

# Chapter 8. 1969 Puerto Rico Census of Agriculture

## GENERAL INFORMATION

### Historical Background

In 1899 a special census of Puerto Rico was taken, but it was not until 1910 that the first census of agriculture was taken on the island by the United States. From 1910 to 1950, a census of agriculture was taken in conjunction with the censuses of population and housing at each decennial enumeration. The 1959 Census of Agriculture was taken separately from the 1960 Census of Population and Housing. In 1970 the census of agriculture, covering the year 1969, was again taken in conjunction with the decennial census of population and housing.

In 1935 a special census of agriculture in Puerto Rico was taken by the Puerto Rico Reconstruction Administration. Although the U.S. Congress in 1909 provided for a census of agriculture to be taken in the United States in 1915 and every 10 years thereafter, in addition to the census of agriculture taken at the time of the decennial census, it was not until 1957 that an amendment was made to the law to include Puerto Rico in the quinquennial enumeration. In 1964, the first mid-decade census of agriculture was taken in Puerto Rico as part of the U.S. mid-decade census of agriculture.

### Legal Authority and Special Agreement With the Commonwealth Government

All aspects of the 1970 censuses in Puerto Rico were governed by the provisions of Title 13, United States Code, and the Acts of the Legislature of Puerto Rico relating to censuses. In addition, a special agreement between the Bureau of the Census and the Government of the Commonwealth of Puerto Rico, signed in November 1969, specified the responsibilities and functions of the Bureau and the Government of Puerto Rico in the taking of the 1970 Census of Population and Housing and the 1969 Census of Agriculture. It provided that: (1) A large share of the responsibility for the planning and conduct of the various separate censuses of Puerto Rico would be shared with the Commonwealth Government. (2) The censuses would be

conducted with attention given to the distinctive needs of the Commonwealth Government. (3) The censuses of population, housing, and agriculture in Puerto Rico would be comparable in scope to the censuses of the continental United States. (4) The budget for the basic census program for Puerto Rico would be determined by the Census Bureau and would be subject to appropriations made for the census program. (5) Additional costs for any expansion of the basic census program would be borne by the Commonwealth Government. (6) For agriculture, two report forms of varying detail would be used in accordance with specific criteria established concerning farm economic size—these forms to be prepared in Washington in consultation with the Puerto Rico Planning Board. (7) The Bureau of the Census would establish a temporary Census Office in Puerto Rico to supervise and coordinate the census enumeration. (8) The Census Bureau would provide training and experience in census methods and procedures to personnel in Puerto Rico. (9) The Commonwealth Department of Education would provide enough teachers not having classroom responsibilities to constitute most of the temporary staff for the enumeration. (10) The Puerto Rico Department of Agriculture would release a number of its agriculture specialists to assist the Census Bureau in completing the enumeration of large farms. (11) The Planning Board would assist the Census Bureau, on a reimbursable basis, in the collection of maps and boundary information, and in the designation of appropriate statistical areas. (12) The Puerto Rico Planning Board would act as the local representative of the Bureau in the distribution of the agriculture, population, and housing census publications.

### Definition of a Farm

As in previous censuses, places qualified as farms for the 1969 Puerto Rico Census of Agriculture if they consisted of 3 cuerdas<sup>1</sup> or more on which agricultural products other than vegetables for home use were produced, or on which any livestock or 15 chickens or more or other poultry were kept at the time of enumeration. Also included, for the first time, were places of less than 3 cuerdas if the gross sales during the census

<sup>1</sup> A cuerda is equivalent to 0.9712 of an acre.

year, or expected gross sales during the following year, were \$100 or more.

**Expenditures for the 1969 Puerto Rico Census of Agriculture\***

Puerto Rico planning and direction (including pretest) .....	\$ 33,170
Data collection .....	194,960
Data processing .....	74,325

\*These figures do not include salaries of Census Bureau Staff.

**Organization of the Work**

The Bureau of the Census assigned two full-time regular employees to the Puerto Rico Census Office to supervise and conduct the enumeration for the agriculture and population and housing censuses, and provided from one to three members of its staff to assist with the work in Puerto Rico for periods of 2 to 12 weeks during the pretest, the enumeration, the clerical processing, and the followup.

The Commonwealth Government assisted by publicizing the temporary field offices and the Puerto Rico Census Office (first for the population and housing and agriculture censuses, and later for the agriculture census alone [see page 89]), and by recruiting a technical staff, including personnel trained in agriculture, to serve as crew leaders for the agricultural census or to assist in the enumeration of large farm operations. Since clerical review of the completed report forms was to be performed in the Puerto Rico Census Office, the Commonwealth Government also assisted in recruiting the staff necessary to perform these tasks. Moreover, the Commonwealth Government assisted the Census Bureau, as agreed, in the collection of maps and boundary information and in the designation of appropriate statistical areas. Specifications for these tasks were provided by the Census Bureau, and office maps and map copies required by the field staff were prepared in Washington.

Persons on loan from the Government of Puerto Rico were paid salaries—\$1.90 per hour for enumerators and \$2.30 per hour for crew leaders—travel expenses, and per diem in accordance with rates established by the Census Bureau. The Bureau reimbursed the Government of Puerto Rico for these expenses.

The design, printing, and distribution of report forms, instruction manuals, training materials, and related forms for the census of agriculture were handled by the Census Bureau, as was publication of the results of the 1969 Puerto Rico Census of Agriculture in a form and manner consistent with the Bureau's total census program.

**PLANNING AND PREPARATORY OPERATIONS**

**Census Calendar**

In 1968 representatives of the Census Bureau and the Commonwealth Government met to formulate plans for the taking of the 1970 Census of Population and Housing and the 1969 Census of

Agriculture in Puerto Rico. From these meetings the following schedule was designed:

**1968**

1. Planning of the major operations for the censuses with the Agricultural Advisory Committee and Puerto Rico officials
2. Preparation of forms and instructions for the pretest
3. Preparation of agreement between the Bureau of the Census and the Commonwealth of Puerto Rico regarding conduct of the censuses
4. Preparation of edit and processing specifications for the short form

**1969**

1. Preparation of edit and processing specifications for the regular form
2. Pretest
3. Pretest evaluation
4. Revision of forms and instructions
5. Printing of forms
6. Revision of edit and processing specifications for the short and regular forms

**1970**

1. Assembly of all enumeration materials in Jeffersonville
2. Organization of Puerto Rico Office
3. Enumeration
4. Followup and cleanup
5. Preparation of final edit and processing specifications
6. Commencement of processing
7. Editing
8. Coding
9. Commencement of design of tables for publication
10. Commencement of posting of historical data

**1971**

1. Commencement of tabulation
2. Completion of processing
3. Completion of tabulation
4. Completion of design of tables for publication
5. Completion of posting of historical data
6. Commencement of posting of 1970 data

**1972**

1. Completion of posting of 1970 data
2. Publication

**Report Form Format and Content**

Two principal forms were used for the enumeration of Puerto Rico: Form 69-A1PR (standard form) was used for farms whose value of sales was estimated to have been \$1,200 or more, and Form 69-A2PR (short form), for farms whose value of sales was estimated to have been less than \$1,200.

Emphasis was placed on obtaining more detailed information for those farms with annual sales of farm products of \$1,200 or

more. In 1964, the 15,426 farms in this group, which made up 34 percent of the total farms, had accounted for more than 94 percent of the total value of all farm products sold and over 80 percent of the total land in farms. It was agreed that the operators of the smaller places need not be burdened with providing the extensive detail required from the operators who were responsible for virtually all of the commercial farm production. Hence, the short form was developed for the operators whose 1969 sales were expected to be less than \$1,200.

Since Spanish is the predominant language in Puerto Rico, enumeration report forms and instruction materials used in the census of Puerto Rico were printed in both Spanish and English. In general, information was to be recorded on the forms by checking the appropriate category or writing the answer in the space provided. Many of the questions were identical to those asked for the 50 States and the resulting data are generally comparable. The principal variations in report form content and subject treatment for Puerto Rico were as follows:

*Cuerdas planted or ready to be planted.*—This item was inserted into the crop sections on the Puerto Rico standard and short forms at the request of the Puerto Rico Department of Agriculture in order to determine the number of cuerdas of each specific crop at the time of the census.

*Milk sold.*—This item appeared in the standard and short forms for the Puerto Rico enumeration because the Puerto Rico Department of Agriculture wanted to determine the number of farms selling milk and the total amount of milk sold.

*Characteristics of farm operators.*—Unlike the standard and short forms used in the 1969 Census of Agriculture in the 50 States, the Puerto Rico standard and short forms did not include a question on the race of the operator. Instead a question was asked to determine if the main occupation of the operator was agriculture or not.

*Livestock and poultry.*—Data on livestock and poultry inventories were to be recorded for the number of animals on the farm as of March 15, 1970, regardless of ownership (the inventory reference date for the United States was December 31, 1969). The farm operator was asked to include in his report animals belonging to him, his family, agregados (laborers who live on the land), medianeros (sharecroppers), or other persons. Each of the forms presented the questions in the same manner for each livestock and poultry item, but the short form (A2PR) contained only inquiries for the major poultry and "other livestock" items.

The numbers of livestock, poultry, and their products sold relate to the calendar year 1969. Since it was expected that nearly all the egg production farms would be classified as commercial operations, the number of eggs sold was not asked on the short form.

In the case of the short form, only the more important crops were itemized. The farm operator was required to indicate in the section for "all other crops harvested" the total cuerdas harvested for all crops not listed separately on the report form. The respondent was to include in the short form all crops that were harvested from the place by him or by others during the calendar year 1969. The cuerdas of each crop harvested, the

quantity harvested, the quantity sold, the cuerdas fertilized, the cuerdas irrigated, and the value of sales (for vegetables) were to be reported for the year 1969.

The section on agricultural activities in 1969 in the short form for the continental United States did not appear in the Puerto Rico short form because the differences in the procedures for the Puerto Rico enumeration made it unnecessary.

The sections on "Value of land and buildings on the place," "Machinery and equipment on this place on March 15, 1970," and "Farm-related income received in 1969" on the Puerto Rico long form were not included in the Puerto Rico short form, although they were on the short form for the United States, because the report form was already too long and the information in these sections was considered to be more important for large farms than for small ones.

### Tabulation Program

In the preliminary planning, the Puerto Rico report forms were expected to vary enough from those for the United States to reflect the special needs of Puerto Rico, that a separate computer edit and tabulation program would be needed to handle them. Considerations of cost and timing led to a decision within the Census Bureau to take all possible steps towards using the same computer edit program for both the United States and Puerto Rico short and long forms, with a minimum of modifications. This involved making the report form items, wording, and format, with few exceptions other than differences in the crop and equipment items to be included, similar to that for the United States. However, after the enumeration was completed and the forms arrived in the United States for processing it was determined that the Puerto Rico reports could not be handled adequately by the computer edit program set up for the United States forms; therefore, a separate program was prepared to handle them.

The Puerto Rico tabulation program was designed to provide data as comparable as possible to the statistics published for the 1964 Puerto Rico census. A set of table outlines was prepared in 1970 which reflected the availability of data, the special needs of Puerto Rico, and the desirability of maintaining comparability with reports for the 1964 Puerto Rico Census of Agriculture.

### Census Pretest

In July 1968 an agreement was made between the Bureau of the Census and Puerto Rico officials to use the procedures proposed by the Census Bureau for a Puerto Rico population, housing, and agriculture pretest. The test was to begin on April 9, 1969, and to be completed during May 1969. The objectives for the pretest were (1) to test the feasibility of conducting the census of population and agriculture together in one-field operation; (2) to determine whether the census could be taken by individuals hired from the Puerto Rico population at large; (3) to provide a "dry run" on those aspects of the census that relied heavily on local assistance, such as translation of materials, and map preparation; (4) to test and evaluate the agriculture standard and short report forms and the Advance (Population and Housing) Census Questionnaire. (See appendix G for

reproductions of the forms and other field materials used in the Puerto Rico pretest.)

The pretest was under the immediate supervision of a census supervisor appointed from Washington. He had one administrative clerk and one office edit and control clerk. One of the two clerical personnel was supplied by the Puerto Rico Planning Board. The functions of these positions were defined as nearly as practicable in terms of the actual census requirements, so that guides, manuals, and office procedures established for the 1969 pretest would not need major changes.

The feasibility of using teachers for both the pretest and census was determined by three considerations: (1) How much of the enumeration could be completed within 2 weeks, according to plan; (2) whether sufficient qualified people could be found outside the educational system; and (3) whether the Bureau could afford the wages necessary to attract them.

When it came time for a determination to be made as to the composition of teams of enumerators and crew leaders, the Puerto Rico officials determined, as a result of the findings of the pretest, that for the census it would be better to employ teachers when possible and others only when necessary. Therefore, most enumerators and crew leaders were recruited from the Puerto Rico educational system and other enumerators and crew leaders were recruited "off the street."

For the pretest, those who were school teachers were hired through an agreement with the Puerto Rico Department of Education which provided for an hourly wage of \$1.75. Census supervisors did not have the option of choosing individuals for the key district office positions. These positions were automatically filled by district school supervisors and principals. Enumerators who were assigned to rural areas received training in enumeration techniques on weekends prior to the taking of the pretest.

There were 60 enumeration districts (ED's) in the pretest, of which 30 were urban and 30 rural. One enumerator was assigned to each ED. Urban areas were covered in the agriculture census because farms did exist outside of the rural areas. Urban ED's averaged about 150 housing units each; rural ED's averaged about 100 housing units. The ED's were also divided so that 40 ED's were located in selected areas in the western part of the

island where educational attainment was below average, and 20 ED's were located in or near San Juan where education and literacy were high. In the Mayaguez area, the urban and rural groups were again divided so that half of the enumerators would be teachers and half would be recruited "off the street." In San Juan, all 20 enumerators were employed through the "off the street" method. Thus, overall, 20 enumerators were teachers and 40 were not. These breakdowns are shown in table 1 below.

The rural areas selected for the test consisted of entire barrios. These were selected in municipios near San Juan and Mayaguez where it was expected that a diversity of types of farms and crops, some absentee ownership, and some farm operators who worked part time off the farm would be found. Barrios within municipios with relatively little village population were selected in this pretest to maximize the number of farms enumerated. Thus, in the rural test areas it was expected that the enumerators would find every rural household qualifying as a census farm, compared with a ratio of 1 to 8 in the census enumeration for all rural areas. The total area covered by the pretest included 15 barrios in four municipios. The rural enumeration districts are in black and the urban enumeration districts are "X'd" (see figure 1 on page 89).

Once the census materials and procedures had been tested, the results of the test precipitated modifications of the report forms, as follows:

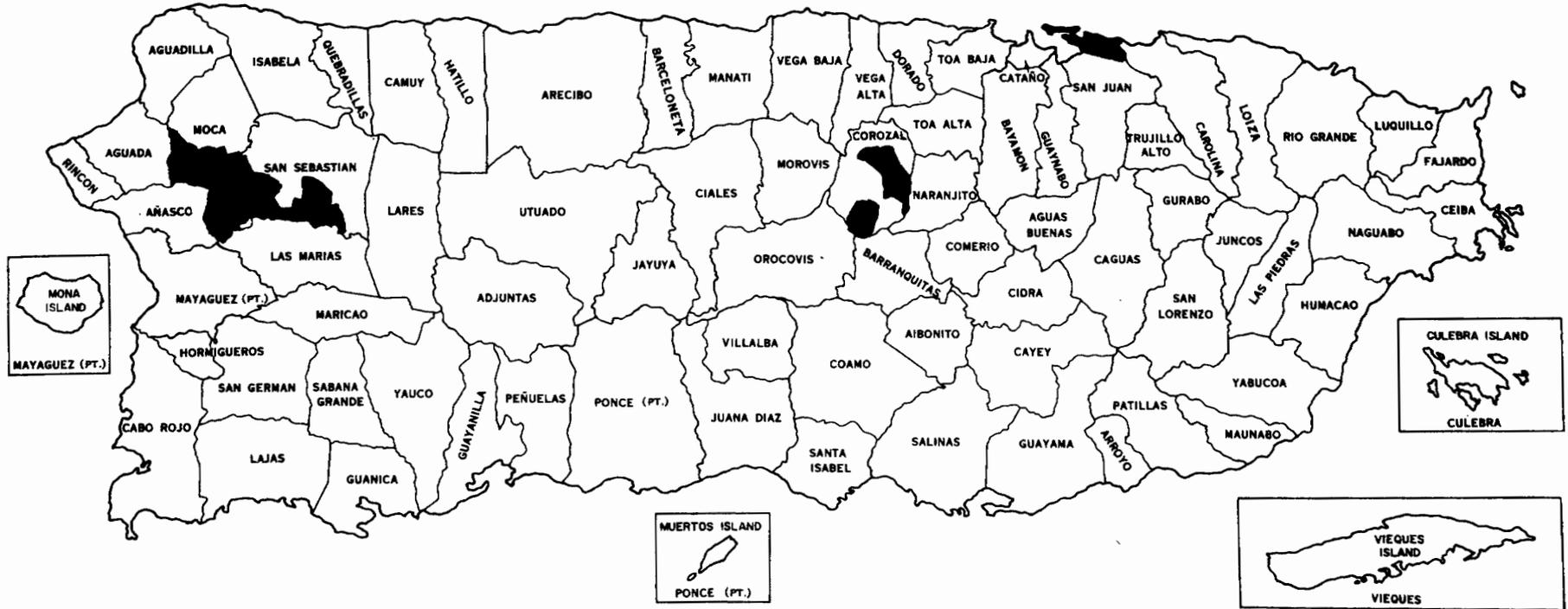
1. The questions concerning "cuerdas planted or ready to be planted" were moved from the first column to the last column in each crop section.
2. Questions regarding the "quantity consumed . . ." of crops were deleted from all crop sections.
3. Questions relating to vegetables were changed to omit those concerning quantity harvested or sold and to add "value of sales."
4. The report form identification number was changed to comply with the 10-digit system used in the United States.

Several other format changes were required as a result of the decision to pattern the report forms after those of the United States.

Table 1. Puerto Rico—Summary Outline of 1969 Pretest

Location and type of enumerator	Number of enumerators (1 enumerator = 1 ED)			Number of housing units in 1960			Number of rural farms in 1959
	Urban	Rural	Total	Urban	Rural	Total	
Mayaguez area . . . . .	20	20	40	2,943	2,070	5,013	841
Teachers . . . . .	10	10	20	—	—	—	—
Others . . . . .	10	10	20	—	—	—	—
San Juan Area . . . . .	10	10	20	1,499	1,029	2,528	355
Teachers . . . . .	—	—	—	—	—	—	—
Others . . . . .	10	10	20	1,499	1,029	2,528	355
Totals . . . . .	30	30	60	4,442	3,099	7,541	1,196

Figure 1. Puerto Rico—Pretest Enumeration Areas



U.S. DEPARTMENT OF COMMERCE  
 SOCIAL AND ECONOMIC STATISTICS ADMINISTRATION  
 BUREAU OF THE CENSUS

Rural
  Urban enumeration areas

## Map Preparation

Maps for the April 1970 enumeration for the censuses were prepared to show the area to be covered by each enumerator, crew leader, and supervisor. A contract was executed in 1969 between the Puerto Rico Planning Board and the Bureau of the Census which provided for the collection of map data for Puerto Rico and the preparation of a set of enumeration maps. A sum of \$30,000 was allocated for the preparation of the following materials:

1. U.S. Geographic Survey quadrant office maps
2. Aldea (village) maps
3. Supervisors' maps
4. Enumerators' maps
5. Listing of ED's for control purposes
6. Other required listings and reports

The Bureau of the Census supplied the specifications to the Planning Board for the maps. The last of the enumerators' maps were delivered to the main Census Office in San Juan on March 2, 1970.

Approximately 4,870 enumeration districts (ED's) were defined and delimited for the Puerto Rico censuses of population and housing, and agriculture.

## Field Organization

The office facilities for the Puerto Rico censuses were comprised of a central office in San Juan and six district offices located in key sites throughout Puerto Rico. The central office in San Juan was opened on January 12, 1970. Although the population and housing enumeration ended on June 23, the central office remained opened until September 30 for the completion of the agriculture census. The district offices were all closed by the middle of May when the population and housing census was virtually completed.

A temporary field staff of about 5,400 was employed to cover the 1970 Census of Population and Housing and the approximately 32,720 farming units found in Puerto Rico for the 1969 Census of Agriculture. This staff included a director, detailed from the Census Bureau in Washington, 6 district managers, 390 crew leaders, and about 5,000 enumerators. The approximately 2,000 urban enumerators were each assigned to enumerate 150 households containing an approximate total of 650 people per ED. Approximately 3,000 rural enumerators were each assigned 100 households, with an approximate total population per ED of 520. The smaller rural assignment compensated for the additional time required to cover the screening questions and, where necessary, to fill the 69-A2PR form.

Recruiting and appointment of personnel to positions in the Puerto Rico office was carried out in accordance with regular Civil Service Commission competitive standards. Unlike the 1964 enumeration for which appointments were for a period not to exceed 1 year, all persons employed for the 1970 enumeration were given temporary appointments which, when necessary, were renewed for an additional short period of time to finish the agriculture census. Generally, field enumerators were employed for a period of 2 weeks; district office staff, 3 months; central office staff, 90 days plus additional time to

complete the agriculture portion of the 1970 Puerto Rico enumeration.

The special agreement between the U.S. Bureau of the Census and the Puerto Rico Planning Board provided that selected personnel employed by the Puerto Rico Department of Education would be employed for the taking of the Puerto Rico censuses. Other enumerators were recruited from the Puerto Rico population at large. Space was allocated in the schools for training and general administrative headquarters.

The Puerto Rico school system is divided into six school regions, each of which is headed by a regional director or supervisor. The six regional directors or their assistants served as the district office managers for the 1970 censuses. The various school supervisors under their direction became the field supervisors for the taking of the censuses, while the crew leaders were recruited from the ranks of school principals or their assistants. Teachers acted as enumerators.

Since the Puerto Rico school system works on a two-shift basis, most teachers work either in the morning or in the afternoon. Those teachers who taught in the morning shift took the censuses in the afternoon and evening and those teachers who had classroom duties in the afternoon enumerated in the mornings.

All candidates were given a test prepared by the Census Bureau to determine eligibility for appointment. The use of school teachers and school supervisors had the advantage of providing the census with qualified field staff. In many instances, teachers taking part in the census worked under supervisors who were their own superintendents or principals. For the most part, this arrangement contributed to the effectiveness of the operation.

The Director, detailed from the Census Bureau, was responsible for recruiting and training the field staff, obtaining space and equipment for the field offices, distributing supplies, supervising the collection of data, and preparing periodic reports on the progress of the enumeration. The six district managers were generally responsible for administering the census program within their areas, while the field supervisors were responsible for training the crew leaders who would work under them. The crew leaders were in charge of the enumerator training, which included practice exercises and household interviews.

All space and equipment were obtained by bid through the local Government Services Administration (GSA) office in San Juan. Office equipment bids and the signing of contracts were handled in Washington. A substantial amount of office supplies was purchased from the GSA store in San Juan.

Agriculture operations utilized office facilities and available staff from the population and housing census for only a part of the enumeration. The Puerto Rico agriculture census and the population and housing census were taken by the same enumerators. Administrative and operational decisions made in the central office and the task force office in Puerto Rico appear to have been oriented to the population census, and to have had enumerators place too little emphasis on either the precision or coverage of the census of agriculture. Thus, the census of agriculture suffered in many instances. This was evidenced in the central office review. As a result of this review, subsequent operations for the agriculture census were con-

ducted independently of the population and housing census. The remainder of the agriculture enumeration and followup was conducted by a new, separate staff, which operated out of the central office. (There were no district offices in this phase of the agriculture enumeration.)

## THE ENUMERATION

### Enumeration Forms and Aids

*The Enumerator's Handbook* served as the basic document for the instruction and training of the field staff. It identified the duties and responsibilities of the enumerator and described the detailed procedures to be followed in obtaining the desired information for the items in the report form. Enumerators were required to carry their handbook and other materials with them during the taking of the censuses and to consult the handbook when questions arose.

Other instructions and training materials included the *Field Supervisor's Handbook*, *Crew Leader's Guide Manual*, *Administrative Handbook*, *Crew Leader's Handbook for Agriculture Followup*, *Followup Agriculture Enumerator's Handbook*, and other miscellaneous materials. All of these materials were prepared in Spanish as well as English.

There were two report forms used for the enumeration: Form 69-A1PR (standard form) for farms with an estimated value of sales of \$1,200 or more; and Form 69-A2PR (short form) for farms with an estimated value of sales of less than \$1,200. The short form did not include the following sections which were on the long form:

1. Section 4, Land irrigated.
2. Section 10, Cultivated or improved pasture.
3. Section 11, Ornamental, flowering plants or lawn grass planted.
4. Section 17, Machinery, buildings, and equipment.
5. Section 18, Employment of hired workers.
6. Section 19, Use of insecticides, herbicides, fungicides, other pesticides, lime, and other chemicals.
7. Section 22, Receipt of farm-related income.
8. Section 23, Type of organization.

The short form differed also from the long form in the following sections:

1. Section 1, Acreage and ownership, did not ask the value of the land and buildings reported.
2. Sections 4 through 8, on the various crops, listed only 16 of 36 crops included in the standard form (sections 5 through 9).
3. Section 13, Expenses, included only 7 of the 10 expenditure items in the standard form.

4. Section 14, Market Value of farm products, included only 13 of the 15 value-of-sales items in the standard form.

To assist in obtaining as complete an enumeration as possible, enumerators were provided with detailed maps of their assigned areas. Enumerators were also provided with a list of large farms located in the assigned areas and were to emphasize contact with these operators. Lists of these farms were prepared from records of the 1964 census and from records obtained from various agencies of the Commonwealth of Puerto Rico.

### Timing of the Enumeration

The Puerto Rico censuses were scheduled to begin on April 1, 1970; the areas, in fact, were canvassed beginning on March 17. Although the urban enumeration began on April 1, the enumeration in the rural areas generally coincided with the Easter vacation schedule, which, in 1970, extended from March 21 to March 30, Easter being March 20. Teachers who served as census enumerators in the rural areas were released from classroom duties by March 17, in order to meet the census schedule. Teachers who served as census enumerators in the urban areas did not begin their work until April 1. Urban enumerators were needed until April 13.

### The Taking of the Census

The data collection phase of the 1969 Puerto Rico census of agriculture included two steps:

1. Collection of data.
2. Review of forms in Puerto Rico for completeness and coverage.

Unlike the 1959 agriculture census in Puerto Rico, parcelas of less than 3 cuerdas were not separately identified—all parcelas with gross sales of \$100 or more, regardless of size, were enumerated as farms.<sup>2</sup> Moreover, the 1969 Puerto Rico census differed from the 1959 census in that the followup on the agriculture long form was conducted independently of the population and housing census followup.

The procedure used in the 1969 Census of Agriculture in Puerto Rico called for a partial mail enumeration instead of complete coverage by personal interviews, as in previous censuses. The large commercial farms automatically received a long form by mail because their individual gross sales were known to be \$1,200 or more. Operating with this criteria in mind, it was expected that 25,000 rural households would qualify for the short agriculture form (A2PR), and about 7,400 for the standard form (A1PR).

The enumerators were assigned specific geographic areas (ED's) and were to visit each household or living unit therein. Their kit included individual forms for agriculture for each household. An Address Register (Form D-130PR) was designed to provide adequate controls over these documents in such a way as to

<sup>2</sup>A parcela may contain from ¼ to 3 cuerdas. The parcelas are tracts of land owned by the Puerto Rico Government and leased free to farmers for their use.

meet the requirements of both the population and housing and the agriculture censuses. The Address Register contained a column for a separate serial number for farm households. The enumerator used one or more screening questions appearing in the Address Register to determine whether or not the housing unit was located on a place which qualified, for census purposes, as an agricultural operation. These screening questions were:

1. Is this house on a place of 3 cuerdas or more?
2. If less than 3 cuerdas, did the person have sales of agricultural products (crops, livestock, or poultry) amounting to \$100 or more during the previous year (or this year does he expect to have sales amounting to \$100 or more)?
3. If 3 cuerdas or more, did he have any agriculture operations?

Once it had been determined that a place qualified as a farm, the enumerator decided which agricultural form was to be used by asking whether the gross sales of agricultural products for the place during the past year were less than \$1,200 or were \$1,200 or more. If the place qualified for an A2PR form (gross sales less than \$1,200), the enumerator filled the form by asking the questions of the operator and recording the answers. If, on the other hand, the place qualified for a standard report form (gross sales of \$1,200 or more), the enumerator left the form (A1PR), the instructions booklet (Form 60-A5PR), and a return envelope addressed to the census office in San Juan.

When a place was located which qualified as a farm but contained no housing unit, the enumerator was to list it on Form 69-A4PR, List of Agricultural Operations Without Housing Units, in the Address Register, and to give it a new serial number, so that the listing of agricultural operations without housing units contained a separate series of consecutive numbers beginning with 1. These serial numbers received special prefixes to distinguish them from other serial orders.

The special section in the Address Register for A4PR addresses was detachable. After check-in operations were completed for each ED, this section was detached and became the master list for A4PR followup. In addition to recording the information needed for A4PR followup, the enumerator made a dot on his map to show the location of the farm household, and entered its serial number next to the map spot. After mail followup, missing A4PR's were completed by personal visit.

By mid-May, this initial agriculture portion of the enumeration was approximately 56 percent complete—a total of 18,500 farms having been covered in this initial enumeration.

### Callback

When the enumerator found no one at home at the time of his first visit he was to enter the following information in his listing book: Name of head of household (obtained from neighbors or from letter boxes), address, and either the best time to call back or the time of the original visit. The enumerator was advised to make his callback as soon as possible so as not to let callbacks pile up. When a callback was completed, a line was drawn through the callback entry in column 17 on the listing page.

### Field Review

A systematic field review by crew leaders, first employed for the 1960 censuses, was again conducted at regular intervals during the period of enumeration of the 1970 Census of Population and Housing and the 1969 Census of Agriculture. The field review served as the means by which the completeness, accuracy, and consistency of the work could be checked, as well as a check of the enumerator's implementation of his instructions for the proper selection of sample units and for handling callbacks.

Verification was made by the crew leader using a partial prelisting of addresses he had drawn up while visiting each ED under his supervision prior to the enumeration. This prelisting of addresses was compared with the addresses entered in the enumerator's listing book. This method enabled the crew leader to determine on a sample basis whether the enumerator had covered the housing units in his jurisdiction.

### Followup

The extensive followup work, which was carried out between July and September 1970, covered an additional 14,216 farms totaling 560,690 cuerdas, as shown below.

	<u>Enumeration<sup>1</sup></u>	<u>Farms</u>	<u>Land in farms (cuerdas)</u>
Total .....	32,718	1,011,775	1,011,775
Initial enumeration .....	18,502	451,085	451,085
Followup enumeration .....	14,216	560,690	560,690

<sup>1</sup> Some of the farms, along with the land in those farms, which are included in the "Followup enumeration" totals, were listed during the initial canvassing but were never enumerated or were nonresponse cases. Farms, and the land in those farms, which were partially enumerated during initial canvassing but which required additional visits for completion or verification of data are included in the "Initial enumeration" totals.

Two Bureau staff members—one hired on a temporary basis—were sent to Puerto Rico to head the operation. To complete the agriculture enumeration and the followup work only 175 people were hired. Eleven persons were appointed crew leaders. The personnel chosen for this work were selected from the Puerto Rico population at large.

After the entries on the report forms were inspected for completeness in the field office, the report forms were transferred to the San Juan Central Office for a more complete check, including coverage by ED.

The field office in Puerto Rico was officially closed on September 30, 1970, and all temporary employees were discharged as of that date. The closing marked the end of field activities on the 1969 Census of Agriculture. All materials were thereafter sent to Jeffersonville, Ind., for review and tabulation.

## DATA PROCESSING

### General

The processing of the 1969 agriculture census for Puerto Rico included the following steps:

1. Clerical editing of reports in Jeffersonville
2. Data keying and verification in Jeffersonville
3. Format and consistency edit by computer in Washington
4. Review of format and consistency edit rejects in Washington
5. Correction of data rejects in Jeffersonville

### Editing and Tabulating

After the report forms had been reviewed again for completeness and consistency, the data collected were keyed directly from the report forms by key encoders onto minitapes, using the computer codes appearing on the forms. The data on the minitapes were then pooled onto larger reels on the computer. These operations were performed in the Jeffersonville office.

These tapes were then transferred to the Census Bureau in Washington where they were converted into binary records, i.e., the data on the pooler tapes were put into the computer's own basic language and were sorted by municipios and identification numbers on the computers. This computer format program, in addition to converting the data, also included the following checks:

1. Illegal items—responses to items which did not appear in the report form
2. Nonresponse to required items
3. Negative items—items reported as minus values
4. Check digit check—a check to insure that the identification numbers were correct
5. Out-of-scope records—records for places that did not qualify as farms

Specifications for the format and consistency edit were furnished in decision logic tables by the subject matter specialists. The edit—

1. Made consistency checks—a procedure whereby the computer checked to see whether the total of the data as reported was equal to the sum of the various pieces of data supplied.
2. Set flags—a procedure whereby the computer indicated that a particular piece of information was incorrect or was not consistent with previously supplied information.
3. Imputed missing or incorrect entries using "cold deck" and "hot deck" values—values established by subject-matter

specialists during the design of the decision logic tables and included in the computer program for editing. Both the cold and hot deck values were used to determine what figures would be allocated to an item on the report form when the reported (keyed) item was not within acceptable parameters (the item was missing, too high, too low, inconsistent with other data, etc.). The cold deck values were constants used to supply an entry for an infrequently reported item or an item for which a hot deck value could not be supplied. The hot deck values, on the other hand, were continually being replaced by values from items on subsequent reports which were within an acceptable range. For example, assume the original hot deck value for cattle sold was established at \$150 per head. The first report to be edited has an entry of 300 cattle sold with no value of sales given. The computer imputes a value of \$45,000 (150 x 300) for value of sales. The second report to be edited, however, reports 310 cattle sold and a value of sales of \$48,050 - an average of \$155 per head. This is within the acceptable range, and thus the value of \$155 per head *replaces* the stored hot deck value of \$150. This process was repeated continuously for all items in the report form for which hot deck figures were established.

4. Coded each report form—for size, by the number of cuerdas; for economic class, by value of sales; for type of farm, i.e., whether dairy farms, sugar cane farms, etc.; and for tenure, i.e., whether the operator was a full owner, part owner, or tenant.

5. Changed records from long form to short form or the reverse if the TVP (total value of farm products sold) checks so directed, i.e., the value of sales determined which form applied.

Once the first edit was completed, a listing of flagged cases was printed. These flagged cases were then reviewed and corrected by the subject specialists. Thereafter, the corrections were coded and keyed using the key tape encoders, edited by the computer, and inserted into the data records on tape. These cases sometimes underwent four or five computer edits because when a block of data was flagged and corrected related data items might be inconsistent with the corrected data. Additional edits were then required to adjust the related data items so that they would be consistent. This cycle was repeated until all errors were corrected. The data were then tallied on two different computer runs. Table layouts, based on the particular items in the report forms, were furnished by the subject-matter specialists. Two sets of tabulations were made:

1. Data items by municipio.
2. Cross tabulations by type, class, size, and tenure of farms, the age of the farm operator, etc.

Tables were reviewed in Washington for consistency and accuracy, corrections were carried to the data tapes to correct major errors, and the data were then retabulated.

Municipio tabulations were run after most of the inconsistent records were corrected. After review of the municipio tables, more corrections were carried to the data file. When all these corrections were carried, final municipio tables and Puerto Rico tables were run.

## COMPLETENESS OF THE CENSUS

Though a complete and fully accurate count of farms, farmland, and farm production is the aim of each general census of agriculture, it has never been achieved. The causes of incompleteness and inaccuracies are a part of the complex structure of agriculture. Among the elements involved are the large number of places to be enumerated, the variety of arrangements under which farms are operated, the continuing changes in the relationship of farm operators to their land, the expiration of leases and the making or renewal of others, the problems of obtaining a complete unduplicated listing of all agricultural operators, the difficulties of locating and identifying places that might be farms, the absence from their farms of some farmers during the period of enumeration and the following period, the opinions of some farmers that some or all of their agricultural operation should not be included in the census, etc.

Various tables compiled from the results of the 1969 Puerto Rico agricultural census show that a substantial reduction from previous census figures exists in both the number of farms reporting and the quantity reported for individual census items. A large quantity of land included as agricultural operations in previous censuses failed to qualify during the 1970 enumeration. This land was generally found to be abandoned farmland or land being held for speculation and not farmed.

## COMPARABILITY OF DATA

Comparisons of the data for the 1970 Puerto Rico enumeration with data of previous censuses should be made only with an understanding of the differences in coverage for specified items.

Those parcels which qualified as farms under the definition were enumerated as agricultural operations during the 1969 census. In 1964, information was obtained separately for parcelas (places containing between  $\frac{1}{4}$  and 3 cuerdas) having agricultural operations; the information was collected for a sample of one-tenth of the parcelas in 1964.

The 1964 census data on facilities, equipment, work off the farm, and farm expenditures were obtained for a sample of approximately one-fifth of the small farms. The data for these items were enumerated for all large farms in that census. For the current census, data on facilities and equipment were obtained only for farms with value of sales of \$1,200 or more, while data for farm expenditures and work off the farm were obtained for all farms.

In addition, there was a change in the manner in which large, multiunit operations were reported. In previous censuses, these farms submitted individual reports for each separate operation. During the 1970 enumeration a composite report for the overall operation was filed by multiunit operators. The result was that the data for these farms were tabulated in the municipio where the farm headquarters was located, substantially increasing figures for some municipios and decreasing figures for others.

## PUBLICATION PROGRAM

Unlike the U.S. reports, which were prepared by utilizing preprinted texts, and tables printed directly from the computer tapes by electronic highspeed printers and then reproduced, the reports for Puerto Rico were typed by hand. The final reports were published in both Spanish and English.

After the tabulated data were posted to the table worksheets and the various measures (percentages, production figures, etc.) were computed, the worksheets were forwarded for typing. The final reports were prepared in several steps as follows:

1. Preparation of first draft of text in English
2. Review of posted tables for internal consistency and general acceptability
3. Preparation of final text and translation into Spanish
4. Typing of text and tables for reproduction
5. Machine check of tables
6. Review of tables by subject specialists
7. Final correction of tables
8. Paging, addition of running titles (titles which appear on each page), final correction of text, etc.
9. Printing

The results of the agriculture census for Puerto Rico were published in Volume I, *Area Reports*, Part 52, 1969 Census of Agriculture. No unpublished data are available from the 1969 Puerto Rico Census of Agriculture.