Introduction

PURPOSE AND SCOPE

The primary purpose of the Irrigation and Water Management Survey (IWMS) is to provide data relating to on-farm irrigation activities for use in preparing a wide variety of water-related local programs, economic models, legislative initiatives, market analyses, and feasibility studies.

Selected irrigation data for on-farm irrigation operations have been collected in the Census of Agriculture since 1890. The 2023 Irrigation and Water Management Survey marks 44 years of comprehensive irrigation data collected on water management practices and water uses in American agriculture. The 1979, 1984, 1988, and 1994 surveys were conducted by the U.S. Department of Commerce, Bureau of the Census. Responsibility for the survey was transferred to the U.S. Department of Agriculture (USDA), National Agricultural Statistics Service (NASS) in 1997. The 1998 survey utilized NASS field offices, which expanded opportunities for telephone follow-up or personal enumeration of nonresponse cases. The 1998 Farm and Ranch Irrigation Survey was the first survey to collect and publish data for each of the 50 States. Previously, the farm and ranch irrigation surveys published data only for the leading irrigation States and the U.S. total without including Alaska and Hawaii. In 2008, horticultural specialty operations with sales of $10,000 or greater were included in the survey for the first time. In 2018, the survey name was changed to Irrigation and Water Management to be more inclusive of nursery and greenhouse growers.

USES OF SURVEY DATA

The 2023 Irrigation and Water Management Survey provides data that supplement the basic irrigation data collected from all farm and ranch operators in the 2022 Census of Agriculture. Irrigation data from this survey, combined with the 2022 census data, provide one of the most complete and detailed profiles for irrigation in the U.S.

Survey data are used by producers, farm organizations, businesses, State departments of agriculture, elected representatives and legislative bodies at all levels of government, public and private sector analysts, the news media, and colleges and universities. The data are used to:

- Compare water use by application methods;
- Develop improved technologies;
- Develop Federal programs;
- Appraise water use trends;
- Assess impact of congressional legislation; and
- Evaluate the impact of irrigated crops by State.

AUTHORITY

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 2023 Irrigation and Water Management Survey was conducted under the provisions of this section.

FARM DEFINITION

A farm 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 or survey year.

DATA COMPARABILITY

The data are mostly comparable between 2023 and 2018. Direct comparisons for Land in Vegetables and Horticulture in the Open are not directly comparable due to vegetable seeds being reported under land in vegetables in 2023 when it was reported under horticulture in the open in 2018, impacting tables 16, 38, 39, 40, 41, 43, 44, 45, 47, and 48. For table 42, the data concerning Surge Flow, Cablegation, and Mulch, as well as the general acres for any water management practices used, are not comparable. In 2018, the three items were recorded together but for 2023 they were individually recorded. For tables 45 and 46, subirrigation including hydroponics was replaced with just hydroponics for 2023 and is therefore not comparable. The rest of the data remains comparable between 2018 and 2023. See Appendix A, Statistical Methodology for a

detailed discussion of data comparability.

WATER RESOURCE REGIONS MAP

The map on page 1 shows the Water Resource Regions delineated to the approximate basin boundaries based on the topographical drainage characteristics. Data are tabulated separately for each of the 20 Water Resource Regions shown on the map.

TABLES AND APPENDICES

The tables are divided into three sections: Entire Farm, Crops Grown in the Open and Pasture, and Horticultural Operations.

Entire Farm Data Tables. Table 1 shows farms and acres irrigated for the 2017 and 2022 Censuses of Agriculture for each State, as well as acres equipped with irrigation systems, which was added in 2022. Table 2 is new in 2023 and presents detailed information on acres equipped with irrigation systems or equipment. Tables 3 through 30 present detailed irrigation data collected in the 2023 Irrigation and Water Management Survey from operations that reported irrigated land during 2023 and in the 2022 census. Excluded from these data are institutional, research, and experimental operations. Table 30 presents data on farm operations with idle irrigation equipment as well as data on operations which irrigated in 2022 but discontinued irrigation, either temporarily or permanently, during 2023 while continuing to operate their farm or ranch. Data are reported at the national level, for each State, and for the 20 Water Resource Regions except for table 17 which reports only at the national and Water Resource Region level.

Crops Grown in the Open and Pasture Data Tables. Tables 31 through 42 present detailed 2023 irrigation data collected on crops grown in the open and pasture. Excluded from these data are institutional, research, and experimental operations. Crops grown under protection and their water usage is reported separately in the Horticultural Operations data tables. Data are reported at the national level, for each State, and for the 20 Water resource regions.

Horticultural Operations Data Tables. Tables 43 through 48 present detailed 2023 irrigation data collected on horticultural crops. Data are from horticultural operations that reported irrigating in the 2022 census and in the 2023 survey. Data are reported at the national level, for each State, and for the 20 Water Resource Regions.

Appendix A. Provides information about data collection and data processing activities and discusses the statistical methodology used in conducting and evaluating the survey. Table A provides a comparison of the irrigated acres published in the 2022 Census of Agriculture and the expanded 2023 Irrigation and Water Management Survey acres irrigated by size group. Table B provides the standard error for selected data for irrigated crops grown in the open in 2023. Table C provides the standard error for selected horticultural data in 2023.

Appendix B. Provides information about the development of the report form. It also contains the definitions of specific terms and phrases used in this publication, including items in the publication tables that carry the note "see text." The facsimiles of the report form and the instruction sheet used to collect the Irrigation and Water Management Survey data are included.

RESPONDENT CONFIDENTIALITY

In keeping with the provisions of Title 7 of the United States Code, no data are published that would disclose information about the operations of an individual farm or ranch. All tabulated data are subjected to an extensive disclosure review prior to publication. Any tabulated item that identifies data reported by a respondent or allows a respondent's data to be accurately estimated or derived, was suppressed and coded with a 'D'. However, the number of farms reporting an item is not considered confidential information and is provided even though other information is withheld.

SPECIAL STUDIES AND CUSTOM TABULATIONS

The 2023 Irrigation and Water Management Survey data, as well as the 2022 Census of Agriculture Volume 1 Geographic Area Series and related reports, are available on the NASS website at www.nass.usda.gov.

Custom-designed tabulations may be developed when data are not published elsewhere. These tabulations are developed to individual user specifications on a cost-reimbursable basis and shared with the public. Quick Stats, NASS's online database that allows data users to build customized queries, should be investigated before requesting a custom tabulation.

All special tabulations are subject to a thorough disclosure review prior to release to prevent the disclosure of any individual respondent data. Instructions to request a special tabulation can be found on the NASS website, including information about timing, fees, and the submission form. Questions can be directed to SM.NASS.Data.Lab@usda.gov.

ABBREVIATIONS AND SYMBOLS

The following abbreviations and symbols are used throughout the tables:

- Represents zero.

(D) Withheld to avoid disclosing data for individual farms.

(H) Coefficient of variation is greater than or equal to 99.95 percent or the standard error is greater than or equal to 99.95 percent of mean.

(L) Coefficient of variation is less than 0.05 percent or the standard error is less than 0.05 percent of the mean.

WRR Water Resource Regions.

(NA) Not available.

(X) Not applicable.

(Z) Less than half of the unit shown.

(cwt) Hundredweight.

gpm Gallons per minute.

psi Pounds per square inch.

sq ft Square feet