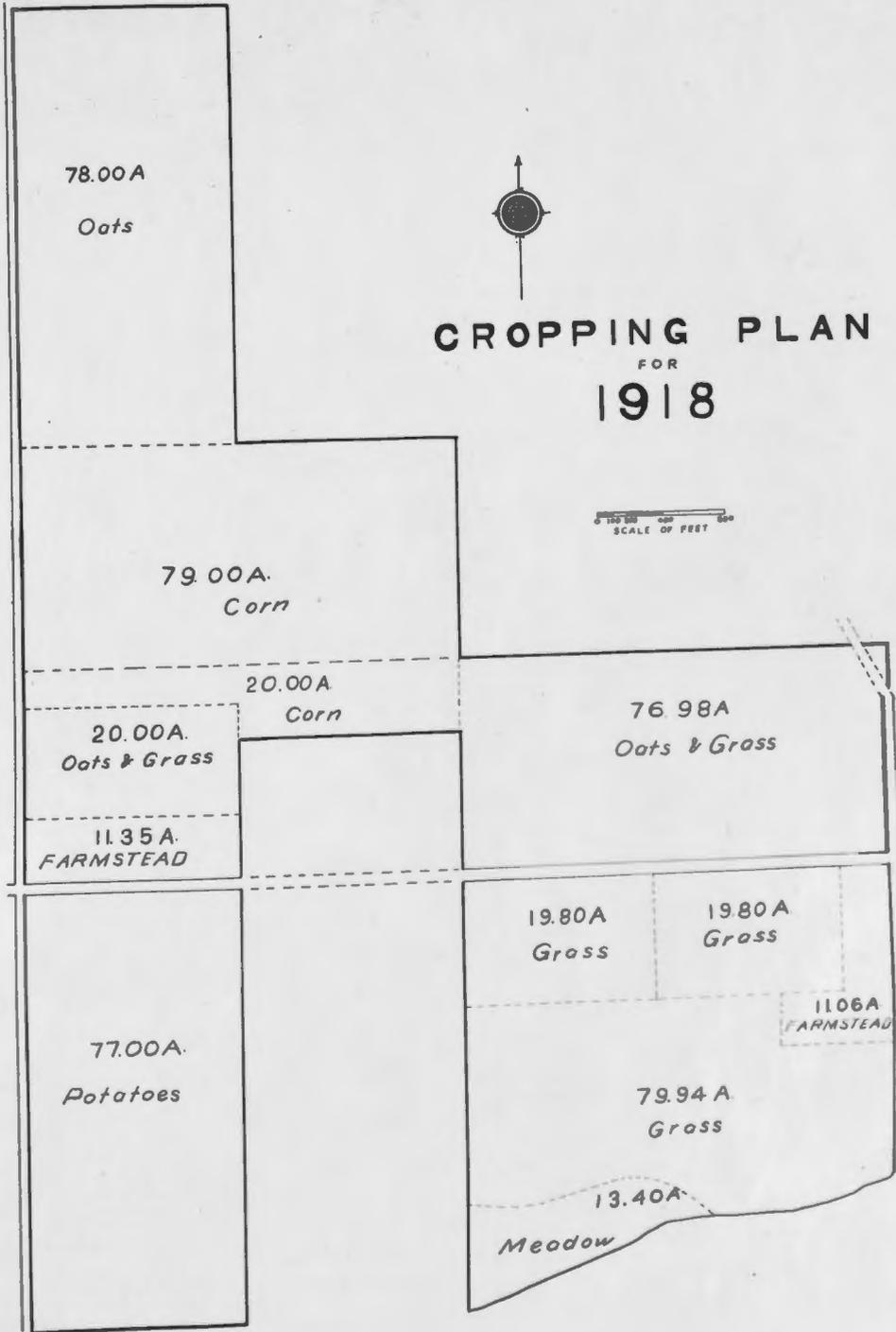
# SOUTH FARM

# PLATE XII.



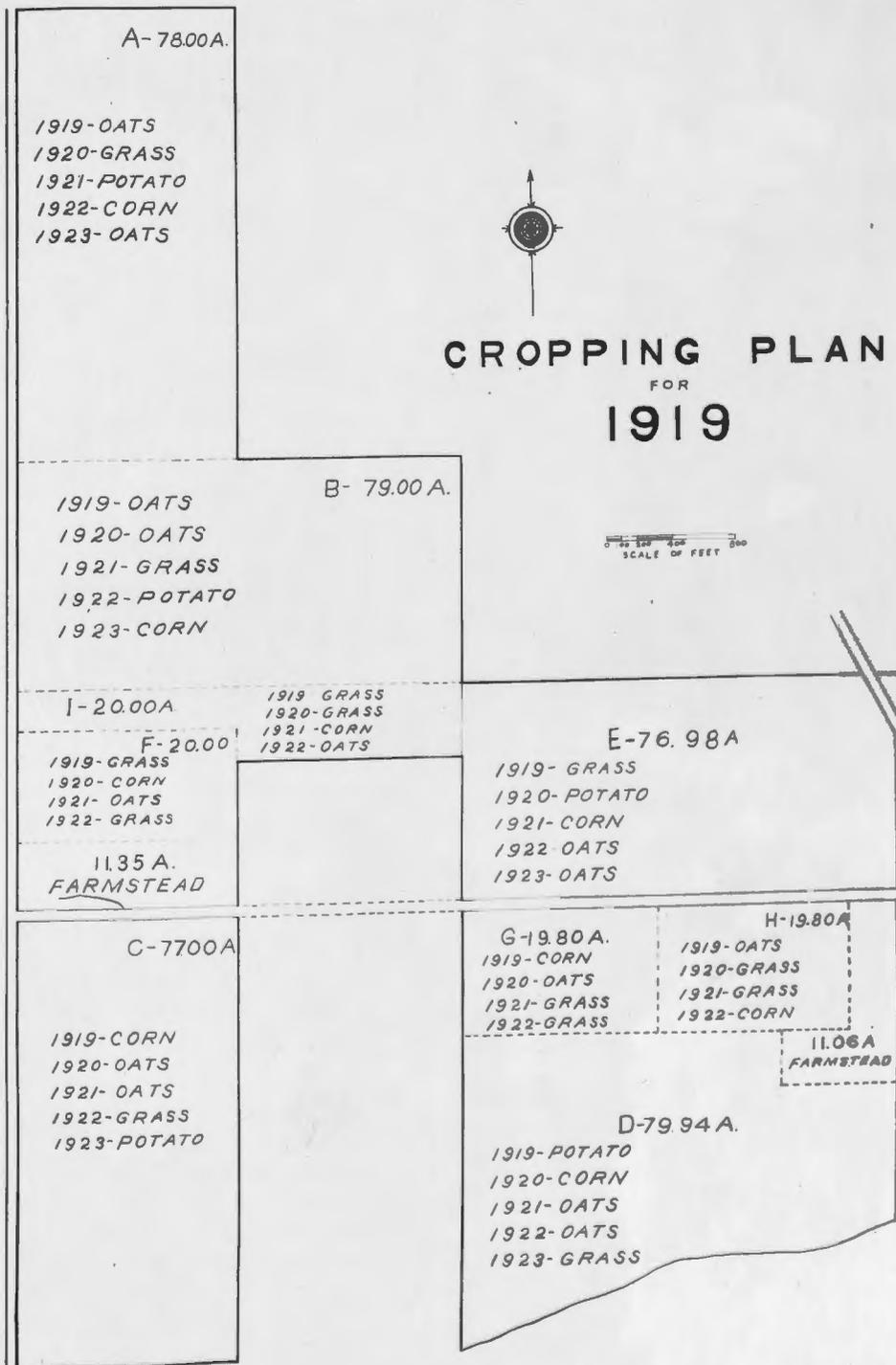
## SOUTH FARM

# PLATE XIII.



# SOUTH FARM

# PLATE XIV



# SOUTH FARM

This cropping system cannot be adopted in one year, however, but will have to be done gradually. By referring to Plates 1X to XIV the cropping for each year can be seen up to the time when the complete rotation is put in operation. Five years' time is taken to make the change from the present cropping plan to the revised rotation plan. There are two rotations in the revised plan; a five year rotation on five eighty acre fields and a four year rotation on four twenty acre fields. The five year rotation is - (1) potatoes - (2) corn - (3) oats or barley - (4) oats or barley with grass - (5) grass, the grass being a mixture of clover and timothy. The four year rotation is - (1) corn - (2) oats with grass - (3) grass - (4) grass. This leaves an eleven acre tract for the new farmstead at G and an eleven acre tract for pasture at H. This pasture can be used for the few cows that will be needed to supply milk and cream for the South farm. The crops grown in the revised plan of operation, acreages, and estimated yield will be as follows:

Crop	Acreage	Yield per acre	Total
Potatoes	80	150 bu.	12,000 bu.
Corn	100	50 "	5,000 "
			(280,000 lbs)
Oats	180	50 "	9,000 bu.
			(288,000 lbs.)
Hay	120	2 "Ton	240 ton.

Practically all of the feed produced on the South farm will be hauled to the North farm, as the only live stock kept on S is just enough to do the farm work. It may be necessary also to haul some corn stover and some straw to the North farm. This will deplete the organic matter of the soil in the five year rotation as there will be very little manure to apply each year. If excessive washing of the soil is to be prevented, special measures should be taken to keep up the supply of organic matter. This can be done by sowing rape in the corn at the last cultivation. The next year with the oats, some sweet clover seed could be sown and the growth plowed under in the fall. The next spring clover and timothy seed will be sown with the oats and left for two years when the second growth is plowed under. These methods will undoubtedly keep up the supply of organic matter, as in addition to this there will always be some corn stalks, straw, and manure to plow under. In time commercial fertilizers might be used to advantage in keeping up the plant food in the soil. It may also be possible to haul manure from the city of Fairbault, but just at present there are a few local seed companies who are bidding high for the privilege of hauling the manure away from the barns in town.

The following tables show the amounts of feed needed by the institution per year and the amounts of seed needed and the amounts furnished by the farm under the proposed plan of reorganization.

Table Showing Amount of Feed Produced

Crop	Acreage	Yield	Silage	Hay	Bu.	Grain ) Lbs.	
Corn	56	10 T.	560				) North Farm
Oats	19	50 bu.			950	30400	
Hay	23	2 T.		46			
Corn	100	50 bu.			5000	280,000	) South Farm
Hay	120	2 T.		240			
Oats	180	50 bu.			9000	288,000	
			<u>560 T</u>	<u>286 T</u>		<u>586,400</u>	

Fields on the South Farm were counted as full eighties, although a few acres should be allowed for roads.

Table Showing Feed Requirements.

Kind of Stock: daily	Silage			Hay			Grain		
	Each lbs.	No days	Total in tons	Lbs. each daily	No days	Total in tons	Lbs. each daily	No days	Total in tons
112 cows	40	200	448	14	200	156.8	6	200	134,400
	15	165	138.6				2	165	36,960
20 calves (1 to 2 yr)			32.5			11.2			
20 calves (0 to 1 yr)			3.5			8.5			10,940
2 Bulls	40	200	8.	20	200	4.	10	365	7,300
				35	165	5.7			
40 Horses				17	365	124.1	15	365	219,000
5 Colts (2 to 3 yr)				12	200	6.	8	365	14,600
				8	100	2.			
5 Colts (1 to 2 yr)				10	200	5.	5	365	9,125
				6	100	1.5			
5 Colts (0 to 1 yr)						1.	2	200	2,000
2200 hens	80	lbs. grain apiece per year							176,000
2200 pullets	40	"	"	"	"	"			8,800
2200 cockerels	40	"	"	"	"	"			8,800
<b>Totals</b>			<b>630.6</b>			<b>325.8</b>			<b>786,325</b>
<b>For fattening hogs</b>									<b>152,600</b>
									<b>938,925</b>

Table Showing Seed Required

	No. Acres	Seed per Acre	Total
Corn	100	1/7 bu.	25 bu.
Oats	199	3 "	587 "
Clover	119	6 lbs.	714 lbs.
Timothy	119	8 "	952 "
Sweet clover	80	15 "	1200 "
Rape	100	4 "	400 "

The following tables show the amount of plant food removed from the soil each year and also the amount put back into the soil by the manure and by plowing under the second crop of clover. The tables were compiled from figures taken from Hopkin's "Soil Fertility" and Lyon & Tippin's "Soils".

Table Showing Fertility Removed Annually.

	Nitrogen	Phosphorous	Potassium
199 acres of oats, 50 bu. per acre	6667 lbs.	1094.5 lbs.	1592 lbs
104 " " corn " " " "	5200 "	884 "	988 "
80 " " potatoes 150 bu. "	2520 "	520 "	3600 "
56 " " silage 10 T per "	8288 "	644 "	1988 "
143 " " clover 2 " " "		1430 "	6580 "
*30 " " garden	960 "	210 "	1350 "
	<u>23635 "</u>	<u>4782.5 "</u>	<u>17798 "</u>

\* The garden was figured as a potato crop.

Table Showing Amount of Manure Produced Annually and Amount Applied to Land, Figuring 25% Loss for Cow and Horse Manure and 50% Loss for Swine and Hen Manure.

	Tons Produced	Tons Applied
Horses	456	342
Cows	975	731
Swine	428	214
Hens	127	64

Table Showing Fertility Put Back into Soil Annually By Manures and Second Crop of Clover.

	Nitrogen	Phosphorous	Potassium
342 Tons Horse Manure	3078 lbs.	1778 lbs	3283.2 lbs.
731 " Cow "	6286.6 lbs.	4239.8 "	6432.8 "
214 " Hog "	3595.2 "	1669.2 "	1369.6 "
127 " Hen "	3025.8 "	3225.8 "	711.2 "
Clover	5720 "		
	<u>21705 "</u>	<u>10912.8 "</u>	<u>11796.8 "</u>
	Nitrogen	Phosphorous	Potassium
Removed Yearly	23635 lbs.	4782.5 "	17,798 lbs.
Put Back Yearly	21705 "	10912.8 "	11,796.8 "

These fertility tables show that nearly as much plant food is put back into the soil as was taken away. Since the soil is very rich in Potassium it will take a long time to use up all there is at this rate. The only element liable to run out is Nitrogen and this can be supplied by plowing under an extra crop of clover occasionally.

Table Showing Efficiency of Proposed Plan  
Of Operation

<u>Product</u>	<u>Amount required</u>	<u>Amount supplied by present plan</u>	<u>Amt. supplied by proposed plan</u>
Silage	630.6 T	400 T	560 T
Hay	325.8 "	325 "	286 "
Grain (Feed and seed)	959109 lbs.	493312 lbs.	586400 lbs.
DAIRY			
Butter	41600 lbs.		
Buttermilk	312000 "		
Cream	109500 ")	666851 lbs.	840000 lbs.
Milk	730000 ")		
Veal	20800 "	611 "	5250 "
GARDEN			
Beans - green	320 bu.	131-1/2 bu.	420 bu.
Beans - ripe	520 "		60 "
Cabbage	16900 head	7905 head	18000 head
Cucumbers	730 bu.	634 bu.	750 bu.
Onions		949.5 bu	450 "
Peas - green	320 bu.		350 "
Potatoes (Inc. seed)	11910 "	9913. bu.	12000 "
Roots	4015 "	1818 "	4250 "
Small fruit	20000 qts.	1546 qts	21500 qts.
Squash		854	16000 lbs.
Sweet corn (no seed)	42000 ears	465-1/2 bu.	56896 ears
Tomatoes	560 bu.	651 bu.	1066 bu.
POULTRY			
Eggs (no hatchings)	15600 doz.	2732 doz.	17600 doz.
Meat	10800 lbs.	2201-1/2 lbs.	22000 lbs.
SWINE			
Pork	20800 lbs.		47250 lbs.

PART III.

SUPERVISION OF STATE FARMS.

There are two ways in which the proposed plan of operation could be put into practice, either on the Faribault farm only, or on all Institution farms.

1. There could be some one to whom the people in charge of the different farm departments could go for advice and for help. This person could be known as the farm supervisor or inspector. It would be his business, besides acting as "information man", to go around the different institution farms and see that his instructions were carried out and help the people in charge of the different farm departments. Whenever necessary he could go out and help to plan cropping systems, locate building sites, farmsteads and act as general advisor for the farms of these institutions. He could work up a uniform system of record keeping for the different farms and call for reports at stated times to see that the records were kept up as they should be. Whenever necessary for some of the larger farms, a farm foreman, or a trained agriculturist could be hired to take charge of the farm, or a trained man to take charge

of some particular enterprise. This would greatly lessen the amount of work and responsibility for the superintendent as the matter of record keeping, hiring of farm foreman, planning crops, etc., would fall upon the state farm supervisor.

Besides being a direct benefit to each farm, the farm supervisor could do much other valuable work in the line of co-operation between the different farms. In fact, this probably would be his most useful line of work. There is an unusually good opportunity for co-operation in the breeding of dairy cattle. Practically all the farms have a large dairy herd of Holstein cows, many of them registered. The state could make no better investment than to purchase a number of the best Holstein bulls in the country for use in these herds. Each bull, by a system of exchange could be made useful for eight or ten years in the state herds. These bulls could be used in breeding the cows of highest production, and thus gradually build up the herd to a state of highest production and quality. In this way each one of these farms would become a central breeding place from which the surrounding farmers could secure high class dairy cows and sires for breeding purposes. If the buying of these bulls were put in the hands of a good judge he could se-

lect them for uniformity of type and each institution would be breeding along the same line instead of different lines. Then and only then is there much advantage in exchanging sires. The same policy could be followed in breeding other lines of live stock. Besides this the farm supervisor could work out systems of trying out and improving field crops, exchanging farm products, etc. He would be in a position to know the special wants and adaptations of each farm and could plan each farm according to its peculiar needs. For example, one farm may be specially adapted to potato growing, another for feed crops, another for vegetables and small fruit. Each farm could be planned for its particular crop and an exchange of products take place later on. The farm supervisor would also keep in close touch with the Agricultural College and cooperate with them whenever possible. The different departments of the college have already agreed to give help wherever and whenever needed if the matter was brought to their attention. Specialists along different lines could be called out from time to time whenever any special problem came up. They would be more than willing to give the benefits of their years of experience and study. Unless there is someone to call on them, however, and someone through

whom they can act they will be of no more use in the future than they have been in the past. It is safe to say that some of these institutions have been very seldom, if ever, visited by anyone from the Agricultural College.

No attempt has been made to give the working details of the preceding plan because it is impossible to tell just how far it can be developed. It will have to be tried out and gradually developed and worked out by those in charge. An attempt has been made, however, to show some of the benefits to be derived from such a system of management. The farms would be put in charge of a man who is specially trained in agriculture. They would become more efficient due to bigger and better crops, better management and more co-operation, without decreasing in any way the value of the farm as a part of the hospital maintained for the care and welfare of the inmates.

2. If the preceding plan cannot be put into operation in the near future, the following plan, at least, should be tried out on one or two of the large farms. The man hired for farm foreman and those hired as his helpers should have special training and experience along agricultural lines. The head dairyman, for ex-

ample, should be a man who can keep records and realize the necessity of keeping records. He should be able to figure a ration for each cow according to what she produces. The hog enterprise should be put in charge of a man who understands the care, handling, and feeding of hogs. The poultry man and the gardener likewise should be experts in their lines. In order to do this, higher salaries would have to be paid than are being paid at present, because men with special training along these lines are in demand and can command high salaries. This would be a big additional yearly expense without bringing the farms into closer co-operation with each other and with the University, although it would make each farm more efficient.

After this plan has been in operation for a few years, it would be comparatively easy to gradually work into the first plan of having a state farm supervisor to bring about the desired co-operation. Eventually, this will lead to a combination of both plans which would give the highest efficiency to each farm, bring them into close co-operation with each other, and thus give the most valuable service to the inmates and to the state.