
CONTENTS

	Page
Introduction	V
General Explanation	VII

MAPS

Water Resources Areas of the United States: 1998	XXI
Percent of Normal Precipitation 1998: January - March	XXII
Percent of Normal Precipitation 1998: April - June	XXIII
Percent of Normal Precipitation 1998: July - September	XXIV
Percent of Normal Precipitation 1998: October - December	XXV

TABLES

1. Irrigated Farms in the Censuses of Agriculture: 1997 and Earlier Censuses	1
2. Irrigated Farms by Acres Irrigated: 1998 and 1994	2
3. Land Use: 1998 and 1994	4
4. Land Irrigated by Method of Water Distribution: 1998 and 1994	6
5. Land Irrigated by Sprinkler Systems: 1998 and 1994	7
6. Land Irrigated by Gravity Flow Systems: 1998 and 1994	9
7. Estimated Quantity of Water Applied Using Only One Method of Distribution: 1998 and 1994	13
8. Estimated Quantity of Water Applied Using Only Sprinkler Systems to Distribute Water: 1998 and 1994	15
9. Estimated Quantity of Water Applied Using Only Gravity Flow Systems to Distribute Water: 1998 and 1994	18
10. Estimated Quantity of Water Applied by Source: 1998 and 1994	20
11. Irrigation by Quantity of Estimated Water Applied: 1998 and 1994	23
12. Irrigation Wells on Farms: 1998 and 1994	25
13. Irrigation Wells Used on Farms by Pumping Depth: 1998 and 1994	27
14. Irrigation Pumps on Farms: 1998 and 1994	34
15. Irrigation Pumps on Farms for Wells: 1998 and 1994	35
16. Irrigation Pumps on Farms Other Than for Wells: 1998 and 1994	37
17. Energy Expenses for On-Farm Pumping of Irrigation Water by Type of Energy: 1998 and 1994	40
18. Investment in Irrigation Equipment, Facilities, and Land Improvement: 1998 and 1994	46
19. Expenses for Maintenance and Repairs of Irrigation Equipment and Facilities: 1998 and 1994	52
20. Irrigation Water From Off-Farm Suppliers: 1998 and 1994	53
21. Farms With Diminished Crop Yields Resulting From Irrigation Interruption by Cause: 1998 and 1994	54
22. Crops Harvested From Irrigated Farms: 1998 and 1994	56
23. Estimated Quantity of Water Applied and Method of Distribution by Selected Crop: 1998 and 1994	77
24. Application of Chemicals in Irrigation Water and Times Irrigated by Selected Crop: 1998 and 1994	101
25. Other Uses of Irrigation Water: 1998 and 1994	125
26. Irrigated Farms by Size: 1998 and 1994	127
27. Irrigated Farms by North American Industry Classification System: 1998 and 1994	130
28. Irrigated Farms by Value of Agricultural Products Sold: 1998 and 1994	132
29. Methods Used in Deciding When to Irrigate: 1998 and 1994	134
30. Water Management Practices for Operators Using Gravity Flow Systems: 1998 and 1994	135
31. Irrigators Participating in Government Programs: 1998 and 1994	137
32. Energy and/or Water Conservation Improvements: 1998 and 1994	139
33. Barriers to Making Improvements to Reduce Energy or Conserve Water: 1998 and 1994	141
34. Sources of Irrigation Information Relied on to Reduce Irrigation Costs or Conserve Water: 1998 and 1994	145
35. Discontinuance of All Irrigation Since 1997 by Reason: 1998	147

APPENDIX

Report Form	A-1
-----------------------	-----

INTRODUCTION

PURPOSE AND SCOPE OF THE SURVEY

The 1998 Farm and Ranch Irrigation Survey provides data to supplement the basic irrigation data collected from all farm and ranch operators in the 1997 Census of Agriculture. This survey collected detailed data relating to on-farm irrigation practices in 1998. These data include acres irrigated by category of land use, acres and yields of irrigated and nonirrigated crops, quantity of water applied and method of application to selected crops, acres irrigated and quantity of water used by source, acres irrigated by type of water distribution systems, and number of irrigation wells and pumps. Also, included are irrigation expenditures in 1998 for maintenance and repair of irrigation equipment and facilities; purchase of energy for on-farm pumping of irrigation water; investment in irrigation equipment, facilities, and land improvement; and costs of water received from off-farm water suppliers.

Irrigation data from this survey and from the 1997 Census of Agriculture provide the most complete and detailed picture possible of irrigation in the United States.

The 23,567 operations sampled for this survey were selected from irrigated farms and ranches identified in the 1997 Census of Agriculture, excluding all abnormal and horticultural specialty farms, but including Indian reservations. Therefore, 59,452 irrigation operations were excluded from sample selection. Most of the irrigated farms (59,079) excluded were horticultural specialty farms which accounted for 3,773,084 acres irrigated, or 2.6 percent of the land irrigated in 1997. Horticultural specialty farms were excluded from the irrigation survey since they are providing irrigation information in the 1998 Census of Horticulture. In 1997, 373 abnormal farms, excluding Indian reservations, accounted for 83,351 acres irrigated, or less than 1 percent of all acres irrigated in the United States.

Some changes occurred between the 1997 Census of Agriculture and the 1998 Farm and Ranch Irrigation Survey. From 1997 to 1998, 10,067 farms irrigating 2.4 million acres left farming. In addition, results of the survey show 18,171 irrigation operations reporting

irrigation on 1.2 million acres in 1997 did not irrigate in 1998. No attempt was made to identify and select new irrigation operations for 1998.

HISTORY

Selected irrigation data for on-farm irrigation operations have been collected in the census of agriculture since 1890. A census of farms which reported irrigation in the 1900 Census of Agriculture was authorized by Congress. Surveys of irrigation in humid areas were taken in connection with the 1954 and 1959 censuses.

This is the first time the farm and ranch irrigation survey was conducted by the U. S. Department of Agriculture (USDA), National Agricultural Statistics Service (NASS). Responsibility for the survey was transferred from the U. S. Department of Commerce, Bureau of Census to NASS. The 1998 Farm and Ranch Irrigation Survey is the fifth survey devoted entirely to the collection of on-farm irrigation data for the United States. The 1979, 1984, 1988, and 1994 Farm and Ranch Irrigation Surveys collected data using similar procedures of data collection and processing. The 1998 survey utilized the resources of the 45 State Statistical Offices (SSO) of NASS. This provided expanded opportunities for telephone follow-up or personal enumeration of nonresponse cases. The 1998 Farm and Ranch Irrigation Survey is the first survey to collect and publish data for each of the 50 States. Previous farm and ranch irrigation surveys published data for only leading irrigation States, with a U.S. total, excluding Alaska and Hawaii.

AUTHORITY AND AREA COVERED

The census of agriculture is required by law under the "Census of Agriculture Act of 1997", Public Law 105-113 (Title 7, United States Code, Section 2204g). The law authorizes the Secretary of Agriculture to conduct surveys deemed necessary to furnish annual or other data on the subjects covered by the census. The 1998 Farm and Ranch Irrigation Survey was conducted under the provisions of this section.

FARM DEFINITION

The definition of a farm for census purposes was first established in 1850. It has been changed nine times since. The current definition, first used in 1974, is any place from which \$1,000 or more of agricultural products were produced and sold, or normally would have been sold, during the census year.

WATER RESOURCES AREAS MAP

The map shows water resources areas delineated on the basis of county boundaries that approximate actual basin boundaries based on topographic drainage characteristics. Data are tabulated separately for each of the 20 water resources areas shown on the map.

PERCENT OF NORMAL PRECIPITATION MAPS

The maps show the areas of the United States with deviations from normal precipitation during 1998. The maps are included for reference purposes only.

TABULAR PRESENTATION

Table 1 shows farms and acres irrigated for the censuses of 1974 through 1997 for each State, summarized by census divisions and regions. Tables 2 through 34 present detailed irrigation operation data collected in the survey from irrigation operations that reported irrigated land in the 1997 Census of Agriculture and also irrigated in 1998. Table 35 presents data for farm operations that irrigated in 1997, but discontinued irrigation either temporarily or permanently in 1998 while continuing to operate a farm or ranch. Tables 2 through 35 present data from the 1998 Farm and Ranch Irrigation Survey separately for each of the 50 States and 20 water resources areas. Additional text tables are shown in the General Explanation.

DATA PRODUCTS

The 1998 Farm and Ranch Irrigation Survey data, as well as the 1997 Census of Agriculture Volume 1 Geographic Area Series and related reports, are available on the Internet, CD-ROM, and in printed reports. The Internet files can be accessed at <http://www.usda.gov/nass>. Separate CD-ROMs are available for the 1992 and 1997 Census of Agriculture products. The 1994 and 1998 Farm and Ranch Irrigation Surveys and can be obtained by calling 1-800-727-

9540.

CUSTOM TABULATIONS

Custom designed tabulations can be developed to user specifications on a programming cost-reimbursable basis. Inquiries about special tabulations should be directed to Data Lab Administrator, Marketing and Information Services Office, National Agricultural Statistics Service, U.S. Department of Agriculture, Washington, D.C. 20250; by phone on 1-800-727-9540; or by e-mail at nass@nass.usda.gov.

DEFINITIONS AND EXPLANATIONS

Definitions and explanations of selected terms used in the tables are further defined in the General Explanation.

ABBREVIATIONS AND SYMBOLS

The following abbreviations and symbols are used throughout the tables:

- Represents zero.
- cwt Hundredweight.
- (D) Withheld to avoid disclosing data for individual farms.
- gpm Gallons per minute.
- (NA) Not available.
- psi Pounds per square inch.
- WRA Water Resources Areas.
- (X) Not applicable.