

University of Minnesota

AGRICULTURAL EXTENSION DIVISION

Special Bulletin No. 59

University Farm, St. Paul

Revised August, 1928

Published by the University of Minnesota, College of Agriculture, Extension Division, F. W. Peck, Director, and distributed in furtherance of the purposes of the co-operative agricultural extension work provided for in the Act of Congress of May 8, 1914.

PLANNING THE FARM BUSINESS

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Division of Agricultural Extension

Agricultural Experiment Station

As they were sitting at the supper table one evening in February, Mr. John Brantwood said to his 16-year-old son, "Oscar, our silage and hay seem to be going rapidly. I wonder if we will have enough to carry our 25 head of cattle and 5 horses through the winter. I notice, also, that our oat bin and corn crib look as tho they would be empty long before we harvest any more grain. I wish we could figure out this farming business on a more exact basis, just as a builder draws plans for a barn and then orders as much lumber of each kind as is needed."

"Well," said Oscar, "how much silage, hay, and grain do we feed in a day, and how long will it be before the cattle are on pasture?"

"I haven't any idea as to how much we feed in a day," said Mr. Brantwood, "but we generally turn the cattle on pasture between May 10 and 15."

"Let us find out how much we feed a day," said Oscar, "and then measure our feed and find out how long it will last."

"Son, that is a good idea. Tomorrow we will do some weighing and measuring."

The next day Oscar and his father found that each cow was getting a daily ration of approximately 35 pounds of silage, 12 of hay, and 7 of grain. Each horse was getting 20 pounds of hay and about 8 of oats and corn; the 10 gilts were getting a bushel of corn and the skimmilk not used by the calves and chickens. On the basis of these calculations, and after allowing for increased feed for the hogs after the pigs were farrowed, and for the horses after spring

¹ In reading this bulletin, it should be kept in mind that the Brantwoods were planning their farm business with reference to the conditions that prevailed in their particular locality in southeastern Minnesota. Every farm needs a plan that is more or less different from that of every other farm, but the steps to be followed are much the same regardless of the location.

work began, they decided that they would be short about 5 tons of hay, 100 bushels of corn, and 75 bushels of oats for summer feed.

MR. BRANTWOOD STARTS A FARM PLAN

The next evening Mr. Brantwood had an idea. "Oscar," said he, "we were a year late on the figuring that we did yesterday. Why can we not make a farm plan now and have next year's operations figured out so that we will have plenty of feed and the right kind of feed for our livestock? When we go out to buy hay for this spring's feeding, we will be buying timothy or prairie hay at high prices because that is the only kind our neighbors have to sell, and in addition we must buy a liberal supply of oilmeal if we are to maintain milk production with that kind of hay."

Mr. Brantwood and Oscar at once started to work out the farm plan a year in advance. The first step was to make a drawing to scale with a carpenter's square and pencil, showing the field arrangement for the preceding year.

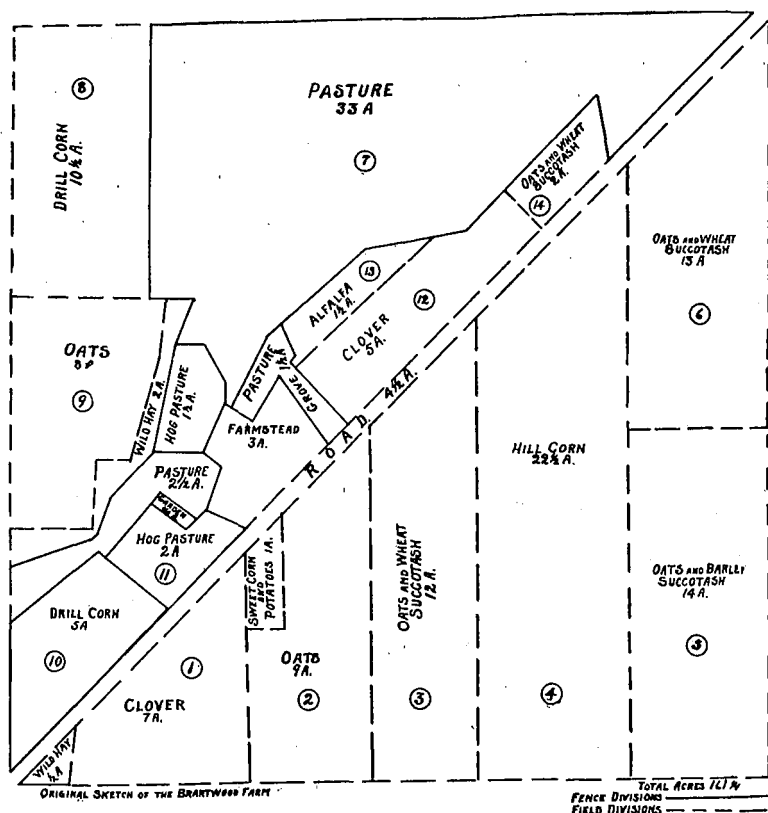
They worked on this the whole evening and then had to leave part of it until they made some field measurements on the following day. The sketch looked like Figure 1, and showed that the cropping plan for the last year had been as follows:

Crop	No. of fields	Acres	Computed yield per acre	Total yield
Corn for grain, bu.	1	22½	42	945
Corn for hogging-off, bu.	1	5	40	200
Corn for silage, tons.....	1	10½	8	80
Wheat and oats succotash, bu.	3	27	17	462
				(46 lb. per bu.)
Oats and barley succotash, bu.	1	14	39	546
				(43 lb. per bu.)
Oats, bu.	2	17	51	870
Clover and timothy hay, tons.....	2	12	2½	31
Alfalfa hay, tons (3 cuttings)....	1	1½	4	6
Garden, mostly potatoes and sweet corn, bu.	2	1¼		100
				(potatoes)
Wild hay, tons.....	2	2½	1	2
Hog and calf pastures.....	4	7½		
Permanent pasture	1	33		
Farmstead and roads.....		7½		
Total	21	161¼		

"Why, Father," said Oscar, "there are 21 fields on this quarter-section farm. That is an average of less than eight acres per field. Even if one leaves out the alfalfa patch, the two pieces of wild hay,

the corn for hogging off, the two garden patches, the permanent pasture, and the four pasture lots for hogs and calves, there are left 10 fields for 110 acres of field crops, an average of only 11 acres per field. I know that our farm is badly cut up because of the sloughs that the county ditch now being constructed will eliminate, and also because the highway cuts the farm diagonally, but I surely thought our fields averaged more than 11 acres."

"Yes," said Mr. Brantwood, "if I hadn't helped you with that map no one could have convinced me that it is our farm that you have drawn."



Replanning the Cropping System

Two evenings having been devoted to making a sketch of the farm as it had been during the last year, the next evening they proceeded to outline a plan for the coming years. First, they classified the crops that were raised the preceding year as follows:

Kind of crop	Acres
Corn for silage and grain.....	33
Small grain	58
Clover hay	12
Corn to hog-off, and hog and calf pastures.....	12½
Permanent pasture (too wet to cultivate until tilled).....	33
Permanent wild hay and alfalfa patches.....	4
Garden	1¼
Farmstead and roads.....	7½
Total.....	161¼

After some pencil work and contemplation of the sketch, Mr. Brantwood said, "There are three small fields, Nos. 12, 13, and 14, totaling 8½ acres. These are too small to work economically. I shall plan to get these fields into alfalfa and when the plan is under way about two acres will be seeded each year, more or less according to the stand, leaving from 6 to 7 acres of alfalfa hay to cut each year. On the piece across the road from the buildings there are 79 acres, and on the same side of the road as the buildings there are two adjoining fields, Nos. 8 and 9, of 8 and 10½ acres. These could be easily put together as one field. This would give an opportunity for 5 fields of 18½ to 20 acres each.

"How will the following cropping plan do for the five fields?"

First year	corn
Second year	small grain
Third year	corn
Fourth year	small grain
	(Seeded to clover and timothy)
Fifth year	hay

"There are two pasture lots totaling 4 acres around the buildings. These can be thrown into one field and used for a calf pasture. Seven acres of tillable hog pasture are left. This will be divided into two equal fields and each year one field will be planted to corn for hogging-off and the other to rape pasture."

"Father," said Oscar, "where will we apply the manure in this rotation plan?"

"Corn gives a big response to manure," said Mr. Brantwood, "and we would naturally apply it to the corn field that followed small grain. If we haul out the manure as it is produced during the winter, we should be able to cover 18 or 20 acres with 7 or 8 tons each year. I heard our county agent say that one gets more for each ton of manure if it is spread thinly instead of making a heavy application on a few acres. If we follow this plan, all our corn should do well, as the part that is not manured will be on a clover sod, and we almost always get a good corn crop following clover."

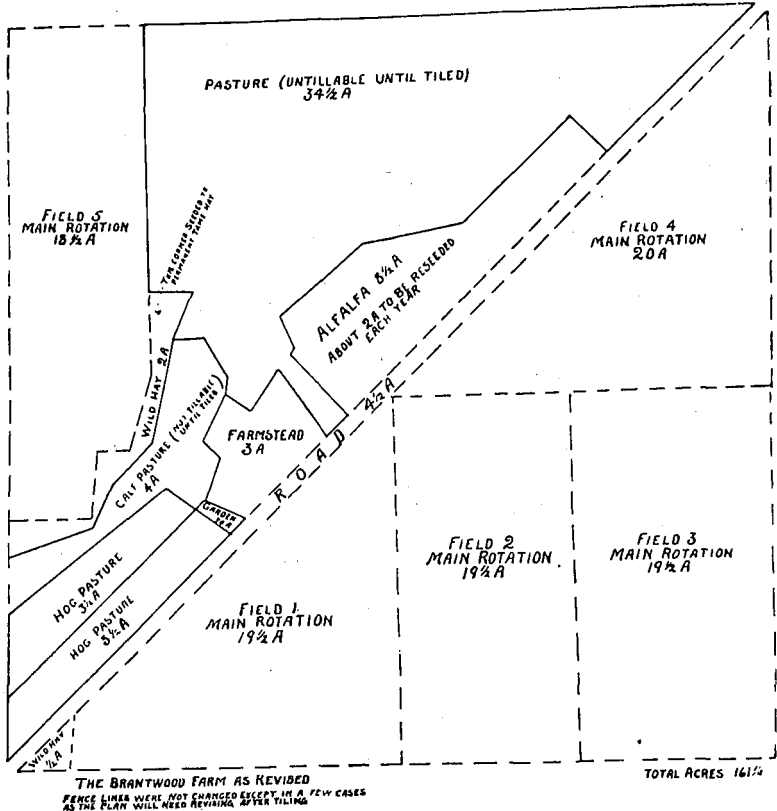
After the revised sketch had been completed, Mr. Brantwood asked his wife her opinion of the new layout. She said, "It looks fine on paper, but where is that acre of potatoes, sweet corn, and other garden truck that we have been accustomed to have just across the road from the house?" "Well, wife," said he, "I seem to have overlooked this important item in the family living." Said Oscar, "How would it do to put an acre of potatoes and sweet corn in one of the cornfields each year, with the potatoes between the field corn and sweet corn, to prevent their mixing, and taking pains to have the garden in the corner of the field nearest to the house." "That would be all right," said Mr. Brantwood, "as it will give a good place to raise potatoes and sweet corn and will avoid the inconvenience of a one-acre field. We will keep all the more or less permanent plantings such as asparagus, berries, currants, and the small garden truck like onions, beets, carrots, etc., in the quarter-acre garden adjoining the farmstead. We will set out enough apple and plum trees about the farmstead to provide fruit for home use."

Mr. Brantwood then made a table showing the acres of each crop under the proposed plan and the estimated yields on the basis of 19½ acres in each field. This is the way the table looked:

Crop	Acres	Estimated yield per acre	Estimated total yield
Corn for grain, bu.	29	40	1160
Corn for silage, tons.....	9	8	72
Corn for hogging-off, bu.	3½	40	140
Oats, bu.	19½	40	780
Succotash (oats and wheat), bu.	19½	wheat 10 oats 20	195 390
Clover and timothy hay, tons (first cutting)	19½	1½	29
Alfalfa hay, tons	6	3	18
Wild hay, tons.....	2½	1	2
Garden, mostly potatoes and sweet corn (in corner of corn field).....	1		
Garden, next to farmstead.....	¼		
Pasture: Permanent cattle pasture....	34½		
Permanent calf pasture	4		
Rape for hogs.....	3½		

"Why, Father," said Oscar, "you have figured the yield of corn at only 40 bushels and we frequently get 50, and you have figured 1½ tons of hay to the acre and with the two cuttings we sometimes have 3 tons." "Yes," said Mr. Brantwood, "but we are planning this farm business on a basis of the yields that we are reasonably certain to get, rather than on the basis of the exceptionally favorable years.

If we get all the hay we need from the first crop, we can cut the second crop of clover for seed. If we have more corn and oats than are needed, we can always carry them over to the following year or sell some."



Making a Livestock Plan

When next Oscar and his father took up the farm plan, the question was, "Does our livestock business need adjusting in order to fit our new cropping plan?" First, Mr. Brantwood had Oscar list the livestock that had been kept the last year. He had the following:

Livestock

Dairy cows	12
Young stock: yearlings	6
calves	6
Bull	1
Brood sows	13
(Raised 85 pigs to 250 lb.)	
Horses	5
Chickens	100

In adjusting the livestock to the new plan, as they had been short of grain the preceding year, they decided to base the calculations on keeping 10 gilts each year and 60 pigs raised to a weight of 225 pounds instead of 13 gilts and 85 pigs raised to 250 pounds weight as had been the case in the preceding year. On the basis of their previous calculations as to the feed requirements of the livestock, the following tables were prepared as to the feed required per head per year by each class of cattle:

Crop	Cows	Bull	Yearlings	Calves
Hay, tons	1.3	3.0	0.7	0.4
Silage, tons	3.8	2.2	1.7	0.2
Grain mixture, lb.	1540	1277	400	580
Whole milk, lb.	....	....	....	300
Skim milk, lb.	....	....	....	3000
Pasture, days	145	....	165	125

It was assumed that the cows, averaging about 25 pounds of 3½ per cent milk per day during a winter feeding period of 220 days, would each consume daily 35 pounds of silage, 12 of hay, and 7 of grain, altho the amount would be varied according to the production of each cow on the basis of about one pound of grain for each 3½ pounds of milk. The grain mixture was assumed to be 30 parts each by weight of corn, oats, and bran, and 10 parts of oilmeal.

According to these figures, Oscar calculated that the feed requirements for 12 cows, 6 yearlings, 6 calves, and one bull would be the following:

Kind of feed	Quantity required
Hay, tons	25
Silage, tons	59
Corn, bu.	137
Oats, bu.	240
Bran, cwt.	77
Oilmeal, cwt.	26
Whole milk, cwt.	18
Skim milk, cwt.	180

Hogs

In order to estimate the pounds of pork produced during the last year, they prepared the following table:

Hogs sold during year, 85 head at an average weight of 250 pounds, lb.	21,250
Hogs butchered, 3 weighing about 260 pounds, lb.	780
Boar on hand at end of year, lb.	300
Gilts on hand at end of year, 10 weighing 250 pounds, lb.	2,500
Total	24,830

Deduct—

Gilts on hand beginning of year, 13 weighing 250 pounds, lb.	3,250
Boar bought, estimated weight, lb.	300
Total, lb.	<u>3,550</u>
Net pork produced, lb.	21,280

Mr. Brantwood and Oscar had considerable trouble in estimating the amount of corn, other grain, and skim milk used for hog feed during the last year. They decided that about 400 pounds of grain, mostly corn, and 300 pounds of skim milk plus pasture would be required for each 100 pounds of pork produced. This indicated that if 60 pigs were raised each year to an average weight of 225 pounds, the following would be required, including feed for the gilts that would raise the pigs:

Corn, bu.	785
Oats, bu.	312
Skim milk, cwt.	405
Rape pasture, acres.	3½

Horses

It was estimated that each horse would consume 2.6 tons of hay per year in addition to oat straw, cornstalk pasture, and some summer pasture; also 35 bushels of corn and 65 bushels of oats. This would provide approximately 8 pounds of grain per day from October 1 to April 1, and from 14 to 15 pounds per day from April 1 to September 30. On the basis of these estimates, the feed requirements of their five horses totaled the following:

Hay, tons	13
Corn, bu.	175
Oats, bu.	325

Chickens

How much feed does it take to keep a chicken per year? This question nearly floored Mr. Brantwood and Oscar; and Mrs. Brantwood did not know much more about it, altho the poultry was her particular department of the farm business. However, she finally recalled that she had heard at a poultry-culling school that a hen would usually eat the equivalent of a bushel of mixed grain or about 50 pounds a year, aside from feed picked up about the barnyard. The following feeds finally were assigned to the 100 chickens:

Corn, bu.	32
Oats, bu.	30
Wheat, bu.	20
Wheat bran, cwt.	8
Skim milk, cwt.	50
Meat scraps, cwt.	3

Feed Produced vs. Feed Required

The next step was to assemble the estimates of feed required and compare the estimated requirements with the estimated production. Here is the table that Oscar prepared under his father's direction.

Kind of feed	Total required as per estimates	Amount that will be produced as per estimates	Surplus for seed, to sell, or to carry over
Hay, tons	38	49	11
Silage, tons	59	72	13
Corn, bu.	1130	1300	170
Oats, bu.	907	1170	263
Wheat, bu.	20	195	175
Whole milk, cwt.	18	...	...
Skim milk, cwt.	635	635	...
Oilmeal, cwt.*	26	...	...
Wheat bran, cwt.*	85	...	...
Meat scraps, cwt.*	3	...	...

* To be purchased.

"Well, Father," said Oscar, "we will have to revise this plan by keeping more livestock, as we do not come out even. We have too much silage, too much hay, too much corn, and too much oats."

"Son," said Mr. Brantwood, "we will not trouble our heads about that as long as we have plenty of feed in proportion to our livestock. I would be better satisfied if our plan showed a larger surplus of silage so that we could have from 25 to 30 tons for use in case of a dry summer, and I would be better pleased if it showed a surplus of 300 to 400 bushels of corn instead of less than 200 bushels, as I would like to have a liberal supply of old corn in reserve until I am sure that the new crop will mature. Each year we can, to a certain extent, adjust our hog business to our corn crop by selling at heavier or lighter weights than our plan calls for."

CAN BRANTWOOD WORK THE PLAN?

"We now have our plan on paper. Can we work the plan?" asked Oscar. Mr. Brantwood replied, "After working on this plan, off and on, for two weeks, I now see that it is impossible to have a farm plan as exact as a bill of materials for a house or barn, but I believe a carefully thought out farm plan is a great improvement over the more

or less hit-and-miss methods that we have followed in the past. Some years our clover may winter-kill and some years we may raise only 40 pigs from 10 gilts instead of the estimated 60, or we may occasionally have 70 to 75 pigs from the 10 gilts. Then, again, after that county ditch has provided an outlet for the low land in the pasture we hope to be able to get the money to put in the necessary tile. That old pasture will then be one of the most productive fields on the farm and we will need to revise our crop plan to include a rotated pasture instead of permanent pasture.

"Then, we may decide that sweet clover should have a place in our cropping system. When we took our auto trip to South Dakota last summer, we saw some fine sweet clover pastures in Western Minnesota and in Eastern South Dakota.

"That convinced me that if one is using tillable land for pasture, sweet clover is one of the most productive crops. However, in our case it might be necessary to lime our land when we work sweet clover into the rotation. If we worked a rotated pasture into the rotation, we would probably decide to depend entirely on alfalfa for hay. If we did this, we would seed down a field and leave it as long as it produced well. When the stand became poor, a new field would be seeded.

"Several farmers with whom I talked mentioned that sweet clover was not only an excellent pasture but that following the sweet clover there was usually an increase in the corn yield of from 10 to 15 bushels per acre.

"While our plan will be changed occasionally to suit conditions, I believe we will make more money in the future than we would without the plan because we will have carefully thought out our farm problems in advance."

MR. BRANTWOOD VISITS THE COUNTY AGENT

A few days later, Mr. Brantwood went to the county seat on jury duty. When he returned, Oscar and Mrs. Brantwood inquired about the cases that were considered. Said he, "I was excused from serving, but I had a mighty profitable trip for when I was there it occurred to me to drop into the office of the county agent and talk over this farm plan idea with him. I wanted to find out if there was any way of checking up our farm plan with what other farmers are doing. He told me that the Minnesota College of Agriculture has been keeping careful cost records on representative farms in several regions in the state since 1901. At present, cost records are being kept on a group of 20 representative farms in the vicinity of Crookston. A study is being made of the ways in which farm profits can be increased on

about 170 farms in Rice, Steele, Freeborn, Dodge, Waseca, Scott, and Goodhue counties. These farmers keep an annual inventory, a record of receipts and expenses, and records of the feed fed to each kind of livestock. A representative of the College of Agriculture visits each farm every three or four months and checks over the records. Each farmer is to get a summary at the end of the year showing the results from his own farm. This will include a confidential report showing how the earnings of the individual compare with the average farmers in the group and with the best farmers. It will also include a statement as to how each one compared with the average in crop yields per



The Proof of Good Farming Is the Harvest

acre, returns per cow, returns for feed fed to hogs, and in amount of labor, horses, and machinery used in proportion to the acreage.

"I would like to get in on that and I told our county agent so. He said he didn't think that there was much opportunity, as the list was complete at present. He explained that the work is in the nature of an experiment for trying out the possibilities of a closer study of the farm business; and that if there was sufficient interest so that each farmer would be willing to pay about \$20 per year for the expense of the man who visits the farms to check the records, the work would be expanded as fast as there was a demand for it. Personally, I would be glad to pay \$20 to join such a co-operative accounting association, as I know that then we would keep more careful records. Furthermore, the report showing just what we are doing as compared to other

farmers under similar conditions should be a great help in getting the best possible plan for running our farm.

"The county agent suggested that if our neighbors would be interested, he might be able to get the farm management specialist of the Agricultural Extension Division to attend a neighborhood meeting. He could then give us first hand information about the figures from the 160 farms in this section of the state."

MAKE A FARM PLAN

We believe that it will be highly profitable for every farmer to imitate Mr. Brantwood's idea of working out a farm plan that he believes best suited to his conditions. The following are the steps taken by Mr. Brantwood in developing such a plan:

1. With pencil and carpenter's square, he made a sketch of his farm to scale, showing present field arrangement. A convenient scale in many cases is one inch for eight rods. The map of a square 160 acres will then be 20 inches square.

2. He outlined a cropping system that would meet the following requirements:

- a. Provide suitable feeds for livestock, especially an adequate supply of clover, alfalfa hay, and silage for his cattle, and of home-raised corn and oats for hogs, horses, and cattle.

- b. A field arrangement that would provide approximately a uniform acreage of each crop in each year.

3. He estimated, on the basis of past experience, the amount of feed that each kind of animal would require per year.

4. He calculated, on the basis of the foregoing, the amount of feed required for each kind of livestock and checked it against conservative estimates of the amount that the proposed cropping system would provide.

5. He made another map of the farm as it would look when the plan was in operation.

The record does not reveal that Mr. Brantwood gave any conscious attention in his farm planning to arranging his cropping system so that as far as possible there would be a uniform amount of work for men and horses through the season. This cuts down expenses by making it possible for each man and each horse to do the greatest possible amount of work in a season. The plan worked out by Mr. Brantwood would meet this requirement fairly well.

Special Bulletin 77, Farm Accounts, How Mr. Fairchild Kept Them, may be helpful to farmers in planning their farm business for greater profit.