

December 1960

A PROGRAM FOR THE FUTURE DEVELOPMENT OF
CROP AND LIVESTOCK ESTIMATES

This statement is presented in response to the directive contained in the Conference Report on appropriations for the U. S. Department of Agriculture for fiscal year 1963 (No. 2381) under the title Statistical Reporting Service which reads that "a review be made of the needs, priorities, and costs for additional estimates on crops and livestock, and that future program requirements be presented for consideration at next year's appropriation hearings."

The objectives for new and expanded statistical programs in the Statistical Reporting Service are to (1) improve the precision and accuracy of current estimates and forecasts, (2) accelerate the assembly, handling, transmission, processing, and dissemination of data, and (3) expand the coverage and detail of current estimates and forecasts for commercially-important agricultural products.

The current program for improvement in crop and livestock estimating is in accord with a report prepared in February 1957 for the Subcommittee on Agricultural Appropriations, House Appropriations Committee. The report, entitled "A Program for the Development of the Agricultural Estimating Service" outlined four projects designated as A, B, C, and D. Projects A and B are primarily concerned with objective (1), Project C with objective (2), and Project D with objective (3). This statement will update the 1957 report by indicating progress made with each of these projects and the needs anticipated to carry them to completion.

Project A, Objective 1

The plan for Project A was developed from research initiated with funds provided by Congress in 1952 when it became evident that voluntary response to the mailed questionnaires used in crop and livestock estimating no longer provided the consistent degree of accuracy required as a result of the increasing tempo of change in agriculture.

Project A provides for a basic change in method for collecting data that undergirds the entire crop and livestock estimating system. It involves enumerative surveys in selected sample areas to provide a more solid foundation of benchmarks for the estimates and forecasts based upon mail questionnaires. Two enumerative surveys are conducted each year: one in the spring to give dependable bases for data on such items as number of farms, land in farms, acreage planted or to be planted to major crops, and livestock numbers; and one in the fall to check the extent to which the plans for production were actually carried out and to re-assess the livestock inventory and estimate acreage of fall-seeded grains. In the interim months between the two enumerative surveys, objective yield surveys on important crops based on field counts and measurements are carried out to undergird the condition and probable yield data from mail questionnaires to arrive at yield forecasts during the season.

In 1957 an appropriation of \$250,000 permitted pilot experimentation with the new method in several States. Starting in fiscal year 1961, Congress provided increments of \$750,000 in 1961; \$500,000 in 1962; and \$760,000 in 1963 for the gradual, systematic implementation of Project A. These funds now support full operations in 24 States and pilot operations in 11 States.

Placement of Project A on a full operating basis in the 48 conterminous States is given highest priority. It is proposed that this be completed in 2 years. Cost of completion is estimated at \$1,700,000. In the first year \$1,045,000, requested in the President's Budget for 1964, would put 11 additional States on an operating basis and the 13 remaining States on a pilot basis; and \$655,000 in the second year would place all States on an operating basis.

Project B, Objective 1

Project B is distinguished from Project A in that it is concerned with price data. The present method for collecting all data for estimating prices received by farmers, prices paid by farmers, and the parity ratio is the mail questionnaire. Dependence on mail questionnaires in the interest of economy detracts from the continuity and completeness of coverage, the efficiency of estimation, and in the absence of a probability sample the possibility of determining the degree of precision. Project B contemplates the establishment of a data collection program embodying stratified probability sampling and personal enumeration of prices as a major source of primary data. It is to be supplemented by mail inquiries to cover items for which the enumerative approach is too costly compared with the quality improvement obtainable.

Experimental work carried out in one State (Ohio) indicates that a corps of nine enumerators per State is sufficient to provide substantially improved data on the major commodities for prices received items and on the more difficult of the prices paid items. It further indicates that a supplementary mail approach will for certain groups of commodities provide adequate data for a part of the items or for parts of the year at less cost than the enumeration of all items.

The study also demonstrates that the enumerative approach to price data collection can be effectively integrated with Project A and consequently should be introduced in a State only after Project A is in operation.

Cost of implementation of Project B is estimated at \$1,950,000. The implementation could be accomplished most efficiently if it were introduced in at least two steps. The first step proposed is to introduce the system into 9 States at a cost of \$425,000, and the second step to extend the system into the remaining States at a cost of \$1,525,000.

Project C, Objective 2

In recognition of the value added to crop and livestock estimates by getting them out promptly, Project C is intended to shorten the time between data collection and report issuance. This may be accomplished by speeding up: data assembly, processing in State offices, transmission of data from State offices to the Crop Reporting Board, computation of national estimates and preparation and distribution of final releases.

The most promising avenue for reaching this objective at this time is to introduce automatic data processing wherever feasible. The computation of standard errors of estimate from the probability samples in Project A, however, increases the computational load to the extent that electronic data processing is required to adhere to the tight schedules now maintained which call for national estimates to be released within 10 days or two weeks after data collection from farmers.

In 1958 a small computer was installed on a rental basis with sufficient work programmed to keep it busy one shift a day. The services of the computer were made available to other U.S.D.A. agencies on a reimbursable basis and several agencies took advantage of this opportunity. By 1961 the work load increased to the point where the computer operated at full capacity or about $2\frac{1}{2}$ shifts a day. In 1962 the data processing unit in the Statistical Reporting Service was designated as the Washington Data Processing Center for the Department of Agriculture and another small computer was included in the consolidation. It is now apparent that larger scale equipment is required to handle the peak loads imposed by the enumerative and objective yield surveys and that sufficient demand for computer services has developed to use the capacity of such equipment efficiently and regularly.

Large-scale equipment adequate to handle the volume of data involved is being acquired to replace the original computer. It will also permit further automation of data handling now performed manually or with desk machines. This equipment can be used effectively only as personnel are trained to handle it and as systems are devised to convert current methods to automated operations. Funds will be necessary to develop the new automatic data processing systems.

New ways will need to be devised to reduce estimating time. Key punching data for computer input is one of the more laborious time-consuming chores. A faster system, less subject to error, is needed to capture the data nearer its source and speed up transmission from source to computer and from computer to report. Studies also need to be undertaken to see if existing equipment such as optical scanners, devices for punching paper tape, wire transmission systems, and high-speed printers can be utilized effectively in conjunction with an appropriate computer system in speeding up the release of Statistical Reporting Service reports.

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Costs of conducting research and development on these problems are included in Item 1b in the summary estimated at \$220,000, of which \$106,000 is included in the President's Budget for 1964.

Electronic data processing brings within range of possibility crop estimating improvements unimagined a few years ago. It is now possible to indicate along with each probability sample the degree of reliance that can be placed upon it. As soon as the enumerative survey becomes operative nation-wide it is proposed that steps be taken to convert the mail questionnaire system to a probability sampling basis. The ultimate goal is to integrate the two methods of collecting data so that standard errors can be computed for the Crop Reporting Board. This will involve a further increase in the computational work to realize the full potential benefits believed to be possible. Development of probability mail sampling, the compilation of appropriate mailing lists, and research on improved samples for enumeration represent formidable challenges yet to be met. The research and development work is set forth as Item 2c at a cost of \$350,000.

Project D, Objective 3

Increased coverage refers to new data on agricultural products that have achieved commercial importance, but quite as often it pertains to needs for more detailed information resulting from technological changes in farm production and marketing. Greater detail is requested in a variety of forms such as smaller geographical breakdowns, more frequent reports covering shorter time periods and narrower classifications of farm products by varieties, size or weight groups or qualities. Most Project D proposals, therefore, should be regarded as refinements of existing series of data.

Estimates involving increased coverage introduced since Fiscal Year 1961 are:

1961 - Market Flow Statistics for Tomatoes and Celery covering 3 States.

Lambs on Feed covering 7 States.

1962 - Small Fruits and Caneberries in 2 States.

Cattle on Feed: monthly, 1 State; quarterly, 2 States; annually, 2 States.

Cotton: Intentions to Plant in March, all States.

Durum Wheat Stocks; on and off farms, quarterly.

Hawaiian and Alaskan Crop Production and Livestock Data.

1963 - Quarterly Pig Reports covering 10 States.

Grape and Lemon Forecasts in 1 State.

Inasmuch as major emphasis in budget requests in recent years has been placed on improving the accuracy of production estimates (Project A), a backlog of proposals related to Project D has accumulated. The more important items are listed in the summary table indicating the relative priorities and estimated costs for each. A brief explanation of each Project D item follows the summary table.

Bases for Priorities

Throughout the research and development work associated with planning and implementation of a long-range program for crop and livestock estimating, the effort is made to knit the projects together for effective administration. The high degree of interdependence is taken into account in the priority groupings shown in the summary table. Within each group there is relatively little difference in priority between the items and no chronology is necessarily implied. As indicated in the explanations, however, some items might best be adopted by sequential steps. This is particularly true of items 1a, and 3a.

Between priority groups a desirable sequence of adoption is suggested. Other considerations in assigning priorities are: (1) economic importance of the proposed service in light of its intended purpose, (2) values placed upon the service as reflected by advisory committee statements and legislative history, and (3) ability to fit the new service into the established system of estimating in light of the facilities, personnel, and costs required.

The suggested timing gives attention to the essentiality of preserving the integrity of established crop and livestock estimating until new techniques are fully tested and proved to be superior. The priority list does not include proposals believed to be of less importance at this time, nor proposals insufficiently developed to provide a basis for estimating cost. Among the latter is the need for conversion of bushels to hundredweight in grain and feed reporting that may be anticipated at some time.

These priorities represent the net judgment of the Statistical Reporting Service taking these factors into account. They are subject to modification especially as conditions change over time.

Attachments-2

*Review
1/15/54
1/15/54
1/15/54*

**SUMMARY OF CROP AND LIVESTOCK ESTIMATING NEEDS WITH
PRIORITY RATINGS AND ESTIMATED COSTS**

Cost

Priority Group 1

- 1a Strengthen Accuracy of Production Estimates (Project A) \$1,700,000
- 1b Development of Automatic Data Processing Systems 220,000

Priority Group 2

- 2 2a Quarterly Pig Crop Reports - 8 States 170,000
- 2b Timber Price Reports 350,000
- 2c Research and Development of Survey Methods 350,000
- 7 2d Market Flow Vegetable Statistics 370,000 415
- 4 2e Sorghum Grain and Rice Stocks Reports, Quarterly 40,000 50,000
- 6 2f Small Fruit and Caneberry Estimates 115,000
- 1 2g ^{Research on} Expenditure Survey for Revision of Price Indexes 1,300,000 57,000
- 1 2h Cattle on Feed Reports 125,000 210,000
- 4 2i Egg Production Statistics 150,000 170,000
- 2j Strengthen Hawaiian Statistics 30,000
- 3 2k Weekly Broiler Reports for Additional States 170,000
- 10 2l Safflower, Castor Bean, Lentils and Grass Silage Reports 80,000 50,000
and research (estimate) 100,000

Priority Group 3

- 3 3a Increase Accuracy of Agricultural Price Statistics 1,950,000 4,330
- 1 3b Expanded Milk Production and Utilization Statistics 345,000
- 1 3c Fruit and Nut Tree Inventories 425,000
- 1 3d Wheat Production and Stocks by Classes 65,000 93,000
- 5 3e Sheep and Lambs on Feed 200,000
- 7 3f Stocks of Dry Beans, Dry Peas, and Lentils 55,000 55,000
- 3 *Expanded Milk Production Statistics* 1,000,000
- 6 *2nd annual annual estimate of production* 50,000
- 8 *Product Production by States by class* 3,300,000
- 4 *estimate annual estimate of production* 1,000,000

Priority Group 3 (Continued)Cost

| | | | | |
|---|------|--|-----------|---------|
| 5 | 3g | Grain Variety Statistics | \$ 75,000 | 95,000 |
| 2 | 3h | Expanded Cold Storage Statistics | 200,000 | |
| | (3i) | Improved Farm Labor and Wage Rate Statistics | 225,000 | — |
| 2 | 3j | Enlarged Seed Estimating Program | 60,000 | 127,000 |
| 5 | 3k | Horticultural Specialty Crops (<i>cut 2 add</i>) | 240,000 | 175,000 |

Priority Group 4

| | | | | |
|----------|------|--|---------|---------|
| 3 | 4a | Irrigated Crop Production Statistics | 270,000 | 350,000 |
| | 4b | Factors of Farm Production | 500,000 | |
| 3 | 4c | Expanded Fluid Milk Consumption and Price Statistics | 200,000 | |
| | (4d) | Market Egg Price Series | 90,000 | |
| | 4e | Expanded Statistics on Turpentine and Rosin | 30,000 | |
| | (4f) | Wool Stocks Reports | 125,000 | |
| 2 | 4g | Improved Coverage in Parity Index | 310,000 | 357,000 |
| (Part) 2 | 4h | Expanded Potato Statistics | 425,000 | 172,000 |
| 4 | 4i | Pasture Acreage and Production Estimates | 40,000 | 52,000 |

EXPLANATIONS OF ITEMS IN SUMMARY TABLE

1a - Strengthen Accuracy of Production Estimates

To extend enumerative and objective yield surveys now operative in 24 States to 48 States as outlined in Project A.

1b - Development of Automatic Data Processing Systems

To design systems for electronically computing data and develop methods for more rapid transmission of data as outlined in Project C.

2a - Quarterly Pig Crop Report

In 1963 Congress directed that a quarterly pig crop report be initiated. Sufficient funds were provided to cover 10 of the 18 States important in pig production. This item is to extend the service to States needed for a report covering about 90 percent of production.

2b - Timber Price Report

In the Appropriation Act for 1962 Congress directed that a special study be made of the feasibility and cost of a timber price reporting service. In accord with that study this proposal would provide the minimum elements of the federally financed portion of a program covering 37 States in which forest products are important enough to justify the service.

2c - Research and Development of Survey Methods

To devise means of obtaining better data through joint use of mailed questionnaires and personal interviews as outlined in Project C.

2d - Market Flow Vegetable Statistics

To report plantings and acreages remaining for harvest on weekly, biweekly or monthly basis for additional States and crops:

| Crop | : Fla. : | Tex. : | Ariz. : | Calif. : | Colo. : | N. Y. : | N. J. : | Mich. : | Wis. : |
|-------------|----------|--------|---------|----------|---------|---------|---------|---------|--------|
| Lettuce | x | x | x | x | x | x | x | x | x |
| Celery | | | | | | x | | x | |
| Carrots | | x | x | x | | | | | |
| Onions | | x | x | x | | | | | |
| Cabbage | x | x | x | x | | | | | |
| Cauliflower | | x | | x | | x | x | | |
| Sweet corn | x | x | | x | | | | | |

At present reports are being issued for tomatoes in Florida and Texas and for celery in California, Arizona, and Florida.

2e - Sorghum Grain and Rice Quarterly Stocks Reports

To provide on a regular basis quarterly reports on stocks of sorghum grain and rice on farms and in off-farm positions.

2f - Small Fruit and Caneberry Estimates

To expand to the remaining 15 producing States the program of acreage, yield, and production reports for 8 bushberry fruits initiated in Washington and Oregon in 1962.

2g - Expenditure Survey for Revision of Price Indexes

This survey would provide the data required to update the Index of Prices Received and the Index of Prices Paid including interest, taxes, and farm wage rates. The latest general revision of these indexes was published in January 1959 and was based on an expenditure survey covering the year 1955. A growing need has developed for a systematic program of updating the weights used in these indexes at intervals of not more than 10 years. A complete survey of expenditures of farmers covering the year 1965 made in 1966 would permit this to be done within the following 2 or 3 years. The estimated cost assumes that detailed data on food expenditures could be secured from the Agricultural Research Service Food Survey proposed for 1964.

2h - Cattle on Feed Reports

To provide for the addition of Nebraska and Texas to the monthly cattle on feed reports now covering California, Arizona, and Colorado and the addition of Florida, Kentucky, Tennessee, and Mississippi to the quarterly reports now issued covering 28 States.

2i - Improved Egg Production Statistics

To provide a monthly mailed questionnaire with enumerated followup to a large sample of commercial egg producers in 16 States where commercial flocks have largely replaced farm flocks. Such work is now being carried on in 7 States.

2j - Strengthen Hawaiian Statistics

To establish price and farm labor reporting in Hawaii and to strengthen production estimating to be comparable with other States.

2k - Expansion of Weekly Broiler Report

To start the weekly broiler-type chicken estimating program in 13 additional States where the production has become important. This will include weekly estimates of chicks hatched by broiler and egg types, and weekly placements. This report now covers 22 States.

2l - Safflower, Castor Bean, Lentil, and Grass Silage Production Reports

Of crops reaching commercial importance, safflower, castor bean, lentils, and grass silage are among those most in need of estimates covering acreage, yield, and production. Annual reports would be issued in December in States with significant production, with additional estimates published in July for safflower, castor beans, and grass silage.

3a - Increase Accuracy of Agricultural Price Statistics

For enumerative data collection and probability sampling as explained in Project B.

3b - Expanded Milk Production and Utilization Statistics

To provide for more comprehensive and improved estimates of production and utilization of milk produced on farms, including a breakdown of production estimates into milk for fluid use and milk for

manufacturing, surveys to determine milk-equivalent factors for manufactured dairy products and additional information on grain, concentrates and roughages fed to milk cows.

3c - Fruit and Nut Tree Inventories

To initiate a continuing national program for inventorying and estimating tree numbers. Rotating 5-year inventories of all commercial citrus trees, deciduous fruit trees and nut trees would be kept up to date, with between-inventory-year changes estimated on a sample basis in 45 States. This information, essential in forecasting future production by quantity and variety, would be used as a better basis for current fruit production estimates.

3d - Wheat Production and Stocks by Classes

To differentiate wheat production and stocks estimates to supply data by class (hard red winter, soft white, etc.) in both on- and off-farm locations.

3e - Sheep and Lambs on Feed

To provide estimates of sheep and lambs on feed as of November 1, January 1, and March 1 in 21 important feeding States, and to estimate marketings and placements for the previous 2 months on each of these dates. Such reports are now being issued covering 7 States. Also to estimate the number of early lambs in 13 important States as of March 1 each year.

3f - Stocks of Dry Beans, Dry Peas, and Lentils

To provide quarterly stocks estimates of pulses and preharvest estimates of dry beans by class, such as navy, lima, kidney, etc.

3g - Grain Variety Statistics

To supply periodic estimates by variety for wheat, barley, soybeans, oats, and sorghum grain, and to re-establish periodic estimates of acreage and production of white corn which is used primarily in hominy manufacture.

3h - Expanded Cold Storage Statistics

To extend coverage of refrigerated food stocks to include chain stores, warehouses, wholesalers, distributors, and jobber facilities. Refrigerated storage by food distribution industries has grown so rapidly that this extended coverage is necessary to make stocks reports reasonably complete.

3i - Improved Farm Labor and Wage Rate Statistics

To improve present employment and wage rate series, especially with more adequate coverage of seasonal workers in selected areas where crop production operations have high labor demands.

3j - Enlarged Seed Estimating Program

To bolster seed estimates through closer contacts with large producers, supplemented by more checks with cleaners and State certifying agencies; and with estimates on additional seeds (Oregon ryegrass) and varieties (e.g., Merion and Park bluegrasses in Minnesota and Pacific Northwest).

3k - Horticultural Specialty Crops

To expand estimates of current production of eight nursery products and of four cut flowers, now reported in 6 States, to all 48 States.

4a - Irrigated and Non-Irrigated Crop Production Statistics

To break down estimates of crop acreage, yield, and production in 17 Western States on irrigated and non-irrigated basis. Differences in yields between irrigated and dry-land conditions and the comparatively greater variation in dry-land yields are often so pronounced within a State as to invalidate yield per acre data for the State as a whole. Considerable changes would be required in the manner of gathering, compiling, analyzing, and publishing crop production information to segregate the two types of production.

4b - Factors of Farm Production

To make surveys measuring inputs of major factors affecting farm production such as power fuel, commercial fertilizer, pesticides, building facilities, and farm machinery. One factor or group of related factors would be covered each year on a rotational plan to indicate the magnitude of changes in agricultural technology.

4c - Expanded Fluid Milk Consumption and Price Statistics

To provide per capita and total estimates of consumption of whole milk, skim milk, milk drinks, and cream annually in all States (only 5 States now covered). To also provide for more accurate and complete reporting of retail fluid milk and cream prices on a monthly basis.

4d - Market Egg Price Series

To permit estimation of egg prices separately in two major categories; all eggs and market eggs in order to eliminate distortion in State averages caused by sale of hatching eggs.

4e - Expanded Statistics on Turpentine and Rosin

To accelerate publication of data on consumption and stocks of turpentine and rosin to a monthly basis for a limited number of user industries.

4f - Wool Stocks Reports

To provide an annual report as of January 1 on stocks of wool on farms and ranches and in country warehouses.

4g - Improved Coverage in the Parity Index

To include important expenditure items now omitted in the Parity Index such as medical, dental, hospital services, and mail order purchases which account for over 7 percent of farm family living expenditures. Also to include such farm production costs as veterinary and other services charged at custom rates.

4h - Expanded Potato Statistics

To expand potato statistics to include:

1. Estimates of acreage and production by varieties--Reds, Round Whites, Long Whites, and Russets.
2. An estimate of April 1 Potato Stocks.
3. Report of monthly production and stocks of Processed Potato items.
4. Report on rate of harvest of acreage and movement of potatoes for the winter, spring, and summer crops.
5. Report as of January 1, growers intentions to plant fall potatoes.
6. Report Utilization of Potatoes by six seasonal groups.
7. Report Semi-monthly on Disappearance of All Potato Crop.
8. Report weekly on the progress of planting, development and harvesting of the various seasonal groups.

41 - Pasture Acreage and Production Estimates

To initiate estimates on pasture acreage and output by establishing a pilot project in a few States. Methods would be tested for obtaining and publishing estimates of a crop of widespread use but with great variations in yield and with no commonly accepted definition of yield.