
Appendix B.

General Explanation and Report Form

DEVELOPMENT OF THE REPORT FORM

Planning for the 2023 Irrigation and Water Management Survey (IWMS) started in 2019 with the closeout of the 2018 IWMS. Evaluations from NASS staff of the 2018 IWMS were reviewed. Extensive correspondence, discussions, and meetings took place with representatives of the Economic Research Service (ERS) and other agencies within the Department of Agriculture.

During the development of the 2023 IWMS form, cognitive testing was conducted under the leadership of the Methodology Division at NASS. As a result, the findings and recommendations led to the following notable changes for the 2023 Irrigation and Water Management Survey.

Major Changes

The most significant change from 2018 was the expansion of Section 2, to include a new column for acres equipped with irrigation equipment. Several sections of the questionnaire were relocated and/or merged to provide a better flow for respondents while completing the questionnaire. In addition, minor content changes were added throughout the questionnaire to collect additional information, clarify reported information, and align the Irrigation and Water Management Survey data with the Census of Agriculture data.

Other Changes

Section 2: An additional column was added to Section 2 that collects acres equipped for irrigation. This change was made in relation to a change in the Census of Agriculture and to provide additional insight into the relationship between acres with irrigation potential and those irrigated. Also removed from Section 2 was a question asking for the State in which an operation had the most irrigated acres.

Section 6: Pump expenses, which were reported separately in 2018, were merged with the pump inventory to create a singular section covering all pump and pump expenses. In addition, well pumps were added to the table in question 2, so operators can report all pumps in one table to help with misreporting of well pumps as relifting or boosting pumps.

Sections 8, 12, & 13: Hydroponics was added as its own category. Prior to 2013, there was a category called Subirrigation (including hydroponics). In 2018, the category was removed from Section 8, but left in the remaining sections. After discussions with external stakeholders, it was determined that subirrigation is too broad of a term and that hydroponic should be a category of its own.

Section 9: This section is new to the questionnaire for 2023. It contains a list of conservation practices from Section 14 of the 2018 questionnaire, along with additional practices that were obtained through discussions with external stakeholders. A question regarding the use of computer software for irrigation system planning was also added.

Sections 10 & 11: A “catch-all” item was added to the end of the tables in Sections 10 and 11 where operators can report land that was irrigated, but failed, idle, or in summer fallow. The purpose of adding this additional item was to allow the sum of all irrigated land in the tables to match the acres irrigated in Section 2. Additionally, it allowed water balancing between sections 3, 4, and 5 with section 10 when other land was irrigated.

Section 12: Vegetable seeds were removed from the nursery in the open section and relocated to “Land in Vegetables”, following the changes made on the 2022 Census of Agriculture. Vegetable seeds grown under protection were unchanged.

Section 14: A question on groundwater recharge was added in 2023 and, as mentioned earlier, the question regarding conservation practices with gravity irrigation systems was expanded upon and moved to Section 9. The listing of USDA water and environmental assistance programs were updated to reflect the most up to date programs available.

Section 16: An additional screener was added to this section and the scope of this section was expanded to include operations that had partially irrigated their operation with equipped acres left idle in 2023.

Data Changes

Some history concerning the data changes from 2003 to present are described here.

Publication Changes

2003: Data were published for irrigating farms and ranches and included data for horticultural operations that reported less than \$10,000 in sales in the 2002 Census of Agriculture. The 2003 FRIS table structure is similar to 2008 FRIS Chapter 1 tables.

2008: Two report forms were used – one for farm and ranch operations and another for horticultural operations with any sales in 2008. Data for farm and ranch operations were published in Chapter 1, Tables 1 through 43 (General Data). Horticultural operations data were published in Chapter 2, Tables 1 through 9 (Horticultural Operations Data). To bridge the 2003 tables with

the 2008 Chapter 1 tables, the 2003 U.S. data were adjusted in the 2008 publication by removing data for horticultural operations with less than \$10,000 in sales.

2013: A single report form was used to collect data from irrigating farm and ranch operations and from horticultural operations with any level of sales. Data published in Tables 2 through 39 (Entire Farm Data) are for all irrigating operations – farms and ranches and horticultural operations combined. Data are not comparable between the 2013 and 2008 surveys because horticultural operations’ data were reported separately in 2008 (Chapter 2). The 2013 horticultural operations data in Tables 40 through 45 are comparable with their corresponding 2008 Chapter 2 tables. To provide a measure of comparability in the 2013 tables, the 2008 U.S. data were adjusted, where possible, to include the 2008 horticultural operations data. In many of the first 27 tables, 2008 U.S. data were omitted.

Several tables were affected by changes to the report form sections. Some tables that appeared in the 2008 FRIS were not published in the 2013 FRIS, including Chapter 1 tables 13, 24, 31, and 40 and Chapter 2 tables 5, 6, and 7. Table 3 was updated to reflect changes that were made to the land use categories in Section 2 of the FRIS report form; specifically the types of pasture – permanent, woodland pastured, and other pasture. The change was made to align FRIS with the 2012 census.

The subirrigation method of water distribution for acres in the open was not included on the 2013 FRIS report form. This change affected Tables 28, 31, 32, and 39. The data for this method are now reported in the Other gravity item. In 2008 data were collected for five categories of Uncontrolled flooding and Other gravity methods and were published in Table 7. Only data for the total acres of each of these conveyance systems were collected and published in 2013.

Wells capable of being used, irrigation water transfers, and other uses of irrigation water are no longer published. Crops with small acreages have high variability because of the sample size. Sugarbeets, barley, and tobacco were removed as individual items in the field crops sections. Respondents reported these in the Other small grains or Other crops categories on the report form.

Water management practices for gravity irrigation were combined into four categories in Table 39.

2018: The title of the survey was changed from Farm and Ranch Irrigation Survey (FRIS) to Irrigation Water Management Survey (IWMS). The name of the survey changed because the name did not specify horticulture operations while the report form was designed to include all irrigators. Only a small number of changes were made to the combined report form to separate mixed values.

Horticulture in the open acreage was recorded under Other cropland on the 2013 report form and was recorded separately from Other cropland in 2018. This change affected tables 35, 36, and 38. Farm counts, acreage values, water application rates, and distribution methods for Other cropland are not comparable between 2013 and 2018.

2023: The report form was expanded to collect additional irrigation related data including the details on acres equipped for irrigation even on operations that may not be irrigating during the 2023 year. Data comparability was maintained for almost all items between 2018 and 2023. The tables on the publication were re-organized and several new tables were introduced to cover the new data. A new early table, Table 2, covers details on the total number of acres equipped for irrigation while tables 3 through 30 presented all irrigators, 31 through 42 focused on irrigators in the open while tables 43 through 48 covered horticultural operations, both in the open and under protection.

Tables were updated and standardized to only cover one or two years each.

Crop yields are no longer published. The definition of the yields on IWMS were not comparable to census or to any yields on other production surveys. Certain commodities, depending on the weather and the need for irrigation during the survey year, may not have sufficient sample sizes for reliable estimates. IWMS is not a production survey but a follow on aimed at collecting data on Irrigation practices, methods, water use, and infrastructure.

Definitions were clarified further on the 2023 form and publication, with new references to recently introduced funding programs. Subirrigation, including hydroponics, was changed into just hydroponics. The reason for this change was due to the 2013 update where subirrigation, also known as water seepage, was removed from the form with the intent that acres would be reported under gravity irrigation. However, hydroponics is its own category and was collected within subirrigation. Therefore, hydroponics was added to the form for consistency and is not comparable to the subirrigation including hydroponics definition.

A list of the new items includes details on acres equipped for irrigation, water use details on failed or idle land, hydroponics being added as an option in the open and listed as its own category in horticulture, expanded details on gravity irrigation practices, and groundwater recharge practices.

DEFINITIONS AND EXPLANATIONS

This section provides definitions and explanations of specific terms and phrases used on the report form or in the publication tables. Items in the publication tables that carry the note “see text” also are explained.

Acre-feet of water. An acre-foot of water is the quantity of water required to cover one acre to a depth of one foot. This is equivalent to 43,560 cubic feet or 325,851 gallons.

Acres affected by irrigation interruption. Acres or area irrigated that had a stoppage of irrigation for a period of time which resulted in an effect on crop yields. Reasons for stopping irrigation included water shortages, equipment failure, energy costs and shortages, water salinity levels, water costs, and changes in water access rights.

Acres and quantity harvested. If two or more crops were

harvested from the same land during the year (double cropping), the acres were counted for each crop. Therefore, the total acres of all crops harvested could exceed the acres of cropland harvested. An exception to this procedure was hay crops.

When more than one cutting of hay was taken from the same acres, the acres were counted only once, but the quantity harvested includes all cuttings. For interplanted crops or “skip-row” crops, acres were reported according to the portion of the field occupied, whether by a crop or whether it was idle land.

If a crop was interplanted in an orchard or vineyard and harvested, then the entire orchard or vineyard acreage was reported under land in bearing and non-bearing fruit orchards, citrus or other groves, vineyards, and nut trees and the interplanted estimated crop acreage was reported under the appropriate crop.

Acres of land in bearing and non-bearing fruit orchards, citrus or other groves, vineyards, and nut trees were included in cropland harvested whether the crop was harvested or not.

Acres equipped. Acres with access to irrigation systems or equipment, also known as acres equipped for irrigation, includes all irrigated acres and all acres that could have been irrigated in 2023, regardless of water rights.

Acres irrigated. Acres or area irrigated are the acres of agricultural land to which water was applied by any artificial or controlled means such as sprinklers, flooding, furrows, ditches, gated pipe, hand watered, capillary mats, trough irrigation, ebb-and-flood irrigation, subirrigation, and spreader dikes including preplanted, partial, and supplemental irrigation. Land flooded was to be included as irrigated only if the water was diverted to agricultural land by dams, canals, or other works. Table 1 provides a comparison with the 2023 Irrigation and Water Management Survey data and the 2022 Census of Agriculture data.

Acres irrigated affected by expenditure. This is the number of acres which were affected by the reported cost of the expenditures.

Acres irrigated on farms with any hired or contract labor. This is the total acres irrigated on the operation. On some operations, hired labor or contract labor were paid for work on all the acres in the operation. On other operations, hired labor or contract labor were paid for work on only part of the total acres irrigated in the operation.

All other crops. Data relate to any crops not having a specified code on the 2023 form. All other crops include grass seed, sunflower seed, sugarcane, etc. Does not include any crops classified as vegetables, berries, or nursery crops, nor any crops that come from any fruit or nut orchard, vineyard or grove, since those have their own general specified codes.

All other irrigated land types such as failed cropland, idle land, and land in summer fallow. This category was added to account for any irrigated land with no specified crop or pasture use. This would include irrigated cropland that failed, idle land,

and land in summer fallow.

All other land. This category includes farmsteads, buildings, livestock facilities, ponds, roads, ditches, wasteland, etc. It includes those acres in the farm operation not classified as cropland, woodland, pastureland, or rangeland.

Any water management practice used. See Water management practices used.

Application of commercial fertilizers or pesticides in irrigation water. This inquiry was intended to measure the number of farms and acres on which fertilizer and pesticides were distributed through irrigation systems.

Area in the open - acres irrigated. Acres in the open irrigated is the total area irrigated for horticultural crops grown in the open, whether harvested or not.

Area under protection - square feet irrigated. The total area used to grow horticultural crops under protection, whether harvested or not.

Average operating pressure. The average operating pressure for pumped wells was reported for up to three individual wells and as the average operating pressure for the remaining wells, if any. Artesian wells are not included as wells pumped. The average operating pressure was calculated using these reported data.

Average pumping capacity. The average pumping capacity for pumped wells was reported for up to three individual wells and as the average pumping capacity for the remaining wells, if any. Artesian wells are not included as wells pumped. The average pumping capacity was calculated using these reported data.

Barriers to making improvements to reduce energy use or conserve water. This item shows the barriers to implementing improvements that might reduce energy and/or conserve water. Respondents were asked to report for the period covering 2019 to 2023. The information was tabulated as reported. No imputation was made for a blank response.

Cablegation. An automated furrow irrigation system in which the irrigation set moves at a slow constant rate across the field. See Water Management Practices.

Cropland harvested. This category includes land from which crops were harvested and hay was cut, land used to grow short-rotation woody crops, and land in orchards, citrus groves, cultivated Christmas trees, vineyards, nurseries, and greenhouses. Land from which two or more crops were harvested was counted only once. Land in tapped maple trees was included in woodland.

Cropland harvested in the open. Acres that included harvested field crops and hay along with land used for vegetables, orchards, citrus groves, vineyards, berries, nuts, cultivated Christmas trees, short-rotation woody crops, nursery and other horticultural crops grown in the open. Does not include land used for growing horticultural crops under protection nor cropland

reported as failed or used for cover crops.

Cropland not harvested or grazed. This category includes acreage which could have been used for crops without any additional improvement and which was not reported as cropland harvested or other pasture or grazing land that could have been used for crops without additional improvements. This category includes:

1. Land used for cover crops or soil improvement but not harvested or grazed.
2. Land in Federal or State conservation programs that was not hayed or grazed in 2023.
3. Land occupied with growing crops for harvest in 2024 or later years (except fruit or nuts in an orchard, grove, or vineyard or berries being maintained for production). Example is acreage planted in winter wheat for harvest in 2024 and no crop was harvested from these acres in 2023.
4. Land in summer fallow in 2023.
5. Land with crops that failed and no crop was harvested on the acreage in 2023.

Crops unit of measurement. Crop units were preprinted on the report forms and respondents were instructed to report crops in these units.

Discharge capacity. See Average operating pressure.

Discharge operating pressure. See Average pumping capacity.

Equipped. See Acres Equipped.

Estimated quantity of water applied. The quantity of water data are based on the best estimates provided by irrigators. Generally, in areas with water shortages, such as southern California and Arizona, irrigators are more likely to provide actual quantities of water used than in Mountain States where water shortages may be less of a problem or precise measuring methods are not readily available. In the Mountain States where water from snow-melt is diverted for use in season, the amount of water used may be a rough estimate, seldom a measured figure.

Expenditures for irrigation facilities and equipment. There are six categories of expenditures. The expenditures purposes include; new expansion, water conservation, energy conservation, and scheduled replacement or maintenance. The expenditures are also grouped by primary source of funding.

Farms with idle irrigation equipment. This represents respondents that indicated the presence of irrigation equipment that went unused during the 2023 growing season.

Farms using off-farm water. Respondents were asked to report the amount (none, some, or all) of off-farm water supplied by the U.S. Bureau of Reclamation, other federal agencies, and all other suppliers. However, many respondents did not answer this question. Instead, the computer edit set the entry to unknown.

The number of farms using water from the U.S. Bureau of Reclamation, other federal agencies, and all other suppliers may be understated.

Flowing wells used. Flowing or artesian wells are wells which flow freely and provide water used for irrigation without pumping during the irrigation season. All flowing or artesian wells were excluded from data for pumped wells.

Gross value of agricultural products sold. See Market value of agricultural products sold.

Horticultural crops. The horticultural data are published in the following categories:

Cultivated Christmas trees and short rotation woody crops in the open. Includes all trees to be cut in 2023 or later years. Irrigated live Christmas trees were reported in nursery crops.

Floriculture and bedding crops. Includes annual bedding/garden plants, herbaceous perennials, vegetable plants, cut flowers and cut cultivated greens, foliage plants for indoor or patio use, potted flowering plants, and other floriculture type crops.

Food crops grown under protection. Includes all food crops that were grown in a greenhouse or under some sort of structure that regulated light, shade, temperature, etc. No food crops grown in open fields were reported for this crop type.

Mushroom crops under protection. Includes all mushroom species that were irrigated in 2023. Logs were converted to and reported in square feet.

Nursery crops. Includes deciduous shade and flowering trees, broadleaf and coniferous evergreens, live Christmas trees for sale as potted trees or balled and burlapped, fruit and nut trees and plants, ornamental grasses, palms for landscaping, shrubs, vines, aquatic plants, and other woody ornamentals.

Propagative materials. Includes dry bulbs, corms, tubers, and rhizomes; cuttings, seedlings, liners, and plugs; flower seeds; vegetable seeds; vegetable transplants; and tobacco transplants.

Sod in the open. Includes all irrigated sod, sprigs, or plugs.

Other horticultural crops. This category includes all crops that are primarily considered ornamental or horticultural and are not listed on the report form. Fruit, nut, and vegetable crops grown in the open are not considered horticultural crops.

Hydroponics. Hydroponics refers to the cultivation of plants in nutrient-enriched water, with or without the mechanical support of an inert medium such as sand, gravel, or perlite.

Institutional, research, and experimental farms. Data for these farms are combined into a single category. Research farms include farms operated by private companies as well as those operated by universities, colleges, and government organizations for the purpose of expanding agricultural knowledge.

Irrigated farms. Irrigated farms or ranches are those with any agricultural land irrigated by any artificial or controlled means in the specific calendar year. The acreage irrigated may vary from a very small portion of the total acreage in the farm or ranch to irrigation of all agricultural land in the farm or ranch. This includes reclaimed water and livestock lagoon wastewater distributed by sprinkler or flood systems.

Irrigated land. Irrigated land is defined as “all land watered by artificial or controlled means.” Therefore, the data for irrigated land include land with as little as one-half inch of water applied as well as land with several acre-feet of water applied.

Irrigation pumps. The inventory data for number of irrigation pumps include well pumps and pumps other than well pumps used for irrigation on the operation.

Land in farms. The acreage designated as “land in farms” consists primarily of agricultural land used for crops, pasture, or grazing. It also includes woodland and wasteland not actually under cultivation or used for pasture or grazing, provided it was part of the farm producer’s total operation. Land in farms includes idle cropland, cropland not harvested, and land in government conservation programs.

Land in farms is an operating unit concept and includes land owned and operated as well as land rented from others. Land used rent free was reported as land rented from others. All grazing land, except land used under government permits on a per-head basis (AUM), was included as land in farms provided it was part of a farm or ranch. Land under the exclusive use of a grazing association was reported by the grazing association and included as land in farms. All land in American Indian reservations used for growing crops or grazing livestock, or with the potential of grazing livestock, was included as land in farms. Land in reservations not reported by reservations, individual American Indians, or non-Native Americans was reported in the name of the cooperative group that used the land. In some instances, an entire American Indian reservation was reported as one farm.

Market value of agricultural products sold. This category represents the gross market value before taxes and production expenses of all agricultural products sold or removed from the place during the survey year, regardless of who received the payment. It includes sales by the producers as well as the value of any shares received by partners, landlords, contractors, or others associated with the operation. It represents the sum of all crops, including nursery products, and livestock and poultry and their products. Market value of agricultural products sold does not include payments received for participation in federal farm programs. Also, it does not include income from farm-related sources such as customwork and other agricultural services, or income from nonfarm sources.

Mulch, or other types of row covers. A water management practice used in gravity irrigation systems to help retain soil moisture. See Water Management Practices.

North American Industry Classification System. The North American Industry Classification System (NAICS) classifies

economic activities. It was jointly developed by Mexico, Canada, and the U.S. The NAICS makes it possible to produce comparable industrial statistics for Mexico, Canada, and the U.S. Farms were classified by NAICS code based on their 2022 census report(s). Establishments primarily engaged in crop production are classified in major group 111. Establishments primarily engaged in production of livestock and animal specialties are classified in major group 112. Establishments are further classified into the appropriate six-digit code for the commodity or commodities which account for one-half of the establishment’s agricultural production.

Nursery and other horticultural crops. Nursery and horticultural crops grown in the open, such as floriculture, bedding crops, nursery crops, sod, propagative materials, cultivated Christmas trees, and short rotation woody crops.

Nursery, greenhouse, and other horticulture under protection. Includes crops grown under glass, rigid plastic, plastic film, shade cloth, fiberglass, “tunnel” protection, and hoop houses. Crops that are covered only temporarily, such as for frost protection, are not considered as crops under protection. Includes floriculture, bedding crops, nursery crops, propagative materials, food crops under protection, and mushrooms.

Off-farm water supply. Off-farm water supply is water from off-farm water suppliers, such as the U.S. Bureau of Reclamation; irrigation districts; mutual, private, cooperative, or neighborhood ditches; commercial companies; or community water systems. It includes reclaimed water from off-farm livestock facilities, municipal, industrial, and other reclaimed water sources.

On-farm surface supply. On-farm surface supply is water from a surface source not controlled by a water supply organization. It includes sources such as streams, drainage ditches, lakes, ponds, reservoirs, and on-farm livestock lagoons on or adjacent to the operated land.

Other drip, trickle, or low-flow micro systems. This category is for any drip, trickle, or low-flow micro systems that were not included in the other three specific descriptions.

Other or unspecified discontinuance. This category is for any discontinuance reason that was not specified on the report form.

Other pasture and grazing land that could have been used for crops without additional improvements. This category includes land used only for pasture or grazing that could have been used for crops without additional improvement. Also included are acres of crops bush-hogged or grazed but not harvested prior to grazing. However, cropland that was pastured before or after crops were harvested was included as harvested cropland rather than cropland for pasture or grazing.

Other small grains (barley, oats, rye, etc.). This category is not comparable with 2008 or earlier FRIS publications. In previous report forms, barley had its own specific code. Beginning in 2013 it did not have a specific code and is included with Other small grains.

Other sprinkler systems. Includes any sprinkler system that was not listed on the report form.

Permanent pasture and rangeland. This land use category encompasses grazing land that does not qualify as woodland pasture or cropland pasture. It may be irrigated or dry land. In some areas, it can be a high quality pasture that could not be cropped without improvements. In other areas, it is barely able to be grazed and is only marginally better than wasteland.

Poly pipe (or other single-year use, lay-flat tubing). Includes all short term surface tubing and pipes. Does not include permanent above ground or underground pipes.

Primary source of funding assistance. Respondents were instructed to only report the primary source of funding assistance for expenditures. Nonresponses to this item were summarized as “No funding assistance.”

Precision (Laser) Leveling. For even distribution of gravity irrigation the field needs to be level. Laser leveling is a method of leveling a field by sighting on a laser and using it as a level. Zero grade means the field is perfectly level from one end to the other.

Pumps by average discharge operating pressure. This category is the average pressure of pumps, other than well pumps, used on the operation.

Pumps by average operating pressure. See Average operating pressure.

Reason for discontinuance of irrigation since 2022. These data reflect the expanded number of operations that irrigated in 2022 but not in 2023 and the acres or area irrigated in the previous census year. The data also show the reason for discontinuance. Some respondents reported multiple reasons, while others gave no specific reason.

Recharge. Ground water recharge is the practice of increasing the amount of water that enters an aquifer through human-controlled means. This can be done by injecting water directly into the subsurface through injection wells or by intentionally applying extra water to the ground for the purpose of replenishing the aquifer.

Reclaimed water. Reclaimed water is wastewater that has been treated for non-potable reuse purposes. Sources include municipal, industrial, off-farm livestock operations, and other reclaimed water sources. Water from off-farm livestock facilities, municipal, industrial, and other reclaimed water sources were reported as off-farm supplies. While reclaimed water from on-farm livestock facilities were reported as on-farm surface water.

Recycled water. Recycled water is the reuse of surface or ground water that has already been used to irrigate a crop on the operation. Recycled water use was reported as on-farm surface water.

Scheduled by water supplier. Producer’s decision to irrigate was determined by a third party, subject to delivery and availability conditions. Examples include water delivered by trucks or canals not controlled by the producer.

Solar pumps. The data were not published at the State level because of low data reliability at the State level. There are few operations with solar pumps in the population.

Sources of irrigation information. These data show which sources were used by farmers to help them make irrigation decisions. The information for this item was tabulated as reported. No imputation was made for a blank response.

Sprinkler systems. Center pivot systems are published as either high-pressure delivery with water delivered at 60 psi or more, medium pressure delivery with water delivered at 30 to 59 psi, or low- pressure delivery with water delivered at less than 30 psi. Linear move tower and solid set or permanent systems are published as medium to high pressure at 30 psi or more or low pressure, less than 30 psi. The mechanical-move systems are further classified as either linear move, side roll, wheel move, or big gun where the sprinkler device is moved across the field either by self-propelled methods or by tractor.

Hand move systems include any distribution systems which are moved without mechanical assistance.

Other sprinkler systems include any other system not listed on the report form.

Surge flow. The intentional application of water to furrows or borders creating a series of on and off periods of constant or variable time spans. See Water management practices.

Tailwater pits. Irrigation water is captured after the initial application of irrigation water. The water drains into a collection pit and is returned through an irrigation system to irrigate the same field or other fields.

Total cropland. This category includes cropland harvested, cropland used only for pasture or grazing, cropland idle or used for cover crops or soil improvement but not harvested and not pastured or grazed, cropland on which all crops failed or were abandoned, and cropland in cultivated summer fallow.

USDA programs for water conservation and environmental improvements (CTA, EQIP, RCPP, AMA, WMB, CIG, etc.). These technical and financial resources include Conservation Technical Assistance, Environmental Quality Incentives Program, Regional Conservation Partnership Program, Conservation Innovation Grants, and others.

Utilized computer software for planning gravity irrigation systems. Indicates if operations used computer software for the measuring or planning of their gravity irrigation system’s pipes or tubing. Software features include determining the location for the pipes or tubes, the location for drilling holes into the pipes or tubes, the diameter of the holes, and the distance between holes for optimal irrigation.

Water management practices. These practices refer to gravity irrigation systems only. The respondent reported whether they used any of the techniques listed on the report form and the number of acres on which they applied this technique.

Water Resource Regions (WRR). Data from IWMS were tabulated by WRR. Boundaries of these areas are shown on the map on page 1. Geographic descriptions of the areas used to approximate water resource region are as follows:

01 New England Region. The drainage within the United States that ultimately discharges into the Bay of Fundy and the Atlantic Ocean. These points of discharge are located within and between Maine and Connecticut; Long Island Sound and the St. Francis River, a tributary of the St. Lawrence River.

02 Middle Atlantic Region. The drainage within the United States that ultimately discharges into the Atlantic Ocean, whose point of discharge is located within and between New York and Virginia, and the Richelieu River, a tributary of the St. Lawrence River.

03 South Atlantic-Gulf Region. The drainage that ultimately discharges into the Atlantic Ocean, whose point of discharge is located within and between North Carolina and Florida; and the Gulf of Mexico, whose point of discharge is located within and between Florida and Mississippi, including the Pearl River.

04 Great Lakes Region. The drainage within the United States that discharges into the Great Lakes system, including the Lakes' surfaces; and the St. Lawrence River as far east as, but excluding the Richelieu River.

05 Ohio Region. The drainage of the Ohio River, excluding that of the Tennessee River.

06 Tennessee Region. The drainage of the Tennessee River.

07 Upper Mississippi Region. The drainage of the Mississippi River above the mouth of the Ohio River, excluding drainage of the Missouri River above a point immediately below the mouth of the Gasconade River.

08 Lower Mississippi River. The drainage of the Mississippi River below the mouth of the Ohio River, but excluding the drainage of the Arkansas, White, and Red Rivers and above the points of highest backwater effects of the Mississippi River in those parts; and the coastal streams, other than the Mississippi River, that discharge into the Gulf of Mexico from the boundaries of, but excluding the Pearl and Sabine Rivers.

09 Souris-Red-Rainy Region. The drainage within the United States of the Souris, Red, and Rainy Rivers.

10 Missouri Region. The drainage within the United States of the Missouri River above a point immediately below the mouth of the Gasconade River and the Saskatchewan River.

11 Arkansas-White-Red Region. The drainage of the Arkansas River above the point of highest backwater effect of the

Mississippi River, the Red River above the point of highest backwater effect of the Mississippi River, and the White River above the point of highest backwater effect of the Mississippi River near Peach Orchard Bluff, AR.

12 Texas-Gulf Region. The drainage that discharges into the Gulf of Mexico from and including Sabine Pass to, but excluding, the Rio Grande and the Lower Rio Grande Valley.

13 Rio Grande Region. The drainage within the United States of the Rio Grande; the San Luis Valley, North Plains, San Augustine Plains, Mimbres, Estancia Jonado del Muerto, Tularosa, Salt, and various smaller closed basins; and the Lower Rio Grande Valley.

14 Upper Colorado Region. The drainage of the Colorado River above the Lee Ferry Compact Point, which is about 1 mile below the mouth of the Paria River; and the Great Divide closed basin.

15 Lower Colorado Region. The drainage within the United States of the Colorado River below the Lee Ferry Compact Point, which is about 1 mile below the mouth of the Paria River; the Rios Yaqui, Magdalena, Sonoita, and other lesser streams that ultimately discharge into the Gulf of California; and the Animas Valley, Wilcox Playa, El Dorado Valley, and other smaller closed basins.

16 Great Basin Region. The drainage of the Great Basin that ultimately discharges into Utah and Nevada.

17 Pacific-Northwest Region. The drainage within the United States that ultimately discharges into the Straits of Georgia and Juan de Fuca and the Pacific Ocean. The point of discharge is within Washington and Oregon, including the Columbia River.

18 California Region. The drainage within the United States that ultimately discharges into the Pacific Ocean, whose point of discharge is within California, which includes the Central Valley; and that portion of the Great Basin and other closed basins in California.

19 Alaska. Entire State.

20 Hawaii. Entire State.

Woodland not pastured. These acres were included in All other land. Woodland includes natural or planted woodlots or timber tracts and cutover and deforested land with young growth which has or will have value for wood products and woodland pastured. Land planted for Christmas tree production and short rotation woody crops was reported in Cropland harvested.

Woodland pastured. This category includes all woodland used for pasture or grazing during the survey year. Woodland or forest land pastured under a per-head grazing permit was not counted as land in farms and, therefore, was not included in woodland pastured.

Zero grade. See Precision (Laser) Leveling.

2023 IRRIGATION AND WATER MANAGEMENT SURVEY

Form Number: 23-A621
(09/13/23)



National Agricultural
Statistics Service

Return your
completed report to:

Census of Agriculture
1201 East 10th Street
Jeffersonville, IN 47132

OFFICE USE ONLY 0010

Make corrections to name, address, and ZIP Code if necessary.

Complete your report by mail or via the internet at www.agcounts.usda.gov

- **Your mandatory report is due by February 15, 2024** – Everyone, including nursery, greenhouse, and other horticultural crop producers, must return this form by this date.
- To fill out the paper form, use a black or blue ballpoint pen.
- **Questions** – Call us toll-free at 1-888-424-7828. Thank you for your cooperation.

SECTION 1 ACREAGE IN 2023

- Report land owned, rented, or used by you, your spouse, or the partnership, corporation, or organization printed above.
- Round to whole acres.
- Include ALL LAND, regardless of location or use – cropland, pastureland, rangeland, woodland, idle land, **greenhouses or other area under protection**, farmsteads, Conservation Reserve Program (CRP) land, etc.

| | None | | Number of Acres |
|---|--------------------------|---|-----------------|
| 1. All land owned 0025 | <input type="checkbox"/> | | |
| 2. All land rented or leased from others , including land worked by you on shares, used rent free, in exchange for services, payment of taxes, etc. Include Federal, state and railroad land leased on a per-acre basis. Exclude leased land (e.g., private, Federal, state, railroad) used on a per-head or animal unit month (AUM) basis under a grazing permit 0026 | <input type="checkbox"/> | + | |
| 3. All land rented or leased to others , including land worked on shares by others and land subleased. 0027 | <input type="checkbox"/> | - | |
| 4. TOTAL ACRES in this operation (items 1 + 2 - 3 = BOX A). 0028 | = | | BOX A |

The information you provide will be used for statistical purposes only. Your responses will be kept confidential and any person who willfully discloses ANY identifiable information about you or your operation is subject to a jail term, a fine, or both. This survey is conducted in accordance with the Confidential Information Protection and Statistical Efficiency Act of 2018, Title III of Pub. L. No. 115-435, codified in 44 U.S.C. Ch. 35 and other applicable Federal laws. For more information on how we protect your information please visit: www.nass.usda.gov/confidentiality. Response to this survey is required by law under Title 7 USC 2204(g) Public Law 105-113.

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a valid OMB control number. The valid OMB number is 0535-0234. The time required to complete this information collection is estimated to average 60 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

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SECTION 2 LAND IN 2023

- Of the acres reported in **BOX A** on the previous page, indicate how all of the land was used in 2023 in column 1 below. If the same land had more than one use, report that land only once in items 1 through 3.
- Report the acres that had irrigation equipment in 2023 in Column 2. Acres with access to irrigation systems or equipment, also known as acres equipped for irrigation, include all irrigated acres and all acres that could have been irrigated in 2023, regardless of water rights. Examples include acres covered by sprinklers, drip trickle, down rows, and controlled flooding irrigation systems.
- Report the acres that were irrigated in 2023 in Column 3. Irrigation is any application of water, including partial, supplemental, or preplant irrigation, by any artificial or controlled means. Fresh, reclaimed, and recycled water are all suitable for irrigation purposes.
- Area under protection includes crops grown under glass, rigid plastic, plastic film, shade cloth, fiberglass, “tunnel” protection, and hoop houses. Crops covered temporarily, such as for frost protection, only to be further grown in the open should be reported as cropland harvested in the open.

1. Cropland – Exclude cropland used only for pasture.

| | | Column 1 | | Column 2 | | Column 3 |
|--|-------------------------------|-----------------|-------------------------------|---|-------------------------------|--|
| | | Number of Acres | | Acres Reported in Column 1 with Access to Irrigation Systems or Equipment | | Acres Reported in Column 2 that were Irrigated |
| a. Cropland harvested in the open – Include harvested field crops and hay; and land in vegetables, orchards, citrus groves, vineyards, berries, nuts, Christmas trees, short rotation woody crops, nursery and other horticultural crops in the open | None <input type="checkbox"/> | 0029 | None <input type="checkbox"/> | 1128 | None <input type="checkbox"/> | 0030 |
| b. Area under protection – Include nursery, greenhouse, and other horticulture under protection. Round to the nearest whole acre | <input type="checkbox"/> | 0077 | <input type="checkbox"/> | 1129 | <input type="checkbox"/> | 0078 |
| c. Cropland not harvested or grazed – Include cropland on which all crops failed, cropland idle, cropland used for cover crops or CRP, and cropland in summer fallow. | <input type="checkbox"/> | 0033 | <input type="checkbox"/> | 1130 | <input type="checkbox"/> | 0034 |

2. Pasture

| | | | | | | |
|--|--------------------------|------|--------------------------|------|--------------------------|------|
| a. Permanent pasture and rangeland | <input type="checkbox"/> | 0135 | <input type="checkbox"/> | 1131 | <input type="checkbox"/> | 0136 |
| b. Woodland pastured. | <input type="checkbox"/> | 0137 | | | | |
| c. Other pasture and grazing land (including rotational pasture) that could have been used for crops without additional improvements | <input type="checkbox"/> | 0107 | <input type="checkbox"/> | 1132 | <input type="checkbox"/> | 0108 |

3. All other land – Include land not reported above. Include woodland not pastured, farmsteads, home, buildings, livestock facilities, ponds, roads, wasteland, etc.

0039

| | | Total Acres on this Operation | | Total Acres with Access to Irrigation Systems or Equipment | | Total Acres Irrigated |
|---|--|-------------------------------|--|--|--|-----------------------|
| | | BOX B | | BOX C | | BOX D |
| 4. TOTAL ACRES – Add acres in each column and enter the totals | | 0041 | | 1133 | | 0042 |

(**BOX B** above should be the same as **BOX A** on page 1.)

- 5. Was any area irrigated on this operation in 2023? (Is **BOX D** positive?)**
- Include all irrigated land in the open and all area under protection in 2023.
 - Exclude land equipped for irrigation that did not receive irrigation in 2023.

0003 1 **Yes** – Continue 3 **No** – Go to Section 16 on page 19



SECTION 3 GROUND WATER FROM WELLS

1. Did this operation irrigate with ground water from wells on this operation in 2023?

0760

1 **Yes - Continue**

3 **No - Go to Section 4**

If exact amounts are not available, provide your best estimate for quantity of water applied. If total area irrigated in the open is less than one acre, report as one acre in item 2. If the wells are not on the operation, such as a municipal or rural water system, report this as off-farm water in Section 5.

2. Report acres in the open irrigated with ground water and the amount of water applied in 2023. Include irrigated horticultural crops grown in the open, irrigated summer fallow, and irrigated pastureland.

None

| Acres in the Open Irrigated by Ground Water | | Quantity of Ground Water Applied | | Enter Code for Unit of Measure 1 = Total Acre-Feet 2 = Total Gallons 3 = Inches/Acre | |
|---|--|----------------------------------|--|---|--|
| 0444 | | 0446 | | 0447 | |

3. Report the area under protection irrigated with ground water in 2023. Under protection includes nursery, greenhouse, floriculture, mushrooms, vegetable seeds, and propagative materials grown under glass, rigid plastic, plastic film, shade cloth, fiberglass, "tunnel" protection, and hoop houses.

None

| Square Feet Under Protection Irrigated with Ground Water | |
|--|--|
| 0455 | |

4. How many wells on this operation were used for irrigation in 2023?

| Number of Wells | |
|-----------------|--|
| 0460 | |

a. Of the (item 4) wells, how many used backflow prevention devices (check valves) and how many acres and/or square feet under protection were irrigated with these wells in 2023?

None

| Number of Wells | | Acres in the Open | | Square Feet Under Protection | |
|-----------------|--|-------------------|--|------------------------------|--|
| 0770 | | 0771 | | 0679 | |

b. Of the (item 4) wells, how many had flow meters or other flow measurement devices and how many acres and/or square feet under protection were irrigated with these wells in 2023?

| | | | | | |
|------|--|------|--|------|--|
| 0683 | | 0772 | | 0680 | |
|------|--|------|--|------|--|

c. Of the (item 4) wells, how many were free flowing wells that did not require a pump?

| | |
|------|--|
| 0486 | |
|------|--|

5. Report for the first three primary wells pumped in 2023.

| | Depth of Well (Feet) | | Depth to Bowls or Impellers (Feet) | | Depth to Water at Start of Irrigation Season (Feet) | | Pump Capacity – Discharge From Well (GPM) | | Operating Pressure at Well Head (PSI) | | Horsepower of Engines or Motors, Including Electric (HP) | |
|-----------------|----------------------|--|------------------------------------|--|---|--|---|--|---------------------------------------|--|--|--|
| Well #1 | 0461 | | 0463 | | 0462 | | 0464 | | 0676 | | 0761 | |
| Well #2 | 0465 | | 0467 | | 0466 | | 0468 | | 0677 | | 0763 | |
| Well #3 | 0469 | | 0471 | | 0470 | | 0472 | | 0678 | | 0765 | |

a. Report averages for all other wells pumped in 2023

| | Average Depth of Well(s) (Feet) | | Average Depth to Bowls or Impellers (Feet) | | Average Depth to Water at Start of Irrigation Season (Feet) | | Average Pump Capacity – Discharge From Well (GPM) | | Average Operating Pressure at Well Head (PSI) | | Average Horsepower of Engines or Motors, Including Electric (HP) | |
|--|---------------------------------|--|--|--|---|--|---|--|---|--|--|--|
| | 0481 | | 0483 | | 0482 | | 0484 | | 0681 | | 0767 | |

6. For the wells used on this operation, what is the best description for the depth to water over the last five years? Mark (X) one.

0487

1 Depth to water did not change

2 Depth to water increased

3 Depth to water decreased

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SECTION 4 ON-FARM SURFACE WATER

1. Did this operation irrigate with on-farm surface water, including recycled water and on-farm reclaimed water, in 2023?

Recycled water is reused surface or groundwater that was previously used to irrigate a crop (e.g. water from a tailwater reuse pit used for irrigation).

On-farm reclaimed water is on-farm livestock wastewater that has been treated for non-potable reuse purposes. (For the purposes of this irrigation survey, to be considered an irrigation application of reclaimed water, at least 0.5 inches of reclaimed water must be applied on the area during the growing season.)

0438 1 **Yes - Continue** 3 **No - Go to Section 5**

If exact amounts are not available, provide your best estimate for quantity of water applied. If total area irrigated in the open is less than one acre, report as one acre in item 2.

2. Report acres in the open irrigated with on-farm surface water and the amount of water applied in 2023. Include irrigated horticultural crops grown in the open, irrigated summer fallow, and irrigated pastureland. None

| Acres in the Open Irrigated by On-Farm Surface Water | | Quantity of On-Farm Surface Water Applied | | Enter Code for Unit of Measure 1 = Total Acre-Feet 2 = Total Gallons 3 = Inches/Acre | |
|--|--|---|--|---|--|
| 0449 | | 0451 | | 0452 | |

3. Report the area under protection irrigated with on-farm surface water in 2023. Under protection includes nursery, greenhouse, floriculture, mushrooms, vegetable seeds, and propagative materials grown under glass, rigid plastic, plastic film, shade cloth, fiberglass, "tunnel" protection, and hoop houses. None

| Square Feet Under Protection Irrigated with On-Farm Surface Water | |
|---|--|
| 0458 | |

4. Did this operation use **on-farm recycled water** to irrigate any crops, including horticultural crops, grown during 2023?

0600 1 **Yes - Continue** 3 **No - Go to item 5 below**

a. How many acres in the open and square feet under protection were irrigated with **on-farm recycled water** during 2023?

| Acres in the Open | | Square Feet Under Protection | |
|-------------------|--|------------------------------|--|
| 0601 | | 0936 | |

5. Did this operation use **reclaimed water from on-farm livestock facilities** to irrigate any crops, including horticultural crops, grown during 2023? (For the purposes of this irrigation survey, to be considered an irrigation application of reclaimed water, at least 0.5 inches of reclaimed water must be applied on the area during the growing season. If this minimum amount is not met, mark (X) "No" below.)

0543 1 **Yes - Continue** 3 **No - Go to Section 5**

a. How many acres in the open and/or square feet under protection were irrigated with one or more applications of **reclaimed water from on-farm livestock facilities** during 2023?

| Acres in the Open | | Square Feet Under Protection | |
|-------------------|--|------------------------------|--|
| 0587 | | 0588 | |

b. How much **reclaimed water from on-farm livestock facilities** was used for irrigation during 2023?

| Acre-Feet | | OR | Gallons | |
|-----------|--|----|---------|--|
| 0599 | | | 0561 | |



SECTION 5 OFF-FARM WATER

1. Did this operation irrigate with off-farm water in 2023?

INCLUDE

- acres in the open and area under protection irrigated with off-farm water from all suppliers
- all off-farm surface water, municipal (such as town or city) water, and rural water suppliers
- area irrigated with reclaimed water from off-farm sources such as treated municipal sewer water (blue water), industrial, off-farm livestock operations, or other off-farm sources

0457 1 **Yes - Continue** 3 **No - Go to Section 6**

If exact amounts are not available, provide your best estimate for quantity of water applied. If total area irrigated in the open is less than one acre, report as one acre in item 2.

2. Report acres in the open irrigated with off-farm water and the amount of water applied in 2023. Include irrigated horticultural crops grown in the open, irrigated summer fallow, and irrigated pastureland

None

| Acres in the Open Irrigated by Off-Farm Water | | Quantity of Off-Farm Water Applied | | Enter Code for Unit of Measure 1 = Total Acre-Feet 2 = Total Gallons 3 = Inches/Acre | |
|---|--|------------------------------------|--|---|--|
| 0454 | | 0968 | | 0969 | |

3. Report the area under protection irrigated with off-farm water in 2023. Under protection includes nursery, greenhouse, floriculture, mushrooms, vegetable seeds, and propagative materials grown under glass, rigid plastic, plastic film, shade cloth, fiberglass, "tunnel" protection, and hoop houses

None

| Square Feet Under Protection Irrigated with Off-Farm Water | |
|--|--|
| 0428 | |

4. Did you pay for the off-farm water received on this operation?

0675 1 **Yes - Report the total dollars paid for the off-farm water**

| Dollars | | |
|---------|----|-----|
| 0456 | \$ | .00 |

3 **No - Continue**

5. How much of this operation's off-farm water was supplied, delivered, or transferred through a project financed, constructed, or managed by –

- a. U.S. Bureau of Reclamation? Include reclamation water delivered through a local district
- b. Other Federal agencies such as the U.S. Army Corp of Engineers, Bureau of Indian Affairs, and USDA small watershed project?
- c. All other suppliers? Include town and city water. Specify:

| | | | |
|------|---------------------------------|---------------------------------|--------------------------------|
| 0664 | 1 <input type="checkbox"/> None | 2 <input type="checkbox"/> Some | 3 <input type="checkbox"/> All |
| 0665 | 1 <input type="checkbox"/> None | 2 <input type="checkbox"/> Some | 3 <input type="checkbox"/> All |
| 0666 | 1 <input type="checkbox"/> None | 2 <input type="checkbox"/> Some | 3 <input type="checkbox"/> All |

6. Did this operation use **reclaimed water from off-farm sources** such as municipal reclaimed water, industrial, off-farm livestock operations, or other off-farm sources to irrigate any crops in 2023? Off-farm reclaimed water is wastewater that has been treated for non-potable reuse purposes. (For the purposes of this irrigation survey, to be considered an irrigation application of reclaimed water, at least 0.5 inches of reclaimed water must be applied on the area during the growing season. If this minimum amount is not met, mark (X) "No" below.)

0602 1 **Yes - Continue** 3 **No - Go to Section 6**

a. How many acres in the open and/or square feet under protection were irrigated with one or more applications of **reclaimed water from off-farm sources** during 2023?

| Acres in the Open | | Square Feet Under Protection | |
|-------------------|--|------------------------------|--|
| 0597 | | 0598 | |

b. How much **reclaimed water from off-farm sources** was used for irrigation during 2023?

| Acre-Feet | | Gallons | |
|-----------|--|---------|--|
| 0644 | | 0645 | |

OR

c. What sources of reclaimed water were used on this operation in 2023? Mark (X) all that apply.

- 1001 Municipal 1002 Industrial 1005
- 1003 Off-farm livestock operation 1004 Other - Specify:

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SECTION 6 PUMPS USED FOR IRRIGATION AND PUMP EXPENSES

1. Were any pumps used on this operation for irrigation during 2023?

INCLUDE

- all pumps supplying irrigation to or through any distribution system (e.g., gravity, sprinkler, drip)
- all pumps moving water into tanks or reservoirs on the operation for irrigation in 2023

EXCLUDE

- any pumps used exclusively for non-irrigation applications such as home use or aquaculture
- any pumps not owned or rented by this operation, such as pumps operated by a water company

0488

1 Yes - Continue

3 No - Go to Section 7

2. Report pumps by use. If the same pump has multiple uses, report that pump only once in items a through d.

| | None | Number of Pumps Used | Vertical Lift (Average Feet) | Discharge Capacity (Average GPM) | Discharge Operating Pressure (Average PSI) |
|---|--------------------------|----------------------|------------------------------|----------------------------------|--|
| | | 1135 | | | |
| a. Well pumps | <input type="checkbox"/> | 0490 | 0774 | 0491 | 0687 |
| b. Tailwater pits (pits that hold water previously used for irrigation) | <input type="checkbox"/> | 0492 | 0775 | 0493 | 0688 |
| c. Ponds, lakes, reservoirs, rivers, canals, etc. | <input type="checkbox"/> | | | | |
| d. Relifting or boosting water within system (pumps providing additional lift, pressure, or lateral movement) | <input type="checkbox"/> | 0494 | 0776 | 0777 | 0778 |

3. Report the energy expense by power source. Report the fuel used and power expense for pumping irrigation water for the pumps reported above. Report energy expense for acres in the open and area under protection. If both exist for a single energy source, report their combined expenses. Include the cost of any additional charges such as the fuel adjustment charge or any other type of charge which was based on the amount of power or fuel purchased. Include landlord's share. If irrigated acres in the open were less than one acre, round to one acre.

| POWER SOURCE | None | Number of Wells and Other Pumps Used (Reported Above) | Cost of Energy Used to Power Pumps (Dollars) | Area Irrigated with Water Pumped from Wells | | Area Irrigated with Pumped Surface Water (Both on- and off-farm) | |
|--|--------------------------|---|--|---|------------------------------|--|------------------------------|
| | | | | Acres in the Open (Whole Acres) | Square Feet Under Protection | Acres in the Open (Whole Acres) | Square Feet Under Protection |
| | | 0495 | 0496 | 0497 | 0124 | 0781 | 0537 |
| a. Electricity | <input type="checkbox"/> | | \$.00 | | | | |
| | | 0498 | 0499 | 0500 | 0125 | 0782 | 0538 |
| b. Natural gas | <input type="checkbox"/> | | \$.00 | | | | |
| | | 0501 | 0502 | 0503 | 0126 | 0783 | 0539 |
| c. LP gas, propane, or butane | <input type="checkbox"/> | | \$.00 | | | | |
| | | 0504 | 0505 | 0506 | 0127 | 0784 | 0540 |
| d. Diesel and biodiesel fuel | <input type="checkbox"/> | | \$.00 | | | | |
| | | 0507 | 0508 | 0509 | 0128 | 0890 | 0541 |
| e. Gasoline, ethanol, and blends | <input type="checkbox"/> | | \$.00 | | | | |
| | | 0779 | | 0780 | 0129 | 0786 | 0542 |
| f. Solar and other pumps without direct energy expense | <input type="checkbox"/> | | | | | | |



SECTION 7 EXPENDITURES FOR IRRIGATION INFRASTRUCTURE

EXPENDITURE AND FUNDING ASSISTANCE CODES – USE IN THE TABLE BELOW

| CODE | PRIMARY PURPOSE OF EXPENDITURE | CODE | PRIMARY SOURCE OF FUNDING ASSISTANCE |
|--|--------------------------------|--|--------------------------------------|
| 1 = New expansion 2 = Water conservation 3 = Energy conservation 4 = Scheduled replacement or maintenance | | 1 = No funding assistance or loans 2 = NRCS Environmental Quality Incentives Program (EQIP) 3 = Other USDA financial assistance or loans 4 = Non-USDA and all other financial assistance or loans | |

Report the 2023 expenditure cost, acres affected (rounded to the nearest acre), primary purpose of expenditure, and primary source of funding assistance by expenditure category using the Expenditure and Funding Assistance Codes from the table above. Include the portion of the expenditures made by or shared with others (landlords or government agencies), including programs such as Environmental Quality Incentives Program (EQIP).

| EXPENDITURE TYPE | None | Total Cost of Expenditure (Include amount financed) | Irrigated Acres Affected by Expenditure (Acres) | Enter Code from Above for Primary Purpose of Expenditure | Enter Code from Above for Primary Source of Funding Assistance |
|---|--------------------------|--|--|--|--|
| | | | | | |
| 1. Purchase of new or replacement irrigation equipment and machinery – Include sprinklers, pipes, siphons, nozzles, pumps, engines, motors, filtration equipment, etc. Exclude computers, computer control panels, and software | <input type="checkbox"/> | 0511 \$.00 | 0514 | 0512 | 0513 |
| 2. New well construction or deepening of existing wells – Include drilling costs, cost of casing, and any costs to prepare well for installation of pump. Exclude cost of pumps or motors | <input type="checkbox"/> | 0515 \$.00 | 0518 | 0516 | 0517 |
| 3. Construction or improvement of permanent storage and distribution systems – Include dams, ponds, reservoirs, permanent ditches, canals, flumes, etc. | <input type="checkbox"/> | 0519 \$.00 | 0522 | 0520 | 0521 |
| 4. Computers, control panels, computer controlled valves, software, and software-controlled hardware for irrigation water management | <input type="checkbox"/> | 0544 \$.00 | 0547 | 0545 | 0546 |
| 5. Clearing or leveling non-irrigated land for new irrigation acres (the primary purpose is expansion of irrigation acres). | <input type="checkbox"/> | 0548 \$.00 | 0526 | | 0549 |
| 6. Land leveling of previously irrigated land (the primary purpose cannot be new expansion) | <input type="checkbox"/> | 0556 \$.00 | 0559 | 0557 | 0558 |

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SECTION 8 METHODS OF WATER DISTRIBUTION IN THE OPEN

1. Did this operation irrigate any land in the open in 2023?
- Include acres of horticultural crops grown in the open or under natural shade.
 - Exclude crops grown under protection: glass, rigid plastic, plastic film, including "tunnel" protection. (Methods for crops grown under protection will be reported in Section 13.)

0489 1 **Yes - Continue** 3 **No - Go to Section 13**

Report acres irrigated by each type of FIELD distribution system listed below. If the same land was irrigated by more than one method of distribution, report acres irrigated by each method used. Report information for the field distribution system, NOT for the delivery system used to convey water from the source to the field, if different.

| Acres in the Open Irrigated by Gravity System (Field Water Conveyance System) | | | | | |
|---|--------------------------|------------------|---|---|-------------------------------|
| Total Acres | Unlined Open Ditch | Lined Open Ditch | Poly Pipe (or other single-year use, lay-flat tubing) | Above Ground Pipe (except poly pipe) ¹ | Underground Pipe ² |
| 0855 | 0859 | 0857 | 0056 | 0057 | 0858 |
| 2. Gravity irrigation None | | | | | |
| a. Down rows or furrows | <input type="checkbox"/> | | | | |
| b. Controlled flooding (within borders, levees, or basins). . . | <input type="checkbox"/> | | | | |
| c. Uncontrolled flooding (rangeland, pastureland, etc.) | <input type="checkbox"/> | | | | |
| d. Other gravity systems, including water seepage | <input type="checkbox"/> | | | | |

¹ Include gated pipe and riser or hydrant systems connected to above ground pipe.
² Include riser or hydrant systems connected to underground pipe.

| Acres In the Open Irrigated by Sprinkler System | | | | |
|--|----------------------------------|-----------------------------|--------------------------------|--------------------------------|
| | Very Low Pressure (Under 15 PSI) | Low Pressure (15 to 29 PSI) | Medium Pressure (30 to 59 PSI) | High Pressure (60 PSI or more) |
| 0569 | 0576 | 0575 | 0570 | |
| 3. Sprinkler irrigation – Inlet pressure None | | | | |
| a. Center pivot systems (circle). | <input type="checkbox"/> | | | |
| b. Linear move tower systems (and other linear continuous move drive systems). | <input type="checkbox"/> | | | |
| c. Solid set or permanent systems (except low-flow micro systems). | <input type="checkbox"/> | | | |

| | | Acres Irrigated (all pressures) | |
|---|--------------------------|---------------------------------|--|
| d. Mechanical move systems | | | |
| i. Side roll, wheel move, or other mechanical move systems and other discrete move systems | <input type="checkbox"/> | 0240 | |
| ii. Big gun or traveler systems | <input type="checkbox"/> | 0241 | |
| e. Hand-move systems, including hand watered nursery and other horticultural crops grown in the open | <input type="checkbox"/> | 0242 | |
| f. Other sprinkler systems. | <input type="checkbox"/> | 0243 | |
| 4. Drip, trickle, or low-flow micro irrigation | | | |
| a. Surface drip (on or above ground) | <input type="checkbox"/> | 0248 | |
| b. Sub-surface drip (root zone) | <input type="checkbox"/> | 0246 | |
| c. Low-flow micro sprinklers or sprays (these systems apply water at low pressure and are not self-propelled or easily moved) | <input type="checkbox"/> | 0247 | |
| d. Other drip, trickle, or low-flow micro systems. | <input type="checkbox"/> | 0249 | |
| 5. Hydroponics | <input type="checkbox"/> | 1136 | |



SECTION 9 ADDITIONAL PRACTICES FOR IRRIGATION METHODS IN THE OPEN

1. Did this operation use gravity irrigation systems or equipment to irrigate any acres in the open in 2023? (Refer to Section 8, item 2.)

1137 1 **Yes - Continue** 3 **No - Go to Section 10**

2. On how many acres in the open did you use the following practices?

| | None | Number of Acres | |
|--|--------------------------|-----------------|--|
| a. Capture irrigation runoff in tailwater pits, restrict runoff by diking end of the field, limit irrigation set times or number of irrigations, or irrigate only alternative rows | <input type="checkbox"/> | 0404 | |
| b. Use any precision-leveling | <input type="checkbox"/> | 0406 | |
| i. How many acres of precision-leveling were considered zero grade (fields with a zero percent/degree decline)? | <input type="checkbox"/> | 1138 | |
| c. Shorten the furrow length; use water-soluble polyacrylamide (PAM); or use special furrowing practices such as wide-spaced bed furrowing, compacted furrows, or furrow diking | <input type="checkbox"/> | 0409 | |
| d. Use surge flow or a surge irrigation system (intermittent application of water to a furrow) | <input type="checkbox"/> | 1139 | |
| e. Use a cablegation system (constant slow flow application to a furrow) | <input type="checkbox"/> | 1140 | |
| f. Apply mulch or other types of row covers. | <input type="checkbox"/> | 1141 | |

3. Did this operation use any computer software for the measuring or planning of their gravity irrigation system's pipes or tubes in any way? Software features include determining the location for the pipes or tubes, the location for drilling holes into the pipes or tubes, the diameter of the holes, and the distance between holes for optimal irrigation.

1142 1 **Yes** 3 **No**



SECTION 10 ACRES IRRIGATED IN THE OPEN

1. Did this operation irrigate any land in the open in 2023?
 • Include irrigated harvested cropland, pastureland, summer fallow, and failed cropland.

1134 1 **Yes - Continue** 3 **No - Go to Section 13**

For each item listed, report the irrigated harvested acres or acres irrigated for non-harvested items in the first column. For selected crops, report the average yield from the irrigated harvested acres in the second column. Then report the average irrigation water applied per acre for the entire year in either acre-feet or inches/acre for the acres reported in column one. Report the crop as irrigated if water was applied to supplemental rainfall, even if the amount of water applied was not sufficient to obtain maximum yields. **Report nursery and other horticultural crops grown in the open in item 18.**

| Irrigated Crops, Pastureland, and Other Land | Irrigated Land Include preplant and supplemental or semi-irrigation | | | | | |
|---|--|--|--------------|--|--------|-----------|
| | Irrigated Acres Harvested | Average Yield per Irrigated Acre Harvested | | Average Estimated Quantity of Water Applied per Acre in 2023 | | |
| | | | | Acre-Feet | Tenths | OR |
| 2. Corn for grain or seed – Exclude popcorn and sweet corn <input type="checkbox"/> | 0050 | 0051 | | 0052 | | 0053 |
| | | | Bu. | | | OR |
| 3. Corn for silage or greenchop – Exclude popcorn and sweet corn <input type="checkbox"/> | 0060 | 0061 | Tenths | 0062 | | 0063 |
| | | | Tons | | | OR |
| 4. Sorghum for grain or seed <input type="checkbox"/> | 0070 | 0071 | | 0072 | | 0073 |
| | | | Bu. | | | OR |
| 5. Wheat for grain or seed <input type="checkbox"/> | 0080 | 0081 | | 0082 | | 0083 |
| | | | Bu. | | | OR |
| 6. Soybeans for beans <input type="checkbox"/> | 0106 | 0101 | | 0102 | | 0103 |
| | | | Bu. | | | OR |
| 7. Beans, dry edible <input type="checkbox"/> | 0110 | 0111 | | 0112 | | 0113 |
| | | | Cwt. | | | OR |
| 8. Rice – Include post harvest water applied to improve residue decomposition . <input type="checkbox"/> | 0120 | 0121 | | 0122 | | 0123 |
| | | | Cwt. | | | OR |
| 9. Other small grains (barley, oats, rye, etc.) . <input type="checkbox"/> | 0130 | | | 0132 | | 0133 |
| | | | | | | OR |
| 10. Alfalfa and alfalfa mixtures (dry hay, greenchop, and silage) <input type="checkbox"/> | 0140 | 0141 | Tenths | 0142 | | 0143 |
| | | | Tons, dry | | | OR |

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SECTION 10 CONTINUED –

| Irrigated Crops, Pastureland, and Other Land | | Irrigated Land Include preplant and supplemental or semi-irrigation | | | | | | |
|--|-------------------------------|--|--|-----------|--|--------|----|-------------|
| | | Irrigated Acres Harvested | Average Yield per Irrigated Acre Harvested | | Average Estimated Quantity of Water Applied per Acre in 2023 | | | |
| | | | | | Acres-Feet | Tenths | OR | Inches/Acre |
| 11. All other hay and haylage including small grain, other tame, and wild hay (dry hay, greenchop, and silage) | None <input type="checkbox"/> | 0150 | 0151 | Tenths | 0152 | | OR | 0153 |
| | | | | Tons, dry | | | | |
| | | 0550 | 0551 | | 0552 | | OR | 0553 |
| 12. Peanuts | <input type="checkbox"/> | | | Lbs. | | | | |
| | | 0160 | 0161 | | 0162 | | OR | 0163 |
| 13. Cotton | <input type="checkbox"/> | | | Lbs. lint | | | | |
| | | 0186 | Tenths | | 0187 | | OR | 0188 |
| 14. All land from which vegetables, potatoes, and melons were harvested | <input type="checkbox"/> | | | | | | | |
| | | 0850 | Tenths | 0851 | 0852 | | OR | 0853 |
| a. Sweet corn | <input type="checkbox"/> | | | Cwt. | | | | |
| | | 0860 | Tenths | 0861 | 0862 | | OR | 0863 |
| b. Tomatoes in the open | <input type="checkbox"/> | | | Cwt. | | | | |
| | | 0870 | Tenths | 0871 | 0872 | | OR | 0873 |
| c. Lettuce and romaine | <input type="checkbox"/> | | | Cwt. | | | | |
| | | 0190 | Tenths | 0191 | 0192 | | OR | 0193 |
| d. Potatoes – Exclude sweet potatoes | <input type="checkbox"/> | | | Cwt. | | | | |
| 15. All other crops grown in the open and not listed - Specify: | | | | | | | | |
| 0620 <input type="checkbox"/> | <input type="checkbox"/> | 0621 | | | 0622 | | OR | 0623 |
| | | | | | | | | |
| | | Irrigated Acres | | | | | | |
| | | 0560 | Tenths | | 0562 | | OR | 0563 |
| 16. All berries | <input type="checkbox"/> | | | | | | | |
| | | 0210 | Tenths | | 0212 | | OR | 0213 |
| 17. Land in bearing and non-bearing fruit orchards, citrus or other groves, vineyards, and nut trees | <input type="checkbox"/> | | | | | | | |
| | | 0690 | Tenths | | 0691 | | OR | 0692 |
| 18. Nursery and other horticultural crops grown in the open (Note: Nursery, greenhouse, and other horticultural crops grown under protection will be reported in a later section.) | <input type="checkbox"/> | | | | | | | |
| | | 0230 | | | 0232 | | OR | 0233 |
| 19. Irrigated pastureland, all types | <input type="checkbox"/> | | | | | | | |
| | | 1144 | | | 1145 | | OR | 1146 |
| 20. All other irrigated land types such as failed cropland, idle land, and land in summer fallow | <input type="checkbox"/> | | | | | | | |



SECTION 11 WATER DISTRIBUTION METHODS AND SOURCES USED IN THE OPEN

1. Did this operation irrigate any land in the open in 2023?
 • Include irrigated harvested cropland, pastureland, summer fallow, and failed cropland.
 1143 1 **Yes – Continue** 3 **No – Go to Section 13**

WATER DISTRIBUTION CODES – USE IN THE TABLE BELOW

| CODE | PRESSURE SYSTEM | CODE | GRAVITY SYSTEM |
|--|----------------------|--|----------------------|
| 01 = Hand-move system 02 = Solid set or permanent system 03 = Side roll or wheel line system 04 = Big gun or traveling gun system 05 = Linear move system (under 15 PSI) 06 = Linear move system (15 to 29 PSI) 07 = Linear move system (30 to 59 PSI) 08 = Linear move system (60 PSI or more) 09 = Center pivot system (under 15 PSI) 10 = Center pivot system (15 to 29 PSI) 11 = Center pivot system (30 to 59 PSI) 12 = Center pivot system (60 PSI or more) 13 = Low-flow irrigation (drip, trickle, or micro sprinkler system) 14 = Other pressure system including hydroponics – Specify: | | 15 = Down rows or furrows from unlined open ditches 16 = Down rows or furrows from lined open ditches 17 = Down rows or furrows from poly pipe, lay-flat tubing, or above ground or underground pipe 18 = Controlled flooding within borders, levees, or basins from unlined open ditches 19 = Controlled flooding within borders, levees, or basins from lined open ditches 20 = Controlled flooding within borders, levees, or basins from poly pipe, lay-flat tubing, or above ground pipe 21 = Controlled flooding within borders, levees, or basins from underground pipe 22 = Uncontrolled flooding (rangeland, pastureland, etc.) including open discharge from a well or pump 23 = Other gravity system – Specify: | |
| 1006 | <input type="text"/> | 1007 | <input type="text"/> |

Report for irrigated acres in the open. For each irrigated crop in the open, report the primary field distribution method, acres irrigated by water source, and acres on which chemigation was used in the irrigation system. Refer to the table above for the water distribution codes.

| Irrigated Crops, Pastureland, and Other Land | Enter Code from Above for Primary Method of Field Water Distribution | Water Source (Column totals may exceed irrigated crop acres reported in Section 10 when more than one water source was used.) | | | Acres on which chemigation was applied through the irrigation system | |
|---|--|--|--|---|--|-------------------------------|
| | | Ground Water from Wells (Acres) | On-Farm Surface Water ¹ (Acres) | Off-Farm Water (All Suppliers) ² (Acres) | Commercial Fertilizer (Acres) | Pesticide Application (Acres) |
| 2. Corn for grain or seed – Exclude popcorn and sweet corn <input type="checkbox"/> None | 0250 | 0255 | 0254 | 0256 | 0252 | 0253 |
| 3. Corn for silage or greenchop – Exclude popcorn and sweet corn <input type="checkbox"/> | 0260 | 0265 | 0264 | 0266 | 0262 | 0263 |
| 4. Sorghum for grain or seed <input type="checkbox"/> | 0270 | 0275 | 0274 | 0276 | 0272 | 0273 |
| 5. Wheat for grain or seed <input type="checkbox"/> | 0280 | 0285 | 0284 | 0286 | 0282 | 0283 |
| 6. Soybeans for beans <input type="checkbox"/> | 0300 | 0305 | 0304 | 0306 | 0302 | 0303 |
| 7. Beans, dry edible <input type="checkbox"/> | 0310 | 0315 | 0314 | 0316 | 0312 | 0313 |
| 8. Rice <input type="checkbox"/> | 0320 | 0325 | 0324 | 0326 | 0322 | 0323 |
| 9. Other small grains (barley, oats, rye, etc.) <input type="checkbox"/> | 0330 | 0335 | 0334 | 0336 | 0332 | 0333 |
| 10. Alfalfa and alfalfa mixtures (dry hay, greenchop, and silage). <input type="checkbox"/> | 0340 | 0345 | 0344 | 0346 | 0342 | 0343 |

¹ On-farm water source includes recycled water and reclaimed water from on-farm livestock operations.
² Off-farm water supplies may include water purchased from the U.S. Bureau of Reclamation; a state, county, or local district; mutual, private, cooperative, or neighborhood ditches; or commercial or municipal water systems.



SECTION 11 CONTINUED –

| Irrigated Crops, Pastureland, and Other Land | Enter Code from Previous Page for Primary Method of Field Water Distribution | Water Source (Column totals may exceed irrigated crop acres reported in Section 10 when more than one water source was used.) | | | | | | Acres on which chemigation was applied through the irrigation system | | | | |
|---|--|--|------|--|------|---|------|--|------|-------------------------------|------|--------|
| | | Ground Water from Wells (Acres) | | On-Farm Surface Water ¹ (Acres) | | Off-Farm Water (All Suppliers) ² (Acres) | | Commercial Fertilizer (Acres) | | Pesticide Application (Acres) | | |
| 11. All other hay including small grain, other tame, and wild hay (dry hay, greenchop, and silage) <input type="checkbox"/> | None | 0350 | 0355 | 0354 | 0356 | 0352 | 0353 | | | | | |
| | | 0580 | 0585 | 0584 | 0586 | 0582 | 0583 | | | | | |
| 12. Peanuts <input type="checkbox"/> | | 0360 | 0365 | 0364 | 0366 | 0362 | 0363 | | | | | |
| 13. Cotton <input type="checkbox"/> | | | | | | | | | | | | |
| 14. All acres in the open from which vegetables, potatoes, and melons were harvested <input type="checkbox"/> | | 0474 | 0479 | Tenths | 0478 | Tenths | 0480 | Tenths | 0476 | Tenths | 0477 | Tenths |
| | | 0900 | 0905 | Tenths | 0904 | Tenths | 0906 | Tenths | 0902 | Tenths | 0903 | Tenths |
| a. Sweet corn <input type="checkbox"/> | | 0910 | 0915 | Tenths | 0914 | Tenths | 0916 | Tenths | 0912 | Tenths | 0913 | Tenths |
| b. Tomatoes in the open <input type="checkbox"/> | | 0920 | 0925 | Tenths | 0924 | Tenths | 0926 | Tenths | 0922 | Tenths | 0923 | Tenths |
| c. Lettuce and romaine <input type="checkbox"/> | | 0390 | 0395 | Tenths | 0394 | Tenths | 0396 | Tenths | 0392 | Tenths | 0393 | Tenths |
| d. Potatoes – Exclude sweet potatoes <input type="checkbox"/> | | | | | | | | | | | | |
| 15. All other crops grown in the open and not listed – Specify: | | 1120 | 1125 | 1124 | 1126 | 1122 | 1123 | | | | | |
| 1119 <input type="checkbox"/> | | 0590 | 0595 | Tenths | 0594 | Tenths | 0596 | Tenths | 0592 | Tenths | 0593 | Tenths |
| 16. All berries <input type="checkbox"/> | | 0410 | 0415 | Tenths | 0414 | Tenths | 0416 | Tenths | 0412 | Tenths | 0413 | Tenths |
| 17. Land in bearing and non-bearing fruit orchards, citrus or other groves, vineyards, and nut trees. <input type="checkbox"/> | | 1110 | 1115 | Tenths | 1114 | Tenths | 1116 | Tenths | 1112 | Tenths | 1113 | Tenths |
| 18. Nursery and other horticultural crops grown in the open (Note: Nursery, greenhouse, and other horticultural crops grown under protection will be reported in a later section.) <input type="checkbox"/> | | 0430 | 0435 | 0434 | 0436 | 0432 | 0433 | | | | | |
| 19. Irrigated pastureland, all types <input type="checkbox"/> | | 1148 | 1149 | 1150 | 1151 | 1152 | 1153 | | | | | |
| 20. All other irrigated land types such as failed cropland, idle land, and land in summer fallow <input type="checkbox"/> | | | | | | | | | | | | |

¹ On-farm water source includes recycled water and reclaimed water from on-farm livestock operations.
² Off-farm water supplies may include water purchased from the U.S. Bureau of Reclamation; a state, county, or local district; mutual, private, cooperative, or neighborhood ditches; or commercial or municipal water systems.



SECTION 12 IRRIGATION FOR NURSERY AND OTHER HORTICULTURAL CROPS GROWN IN THE OPEN

1. Were any irrigated nursery, floriculture, sod, propagative materials, Christmas trees, or other horticultural crops grown in the open (including natural shade) on this operation in 2023?

0751 1 **Yes - Continue** 3 **No - Go to Section 13**

2. Report total acres and irrigated acres for nursery and other horticultural crops grown in the open (including natural shade) None

| Acres in the Open | | | |
|-------------------|--------|-----------------|--------|
| Total Acres | | Irrigated Acres | |
| | Tenths | | Tenths |
| 0737 | | 0738 | |

3. For nursery and other horticultural crops in the open, enter the total acres and irrigated acres by crop category on this operation in 2023.

NURSERY AND OTHER HORTICULTURAL CROPS IN THE OPEN

- a. Floriculture and bedding crops
Bedding/garden plants - annuals, herbaceous perennials, vegetable plants; cut flowers and cut florist greens; indoor foliage plants; potted flowering plants; hanging baskets None
- b. Nursery crops
Nursery stock - ornamentals, shrubs, flowering trees, evergreens, live Christmas trees, fruit and nut trees and plants, vines, palms, ornamental grasses, bareroot herbaceous perennials; aquatic plants
- c. Sod
- d. Propagative materials
Bulbs, corms, rhizomes, tubers, cuttings, seedlings, liners, plugs, flower seeds, tobacco plants
- e. Christmas trees and short rotation woody crops

| Total Acres | | Irrigated Acres | |
|-------------|--------|-----------------|--------|
| | Tenths | | Tenths |
| 0739 | | 0740 | |
| 0741 | | 0742 | |
| 0743 | | 0744 | |
| 0745 | | 0746 | |
| 0747 | | 0748 | |

f. Other horticultural crops - Specify:

1010

| | | | |
|------|--|------|--|
| 0749 | | 0750 | |
|------|--|------|--|



SECTION 12 CONTINUED –

4. For nursery and other horticultural crops in the open, report area irrigated in 2023 by method used. If more than one method was used on the same area, report for all methods that apply. Report the quantity of water and the unit measure for each irrigation method used on this operation for the entire year. If the total quantity of water (column 2) is unknown, then use column 3 to report the quantity of water used instead.

| IRRIGATION METHODS | None | 1 | 2 | | OR | 3 | | |
|--|--------------------------|---|---|--|----|---|---|------------------------------------|
| | | Total Acres Irrigated or Watered <small>Tenths</small> | a. Quantity of Water Applied in 2023 | b. Enter Code for Unit of Measure <small>1 = Acre-Feet 2 = Gallons 3 = Inches/Acre</small> | | a. Average Flow Rate <small>(Gallons per Minute) <small>Tenths</small></small> | b. Number of Hours per Week Used in 2023 | c. Number of Weeks Used in 2023 |
| | | 0796 | 0797 | 0798 | | 0799 | 0800 | 0801 |
| a. Hand watered | <input type="checkbox"/> | | | | OR | | | |
| | | 0802 | 0803 | 0804 | | 0805 | 0806 | 0807 |
| b. Gravity irrigation | <input type="checkbox"/> | | | | OR | | | |
| | | 0808 | 0809 | 0810 | | 0811 | 0812 | 0813 |
| c. Sprinkler | <input type="checkbox"/> | | | | OR | | | |
| | | 0814 | 0815 | 0816 | | 0817 | 0818 | 0819 |
| d. Drip, trickle, or low-flow micro irrigation | <input type="checkbox"/> | | | | OR | | | |
| | | 1157 | 1158 | 1159 | | 1160 | 1161 | 1162 |
| e. Hydroponics | <input type="checkbox"/> | | | | OR | | | |

5. For each method used to irrigate nursery and other horticultural crops in the open, report the percentage of water applied by source. If more than one source was used, report all that apply. For example, if the only source for hand watered crops was ground water, then report 100 percent in column 1, row a. If this operation used gravity irrigation and half of the water came from ground water and half came from on-farm surface water, then report 50 percent in column 1, row b and 50 percent in column 2, row b.

| IRRIGATION METHODS | Water Source | | | |
|--|--|--|---|-------------|
| | 1 Ground Water from Wells <small>(Percent)</small> | 2 On-Farm Surface Water <small>(Percent)</small> | 3 Off-Farm Water (All Suppliers) <small>(Percent)</small> | Total |
| | 0832 | 0833 | 0834 | |
| a. Hand watered | | | | 100% |
| | 0835 | 0836 | 0837 | |
| b. Gravity irrigation | | | | 100% |
| | 0838 | 0839 | 0840 | |
| c. Sprinkler | | | | 100% |
| | 0841 | 0842 | 0843 | |
| d. Drip, trickle, or low-flow micro irrigation | | | | 100% |
| | 1163 | 1164 | 1165 | |
| e. Hydroponics | | | | 100% |

For each irrigation method used, columns 1 + 2 + 3 must equal 100 percent.



SECTION 13 IRRIGATION FOR NURSERY, GREENHOUSE, AND OTHER HORTICULTURAL CROPS GROWN UNDER PROTECTION

1. Were any irrigated nursery or greenhouse crops, floriculture, mushrooms, vegetable seeds, propagative materials, or other horticultural crops grown under protection on this operation in 2023? Include crops grown under glass, rigid plastic, plastic film, shade cloth, fiberglass, "tunnel" protection, and hoop houses. Exclude crops temporarily covered for early germination, frost protection, etc. Report crops grown under natural shade in Section 12.

0627 1 **Yes - Continue** 3 **No - Go to Section 14**

2. Report total area and irrigated area for nursery, greenhouse, and other horticultural crops grown under protection. None

| Square Feet Under Protection | | | |
|------------------------------|--|----------------|--|
| Total Area | | Irrigated Area | |
| 0628 | | 0629 | |

3. For nursery or greenhouse crops, floriculture, mushrooms, vegetable seeds, propagative materials, or other horticultural crops grown under protection, enter the total area and irrigated area by horticultural crop category on this operation in 2023.

NURSERY, GREENHOUSE, AND OTHER HORTICULTURAL CROPS UNDER PROTECTION

- a. Floriculture and bedding crops
Bedding/garden plants - annuals, herbaceous perennials, vegetable plants; cut flowers and cut florist greens; indoor foliage plants; potted flowering plants; hanging baskets None
- b. Nursery crops
Nursery stock - ornamentals, shrubs, flowering trees, evergreens, live Christmas trees, fruit and nut trees and plants, vines, palms, ornamental grasses, bareroot herbaceous perennials; aquatic plants
- c. Propagative materials
Bulbs, corms, rhizomes, tubers, cuttings, seedlings, liners, plugs, flower seeds, tobacco plants, vegetable seeds, vegetable transplants to farm fields
- d. Food crops grown under protection
Tomatoes, other vegetables and fresh cut herbs, fruits and berries.
- e. Mushrooms

| Total Area (Square Feet) | | Irrigated Area (Square Feet) | |
|--------------------------|--|------------------------------|--|
| 0630 | | 0631 | |
| 0632 | | 0633 | |
| 0636 | | 0637 | |
| 0638 | | 0639 | |
| 0640 | | 0641 | |

f. Other horticultural crops – Specify:

1011

| | | | |
|------|--|------|--|
| 0642 | | 0643 | |
|------|--|------|--|

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SECTION 13 CONTINUED –

4. For nursery, greenhouse, and other horticultural crops under protection, report area irrigated in 2023 by method used. If more than one method was used on the same area, report for all methods that apply. Report the quantity of water and the unit measure for each irrigation method used on this operation for the entire year. If the total quantity of water (column 2) is unknown, then use column 3 to report the quantity of water used instead.

| IRRIGATION METHODS | None | 1 | | 2 | | OR | 3 | | |
|--|--------------------------|---|--------------------------------------|--|--|----|--|---------------------------------|------|
| | | Total Area Irrigated or Watered (Square Feet) | a. Quantity of Water Applied in 2023 | b. Enter Code for Unit of Measure 1=Acre-Feet 2=Gallons 3=Gallons/Sq Ft 4=Inches/Sq Ft | a. Average Flow Rate (Gallons per Minute) Tenths | | b. Number of Hours per Week Used in 2023 | c. Number of Weeks Used in 2023 | |
| | | 0701 | 0702 | 0703 | | | 0704 | 0705 | 0706 |
| a. Hand watered | <input type="checkbox"/> | | | | | OR | | | |
| | | 0707 | 0708 | 0709 | | | 0710 | 0711 | 0712 |
| b. Gravity irrigation | <input type="checkbox"/> | | | | | OR | | | |
| | | 0713 | 0714 | 0715 | | | 0716 | 0717 | 0718 |
| c. Sprinkler | <input type="checkbox"/> | | | | | OR | | | |
| | | 0719 | 0720 | 0721 | | | 0722 | 0723 | 0724 |
| d. Drip, trickle, or low-flow micro irrigation | <input type="checkbox"/> | | | | | OR | | | |
| | | 1166 | 1167 | 1168 | | | 1169 | 1170 | 1171 |
| e. Hydroponics | <input type="checkbox"/> | | | | | OR | | | |

5. For each method used to irrigate nursery, greenhouse, or other horticultural crops under protection, report the percentage of water by source applied. If more than one source was used, report all that apply. For example, if the only source for hand watered crops was ground water, then report 100 percent in column 1, row a. If this operation used gravity irrigation and half of the water came from ground water and half came from on-farm surface water, then report 50 percent in column 1, row b and 50 percent in column 2, row b.

| IRRIGATION METHODS | Water Source | | | |
|--|--|--------------------------------------|---|-------|
| | 1 Ground Water from Wells (Percent) | 2 On-Farm Surface Water (Percent) | 3 Off-Farm Water (All Suppliers) (Percent) | Total |
| | 0646 | 0647 | 0648 | |
| a. Hand watered | | | | 100% |
| | 0649 | 0650 | 0651 | |
| b. Gravity irrigation | | | | 100% |
| | 0652 | 0653 | 0654 | |
| c. Sprinkler | | | | 100% |
| | 0655 | 0656 | 0657 | |
| d. Drip, trickle, or low-flow micro irrigation | | | | 100% |
| | 1172 | 1173 | 1174 | |
| e. Hydroponics | | | | 100% |

For each irrigation method used, columns 1 + 2 + 3 must equal 100 percent.



SECTION 14 IRRIGATION AND WATER MANAGEMENT PRACTICES

1. How did you decide when to irrigate in 2023? Mark (X) all that apply –

| | |
|--|--|
| 1020 <input type="checkbox"/> Condition of crop (observation or experience) 1021 <input type="checkbox"/> Feel of the soil 1022 <input type="checkbox"/> Use of soil moisture-sensing devices (moisture blocks, tensiometers, capacitance, other electronic sensors) 1023 <input type="checkbox"/> Use of plant moisture-sensing devices such as pressure (chamber) bombs or infrared (IR) thermometer 1024 <input type="checkbox"/> Use of irrigation scheduling service, including commercial and government | 1025 <input type="checkbox"/> Reports on daily crop-water evapotranspiration (ET) use (Internet, newspapers, radio, TV, fax, or email) 1026 <input type="checkbox"/> When water was delivered or available by irrigation water supplier (no choice by water user) 1027 <input type="checkbox"/> Personal calendar schedule 1028 <input type="checkbox"/> Computer simulation models (not from a commercial service) 1029 <input type="checkbox"/> When neighbors began to irrigate |
|--|--|

2. Did you have to discontinue irrigation during 2023 long enough to affect crop yields?

| | |
|---|---|
| 0669 1 <input type="checkbox"/> Yes – Continue | 3 <input type="checkbox"/> No – Go to item 3 |
|---|---|

 - a. On how many acres did you discontinue irrigation long enough to affect crop yields for any reason during 2023?

| | Number of Acres |
|-------------------------------|---|
| None <input type="checkbox"/> | 1039 <input style="width: 100px;" type="text"/> |
 - b. What were the reasons for discontinuing irrigation? Mark (X) all that apply –

| | |
|--|--|
| 1030 <input type="checkbox"/> Shortage of surface water (water from reservoirs, lakes, streams, water supply organizations, etc.) 1031 <input type="checkbox"/> Shortage of ground water (lowering water level of wells or depletion of ground water) 1032 <input type="checkbox"/> Irrigation equipment failure 1033 <input type="checkbox"/> Energy price increases or energy shortage 1034 <input type="checkbox"/> Water salinity too high 1035 <input type="checkbox"/> Loss of water rights not due to voluntary transfers 1036 <input type="checkbox"/> Cost of purchased water 1037 <input type="checkbox"/> Other – Specify: | 1038 <input style="width: 100%; height: 20px;" type="text"/> |
|--|--|

3. What sources of information does this operation rely on for guidance in reducing irrigation costs or to conserve water used for irrigation? Mark (X) all that apply –

| | |
|--|---|
| 1040 <input type="checkbox"/> Extension agents or university specialists 1041 <input type="checkbox"/> Private irrigation specialists or crop consultants hired by owner or operator 1042 <input type="checkbox"/> Irrigation equipment dealers 1043 <input type="checkbox"/> Local irrigation district employees or others hired by the water supplier 1044 <input type="checkbox"/> Government specialists from the Natural Resources Conservation Service, local conservation district, Bureau of Reclamation, or other Federal or state agencies | 1045 <input type="checkbox"/> Media reports or information in the press 1046 <input type="checkbox"/> Neighboring farmers 1047 <input type="checkbox"/> Electronic information services (Internet, DTN, Internet links to private or public data sources, etc.) 1048 <input type="checkbox"/> None |
|--|---|

4. Did this operation participate in on-farm groundwater recharge by applying excess water to irrigated fields or other recharge sites such as basins, ditches, and ponds?

| | |
|--|--------------------------------------|
| 1154 1 <input type="checkbox"/> Yes | 3 <input type="checkbox"/> No |
|--|--------------------------------------|

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SECTION 14 CONTINUED –

5. Did any of the following prevent you from implementing improvements that would have reduced energy and/or conserved water in your irrigation system during the past five years? Mark (X) all that apply –
- 1070 Investigating improvements is not a priority at this time
 - 1071 Risk of reduced yield or poorer quality crop from not meeting water needs
 - 1072 Physical field or crop conditions limit system improvements
 - 1073 Improvements will reduce costs, but not enough to recover implementation costs
 - 1074 Cannot finance improvements
 - 1075 Landlord(s) will not share cost of improvements
 - 1076 Uncertainty about future availability of water
 - 1077 Will not be farming this operation long enough to justify new improvements
 - 1078 Improvements will increase management time or cost
6. Has this operation made irrigation and/or drainage improvements above regular maintenance in the past five years?
- 0209 1 **Yes - Continue** 3 **No - Go to Section 15**
7. Did you receive any technical or financial assistance for these irrigation and/or drainage improvements?
- 0211 1 **Yes - Continue** 3 **No - Go to Section 15**

a. From which of the following sources did you receive technical or financial assistance for these improvements? Mark (X) all that apply –

SOURCE OF ASSISTANCE

- i. USDA programs for water conservation and environmental improvements (CTA, EQIP, RCPP, AMA, WMB, CIG, etc.)
- ii. Other USDA programs for stewardship (such as CSP) or easements (ACEP/WRP, CRP (including CREP), etc.)
- iii. Non-USDA Federal programs from agencies such as the Bureau of Reclamation and EPA
- iv. State programs, local water management, or water supply districts
- v. Private businesses such as equipment dealers, bankers, or lenders

| Technical Assistance | | Financial Assistance | |
|----------------------|--------------------------|----------------------|--------------------------|
| 0215 | <input type="checkbox"/> | 0216 | <input type="checkbox"/> |
| 0217 | <input type="checkbox"/> | 0218 | <input type="checkbox"/> |
| 0219 | <input type="checkbox"/> | 0235 | <input type="checkbox"/> |
| 0236 | <input type="checkbox"/> | 0237 | <input type="checkbox"/> |
| 0238 | <input type="checkbox"/> | 0239 | <input type="checkbox"/> |

SECTION 15 LABOR USED FOR IRRIGATION

1. Report the number of hours that hired workers performed irrigation work on this operation in 2023 and the average hourly wage. (Exclude contract labor.)
- | | | | | |
|-------------------------------|---|--|---------------------|----|
| None <input type="checkbox"/> | Total Hours of Paid Irrigation Labor per Year | | Average Hourly Wage | |
| | 0732 | | 0733 | \$ |
- Cents
2. Report contract irrigation labor expenses on this operation in 2023
- | | | | |
|-------------------------------|---|----|-----|
| None <input type="checkbox"/> | Total Expense for Contract Irrigation Labor | | |
| | 0788 | \$ | .00 |

SECTION 16 NO IRRIGATED LAND OR LAND WITH UNUSED IRRIGATION SYSTEMS

1. Complete this section if you did not irrigate any land or if you had acres with access to irrigation systems or equipment that did not receive any irrigation in 2023. If you did irrigate all of your equipped land in 2023, skip to Section 17.
2. Was there any land on this operation with access to irrigation systems or equipment in 2022, regardless of water rights and availability? Include all land that was irrigated and all land that could have been irrigated during 2022.
- 1155 1 **Yes - Continue** 3 **No - Go to Section 17**



SECTION 16 CONTINUED –

3. Was any of the land with access to irrigation systems in the previous question irrigated in 2022?

1156 1 **Yes** 3 **No**

4. What were the reasons for not irrigating in 2023? Mark (X) all that apply –

| | |
|---|---|
| 1050 <input type="checkbox"/> Sufficient soil moisture – no irrigation needed | 1057 <input type="checkbox"/> Sold or leased irrigated land or irrigated area under protection to others |
| 1052 <input type="checkbox"/> Shortage of surface water (water from reservoirs, lakes, streams, water supply organizations, etc.) | 1058 <input type="checkbox"/> Restrictions on water use |
| 1053 <input type="checkbox"/> Shortage of ground water (lowering water level of wells or depletion of ground water) | 1059 <input type="checkbox"/> Converted to non-agricultural use |
| 1054 <input type="checkbox"/> Irrigation uneconomical due to high fuel and power costs and/or low commodity prices | 1060 <input type="checkbox"/> Converted to an agricultural enterprise not requiring irrigation |
| 1055 <input type="checkbox"/> Loss of water rights not due to voluntary transfers | 1061 <input type="checkbox"/> Available surface water too salty |
| 1056 <input type="checkbox"/> Sold or leased water rights or annual water allocation | 1062 <input type="checkbox"/> Other Specify: 1063 <input style="width: 200px; height: 20px;" type="text"/> |

5. Has this operation ceased irrigation permanently? 0530 1 **Yes** 3 **No**

SECTION 17 VALUE OF SALES IN 2023

1. Which range includes the gross value of all agricultural products sold from this operation in 2023 including landlord's share? Mark (X) only one –

0980 1 \$0 - \$9,999 2 \$10,000 - \$24,999 3 \$25,000 - \$49,999 4 \$50,000 - \$99,999
5 \$100,000 - \$249,999 6 \$250,000 - \$499,999 7 \$500,000 - \$999,999 8 \$1,000,000 and over

2. What percent of total sales were from **irrigated** crop sales, including irrigated nursery or greenhouse crops, floriculture, sod, mushrooms, vegetable seeds, and propagative materials?
3. What percent of total sales were from **non-irrigated** crop sales and livestock sales?

| Percent | |
|-------------|---|
| 0981 | <input style="width: 50px; height: 20px;" type="text"/> |
| 0982 | <input style="width: 50px; height: 20px;" type="text"/> |
| 100% | |

SECTION 18 PERSON COMPLETING THIS FORM – Please print

Name Area Code and Phone Number - - check if cell phone Date (MM DD YY) / /

9912 9911 9910

E-mail

1095

Thank you for your cooperation.
The complete report will be available on the Internet at <http://www.nass.usda.gov> in fall of 2024.

OFFICE USE

| Response | Respondent | Mode | Enum. | Eval. | R. Unit | Change | Optional Use | | | | |
|-------------------------|---|--|--------------|-------|---------|--------|--------------|------|------|------|--|
| 1-Comp 2-R 3-Inac | 9901 1-Op/Mgr 2-Sp 3-Acct/Bkpr 4-Partner 9-Oth | 9902 1-PASI (Mail) 2-PATI (Tel) 3-PAPI (Face-to-Face) | 9903 9998 | 9900 | 9921 | 9985 | 9907 | 9908 | 9906 | 9916 | |
| S/E Name | | | | | | | | | | | |

21303201





INSTRUCTION BOOKLET 2023 IRRIGATION AND WATER MANAGEMENT SURVEY



Completing the 2023 Questionnaire

Everyone who receives a questionnaire must fill out this form and return it, including nursery, greenhouse, and other horticultural crop producers.

Use a **black or blue** ball point pen.

Round to whole acres, unless otherwise noted.

If You Received More than One Questionnaire for the Same Operation

Duplicate form(s) — If you received extra questionnaires for the SAME farming operation, return all questionnaires in the same envelope as the completed report. Make all entries clear and easy to read.

General

Refer to the instructions below for completing your questionnaire. The enclosed census follow-on questionnaire was mailed to producers and growers throughout the United States. Since the form is meant for use in all parts of the country, it may contain items and inquiries which do not apply to your operation. In this case, mark the "No" or "None" box and go on to the next item or section.

Partial Year Operation

If you stopped farming during 2023, complete the questionnaire for the portion of 2023 that you did farm. Write "Stopped farming in 2023" and the date you stopped farming below the address area. Mail the completed questionnaire in the return envelope.

Partnership Operations

Complete only ONE questionnaire for a partnership operation and include all partners' shares on the same questionnaire. If two or more questionnaires were received for the partnership, see instruction on "If You Received More Than One Questionnaire for the Same Operation" above.

How to Enter Your Responses on the Questionnaire

Please enter your answers in the spaces provided and, in the units, requested, i.e., number of acres, dollars, percent, etc. Mark all applicable Yes/No boxes with an "X".

Instructions by Section

Complete Sections 1 and 2 of the questionnaire. If you did not irrigate or water any cropland (including nursery and greenhouse area in the open and under protection), pastureland, or rangeland in 2023, complete Sections 1 and 2 and then go to Section 16 on page 19 and complete the remainder of the questionnaire.

Section 1 - Acreage in 2023

Report land owned, rented, or used by the respondent, spouse, partnership, corporation, or organization identified on the questionnaire. If you did not operate any land in 2023, go to Section 18 on the back page and complete the remainder of the questionnaire.

Include all land, regardless of location or use. This should include all cropland, pastureland, rangeland, woodland, idle land, **greenhouses or other area under protection**, farmsteads, Conservation Reserve Program (CRP), Wetlands Reserve Program (WRP), Farmable Wetlands Program (FWP), and Conservation Reserve Enhancement Program (CREP), etc. All responses in this section should be rounded to whole acres. Area under protection less than one acre should be reported as one acre. **Exclude** land used under a grazing permit.

Item 1 - Report all land owned in 2023 by you and/or your spouse, or by the partnership, corporation, or organization identified on the questionnaire.

Item 2 - Report all land rented or leased from others on shares, cash rent, used rent-free, in exchange for services, for taxes, etc., regardless of location, even if used only for part of the year. **Exclude** land used on a per-head basis under a grazing permit or animal unit month (AUM) basis.

Item 3 - Report all land rented or leased to others regardless of the purpose. Include land that was rented and subleased to others.

Item 4 - The acres in item 4, **Box A**, should equal item 1 plus item 2 minus item 3. All responses to this questionnaire should refer to these **total acres in this operation**. It is important that this number is correct as it is used to establish consistency throughout the questionnaire. The acreage of this operation must equal the acreage reported in Section 2, item 4, column 1, **Box B**. After completing Section 1, if the acres in Item 4, Box A equal zero and you did not raise or own any livestock, aquaculture, or poultry in 2023, write a description of the land use in the space by item 4; then complete Section 18 and mail the questionnaire in the return envelope.

Section 2 - Land in 2023

Account for total acres in **this operation** in column 1, acres with access to irrigation equipment in column 2, and acres irrigated in column 3. If all acres that had access to irrigation were irrigated in 2023, then columns 2 and 3 will match. If the same land had more than one use in 2023, report that land only once in the first use that applies. Irrigation is the application of water by any artificial or controlled means, such as with sprinklers,

furrows and ditches, spreader dikes, flooding, hand watering, or subirrigation pipes. Include the area where lagoon waste water from livestock operations was distributed by a sprinkler or flood system.

Include both the acres in the open as well as the area under protection when reporting cropland. Under protection includes nursery, greenhouse, floriculture, mushrooms, vegetable seeds, and propagative materials grown under glass, rigid plastic, plastic film, shade cloth, fiberglass, "tunnel" protection, and hoop houses. Crops covered just temporarily only to be further grown in the open should not be recorded as area under protection but instead as acres in the open.

In addition to fully irrigated land, report as irrigated any land to which partial, supplemental, or semi-irrigation was applied in column 3. Also include any acreage which received only preplant irrigation (watered before planting). Hayland, pastureland or rangeland should be reported as irrigated if spring flood water was spread by man-made canals, ditches, spreader dikes, pipes, or other water works. Include acres where lagoon wastewater from livestock operations was used for irrigation. Include area under protection that was hand watered.

For conservation program land, if the operator was allowed to cut conservation program land for hay, then this land should be considered cropland harvested; if it was grazed, it should be considered other pasture and grazing land. Except for disaster designation uses, almost all conservation program land will be reported in item 1c, cropland not harvested or grazed.

Item 1a - Include as cropland harvested in the open: field crops, hay and forage, land in vegetables, citrus groves, vineyards, berries, nuts, orchards (bearing and non-bearing), Christmas trees (whether harvested in 2023 or not), and short rotation woody crops. Also include nursery and other horticultural crops if they were grown in the open, such as bedding and garden plants, nursery stock, and propagative materials.

For winter wheat, report the 2023 acres harvested.

For double cropped acres if more than one crop was harvested from the same land in 2023, report those acres only once as cropland harvested.

Item 1b - Include nursery, greenhouse, and other horticulture crops grown under protection. Under protection means grown under glass, rigid plastic, plastic film, shade cloth, fiberglass, "tunnel" protection, and hoop houses. Crops covered only temporarily, such as for frost protection, to be further grown in the open should not be included as area under protection.

Item 1c - Include cropland used for cover crops, cropland on which all crops failed, idle cropland, cropland in

summer fallow, and cropland in government programs, including conservation program land unless used for grazing, hay, or forage.

Item 2a – Exclude land used under a grazing permit.

Item 2b – Report woodland pastured.

Item 2c - Include any pastured land other than cropland and woodland pastured. Include rotation pasture and grazing land that could have been used for crops without additional improvements.

Item 3 - Any land that does not fit into one of the above categories. Include land in roads, buildings, farmsteads, woodland not pastured, and wasteland.

Item 4 – Box B should equal the sum of all land uses reported in items 1 through 3. The acres in **Box B** must equal the acres reported in **Box A**. **Box C** must be greater than or equal to **Box D**.

Item 5 – This question helps determine if this operation irrigated any area in the open or under protection in 2023. If the answer to this question is 'Yes', then continue completing the form. If you did not irrigate any area in the open or under protection, check the 'No' box and go to Section 16 on page 19.

Section 3 – Ground Water From Wells

Data for water usage will be published in acre-feet. An acre-foot is the quantity of water needed to cover one acre to the depth of one foot, or approximately 326,000 gallons. Ground water is water from a well or wells located on this operation.

Item 1 - Report whether this operation irrigated any land with ground water from wells on this operation at any time during 2023.

Item 2 - Report acres in the open irrigated with ground water from wells and the estimated quantity of ground water used in one of the following units:

- total acre-feet; or
- total gallons; or
- average inches applied per acre

Item 3 - Report the area under protection irrigated with ground water in square feet. Report the area only once, regardless of how many crops were grown for sale from the same area.

Item 4 - Report the total number of wells used on this operation in 2023.

Item 4a - Report the number of wells reported in item 4 above that used backflow prevention devices (check valves) in 2023. Report the number of acres and area under protection irrigated in 2023 with water pumped from wells with backflow prevention devices.

Item 4b - Report how many wells reported in item 4 above used flow meters or flow measuring devices. Report the number of acres and area under protection irrigated in 2023 with water from wells with flow measurement devices.

Item 4c - Report the number of free flowing wells used in 2023. Free flowing wells do not require the use of a pump to lift the water to the surface. Water flows to the surface under natural pressure. These are most commonly found in Florida and some western states.

Item 5 - Report the well characteristics for up to 3 primary wells pumped on this operation in 2023. **Note:** The 3 primary wells should include those wells with the greatest quantity of water pumped in 2023. Report the characteristics for each individual well even if these values are similar across wells. If less than 3 wells were pumped in 2023, then only report for those wells used. Do not include the characteristics of free flowing wells that did not use a well pump, reported in Item 4c.

Item 5a - If you used more than 3 wells in 2023, reported the average value for well characteristics for all other wells (excluding the 3 primary wells).

Item 6 – Check the best response for the change in depth to water. Change in depth to water is defined as a change in the depth of water from the well-head to the water table level that has occurred over the last five years prior to 2023.

Section 4 – On-Farm Surface Water

On-farm surface water is a water supply not controlled by a water supply organization and includes water from a stream, drainage ditch, lake, pond, spring, or reservoir on or adjacent to your farm.

Item 1 – Report whether this operation used any on-farm surface water including recycled and reclaimed water. For this survey, recycled water is the reuse of irrigation water that was previously used to irrigate a crop on the operation. Reclaimed water is treated wastewater used for irrigation.

Item 2 – Report acres in the open on this operation irrigated with on-farm surface water and the estimated quantity used in one of the following units:

- total acre-feet; or
- total gallons; or
- average inches applied per acre

Item 3 - Report the total area under protection irrigated with on-farm surface water in square feet. Report the area only once, regardless of how many crops were grown for sale from the same area.

Item 4 - Report whether this operation used recycled water to irrigate any crops in 2023.

Item 4a - Report the area on which one or more applications of recycled water for irrigation were made in 2023. Report the acres only once even if multiple applications were made to the same acreage.

Item 5 - Report whether this operation used reclaimed water from on-farm livestock to irrigate any crops in 2023. For the purposes of this survey, the total 2023 application of reclaimed water needs to be at least half an inch (0.5 inches) to be considered irrigation.

Item 5a - Report the area on which one or more applications of reclaimed water for irrigation were made in 2023. Report the acres only once even if multiple applications were made to the same acreage.

Item 5b - Report how much reclaimed irrigation water was used on this operation in 2023. Report the quantity of reclaimed water in acre-feet or total gallons.

Section 5 – Off-Farm Water

Off-farm surface water is surface or ground water from the U.S. Bureau of Reclamation, other Federal agencies, irrigation districts, or other suppliers.

Item 1 – Report whether this operation used water from off-farm sources for irrigation.

Item 2 – Report acres in the open on this operation irrigated with off-farm water and the estimated quantity used in one of the following units:

- total acre-feet; or
- total gallons; or
- average inches applied per acre

Item 3 – Report the total area under protection irrigated with off-farm water in square feet. Report the area only once, regardless of how many crops were grown for sale from the same area.

Item 4 - Report whether this operation paid for any off-farm water and total cost, if any was purchased. Report in whole dollars.

Item 5 - Report the supplier of off-farm water.

Item 6 - Report whether this operation used reclaimed water from an off-farm source to irrigate any crops in 2023. For the purposes of this survey, the total 2023 application of reclaimed water needs to be at least half an inch (0.5 inches) to be considered irrigation.

Item 6a - Report the area on which one or more applications of reclaimed water for irrigation were made in 2023. Report the acres only once even if multiple applications were made to the same acreage.

Item 6b - Report how much reclaimed irrigation water was used on this operation in 2023. Report the quantity of reclaimed water in acre-feet or total gallons.

Item 6c - Identify the source(s) of reclaimed water used on this operation by marking an 'X' in all the sources that apply.

Section 6 – Pumps Used for Irrigation and Pump Expenses

This section collects data on pumps used for pumping water from wells, surface water from rivers and streams, irrigation channels, ponds, and other water holding systems. Please include all pumps supplying irrigation to or through any distribution system, as well as any pumps moving water into tanks or reservoirs on the operation for irrigation purposes in 2023. Do not include any pumps used exclusively for non-irrigation applications such as home use or aquaculture or any pumps not owned or rented by this operation, such as pumps operated by a water company.

Item 1 – Report whether this operation used any pumps for irrigation during 2023.

Item 2 – Report the number of pumps for each use type alongside their average vertical lift, discharge capacity, and discharge operating pressure. Pumps used multiple times, whether on one source or on multiple sources, should only be counted once.

Vertical lift is the average surface-level feet-of-lift the pumps must raise the water to distribute the water through the field irrigation system.

Discharge capacity refers to average pumping capacity in gallons per minute (GPM).

Discharge operating pressure refers to the average operating pressure in pounds per square inch at the point of discharge.

Item 2a – Well Pumps – Report the number of pumps used to directly pump ground water from wells. The number of pumps reported should be equal to or less than the number of wells reported in Section 3 under item 4 (number of wells). Wells which used multiple pumps (generally in series) should report all extra pumps as relifting or boosting pumps.

Item 2b – Tailwater Pits – are pits that collect and hold water previously used for irrigation. Report the number of pumps used to directly pump water from tailwater pits. Only count the number of pumps directly pumping the water from the source. All additional pumps providing additional lift or boosting (in series) should be reported under relifting or boosting instead.

Item 2c – Ponds, lakes, reservoirs, rivers, canals, etc. – Report the number of pumps used to directly pump water from any surface source or storage reserve. Only count the number of pumps directly pumping the water from the source. All additional pumps providing additional lift or boosting (in series) should be reported under relifting or boosting instead.

Item 2d – Relifting and boosting water within system - Report the number of pumps which provided additional lift or boost for irrigation. No pumps which directly pull from a source should be reported as a relift or booster pump – they should instead be reported as one of the three prior types. Apart from artesian wells, most sources of water require a pump to utilize the source before it can use a relift or booster pump.

Item 3 - For each power source, report the number of pumps, the cost of the energy used to power the pumps (include the landlord's share of pumping costs), and the number of acres irrigated by water source. The sum of the pumps reported in Item 3 should be equal to the sum of the pumps in Item 2. The sum of acres irrigated across all energy types may be less than the total acres irrigated for the operation reported in Section 2, item 4, column 3, Box D. The difference should equal those acres irrigated using no pumps to supply water to the field.

Section 7 - Expenditures for Irrigation Infrastructure
For each expenditure type, report the cost of the expenditure in column 1, the irrigated acres affected in column 2, the primary purpose code of the expenditure in column 3, and the primary source code of the funding assistance in column 4. Primary purpose codes (column 3) and source of funding codes (column 4) can be found at the top of the page.

Section 8 - Method of Water Distribution in Fields in the Open

This section refers to the method used to distribute irrigation water.

Item 1 – Report whether this operation irrigated any fields in the open. If so, complete this section. Report the acres of land irrigated by each of the distribution systems listed. If the same land was irrigated by more than one method, then report acres irrigated by each method used. **Note:** Do not report information for the delivery system used to convey water from the source to the field. Report the method only for the field distribution system.

Item 2 - Gravity irrigation refers to the free flowing application of water across a field. The water is distributed across a field using either pipes or open ditches near the head of the field from which water is released to flow down furrows or to flood the field.

Item 2a - Row crops are generally irrigated by water flowing down furrows.

Item 2b – Report the controlled flooding acreage for crops such as rice or cranberries which are flooded across the entire field with the water contained within borders or basins.

Item 2c - Uncontrolled flooding is often used to water pasture or rangeland. Water is directed to the area by

artificial or controlled means but there are no furrows or borders within the field when uncontrolled flooding is used.

Item 2d - Report acreage here if not reported in any of the above gravity system categories.

Item 3 - Sprinkler irrigation is separated into six categories: center pivot, linear move tower, solid set and permanent systems, mechanical move systems, hand-move systems, and other sprinkler systems. Use nozzle pressure for the pressure categories.

Item 3a - A center pivot system uses a boom half the width of the field. It is anchored at the center of the field and sweeps in a circle.

Item 3b - Linear move tower systems and other linear continuous move drive systems are self-propelled systems that travel in straight lines across the field.

Item 3c - Report for solid set and permanent systems. Exclude low-flow micro systems.

Item 3di - Mechanical move systems include side roll, wheel move, other mechanical move systems, and other discrete move systems.

Item 3dii - Big gun or traveler systems use large pulsating sprinklers and travel across the area being watered.

Item 3e - Hand-move systems are any non-self-propelled system which must be moved manually.

Item 3f - Report acreage here if not reported in any of the above sprinkler system categories.

Item 4 - Drip, trickle, or low-flow micro irrigation water is generally distributed by tubes or tapes which meter out small amounts of water at low pressure.

Item 4a - Report acres on which on or above ground surface drip irrigation was used.

Item 4b - Report acres on which sub-surface or root zone drip was used.

Item 4c - Report acres on which low-flow micro sprinklers were used. This refers to micro sprinklers that apply water at low pressure and are not self-propelled or easily moved.

Item 4d - Report acreage here if not reported in any of the above drip, trickle, or low-flow system categories.

Item 5 - Hydroponics is the cultivation of plants in nutrient-enriched water, with or without the mechanical support of an inert medium such as sand, gravel, or perlite.

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The total acres, by method of water distribution, should be equal to or greater than Section 2, column 3, item 4, total acres irrigated, Box D. Every acre reported as irrigated in Section 2 needs to be reported by method of irrigation in Section 8. If you use multiple methods of water distribution for the same acres, this sum may be larger than Section 2, column 3, item 4, total acres irrigated, Box D.

Section 9 – Additional Practices for Irrigation Methods in Fields in the Open

This section refers to specific practices related to gravity irrigation.

Item 2 - If you reported gravity irrigation in Section 8, item 2, then report the number of gravity irrigated acres using the specific practices listed.

Surge Flow Irrigation – The intentional application of water to furrows or borders creating a series of on and off periods of constant or variable time spans.

Precision-Leveling – The practice of leveling land towards a completely flat state where the field will have a zero or near zero-degree incline across its surface. Leveling land is used to help distribute water and improve yields. Include all acres that were precision leveled, whether they were partially or completely leveled (also known as zero grade). Terraced acres can be precision-leveled and can reach a zero grade status since the individual fields on each terrace can be leveled.

Zero Grade – Acres which received precision-leveling (see above) to the point of achieving a zero-degree incline on the field. Not all acres that received precision-leveling reach a zero-grade state but all zero grade acres are precision-leveled.

Cablegation – an automated furrow irrigation system in which the irrigation set moves at a slow constant rate across the field.

Item 3 – Indicate whether this operation used any computer software to aid in the measuring or planning of the gravity irrigation system(s).

Section 10 - Acres Irrigated in the Open

Report the irrigated acres for each crop harvested as well as for non-harvested items such as orchards, nursery crops, pastureland, and all other land. Report acres of each crop harvested, even when multiple crops have been harvested off the same acres. If an irrigated commodity has failed acres, split the acres and report the failed acres under item 20. In addition, for each item, report the estimated average quantity of water applied per acre for the 2023 irrigation season. Report water applied in acre-feet or in inches per acre (but not both). Acre-feet should be reported to the nearest tenth (for example, 1.6 or 2.3 acre-feet), while inches per acre should be reported to the nearest whole inch (for example, 19 or 28 inches per acre).

The sum of irrigated acres harvested in Section 10 should be equal to or greater than Section 2, item 4, column 3, Box D, total acres irrigated.

Any irrigated crop grown in the open not pre-listed should be entered under item 15 'all other crops grown in the open.' Report the crop name(s) in the 'specify' area.

Section 11 - Field Water Distribution and Water Source Used in the Open

For each item with irrigated acres reported in Section 10, report the primary type of irrigation system in the first column by selecting the appropriate water distribution code from the water distribution code list above the table. Report the number of acres irrigated from each water source (ground, on-farm surface, and off-farm suppliers).

Then, for each irrigated item, report the number of acres in which chemigation was applied through the irrigation system. Chemigation is the application of fertilizers or pesticides through the irrigation water. Report the acres of commercial fertilizer application and acres for pesticide application separately.

Note: For each item, an irrigated acre may be reported in both the fertilizer and pesticide columns. Therefore, for each crop, the sum of chemigation acres may total more than the corresponding irrigated harvested acres reported for that crop in column 1 of section 10.

Section 12 - Irrigation for Nursery and Other Horticultural Crops Grown in the Open

Item 1 - Report whether this operation grew any nursery, floriculture, sod, propagative materials, Christmas trees, or other horticultural crops grown in the open in 2023. If any horticultural crops on your operation were grown in the open, then complete this section.

Item 2 - Report the total acres and irrigated acres for horticulture crops grown in the open to the nearest tenth acre. Report the acres only once even when multiple crops were harvested off the same acres. Irrigation refers to the application of water to land or crops by any artificial or controlled means.

Item 3 - Report total acres and irrigated acres for each horticulture crop listed to the nearest tenth acre. Report acres of each crop harvested, even when multiple crops were harvested off the same acres. For example, if annual bedding plants and a nursery crop were harvested from the same 2 acres, enter 2.0 acres in the Floriculture and bedding crops category and 2.0 acres in the Nursery crop category. For each category, enter the total acres grown in the open and irrigated acres.

Report for each crop category grown on this operation, the total acres in the open and irrigated acres in the appropriate category:

- a. *Floriculture and bedding crops* - Bedding/garden plants - annuals, herbaceous perennials, vegetable plants; cut flowers and cut florist greens; indoor foliage plants; potted flowering plants; hanging baskets
- b. *Nursery crops* - Nursery stock - ornamentals, shrubs, flowering trees, evergreens, live Christmas trees, fruit and nut trees and plants, vines, palms, ornamental grasses, bareroot herbaceous perennials; aquatic plants
- c. *Sod*
- d. *Propagative materials* - Bulbs, corms, rhizomes, tubers, cuttings, seedlings, liners, plugs, flower seeds, tobacco plants, vegetable transplants to farm fields
- e. *Christmas trees and short rotation woody crops* - A short rotation woody crop is a tree that grows from seed to a mature tree in 10 years or less.
- f. *Other horticultural crops* - If more than one crop was grown for this category, report the primary type of crop in the specify area.

Item 4 - Report the acres irrigated or watered for horticultural crops grown in the open in 2023 by irrigation method used on this operation. If more than one method was used, report acres in all methods that apply. Report quantity of water in the unit of measure most used for each method. If the total quantity of water, column 2a, and the unit of measure, column 2b, is known, then skip column 3.

Report for the following irrigation methods:

- a. *Hand Watered*
- b. *Gravity Irrigation* - refers to the free-flowing application of water.
- c. *Sprinkler* - Exclude hand-held sprinklers.
- d. *Drip, trickle, or low-flow micro irrigation* - the water is distributed down the rows by tapes which meter out small amounts of water at low pressure near the plant's roots.
- e. *Hydroponics* - the cultivation of plants in nutrient-enriched water, with or without the mechanical support of an inert medium such as sand, gravel, or perlite.

The total acres reported, by method used, should be equal to or greater than item 2, irrigated acres, code 0738 in section 12.

Item 5 - Report the water source percentage for each irrigation method listed. The percentage for ground water, on-farm water, and off-farm water should add to 100% for each method (row).

Definitions of Water Sources

Ground water is water from a well or wells located on this farm.

On-farm surface water is a water supply not controlled by a water supply organization and includes water from a stream, drainage ditch, lake, pond, spring, or reservoir on or adjacent to your farm.

Off-farm water is surface or ground water from U.S. Bureau of Reclamation, other Federal agencies, or other suppliers.

Section 13 - Irrigation for Nursery, Greenhouse, and Other Horticultural Crops Grown Under Protection

Item 1 - Report whether this operation grew any nursery, greenhouse, floriculture, mushrooms, propagative materials, or other horticultural crops grown under protection. Under protection includes horticultural crops grown under glass, rigid plastic, plastic film, including "tunnel" protection and hoop houses. If any horticultural crops on your operation were grown under protection, then complete this section. Crops covered only temporarily to be further grown in the open should not be included for area under protection.

Item 2 - Report the total area and irrigated area under protection in square feet. Report the area only once, regardless of how many crops were grown for sale from the same area. Irrigation refers to one or more applications of water to land or crops by any artificial or controlled means.

Item 3 - Report the total area and irrigated area, in square feet, for each category listed. Report the area of each crop, even when multiple crops were harvested off the same area. For example, if two crops of annual bedding plants were grown from 1,000 square feet, enter 1,000 in the Floriculture and Bedding Crops category. If 500 square feet of food crops were also grown in the same area, then also report 500 in the Food crops grown under protection category.

Report crops grown on this operation in the appropriate category:

- a. Floriculture and bedding crops - Bedding/garden plants - annuals, herbaceous perennials, vegetable plants; cut flowers and cut florist greens; indoor foliage plants; potted flowering plants; hanging baskets
- b. Nursery crops - Nursery stock - ornamentals, shrubs, flowering trees, evergreens, live Christmas trees, fruit and nut trees and plants, vines, palms, ornamental grasses, bareroot herbaceous perennials; aquatic plants
- c. Propagative materials - Bulbs, corms, rhizomes, tubers, cuttings, seedlings, liners, plugs, flower seeds, tobacco plants, vegetable seeds, vegetable transplants to farm fields
- d. Food crops grown under protection - Tomatoes, other vegetables and fresh cut herbs, fruits and berries.
- e. Mushrooms

- f. Other horticultural crops - If more than one crop was grown for this category, report the primary type of crop in the specify area.

Item 4 - Report the area irrigated or watered for horticultural crops grown under protection in 2023 by irrigation method used on this operation. If more than one method was used, report area in all methods that apply. Report quantity of water in the unit of measure most used for each method. If the total quantity of water, column 2a, and the unit of measure, column 2b, is known, then skip column 3.

Report for the following irrigation methods:

- a. Hand Watered
- b. Gravity Irrigation - refers to the free-flowing application of water.
- c. Sprinkler - Exclude hand-held sprinklers.
- d. Drip, trickle, or low-flow micro irrigation - the water is distributed down the rows by tapes which meter out small amounts of water at low pressure near the plant's roots.
- e. Hydroponics - the cultivation of plants in nutrient-enriched water, with or without the mechanical support of an inert medium such as sand, gravel, or perlite.

The total area reported, by method used, should be equal to or greater than item 2, irrigated area, code 0629 in section 13.

Item 5 - Report the water source percentage for each irrigation method listed. The percentage for ground water, on-farm water, and off-farm water should add to 100% for each method (row).

Definitions of Water Sources

Ground water is water from a well or wells located on this farm.

On-farm surface water is a water supply not controlled by a water supply organization and includes water from a stream, drainage ditch, lake, pond, spring, or reservoir on or adjacent to your farm.

Off-farm surface water is surface or ground water from U.S. Bureau of Reclamation, other Federal agencies, or other suppliers.

Section 14 - Irrigation and Water Management Practices

Item 1 - Report on the method(s) or approach(es) used to decide when to schedule water applications in 2023. Mark all that apply.

Item 2 - Report whether this operation had to discontinue irrigation in 2023 long enough to affect crop yield.

Item 2a - Report the number of acres in which irrigation was discontinued long enough to reduce crop yields. Only consider the acres which received irrigation during 2023. Do not include acres that received no irrigation.

Item 2b - Report the reason(s) if irrigation was discontinued. Mark all that apply. If "other" is marked, report the reason for discontinuing irrigation in the "specify" response area.

Item 3 - Report the sources that this operation relied on for guidance in reducing irrigation costs or to conserve water. Mark all that apply.

Item 4 - Indicate whether this operation participated in any groundwater recharge efforts.

Recharge - the practice of increasing the amount of water that enters an aquifer through human-controlled means. This can be done by injecting water directly into the subsurface through injection wells or by intentionally applying extra water to the ground for the purpose of replenishing the aquifer.

Item 5 - Report any issues which prevented you from implementing improvements to existing irrigation systems during the past five years. Mark all that apply.

Item 6 - If you made irrigation and/or drainage improvements above regular maintenance in the past five years, then mark item 6 'Yes'.

Items 7 and 7a - If you received any technical or financial assistance for irrigation and/or drainage improvements, mark yes to item 7 and indicate the sources you received technical or financial assistance from in item 7a. Mark all that apply. If no assistance was received, do not mark any check box.

Section 15 – Labor Used for Irrigation

Report the total hours and average hourly wage for irrigation labor in item 1. Report contract labor expenses for irrigation activities in item 2. Contract labor expenses pertain only to the operation and maintenance of the irrigation systems and facilities. Include the landlord's share of irrigation labor costs. Exclude cost for custom work and contract labor for harvesting.

Section 16 – No Irrigated Land or Land with Unused Irrigation Systems

Complete this section if you did not irrigate any land in 2023 or if you only irrigated part of your equipped acres. If you irrigated all of your equipped acres then proceed to Section 17.

Item 2 - Report whether any land on this operation had access to irrigation systems or equipment in 2022, regardless of usage rights and/or availability of source water.

Item 3 - Report whether any land on this operation was irrigated in 2022.

Item 4 - Report the reasons for not irrigating in 2023. Mark all that apply and if 'other' is marked, report the reason(s) in the "specify" response area.

Item 5 - Report whether the discontinuance of irrigation is permanent.

Section 17 - Value of Sales in 2023

Item 1 - Select the appropriate range of the gross value of sales of all agricultural products sold from this operation in 2023. Agricultural products include all crops and livestock sold from this operation.

Item 2 - Report the percent of the total gross value of sales that were from **irrigated** crops.

Item 3 - Report the percent of the total gross value of sales that were from **non-irrigated crop** or **livestock** sales. The sum of items 2 and 3 should equal 100 percent.

Section 18 - Person Completing this Form

Please print the name of the person completing this form, the date completed, telephone number, and e-mail address.