

furnish data for 119 economic subregions. In most cases, the tabulations were made for the purpose of obtaining totals and counts for all items for each area. Nearly all the tabulations made for counties included data for all farms in the county. However, most of the tabulations for State Economic Areas, States, and for economic subregions were made only for a sample of farms. Estimates were prepared on the basis of these tabulations to obtain a total of all farms for State Economic Areas, States, and economic subregions.

Review of tabulations.—All tabulations were examined to insure that the data were reasonable and consistent. This review included comparisons with data for prior Censuses or with data from other sources; a checking of data for one item against those for another item (for example, acres against quantity harvested for a crop); the comparison of totals and averages for an area with those for nearby areas; the checking of the totals for one tabulation with the totals for other tabulations for the same item; etc. This review required the judgment of specialists and was the primary responsibility of senior Census staff members. However, qualified State personnel of the Agricultural Marketing Service, U. S. Department of Agriculture, assisted in examining the data, especially those for crops and livestock, evaluating the results, and calling attention to the situations for which further checking seemed necessary.

SAMPLING

There were two major uses of sampling in connection with the 1954 Census of Agriculture. First about one-fourth of all information on the agriculture questionnaire was obtained by Census enumerators for only a sample of farms. This information, collected for only a sample of farms, comprised Sections VIII through XIII on the agriculture questionnaire (see the Appendix for a copy of the agriculture questionnaire) and related to such items as use of fertilizer and lime, principal farm expenditures, farm labor, farm facilities, farm equipment, value of farm land and buildings, etc. Second, the sample of farms was used to tabulate data as a basis for making estimates for Census tabulations by tenure of farm operator, economic class of farm, type of farm, etc. Nearly all the data published for State Economic Areas, and for subregions, represent estimates based upon tabulations of data for the sample of farms.

Description of the sample for the 1954 Census.—The sample used for the 1954 Census of Agriculture consisted of specified farms and one-fifth of the remaining farms. Thus, the sample for most areas comprised somewhat more than 20 percent of all farms. Farms comprising the sample represented 22.5 percent of all farms in the United States. Farms in the sample comprised a larger proportion of all farms in the Western States than in other geographic areas.

The actual selection of farms in the sample was made by Census enumerators as part of the enumeration procedure. The enumerator listed the head of each household on a single line on Form A2 and determined whether an agriculture questionnaire was to be obtained. If he filled an agriculture questionnaire, he was required to indicate in which one of the 5 size-of-farm groups the farm belonged. Each line on the Form A2 contained squares listing 5 size-of-farm groups. The enumerator was required to indicate for each farm or place enumerated in which of these 5 size-of-farm groups, the farm or place belonged. A random fifth of the squares for each of four of these 5 size groups was lightly shaded. (See Appendix for a facsimile of a page of Form A2.) If the farm was indicated as belonging in a shaded square, the farm was included in the sample. The fifth square, always shaded, was provided for indicating all farms of 1,000 acres or more; thus all farms of 1,000 or more acres were included in the sample.

In some States, all farms with more than a given acreage of cropland harvested, or irrigated cropland harvested, or more than a given number of total cattle and calves on hand, milk cows on

hand, or chickens sold also were included in the sample regardless of the size of farm. (See "Specified Farms" for a list of the items and the States in which used.)

The work of each enumerator was checked by the crew leader and again in the 26 field processing offices to see that the sampling procedure had been followed and that all the necessary information for items to be obtained for only the farms in the sample had been obtained. The proportion of the farms in the sample was determined before the enumeration for a county was accepted, and if this proportion was not within acceptable limits special instructions were issued by the Washington office for additional enumeration to provide a satisfactory sample.

Adjustment of the sample.—For the 1954 Census of Agriculture, as for the 1950 Census, it was considered desirable to make adjustments in the sample in order to improve the accuracy of estimates based upon tabulation of data for the sample.

An adjustment in the 20 percent part of the sample was made by a process essentially equivalent to stratifying the farms in the sample by size, for the purpose of (1) improving the reliability of the estimates from the sample on an economic area level, and (2) for the purpose of reducing the effects of possible biases introduced because some Census enumerators did not follow perfectly the method devised for selecting the farms in the sample. In order to adjust the sample for each State economic area, counts were obtained of all farms and of sample farms for each of ten size-of-farm groups based on "acres in this place." The 10 size-of-farm groups were as follows: Under 10 acres, 10–29 acres, 30–49 acres, 50–69 acres, 70–99 acres, 100–139 acres, 140–179 acres, 180–259 acres, 260–499 acres, and 500–999 acres. In determining the extent of the adjustment, the difference between the number of farms in the sample and the total number of farms divided by 5 was obtained for each size group. The actual adjustment for each size group was made by eliminating farms when too many were included in a size group and by duplicating all the information for one or more farms when too few were included in the sample size group. The farms for which all the information was eliminated or duplicated were selected at random from counties over or under represented in each size group in the State economic area. Although adjustments were made in 98 percent of the counties in the United States, the gross adjustments involved were small, averaging 3.2 percent for farms eliminated and 4.0 percent for farms duplicated for all areas in the United States. These adjustments are summarized in Tables 3 and 4.

Method of estimation.—Estimates based on tabulation of data for a sample of farms were obtained by multiplying by 5 the tabulated total for the item for the farms in the 20 percent part of the sample and adding to this total the total for the specified farms.

Reliability of estimates based on the sample.—The estimates based on the tabulation of data for a sample of farms are subject

TABLE 3.—SUMMARY OF SAMPLE ADJUSTMENT BY GEOGRAPHIC DIVISION: 1954 CENSUS OF AGRICULTURE

Geographic division	Number of farms	Adjustment in number of farms		Total adjustment	
		Farms duplicated	Farms eliminated	Farms duplicated plus farms eliminated	Net adjustment (number of farms)
Total.....	4,782,416	37,181	29,938	67,119	+7,243
New England.....	81,878	721	951	1,672	-230
Middle Atlantic.....	257,276	1,617	2,375	3,992	-758
East North Central.....	798,690	5,421	5,260	10,681	+161
West North Central.....	905,248	4,050	6,684	10,734	-2,634
South Atlantic.....	858,971	10,860	3,480	14,340	+7,380
East South Central.....	789,507	6,150	2,817	8,967	+3,333
West South Central.....	668,129	4,570	5,300	9,870	-730
Mountain.....	180,026	1,786	1,585	3,371	+201
Pacific.....	242,691	2,006	1,486	3,492	+520