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System of farm cost accounting

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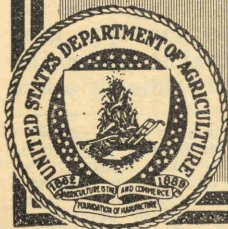
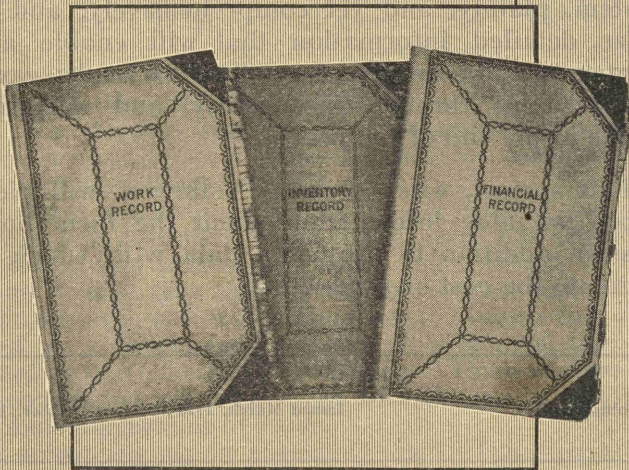
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U. S. DEPARTMENT OF
AGRICULTURE
FARMERS' BULLETIN No. 572

A SYSTEM
OF FARM COST
ACCOUNTING



THE INCREASED interest in cost of production of farm products has stimulated the demand for systems of farm cost accounting, and especially for a system that is simple in application and planned to give the farmer the information he requires without going into the complexity of detail involved in a highly technical system.

It is the object of this bulletin to explain such a system, plainly, and yet comprehensively, and to offer detailed information that will enable any farmer to make an inventory, open his books, carry his accounts through successfully, and close his books at the end of the year.

This system, when properly followed, will yield much valuable information about the farm business in addition to providing data with which to estimate the cost of production.

Washington, D. C.

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A SYSTEM OF FARM COST ACCOUNTING

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THE BUSINESS FARMER wishes to know how much he is making or losing on his business each year, how much he is making or losing on each crop or class of animals, and how he can improve his business so as to make more money. The function of farm cost accounting is to supply this information. Cost accounting for the farm is the same sort of work large manufacturing companies do to learn whether they are making a profit on their different products. The farmer wants to know whether his wheat pays, whether his cows pay, or his orchard. These are some of the questions a set of farm cost accounts will settle.

Many farmers are desirous of keeping accounts of this sort but do not know how to start. Undoubtedly many are deterred from starting because they believe they do not know enough about book-keeping and because they have in mind no definite method of procedure. To any such men who desire to keep accounts and who have not worked out a system for themselves, it is believed that the system outlined in this bulletin will be helpful. Those who are already keeping accounts but are not satisfied with the results obtained may find here some suggestions of value.

No cost accounting can be absolutely exact. Commercial cost accounting and farm cost accounting are alike in this respect. Both are based partly on estimates and partly on ascertainable facts, and both approach exactitude in proportion to the accuracy of these estimates. It is therefore important to make the most accurate estimates possible rather than be satisfied with rough approximations.

NOTE.—This System of Farm Cost Accounting was developed by Prof. G. F. Warren, of the New York State College of Agriculture, on his own farm, where it has been used for 12 years. The principles of the system are outlined in his book entitled "Farm Management." It has been given a thorough trial for 8 years with a number of farmers under the immediate supervision of Mr. Ladd and others, working jointly for the U. S. Department of Agriculture and the New York College of Agriculture, and has given excellent satisfaction and valuable results.

As the work is carried on year by year and experience is gained, greater accuracy in estimating is attained, with correspondingly greater accuracy in the results of the cost accounts.

On the other hand it is not wise to spend much time with refinements in methods of bookkeeping that are designed to check to the last cent. In fact, attempts to find insignificant errors often disgust inexperienced persons with the whole question of accounting.

This bulletin aims to give a description of a successful system of farm accounting which has been tried for eight years in the State of New York with a number of farmers under widely differing conditions. It is aimed herein to outline the practical working of the system in sufficient detail so that any one who wishes may start it without further aid. No bookkeeping knowledge is necessary.

This is a "direct-entry" system, in that there are no preliminary books in which the original entries are to be made and from which they are to be "posted" or copied to the permanent accounts. This feature is a valuable one for the farmer who keeps his own books in that it does away with "posting" and saves much time. It is, however, often advisable in busy seasons to keep a pocket memorandum book in which to make notes from day to day so that nothing is forgotten or overlooked.

TIME REQUIRED TO KEEP ACCOUNTS

The time required is one of the chief objections made to farm cost accounting. Farmers who have used this particular system during the past eight years estimate it takes only from 2 to 10 minutes per day. The average seems to be about 5 minutes for the daily entries. To this must be added a number of hours' work, or perhaps a day or two, at the end of the year to close the year's accounts and open the books for the new year. This time will vary with the type of farming, the complexity of the business, and the degree of accuracy and completeness with which the accounts have been kept.

The daily work of keeping this set of accounts ordinarily consists in entering the receipts and expenditures for the day and recording the hours of work done. On many days there are no cash receipts and expenditures, as these are likely to be bunched on the days when trips are made to town. The entry of these items to the proper accounts, with the filling of the chore blanks, if necessary, should not take more than five minutes. It is being done in less than an average of five minutes per day by a number of New York farmers whose education varies from that acquired at a district school to that of the college graduate, all of whom are working every day in the field with their hired men.

A FAVORABLE TIME TO START ACCOUNTS

Accounts may be started any time after the last crop is harvested in the fall and before the first crop operations are started in the spring. They should be started on the first day of some month, but the exact date will depend upon the geographical location of the farm and the nature of the business or type of farming in practice. The time should be as late as possible in order that there may be the smallest quantities of last year's crops on hand to be inventoried. However, the date should be early enough to allow sufficient time to

close the year's accounts, work out results, plan the next year's business, and open the new accounts before the spring crop work begins. In a large majority of cases the best date will fall between January 1 and April 1. For a tenant the date of taking an inventory and opening the accounts will, of course, correspond to the date of his lease.

REQUIREMENTS FOR KEEPING A COMPLETE SET OF FARM COST ACCOUNTS

In order to have a complete set of farm cost accounts four classes of records are necessary.

1. An inventory at the beginning and end of the year.
2. An account of all money paid out or received, and of all purchases or sales on credit.
3. A record of feeds consumed, crop supplies used, and crop yields.
4. A record of all work done by men, horses, tractor, or other power during the year.

In this system these four classes of records are carried in the three books illustrated on the title page of this bulletin, known as the Inventory Record, Financial Record, and Work Record. In the second book all entries are made of class 3 as well as the cash items of class 2.

INVENTORY RECORD

To make an inventory on an ordinary farm is a matter requiring from two to five hours work at the beginning of each year. The same inventory is used for closing the accounts of one year and opening those of the next. The inventory should be a detailed list, with values of all the farm property and farm debts, and should include:

1. The farm, subdivided into buildings and land (each building being listed separately), giving the number of acres of land and its value per acre. The total value of the land and buildings listed should equal the value of the whole farm. Where there is land of greatly differing values the list should show acreage and value per acre of each kind.
2. The horses, listed by name.
3. The other classes of livestock listed separately, giving value per head.
4. Machinery and tools, each item being listed separately, except that the very small and cheap tools may be listed as one item.
5. Feed, produce, and supplies, giving both quantities and values.
6. Growing crops (value of labor and materials already spent for next year's crops).
7. Cash on hand and in bank.
8. Accounts receivable or amounts owing to the farm for goods sold or services rendered on credit.

The foregoing are known as the "assets" of the business, and the grand total of them all should be found. From this grand total should be subtracted the total of the "liabilities" of the business, which would include the mortgage, if there is one, any notes owed to the bank or others, and all bills which may be owing for goods purchased on credit.

In estimating values, the market price *at the farm*, or price at the market point, less the cost of hauling and shipping to market, should be the standard for all marketable produce and livestock; other assets, such as machinery, buildings, and any items of like nature,

should receive the "going-concern" value. By "going-concern" value is meant what they are worth to the farm as a going business. The value put upon any item should be what it is thought can be obtained for it at normal sale and should neither be overrated nor underrated. It is best to be fair and conservative and to use good judgment in placing values. Value all purchased supplies at cost.

Table 1 is presented here as a suggestion as to the way in which the inventory items appear when classified and grouped according to the foregoing schedule, and also illustrates how the net worth is determined and the gain or loss in net property value during the year is set forth.

TABLE 1.—*Sample of an inventory*

| | | | | | | |
|---|--|--------|------|------|---|---------------|
| Farm: | | | | | | |
| Land— | | | | | | |
| | Crop land, 92.62 acres, at \$96 | | | | | \$8, 891. 52 |
| | Woods, 22.60 acres, at \$40 | | | | | 904. 00 |
| | Apple orchard (30 years), 3.83 acres, at \$300 | | | | | 1, 149. 00 |
| | Total land, 119.05 acres | | | | | \$10, 944. 52 |
| Buildings— | | | | | | |
| | Dwelling, 35 by 50, built 1884, cost \$3,000 | | | | | 2, 500. 00 |
| | Tenant house, 35 by 25, built 1864, cost \$1,000 | | | | | 788. 00 |
| | Barn, 90 by 20, built 1870, cost \$3,500 | | | | | 2, 900. 00 |
| | Hen house, 12 by 90, built 1908, cost \$200 | | | | | 178. 00 |
| | Total buildings | | | | | 6, 366. 00 |
| | Total value of farm | | | | | 17, 310. 52 |
| Livestock: | | | | | | |
| Horses— | | | | | | |
| | Nell, bay mare, born 1907, cost \$250 | | | | | 170. 00 |
| | Bell, gray mare, born 1907, cost \$250 | | | | | 170. 00 |
| | Tom, brown gelding, born 1904, cost \$275 | | | | | 110. 00 |
| | Dick, chestnut gelding, born 1906, cost \$250 | | | | | 120. 00 |
| | Total horses (4) | | | | | 570. 00 |
| Cattle— | | | | | | |
| | Cows (2), at \$75 | | | | | 150 |
| | Heifer | | | | | 50 |
| | Total cattle | | | | | 200. 00 |
| Swine— | | | | | | |
| | Brood sows (7) | | | | | 300 |
| | Boar | | | | | 50 |
| | Hogs (29) | | | | | 545 |
| | Total swine | | | | | 895. 00 |
| Poultry— | | | | | | |
| | Hens and roosters (50) | | | | | 60. 00 |
| | Total value of livestock | | | | | 1, 725. 00 |
| Machinery and tools: | | | | | | |
| | Plows, walking | 12 in. | 1912 | \$12 | 2 | \$7 |
| | Disk, double | 6 ft. | 1913 | 28 | 1 | 18 |
| | Binder, grain | 6 ft. | 1911 | 128 | 1 | 55 |
| and so on through list of machines owned. | | | | | | |
| | Total value machinery and tools (including items omitted here) | | | | | 1, 196. 25 |
| Farm produce: | | | | | | |
| | Corn, 50 bushels of ears, at \$0.90 | | | | | \$45. 00 |
| | Hay, 32 tons, at \$20 | | | | | 640. 00 |
| | Straw, 2½ tons, at \$5 | | | | | 12. 50 |
| | Total value of farm produce | | | | | 697. 50 |

TABLE 1.—*Sample of an inventory—Continued*

| | |
|---|-------------|
| Feed and supplies: | |
| Bran, 500 pounds, at 2¾ cents----- | \$13. 75 |
| Tankage, 1,600 pounds, at 4 cents----- | 64. 00 |
| Lime, 4 bags, at 40 cents----- | 1. 60 |
| Seed oats, 40 bushels, at 64 cents----- | 25. 60 |
| Cement, 2 bags, at 50 cents----- | 1. 00 |
| Total value of feed and supplies----- | \$105. 95 |
| Growing crops: | |
| Wheat field B— | |
| 72 hours of man labor, at 30 cents----- | 21. 60 |
| 225 hours of horse labor, at 12 cents----- | 27. 00 |
| 26 bushels seed wheat, at \$2.50----- | 65. 00 |
| 1 ton fertilizer, at \$34----- | 34. 00 |
| Total value of growing crops----- | 147. 60 |
| Account receivable, for 1 cow----- | 70. 00 |
| Cash on hand and in bank----- | 252. 04 |
| Total value of assets (or property owned)----- | 21, 504. 86 |
| Farm mortgage (interest due Jan. 1 and July 1)----- | 9, 250. 00 |
| Note at bank, due Apr. 18----- | 250. 00 |
| Accounts payable: | |
| For thrashing bill----- | \$29. 76 |
| For labor----- | 16. 11 |
| On cattle----- | 85. 00 |
| | 130. 87 |
| Total "liabilities" (or values owed others)----- | 9, 630. 87 |
| SUMMARY | |
| Total value assets----- | 21, 504. 86 |
| Total liabilities----- | 9, 630. 87 |
| Present net worth----- | 11, 873. 99 |
| Net worth one year ago----- | 10, 976. 50 |
| Gain in net worth----- | 897. 49 |

Figure 1 illustrates how the entries appear in the Inventory Record. It is best to put only one class of property on each page so as to allow for expansion in number in the years to come. It is also shown in this figure how, by trimming intermediate pages, a single series of certain property item entries may serve for many years by extending the money value of each item to the next succeeding column on each subsequent inventory date. This is a feature of the book that saves much clerical work at inventory time.

No other account will give so valuable information for the time and labor expended as the annual inventory. By comparing the net worth as shown by the current inventory with the net worth of previous years, the farmer can determine whether his business is progressing or going backward.

FINANCIAL, FEED, AND CROP RECORD

For this record, referred to in this bulletin as the Financial Record, a book called by stationers a "broad day-book" or "journal" is used. The requirements are that there be a place for a date on the left-hand side of the page, a broad space in the middle of the page in which to write explanations, and columns ruled for dollars and cents at the right. Two pages facing each other are taken for each account. The name of the account is written at the top of the pages. The

right-hand page is marked "Credits" and is used only to record credits to the account. The left-hand page is marked "Charges" and is used only for charges against the account. Figure 2 gives a good idea of how the pages are ruled and the manner in which the entries are made in this record. At the end of the year this book becomes the completed account book, as to it at that time are entered the items from the other two record books as described later.

A separate account is kept with real estate, each crop grown, each class of animals, machinery, labor, interest, each person dealt with on credit, and such other headings as may be found necessary or convenient.

The image shows an open account book with two pages visible. The left page is titled "General Inventory" and lists various items with their quantities and values for three consecutive years: Jan. 1, 1922, Jan. 1, 1923, and Jan. 1, 1924. The right page is titled "Inventory Record" and shows a grid of entries for various items, with columns for the same three years. The book is bound with a dark cover and has several rings on the right side.

FIG. 1.—Showing how the entries are made in the Inventory Record

The following classification of account headings, taken from the account book of a New York farmer, will give some idea of the number and kind of accounts it may be necessary to keep:

| | | |
|-----------------------|----------------------------|--------------------------|
| Crop accounts: | Livestock accounts: | General accounts: |
| Corn. | Cows. | Real estate. |
| Oats. | Hogs. | Feed and supplies. |
| Peas. | Poultry. | Interest. |
| Hay. | Pasture. | Manure. |
| Potatoes. | Labor accounts: | Loss and gain. |
| Orchard. | Man labor. | Personal. |
| Buckwheat. | Horses. | Next year crops: |
| Rye. | Equipment. | Wheat, etc. |
| Wheat. | Tractor. | |

In addition to the foregoing were the accounts with each firm or person with whom dealings were had on credit.

HOW THE ENTRIES ARE MADE

At the end of each day, if time permits, all money received or paid out since the last entries were made should be entered in the various accounts, *crediting* all money received and *charging* all money paid out. For instance, if on a trip to town on June 1, \$1.40 is spent for horseshoeing, \$3 for fencing, \$5 for cow feed, and a \$65 check received for 200 gallons of milk, the entries are made as follows: The account marked "Horses" is found, and on the left-hand page, headed "Charges," is entered "June 1, Shoeing, \$1.40." The "Real estate" account is then found, and on the left-hand page is entered "June 1, Fencing, \$3." The "Cows" account is

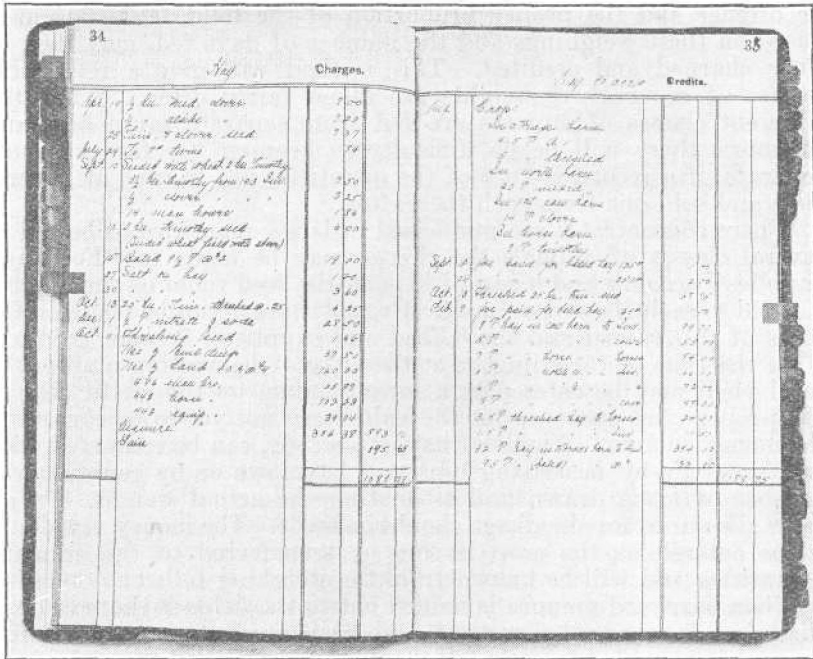


FIG 2—Showing how pages are ruled and entries made in the Financial Record

next found, and at the left is entered "Cow feed bought, \$5," while on the right-hand page, under "Credits," is entered, "June 1, Milk, 200 gals., \$65." These entries are now complete.

Indexing.—Finding the account wanted is made easier by indexing the books in the following manner: A piece of adhesive tape about 1½ inches long is bent double and stuck on the edge of the page in such a manner that it projects about a half inch. On this projection is written the name of the account kept on that page. A piece of tape is put on each account, arranged one below the other along the edge of the book so that all may be seen at the same time. Figure 2 illustrates how these tapes appear when properly placed. Prepared paper tabs, suitable for this purpose, can be purchased from most stationers. (See fig. 1.)

Feed and crop entries.—All feed bought is charged as purchased directly against the accounts of the animals for which it was secured, the same as any other cash item. If the hog feed should run out some day and a bag of cow feed taken for the hogs, the entries should be made in the record book just as if the cows had sold this feed and the hogs had bought it.

The value of all home-grown feeds consumed must be charged to the livestock accounts and credited to the crop producing them. This can be done at convenient stated periods, as each week or each month. As home-grown crops are fed out an estimate must be made of the quantities fed to horses, cows, and other stock, and these accounts charged with the values thereof, credit being given the crop accounts. A day's rations may be weighed or estimated once a month or oftener and the proper proportion of the total feed consumed, based on these weighings and the number of days fed, may then be duly charged and credited. This method will give a reasonable degree of accuracy if weights are taken fairly often. When the different classes of animals are fed from separate grain bins and haymows there will be no difficulty in keeping the feed accounts separate, if a record is kept of the quantities put in each at harvest time and sold out from each thereafter.

Where concentrates are purchased in large quantities to be fed to several classes of animals the charge may be made to "Feed and supplies" account and a record kept in the feed room of the quantities fed to each class of animals. Proper charges can be made on the basis of this record and the "Feed and supplies" account credited.

At the time of threshing or at the close of harvesting a crop, the total yield may be entered as a memorandum on the credit side of the proper crop account, but the values are not yet to be carried to the money column. Yields of hay, straw, etc., can be estimated with fair accuracy by measuring bins and haymows or by counting the number of loads drawn and estimating the actual weight. In all cases allowance for shrinkage should be made. The money values are to be entered as the crop is sold or transferred to the animals. Quantities sold will be known from the weighing bills or otherwise.

When barnyard manure is hauled out to the fields it should not at that time be charged directly to the crop accounts. A "Manure" account is provided to carry all manure charges until the end of the season. The entries in this account should give the crop to which applied, the kind of manure, the number of tons or loads hauled out each day, and the value. At the end of the year the manure account is closed by charging each crop account in a single item for its proportion of the total value of the manure applied thereon, together with the cost of applying, as explained hereafter. (See Table 2 for sample crop account.)

TABLE 2.—Sample account with potatoes

| Charges | | | Credits | | |
|------------------------|---|------------|------------------------|---|------------|
| 1918 | Item | Amount | 1918 | Item | Amount |
| June 3 | Seed, 160 bushels at \$1. | \$160. 00 | Oct. 5 | Sold 226 bushels at \$1.05 | \$237. 30 |
| 4 | Corrosive sublimate, 3 ounces | 60 | 19 | Sold 510 bushels at \$1.15 | 586. 50 |
| 10 | Seed, 43¾ bushels at \$1.10 | 48. 13 | Nov. 1 | Sold 241 bushels at \$1.25 | 301. 25 |
| 11 | Corrosive sublimate, 6 ounces | 1 20 | | | |
| July 12 | Paris green, 6 pounds | 3. 00 | Date of closing books. | Saved for seed 135 bushels at \$1.00. | 135. 00 |
| 15 | Lead arsenate, 160 pounds | 25. 60 | | Saved for home use, 16 bushels at 75 cents. | 12. 00 |
| Date of closing books. | Use of land 5 per cent on \$100 per acre. | 70. 00 | | | |
| | Man labor, 796 hours at \$0.282. | 224. 47 | | | |
| | Horse labor, 839 hours at \$0.1846. | 154. 88 | | | |
| | Equipment use, 839 hours at \$0.035. | 29. 36 | | | |
| | Manure, 30 per cent of 1916 application. | 6. 00 | | | |
| | Manure, 40 per cent of 1917 application. | 12. 00 | | | |
| | Total charges | 735. 24 | | Total credits | 1, 272. 05 |
| | Gain | 536. 81 | | Total charges | 735. 24 |
| | Grand total | 1, 272. 05 | | Gain | 536. 81 |

WORK RECORD

For the Work Record a book like the Financial Record book is used. There must be two double columns at the right of the page as shown in Figure 3. This book should be indexed in the manner already described. In this book no separate pages are used for charges and credits and no entries made in terms of dollars and cents. In the first double column at the right-hand side of the page are entered hours and minutes of man labor, and in the second are entered hours and minutes of horse labor. These headings are placed at the top of each double column so that the book appears as shown in Figure 3. This book is to receive simply a record of the work done on the farm during the year, classified according to the enterprise for which it was done, and it also gives the date and number of hours for each operation. Where a tractor is in use, the tractor hours may be carried in the narrow space immediately preceding the man-labor columns.

HOW THE ENTRIES ARE MADE

The method of making entries in the Work Record will be understood from the following example: The date is May 1. The work done this day is, aside from chores, drilling oats 6 hours with two horses; plowing for corn 8 hours with three horses; repairing plow 2 hours. The entries are made as follows: The "Oats" account is found, "May 1" written in the left-hand column, the single word "Drilling" written in the broad space in the middle of the page, and the Figure 6 entered under man-hours. Since 2 horses were used for 6 hours, the Figure 12 should be entered under horse-hours. In the same way, on turning to the "Corn" account, "May 1, plowing 8 (under man-hours), 24 (under horse-hours)" is entered. Turning to the "Machinery" account, "May 1, repairing plow. 2

(under man-hours)" is entered. When this has been done the work entry for the day is complete.

Recording routine work or "chores."—For chores special pages are to be ruled in the front or back of the Work Record as follows:

Routine work estimates

| Date | Horses | | Cows | | Poultry | | Hogs | |
|-----------------------------|--------|---------|-------|---------|---------|---------|-------|---------|
| | Hours | Minutes | Hours | Minutes | Hours | Minutes | Hours | Minutes |
| 1918 | | | | | | | | |
| May 1 | 2 | 20 | 4 | 15 | ----- | 30 | 1 | 10 |
| May 15 | 2 | 40 | 5 | 5 | 1 | ----- | 1 | 30 |
| Average for May | 2 | 30 | 4 | 40 | ----- | 45 | 1 | 20 |
| Total for May (31 days).... | 77 | 30 | 144 | 40 | 23 | 15 | 41 | 20 |

NOTE.—If hoises are used in the chore work, extra columns must be ruled under each heading where they are used to provide a place for the hours and minutes of horse labor

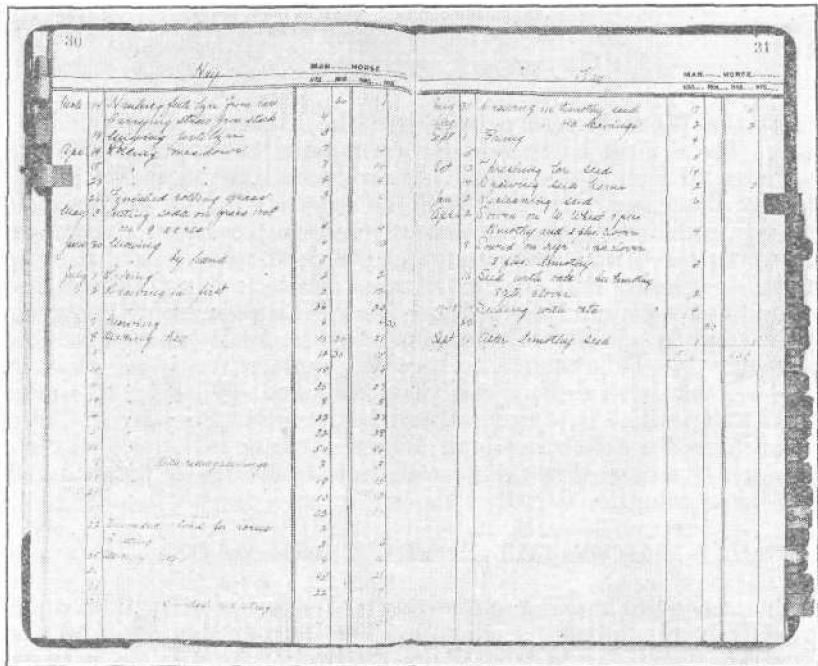


FIG. 3.—Showing how the pages are ruled and headed and the entries made in the Work Record.

It may be somewhat more accurate to enter the time spent in chores every day, but, if chore time is fairly uniform, estimates made two or three times a month will be all that is required. If the time spent on chores changes greatly at any time, for instance when the cows are turned out on pasture in the spring, or when additional stock is purchased, entries should be made so that these changes may be taken into account. On the basis of the estimates

of chore labor the total time for the month is figured under each heading. The monthly totals may be charged to the proper accounts once a month, or the total time for the year may be found and charged as a single item just before the books are closed at the end of the year. When any special work is done on livestock accounts, as for instance when sick animals are cared for, it should be charged direct to the proper account, no attempt being made to allow for it in the chore estimates.

CLASSIFICATION OF TROUBLESOME ITEMS

The entry of some items may be confusing to the beginner. In most cases a little thought coupled with common sense will straighten him out if he will ask himself: "What account produced this value and therefore really deserves this credit?" or, "What account caused this expense and therefore really deserves this charge?"

The "Real estate," "Machinery," and "General expense" accounts usually puzzle the beginner in keeping farm records. All items of permanent improvement or repairs to buildings, fences, ditching, removal of old fences, new buildings, new fences, etc., as well as the insurance on buildings and the real estate taxes, are handled in the "Real estate" account. Many of these are the charges which the landlord usually pays on tenant farms. This account should be credited with receipts for land rented out, old buildings sold, stone or sand sold, and other similar items. Sometimes it may be desirable to open a separate subaccount under this general class when a special improvement is made, as a new silo or barn. When the improvement is completed, its net cost can be figured from this subaccount, which can then be closed by charging the improvement to the "Real estate" account as a single item and crediting the subaccount in like amount.

Against the "Machinery" account should be charged all costs for repairs to machinery and tools, all harness items, and the purchase of new implements or tools, getting them to the farm and setting them up, as well as any fuel or lubricants for the farm engine. This account should be credited when machinery is rented to neighbors or when old machines and junk are sold.

Where a separate account is carried with a tractor or automobile, all items pertaining to these special accounts should be charged or credited to them and not to the general "Machinery" account.

It is not desirable to keep an account with "General expense," as such an account has proved to be a troublesome one to distribute. Nearly all items can be distributed as they occur. For instance, in the case of telephone rentals, if the telephone is kept for both personal and farm purposes, the rental can be charged partly to "Personal" account and partly to those farm enterprises for which it is mostly used. Other general items, as postage, stationery, etc., can be handled in the same manner. It is nearly always possible to scatter the charges to different accounts as they occur and it saves time when closing the books at the end of the year. If a "General expense" account is found to be indispensable, it should be limited to the fewest possible items.

SUPPLEMENTARY NOTES

There are many supplementary notes which it is desirable to keep in the same books with the accounts. Sometimes they are written on the page of the special account to which they belong; at other times they are kept by themselves at the back of the book. Dates of "last killing frost in spring," "first killing frost in fall," "death of horse or cow," and "height of hay in mow or silage in silo at this [given] date" may be cited as valuable information that may be recorded.

There are other records that may be kept if desired, such as herd records, maps of ditches, maps of the farm showing crops grown each year, and yearly crop records showing fertilizer or manure applied and yields each year. These are not necessary to the success of the cost accounting but are useful at times and may be kept in the back of one of the books if desired.

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2. Itemized statements should be requested from all dealers from whom goods are regularly bought on credit. These should all be inspected and any items thereon which have not yet been entered on the books should be entered at once. Memoranda should be made of amounts due the hired men or any other persons. For instance, if a month's wages, \$45, is due the hired man, labor account should be charged and a personal account with the hired man credited with this amount. After the first of the new year, when his amount is paid to the hired man, the labor account of the new year should not be charged with it, but the personal account of the hired man should receive this charge and the account be closed. All accrued income and expense of every nature that pertains to the old year and is not yet entered on the books should be handled in this manner.

3. Accounts receivable should be inspected and handled in the same manner described in step No. 2. For instance, if last month's milk check has not yet been received, the amount thereof should be secured by telephone or otherwise and the proper entries made on the books as aforesaid.

4. The "Feed" records are next figured up to date and the corresponding entries made charging the animal accounts and crediting the crop accounts, or "Feed and supplies," as the case may be.

5. The various livestock accounts should be credited with the value of any feeds charged to them at harvest, or time of purchase and not yet consumed, as they may appear in the final inventory. After the books are closed the animal accounts for the new year should be charged in like amounts in opening the books, the values of these being thus deducted from the expenses of the year in which purchased and being charged against the year in which they were consumed. This is sound accounting practice, and is known as "reversing the entries."

6. The value of pasture utilized by the animals during the year should be charged to their respective accounts and "Pasture" account credited in like amount. The rate charged for pasture should be as near as possible the price for which pasture rents in the region. Pasture account should, of course, be charged with all the expenses of pasture maintenance, as well as for the use of land in pasture as hereafter described.

7. The value of farm produce used in the home, if not entered before, should be attended to next. Included in this would be estimates of the quantities of milk, butter, eggs, potatoes, apples, etc., used by the farmer and his household. Personal account should be charged with these values and the proper animal or crop accounts credited.

8. The value of the board, produce, or other allowances furnished the farm laborers should be estimated and the amount charged against "Labor" account, crediting "Personal" account with the value of the board and the crop or other accounts for the value of the produce or other allowances.

9. The value of the unpaid farm labor done by the farmer and members of his family who are not being paid regular wages should next be estimated and entered. "Labor" account should be charged and "Personal" account credited.

10. The animals should be credited with the value of the manure produced by them during the year and the total value of manure charged against the "Manure" account. These data can be secured from the "Manure" account in the Work Record if the latter has been properly kept.

11. Estimates of proper amounts for the use of the farm buildings for the year should be made. Each crop or class of animals, the "Personal" account, and the accounts with machinery and man labor should receive a charge proportionate to its use of the buildings and the total amount so charged should be credited to the "Real estate" account. For example, charges for the use of barns on one farm were made as follows:

Distribution of annual charge for use of buildings

[Barns: Value \$2,000; use for year at 10 per cent, \$200]

| Account to be charged | Per cent of total charge | Amount | Account to be charged | Per cent of total charge | Amount |
|-----------------------|--------------------------|--------|-----------------------|--------------------------|--------|
| Cows..... | 30 | \$60 | Oats..... | 10 | \$20 |
| Horses..... | 20 | 40 | Hay..... | 20 | 40 |
| Hogs..... | 5 | 10 | | | |
| Machinery..... | 10 | 20 | Total..... | 100 | 200 |
| Corn..... | 5 | 10 | | | |

The use of other kinds of buildings is estimated in the same way, and when all have been so handled the total "Use of buildings" cost is found and charged to each account. As a general rule it is safe to charge 8 to 10 per cent of the current value of ordinary frame farm buildings as annual use cost or rent. Brick, stone, tile, and concrete buildings should take a somewhat lower rate.

12. The Work Record should next be reviewed and the hours and minutes of man labor charged to each account should be added up. The various totals

should then be added together and the total hours of man labor found for the year.

13. The total net cost of the "Man labor" account in the Financial Record should then be found by subtracting from the total of the charges the total of any credits. This net cost should then be divided by the total hours of man labor for the year. This gives the man-hour rate. It should be worked out in terms of cents and mills per man-hour.

14. The total hours of man labor, including chores, found against each account in the Work Record should be carried over to the charge page of the same accounts in the Financial Record. The hours should then be multiplied in each case by the man-hour rate (see step 13) and the cost in dollars and cents carried to the money columns, crediting "Man labor" account, item by item, with the same. When this has been completed the "Man labor" account will balance within a small amount. Any difference will be caused by the fact that the man-hour rate was not worked out to sufficient decimal places, as a difference in a tenth of a mill per hour where 6,000 hours are involved would make the account out of balance 60 cents. The difference, if any, may be carried to the "Loss and gain" account and entered on the charge side thereof, if the charge side of the "Man labor" account is greater, and on the credit side if the reverse be true.

15. The total hours and minutes of horse labor are next found in exactly the same manner as the man labor (step 12). Before the net cost of horse labor can be found, interest (at current rates for secured loans) must be charged (see step 20), and the final inventory value of the horses must be credited to their account. After this has been done the net cost of horse labor and the horse-hour rate are determined exactly as for man labor (step 13).

16. The total hours of horse labor against each account in the Work Record are next charged against the same accounts in the Financial Record, the values found by multiplying by the horse-hour rate and extended to the money columns of the various accounts, and the sum total credited to the "Horse account" exactly similarly to the method of handling the man labor (step 14). If the "Horse account" does not finally balance, it is handled in the same way.

17. The distribution of the annual cost of using machinery is the next step, and it is handled just as were the man and horse labor costs, with a few important exceptions. The inventory value of machinery and any machinery parts on hand at the end of the year is first credited to the "Machinery" account in the Financial Record, interest charged (see step 20), and the net cost for the year ascertained. To distribute this cost is now the problem. There is no record of machinery hours, but such a record can be dug out of the various accounts in the Work Record if desired and an hour rate worked out for each important machine and group of minor tools. This is the most accurate manner in which this cost can be distributed, but while valuable results to the student and investigator would be obtained, it is doubtful whether the practical farmer would find them useful enough to pay for the long process of figuring involved. A shorter method will now be described. It will be assumed that for every hour a horse is worked machinery is also used, and therefore each account should have charged against it the same number of machinery hours as horse hours. Machinery cost may then be distributed on the basis of horse hours. There is only one hitch here. Horse hours have been charged to "Machinery" account, and, therefore, if this basis is used machinery will have recharged against it a certain proportion of its own cost. This can be obviated by first deducting from the total horse hours the number of horse hours charged to "Machinery" account and using the remainder as the basis for distributing the entire machinery cost. This should now be done, proceeding with the distribution exactly as explained for the man-labor cost (step 14).

18. Any other accounts of convenience, as "Manure," "Feed and supplies," "General expense," etc., should now be distributed and these accounts closed.

19. All other values in the final inventory, not already credited, should be carried to their respective accounts and credited on the right-hand pages thereof.

20. Interest, based on the average inventories of each account (except "Horses" and "Machinery," which have already been charged), should be charged thereto and "Interest" account credited with the total. The rate should be the same as that already used in the two accounts specified.

21. A proper charge to crops and pasture should now be made for the use of the land and the total credited to "Real estate" account. The rate per acre should be high enough to cover interest and taxes but not so high as to make "Real estate" account show any great profit. In fact the "Real estate" account should be, if possible, made to balance by the credit for use of land. This can be done by finding the net balance of the "Real estate" account and dividing by the number of acres to be charged with rent. This will give a rate per acre which can then be handled exactly like that of "Man labor," "Horse," and "Machinery" accounts, and any small balance remaining can be handled in the same way. A point to remember is that if the final inventory value of the real estate has been increased over that at the beginning of the year to keep pace with actual advances in real estate values in the locality, such advanced values should not be used in making the above distribution, but the amount of such advance should be first taken out of the account and carried to "Loss and gain" account as a separate, distinct gain.

22. Both sides of the crop, livestock, pasture, and any other enterprise accounts should now be footed up and the lesser total subtracted from the greater to obtain the balance as shown by each account. These balances are now to be closed to "Loss and gain" account. If the charge side is greater in an account the excess represents a loss and should be carried to the "Loss and gain" account as such by entering it on the left-hand page under charges. If the credit side of an account be greater a profit has been made and should be carried accordingly to the credit side of the "Loss and gain" account. Table 2 illustrates a crop account on which a gain of \$536.81 has been closed to "Loss and gain" account.

23. Both sides of the "Loss and gain" account should now be footed up, the lesser subtracted from the greater, and thus the net gain or loss for the year determined.

When all these steps have been completed the books are said to be finally "closed." It is a good plan to make up a Profit and Loss Statement for the year for convenience in further study of the year's business and to preserve, for comparison with similar statements for future years. Such a statement may be prepared in the following manner :

Statement of losses and gains, 1918

| Account | Number of acres or animals | Losses | Gains | Per acre or animal | |
|-----------------------------------|----------------------------|---------|----------|--------------------|---------|
| | | | | Loss | Gain |
| Cows..... | 19 | -- | \$359 11 | | \$18 90 |
| Hogs..... | 3 | -- | 14 82 | | 4 94 |
| Poultry..... | 82 | -- | 19 65 | | 24 |
| Corn..... | 10 5 | -- | 26 60 | | 2 53 |
| Potatoes..... | 14 | -- | 536 81 | | 38 34 |
| Wheat..... | 4 5 | -- | 35 17 | | 7 80 |
| Rye..... | 3 | \$19 91 | -- | \$6 64 | |
| Oats..... | 15 | 3 84 | -- | 26 | |
| Buckwheat..... | 5 | 13 63 | -- | 2 73 | |
| Peas..... | 6 | -- | 35 39 | | 5 90 |
| Hay..... | 40 | -- | 195 65 | | 4 89 |
| Orchard..... | 3 | -- | 148 52 | | 49 51 |
| General expense..... | -- | 151 45 | -- | | |
| Totals..... | | 188 83 | 1,371 72 | | |
| Subtracting the lesser..... | | | 188 83 | | |
| Net gain on farm enterprises..... | | | 1,182 89 | | |
| Personal accounts..... | | | | | |
| Interest..... | | | 388 00 | | |
| Personal..... | | | 373 85 | | |
| | | | 1,944 74 | | |

STUDY AND INTERPRETATION OF RESULTS

Unless studied, farm accounts are of little use to help make business more profitable in the future. It is just as important to study the different items of cost and returns in an account as to know whether or not it pays. Weather conditions, crop conditions, and market conditions, for the year, as compared with an average year, must be considered. For instance, potatoes in some year may show heavy losses on many farms because of low prices or losses by rot. By studying the potato account to find the factors of production, and considering a normal yield and price for the locality, conclusions could be reached as to whether ordinarily it would or would not be profitable to raise potatoes.

The potato account in Table 2 when studied, yields the following figures:

| | |
|---------------------------------------|--------------|
| Total acreage..... | 14 |
| Total yield (bushels)..... | 1, 128 |
| Total cost..... | \$735. 24 |
| Total value..... | \$1, 272. 05 |
| Total profit..... | \$536. 81 |
| Yield per acre (bushels)..... | 80. 6 |
| Cost per acre..... | \$52. 52 |
| Value per acre..... | \$90. 86 |
| Profit per acre..... | \$38. 34 |
| Man hours per acre..... | 57 |
| Horse hours per acre..... | 60 |
| Labor cost per acre..... | \$27. 10 |
| Cost per bushel..... | \$0. 652 |
| Value per bushel..... | \$1. 128 |
| Profit per bushel..... | \$0. 476 |
| Net return per hour of man labor..... | \$0. 672 |

Besides the satisfaction of knowing which crops or enterprises paid and how much, there are many other ways in which the accounts may be useful. They may be used to study the seasonal distribution of the labor on the farm as a whole and on certain enterprises, disclosing just where the rush seasons occur and what causes them. They may be used to compare results with neighbors, or with published cost records in newspapers and bulletins. The results of such comparisons should be to teach methods by which labor can be saved, thus cheapening production and correspondingly increasing the chances of a good profit.

By keeping cost accounts an idea of the value of labor will be gained, it is soon discovered that time represents money, and that it is as important to save one as the other. The results set forth by the accounts will often give a farmer many surprises. Sometimes it is found that the enterprises which he thinks are the best and to which he devotes most of his time do not show up so well financially as the enterprises that get little attention.

Cost accounts, carefully and consistently kept, year after year, are certain to develop both the business of farming and the farmer's power of analyzing the causes and effects involved in his operations.

**ORGANIZATION OF THE
UNITED STATES DEPARTMENT OF AGRICULTURE**

February 24, 1926

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This bulletin is a contribution from

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|---|----------------------------------|
| <i>Bureau of Agricultural Economics</i> | THOMAS P. COOPER, <i>Chief</i> . |
| <i>Division of Cost of Production</i> | R. H. WILCOX, <i>in Charge</i> . |

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