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# CROP AND LIVESTOCK REPORTING

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RECORDS of the collection of statistics of agricultural production by governmental agencies can be traced back almost to the dawn of history, but it was only during the last half century that modern nations began to collect statistics of agriculture regularly and systematically. An enumeration of agricultural production in the United States was first made in connection with the decennial Federal Census of 1840. In response to the post-war demand for statistical information, the decennial census of agriculture was placed on a quinquennial basis in 1925. It was not until the Department of Agriculture was organized in 1862 that the regular and systematic collection of annual and monthly agricultural statistics was provided for in this country.

As the agriculture of the Mississippi Valley developed, annual or bi-annual enumerations of acreage, crop production and numbers of livestock were provided for by several of the important states in the region including Kansas, Nebraska, Missouri, Iowa, the Dakotas, Minnesota, Wisconsin, Indiana and Ohio. These state enumerations are generally made by the local tax assessors. A few states outside of the Mississippi Valley such as North Carolina, West Virginia, Colorado, and Utah are now making assessors' enumerations of crop acreage, either annually or bi-annually. One southern state, Alabama, in cooperation with the Federal Crop Reporting Service, is making a semi-annual sample census of agriculture, similar in many respects to the partial censuses made in Scandanavian countries prior to 1914. More will be said later concerning the importance of this method of securing reliable estimates of acreages of crops and numbers of livestock.

This country differs from many other countries in that an annual enumeration of acreage and livestock numbers is not made throughout the country by regularly employed officials. Consequently the most important problem confronting our statisticians is that of estimating changes in acreage, and changes in numbers of livestock from year to year, largely on the basis of sample data obtained entirely from voluntary correspondents—farmers who receive no compensation for their valuable services. These sample

data are obtained by mailed questionnaires or by means of questionnaires distributed to farmers and collected by the rural mail carriers of the Post Office Department.

Although this country is handicapped because of the lack of annual enumerations, a rather comprehensive system of collecting data concerning the commercial movement of agricultural products is being developed. These data serve as a check on the estimates and make it possible to measure the bias of the sample data on which the estimates are based. For example, there is the annual enumeration of bales of cotton ginned, which has been made since 1906, the excise records of the sales of tobacco, the reports from the railroads to the Department of Agriculture of the carlot shipments of fruit and vegetables and livestock, the receipts of livestock at the great central markets, such as Chicago, Kansas City, and other livestock centers, as well as the receipts of livestock at packing houses, and the Bureau of Animal Industry records of inspected slaughter. Agricultural products received by trucks at some of the principal cities are now being recorded. Reports on the quantities of butter, cheese, condensed milk and ice cream manufactured are now obtained regularly. Associations of canners report the total pack of fruits and vegetables. Receipts of grain at elevators, mills, and warehouses are also reported for some states. This compilation of the commercial movement and production of agricultural commodities is valuable for other purposes in addition to affording a basis for checking estimates of agricultural production.

From the beginning of crop estimating in the Department of Agriculture in the sixties, data have been obtained concerning the condition or appearance of the growing crops on the first of each month from planting time until harvest. It was not until 1912, however, that the Department began to interpret these condition reports into terms of probable production. An arithmetical method was used in making this interpretation until within the past two years when statistical methods, based on correlation technique, were developed for this purpose. With crops in those states where there has been little apparent relationship in past years between the appearance or condition of the growing crop and the final yields per acre, meteorological data are being used successfully as a basis for making forecasts of crop production.

In addition to making forecasts and estimates of crop and live-

stock production, periodical estimates are made covering stocks of grains, potatoes, and apples on farms. Prices received by farmers for farm products are obtained monthly from special price correspondents; prices paid for farm labor are collected quarterly; values of agricultural land are estimated annually. These data of a more general economic nature form the basis of index numbers of farm prices, farm retail prices, wages, and land values.

The crop and livestock estimating work is carried on by the Division of Crop and Livestock Estimates of the Bureau of Agricultural Economics. There is a staff of twelve trained statisticians and eighty clerks in Washington. Forty-one field offices are maintained in each of which there is a trained statistician in charge, with from one to three technical assistants, depending upon the size of the state, and also a small staff of clerks. Estimating in the New England States is carried on from one field office; in Maryland and Delaware from one office; and in Utah and Nevada from one office. In each of the other states a separate field office is maintained by the Division of Crop and Livestock Estimates. In addition to the field statisticians who are required to travel throughout their respective states to observe crop conditions, a large corps of voluntary correspondents, numbering about 300,000—mostly farmers—are maintained on various lists. In June and December when surveys covering livestock are made and in September when surveys covering crop acreage are made, in each case with the assistance of the rural mail carriers, reports are secured from many additional farms. In September, about a million acreage cards are distributed through the carriers. In many of the larger states from 8,000 to 15,000 farms are included in the sample.

In thirty-seven of the states the United States Department of Agriculture has cooperative agreements with either the state department or board of agriculture or with the college of agriculture, whereby the work of making crop and livestock reports for the state is conducted jointly. So far as I know there is no state at the present time in which crop reports are issued independently by any branch of a state government. The cooperative arrangements between the state and federal governments have tended to increase the scope and accuracy of the reports by making more funds available for technical and clerical help. They have also reduced confusion by eliminating two official crop reports, one state and the other federal, for any given state. For the current

fiscal year the contributions to the crop reporting work by the various states exceed $300,000, while the federal government is contributing somewhat in excess of $700,000.

All of the crop reports issued by the Department of Agriculture are reviewed by a Crop Reporting Board, consisting of a Chairman and from five to seven members. The chairman and members of the Board are named by the Chief of the Bureau of Agricultural Economics and approved by the Secretary of Agriculture. The members are selected almost without exception from the statistical staff of the Division of Crop and Livestock Estimates. At present, the chairman is also the administrative head of the Division of Crop and Livestock Estimates, but the previous chairman was Assistant Chief of the Bureau of Agricultural Economics, and some time prior to that, the Assistant Secretary of Agriculture presided. Usually from two to three of the field statisticians are called in each month to serve on the Board, being alternated from month to month. In the case of cotton the law requires that at least three of the members shall be supervising field statisticians familiar with the growing of cotton.

The Board as a whole actually prepares the reports which are issued on speculative crops such as cotton, wheat and corn. For the non-speculative crops the Board is divided into groups, each group being responsible for certain crops. In such cases the Board simply reviews and approves the work of the group.

Most of those present have heard something of the care which is taken to prevent "leaks" of the information. Very stringent laws are in force which provide heavy penalties for divulging any of the information in advance of the time set by law or department regulation for the release of reports. Because of the influence which the reports on cotton, wheat and corn exert on the futures market you can readily see how important it is that no one shall have advance information.

The reports on the so-called speculative crops received from the field offices go directly from the post office in sealed envelopes to a safe under the jurisdiction of the secretary's office. The safe has two locks and two different persons hold the keys. On the morning of the day a report is to be released, the chairman and the secretary of the Board go to the secretary's office where the secretary or his assistant opens the safe and takes out the reports and hands them to the chairman. They are brought back to the

rooms of the Crop Reporting Board under police guard. As soon as they arrive the doors are locked and guarded until the time fixed by the secretary for release. The windows are also covered and sealed and telephones and call bells disconnected. In fact, no communication between the Board and the outside world is permitted while a report is in process of being made. The schedules received direct at Washington from reporters are tabulated piecemeal for each state and the data are not assembled by the clerical staff of the Board until after the Board is in session. These extreme precautions seem necessary because of the tremendous financial interests involved.

Just before the time of release the Secretary or Acting Secretary of Agriculture is admitted to the rooms of the Board to approve the report. A minute or two before the time of release the chairman and one or two members of the Board carry the report under police guard to the release room. Here are to be found a rather large assembly of men representing the press and other interests. They are required to stand in the middle of the room until the report is distributed face down beside the many telephone and telegraph instruments which have been provided. At a signal there is a wild rush to get the information out and in a minute the high lights of the report are known throughout the world, especially reports relating to cotton and wheat.

The estimating of the acreage of some seventy crops each year presents a great variety of problems, many of which are still awaiting solution. When the great variety of crops grown in the United States and the character of these crops is considered, a tremendously wide field is presented to the statistician. For instance, in attempting to forecast or estimate the production of apples, quite different methods must be used from those used in connection with an annual crop, such as wheat. In the livestock field, many statistical problems are presented that involve the use of sample data in estimating total numbers of livestock by age and sex classifications. Fortunately for the accuracy of the livestock reports, a great deal of check data are available in the form of receipts of livestock at stockyards, records of animals slaughtered, and assessors' enumerations for purposes of taxation.

In order to collect the information needed to cover the various reports made by the Division, about 420 different kinds of questionnaires are used each year and over 9 million questionnaires are

mailed out from Washington and the field offices. From about 1883 to within the past three or four years, a complete dual system of reports was maintained. That is, questionnaires on all subjects were sent out from and returned to Washington for tabulation, as well as from each of the field offices. The data compiled in the field offices were sent to Washington, where the results obtained from the two independent sources formed the basis of the estimates of various kinds. The work of collecting data for the estimates of acreage and numbers of livestock has now been delegated entirely to the field offices, which send out all of the questionnaires relating to acreages as well as numbers of livestock and tabulate them in their offices.

Under the present plan, immediately preceding the issuance of reports covering acreages and numbers of livestock—the bulk of which are issued as of July 1, December 1, and January 1—each of the field offices is visited by a member of the Crop Reporting Board from Washington who reviews the data collected and the conclusions reached by the field statisticians. These he submits with his recommendations to the Crop Reporting Board at Washington. These recommendations are usually accepted by the Board, with only occasional or slight modifications. The dual system is still maintained in all important states, in collecting information concerning the condition of crops, yield per acre, and similar information. The field statisticians send in to the Crop Reporting Board their recommendations as well as the results of their inquiries, which are compared with the inquiries obtained in Washington. It is interesting to note that for crops grown extensively in any state, the average of the reports concerning condition of a growing crop or the yield per acre at harvest, received by the field offices, usually agree very closely with those received and tabulated in the Washington office. When the data from the two separate sources of information do not agree it is necessary to review the two samples, district by district, in order to discover in so far as possible the cause of the discrepancy.

## CONDITION OF THE GROWING CROPS AND FORECASTS OF PRODUCTION

Some persons have criticised the basis on which condition figures are obtained, namely, that of comparing the condition of a

growing crop at a given time with a normal condition taken as equal to 100 per cent. Some of our friends from across the water have been particularly critical of this basis of comparison, insisting that a normal crop was an ideal seldom realized, and which was entirely too subjective to furnish a satisfactory basis of comparison. The fact, however, that reports received from two completely different lists of crop reporters at a given time, in which they have been asked to compare the condition of a certain crop with normal, will almost always agree within one or two per cent, would seem to indicate that farmers have a rather definite concept concerning a normal or full crop.

I am of the opinion, however, that it makes no difference whatever, whether the basis of comparison for the crop reporter is a normal crop or an average crop, so long as a statistical method of interpretation rather than the arithmetical method is used in making a forecast of probable yield per acre. When the average of past years is used as a basis of comparison for the farmers' reports on condition of the growing crop, an historical series may be accumulated which may serve as a reliable barometer of the final yield per acre and be used statistically for forecasting purposes. When an average for the past five or ten years is calculated and used to arithmetically interpret the current condition figure, reported as a percentage of an average, there is a tendency for the forecasts to be less than the final out-turn of the crop, as has been the situation in England and Canada where the average rather than the normal is used. The older "par" method of interpreting the condition of a crop in per cent of normal avoided this difficulty of understatement, providing there was no time trend in the relationship between the reported condition figure and the final yields per acre.

The weakness of the arithmetical method of interpretation, including the par method, lies in the fact that it assumes a positive one to one relationship between condition and final yield. While this might be a reasonably satisfactory *a priori* assumption, we have discovered that it is possible to have an inverse relationship between the condition or appearance of a crop and the final yield per acre. This is the case with potatoes, for example, in Maine.

I think I can best illustrate this by the use of the blackboard on which I will sketch a chart showing roughly the relationship of condition September 1, and final yields of Kansas corn. On this

chart you will note that I have plotted on the vertical line the yields per acre, and on the horizontal line, the condition of the growing crop. The purpose of this dot chart is to compare the condition as of a given date with the final yield over a period of years. Charts of this character are used in making forecasts of yield per acre for every crop in each state. For instance, on September 1, the condition, say of corn, is 70. What does this mean in terms of bushels per acre at harvest? You will note that in previous years, when the condition is plotted against the final yield, that the dots tend to fall in a rather regular and more or less straight line. In some cases you will find a distinct curve to this line while in others the observations are so scattered, that the result is similar to the pattern made by a shot-gun, indicating that there is little, if any, relationship between the condition as of a given date, and final yield.

When the dots showing the relationship between condition and final yield in previous years, tend to fall on a well defined line, the matter of forecasting is very simple. When, however, the dots are scattered over the chart, there is no basis for a forecast and the necessity of approaching the problem from some other angle, such as the use of meteorological data, is apparent. It is frequently found, when an analysis is made of past years' records, that during dry years there is a tendency for the condition to be reported lower than in wet years. In fact, the rank vegetative growth common in years of ample moisture frequently fails to produce as high a yield as in years which are more favorable for the production of grains or tubers. Although the dots on the chart, on first examination, may appear to show no significant relationship between condition and yield per acre in past years, a further analysis in which weather factors are used to supplement the condition reports may reveal a satisfactory basis of forecasting. That is, methods of multiple correlation are being successfully used at this time in forecasting the yield per acre of important crops in important states.

There are some cases where the use of the condition figure is actually misleading as a basis for forecasting the yield per acre of a given crop in a particular state. The higher the reported condition, the lower the final yield has been at harvest. That is, there are cases of minus or inverse correlation. This situation

exists in connection with potatoes in Maine as of August 1. It is also true in Maryland and other Atlantic Coast States with respect to wheat. Apparently, in Maine in years of heavy precipitation the farmers are influenced by the fine appearance of the crops to report a high condition on August 1, whereas an analysis of the relation of rainfall to yield indicates that when rain is abundant within a certain period, it tends to result in greatly reduced yields. In Maryland, where we have a similar situation with respect to wheat it was found, after studying the historical data, that prior to 1900 there was a close relationship between the condition of the growing crop as of May 1, and as of June 1, and the final yield per acre of wheat, but that the relationship has been reversed in recent years. This is due to the fact that a disease called "Septoria nodorum" became prevalent, and weather which gave the crop an unusually fine looking appearance usually resulted in a serious attack of this disease and in consequence greatly reduced the yields.

This year in Florida, for instance, the condition of the crop prior to harvest indicated a rather high yield per acre of potatoes. Early harvestings supported the high figure. A careful analysis was made of the relation of weather to yield in that territory and the evidence was so convincing that a forecast was made based largely upon the relationship of the weather to potato yields in that area. From a check up of the crop based on carlot shipments of potatoes, it has turned out that this forecast was much better than could have been made from the regular condition reports The same has been found true in Maine with regard to potatoes and also with some of the other crops. One of the difficulties presented in studying the relation of weather to yield has been the shortness of the historical series as well as the inaccuracy of some of the records of yields.

With respect to forecasting the apple crop, quite a different method of procedure is followed. It has not been found possible to establish any basis of a normal yield per acre or per tree. Therefore, the crop estimating service has had to depend very largely on census reports as a basis for forecasting. As you know the census of agricultural production is taken every five years. Each year the Division asks its correspondents to estimate at the close of the season the size of the apple crop in percentage of normal.

Suppose, for example, that for the State of New York the census for 1924 showed a production of 5,000,000 bushels of apples and at the same time the crop correspondents estimated that the crop was 50 per cent of normal. This would mean that under normal conditions the crop would have been 10,000,000 bushels. Similar records for previous census years are available, and from these two known factors a par or 100 per cent production indication has been derived. This par production is adjusted from year to year in the light of new plantings, of old trees pulled out, and from the record of carlot shipments which is available. In addition to the monthly forecasts of production based on these data, a forecast is made each year on the first of November as to the carlot movement of apples. These forecasts of the carlot movement have been surprisingly accurate.

## ESTIMATING CROP ACREAGES

The estimating of crop acreages (both absolute and relative) presents some of the most difficult problems connected with crop estimating. The decennial and quinquennial censuses of agriculture have been and are still the principal bases upon which annual statistics of acreages of crops are made in inter-census years. The census data are modified in the light of other information such as the commercial data relative to carlot shipments, and so forth, which are used to measure the incompleteness of the various censuses.

For nearly fifty years prior to 1925, the estimates of changes in acreages from year to year were based almost entirely upon a judgment inquiry sent to crop correspondents in which they were asked to give their best judgment as to the increase or decrease of the acreage in various crops in their locality as compared with the previous year taken as equal to 100 per cent. About two decades ago a second question was included, asking the correspondents to compare the acreage, not only with the preceding year, but also with the acreage usually grown in their locality. This was done in order to overcome the difficulty which arose when the distribution of acreages for the previous year was an abnormal one due to winter-killing, drouths, or other causes.

About 1918, the judgment inquiries were supplemented by a questionnaire to correspondents asking them to report for their

individual farms the acreage in the various crops for the current year as well as the acreage they had harvested the preceding year. This was a marked step in advance as it had been found from long experience that in the case of unusually large increases or decreases the judgment inquiries failed to reveal the change. In 1924, the collection of a more nearly random sample of acreages from the rural mail carriers was begun. This sample was less selective as revealed by the measurements of average size of farm and average acreages in crops and was more accurate when tested by check data, such as assessors' enumerations in states having annual enumerations, cotton ginnings, carlot shipments, and mill-door receipts of grain and carlot shipments of vegetables, including potatoes. An improvement of method, both with respect to the mail and the rural carrier samples in various areas, has been made in the comparison of changes on identical farms. That is, reports for each of two years from the same farms are used as an indication of the change in acreage of a given crop. In many states sufficient returns are now being received to make it possible to compare a large number of identical farms for two years. The questionnaires going to the rural mail carriers ask only for the acreage for the current year, as it has been found that memory bias tends to distort the comparison when farmers are asked to report for the present and previous year at the same time. This is especially true with cash crops and crops of small acreage. A moment's consideration, however, will disclose the great unsolved problem still before us, which we have ever in our minds, and for which a somewhat arbitrary discount must be made at present for lack of any quantitative basis of measurement. Both questionnaires sent by mail and collected by rural carriers deal with individuals living on farms now. Nothing in the sample itself reveals who was on the farm last year and not at present, or now and not last year, or what unit of land was operated last year and not this year, or this year and not last year. In other words, in a region of expanding agriculture, these samples tend to understate acreage changes, while in a region of declining agriculture, they overstate changes in acreage. Fortunately, in the great agricultural areas of the Middle West these changes are small but in other areas they are important, and ways and means must be de-

vised to go beyond the present sample in order to measure the influence of shifts of land into and out of agriculture.

A few years ago one of our field men invented what is now called a "crop meter," which is a measuring instrument which is attached to an automobile in the same manner as a speedometer and by means of which the frontage in number of feet in each kind of crop along selected highways may be measured from year to year. From frontage measurements over identical routes for two years indications of change in acreage can be derived. These meters have been made with 24 dials and can be used either for measuring 24 kinds of crops along one side of the road, or may be divided and measurements taken of a smaller number of crops, on both sides of the road at the same time. Valuable results have been secured from the use of this crop meter and we think that it will help us to solve some of our problems with respect to new land taken up for agricultural purposes, for pasture, and so forth. For instance, our statistician for Virginia tells me that along the routes he selected to cover in that state there has been an increase in land going back to forest of about 2 per cent a year for several years. It is a purely objective method of measuring changes in acreage and is especially valuable with important cash crops such as cotton, potatoes, and so forth where there is a marked tendency to understate the crop acreage of the current year.

We have come to the conclusion that sooner or later for the solution of these problems we will have to use some other method of collecting sample data from the farms. The method which shows greatest promise is that of a partial or sample census each year of representative areas well distributed over a given state. The general method of purposive selection as developed by the Scandanavian countries during the decade following 1900 could be applied with advantage to selected representative areas or enumeration districts or individual farms. Well trained and paid enumerators would take this census in the same areas from year to year. Such a sample could be made much more representative of all classes of farmers than is possible when the sample is made up only of reports from those who are willing to render a report voluntarily. This method of a partial annual census is now being used successfully in Alabama.

## PROBLEMS IN LIVESTOCK ESTIMATING

The problems involved in estimating the number of livestock of different species on farms (taking an annual inventory), and in estimating the quantity and value of annual livestock production, are considerably different from those encountered in estimating crop production. They are quite as difficult of solution, however, and it is only within the last four or five years that real progress has been made. These problems also differ as among different species of livestock. For example, hogs are produced very largely for meat; they are marketed or slaughtered on the average when less than a year old; the basic breeding stock is small compared with production; and yearly changes in numbers produced may change markedly. On the other hand, cattle are marketed at all ages, from calves to worn out dairy cows; to a considerable extent they are produced primarily for purposes other than slaughter; the basic breeding stock is large compared with yearly production; and increases in numbers can be brought about but slowly.

Until a few years ago the activities of the Department of Agriculture as regards statistics of livestock production were directed largely to securing inventory numbers. The estimate of the number and value of livestock on farms, made as of January 1, was the principal livestock estimate of the year, and, as with crops, was based upon judgment inquiries, with but little effort to adjust for the bias which nearly always exists in such data. This accounts for the radical revisions which have sometimes been necessary following a new census. While a yearly inventory of livestock numbers is much more significant for indicating livestock production than a similar figure for grains, hay, or cotton would be for indicating the production of these crops, it was at best entirely inadequate to furnish a basis for arriving at the annual number and value of livestock produced. Little or no information as to actual livestock production, even after the close of the year, was secured, and practically nothing was sought as to production as it was taking place in advance of the movement to market.

At present the livestock activities of the Division of Crop and Livestock Estimates are being centered more and more upon securing information of production, and methods are being devel-

oped for obtaining such data currently and publishing them well in advance of the time when the supply will be marketed. Because of the comparatively short interval of time between birth and marketing of hogs and lambs, information as to current production is of greater utility with these species than with others. While considerable progress has been made in this field, much still remains to be done to develop a satisfactory statistical technique.

Pigs are raised generally as two crops, a spring crop and a fall crop, so that it is necessary to prepare two reports each year on pig production. Lambs are a single crop, born largely between March 1 and June 1, hence only one general estimate—in July—is made of the lamb crop. This is supplemented, however, by reports on the early lamb crop in those states where large numbers of lambs are born before March 1, and marketed before July, so that producers and the trade may be advised as to the prospective numbers of early lambs.

In addition to estimates of numbers on farms and of production, a number of estimates of short period supplies are made. These include estimates of cattle, sheep and lambs on feed for market on selected dates during the year, prospective marketings of western cattle over seasonal periods, the fall shipments of western lambs, and so forth.

The securing of dependable information upon which to make these various estimates, and checking the accuracy of the estimates as made, present some interesting problems, some of which are not easily solved. As with crops, the census enumerations are used as the basis for estimating changes in numbers between census periods. The changing of the time of taking each census, with which you are all familiar, has greatly increased the difficulties of making estimates of numbers as of the same date over a period of years.

In general the basis of most of these estimates of changes in numbers in intercensal years is the individual farm sample. The problem of such samplings is to secure large enough returns, properly distributed, to be respresentative. For livestock reports these sample data are secured from regular and special lists of reporters, and from schedules distributed by the rural carriers of the Post Office Department. The sample secured by the latter method is probably a better one than that secured from regular reporters,

since the latter tend to represent the better and more stable producers.

As with acreage, the preparation of questionnaires that will furnish the desired information, and yet be simple enough to be understood by the reporters, is not an easy matter. One of the difficulties is to adopt words and phrases that have the same significance in all parts of the country. For example, the pig survey cards ask for the "number of pigs saved" from all litters farrowed during a stated period. Over a large part of the Corn Belt, the principal hog producing area, the phrase "pigs saved" has a rather general specific meaning, which is, pigs that lived to be several weeks of age. In other sections, apparently, this phrase does not have such a meaning, and it is often difficult to determine what the reporter actually has in mind. But great caution is needed in changing the wording of schedules, both because the new schedule may turn out to be no better than the old, and because the comparability of the returns for the two years may be affected.

Covering the last seven years the Division has been obtaining quite complete information as to monthly and yearly movements of livestock by states, for the principal producing states. This includes shipments into, as well as from these states and makes possible a computation of the net output. On the basis of such information and sample data covering other items, balance sheets of livestock numbers per state, showing items of increase and decrease during the year, together with numbers at the beginning and end of the year, have been prepared. The information secured by sample, covering such items as births, deaths, and farm and local slaughter, is rather uncertain, since it involves a correct memory of such items by the reporter covering a number of months. That there is a considerable memory bias in such returns seems certain, but it is difficult to measure this from sample data alone, for the representativeness of the sample is always in question. At the same time such census data as there are covering these items are apparently lacking in dependability as giving absolute numbers that can be used as a basis for estimates.

For checking estimates of numbers on farms and other similar estimates, the marketing figures are very useful for some species. The best information for such checking purposes for cattle and

horses and mules is that obtained from the annual reports of tax commissioners or state auditors which give the number of livestock taxed each year. These are available for all of the principal livestock states. The yearly changes in assessments, except under abnormal conditions which tend to affect the normal proportion of animals returned for assessment, are probably the best indications of yearly changes, and especially of trends over a period of years. These, however, are only available for checking the estimate of the previous year. For the current year, sample data of various kinds must continue to be the principal source of information.