Appendix B.
General Explanation and Report Form

DEVELOPMENT OF THE REPORT FORMS

Planning for the survey started in 2004 with the closeout of the 2003 Farm and Ranch Irrigation Survey (FRIS). Extensive correspondence, discussions, and meetings took place with representatives of the Economic Research Service (ERS) regarding 2008 survey content. Evaluations from NASS staff of the 2003 survey were reviewed. The decision was made to incorporate a separate report form into the survey to collect irrigation data from operations with any horticultural sales in the previous census year. No significant changes were recommended for the general FRIS report form.

Report form drafts were developed in headquarters. NASS staff in selected field offices reviewed the drafts and solicited input from various data users in their respective States. Letters were sent to individuals in water-related government organizations, industry, and academic positions to solicit their comments on report form content and design.

Pretesting was limited to the horticultural operations report form since the general FRIS report form remained mostly unchanged. Participating field offices evaluated the results of their findings, identified flaws discovered during the interview process, and submitted recommendations to headquarters. All responses were reviewed and categorized to evaluate data collection feasibility and priority needs. Results of the pretest lead to a redesign of the horticultural operations report form.

DATA CHANGES

In 2008 the general FRIS tables exclude operations that reported any horticulture sales in the previous census year. In 2003 horticultural operations that reported less than $10,000 in sales in the previous census year were included in the 2003 FRIS publication. For data comparability, operations that reported any horticultural sales in the previous census year were sampled and the data were collected on a horticulture version of the FRIS report form. Some report form changes affected some of the general FRIS publication tables. A few tables were affected by improvements in the way some data items were calculated. Following are descriptions of those changes.

- Additional programs were added to the government programs section to make the descriptions more inclusive. Data are comparable.

- Questions for on farm use of recycled and reclaimed water were added. Data are published in a new table.

- In 2003 the percent of sales from livestock was asked. In 2008 the question was changed to the percent of sales from non-irrigated crop or livestock sales. The 2008 data in Table 35 for non-irrigated crop or livestock sales are not comparable with 2003.

- The formula for cost per acre was improved. The previous calculation divided the sum of the off-farm water expense by the total acre-feet of off-farm water used, regardless if there was a fee for the acre-feet used. The 2008 calculation only uses the acre-feet in the denominator of the formula if there was a fee for the producer.

- In Table 25 for 2008, hired labor average expense per acre irrigated is the sum of hired irrigation labor reported in Section 14, item 1a regardless of the value of item 2a, contract labor; divided by the sum of total acres irrigated in Section 2, column 2, item 5. In 2003 hired labor average expense per acre irrigated was the sum of hired irrigation labor reported in Section 14,

item 1a when an individual report form's item 1a was greater than zero and item 1b, contract labor, was zero; divided by the sum of total acres irrigated in Section 2, column 2, item 5. Data are not comparable.

Similarly, in 2008 hired contract irrigation labor average expense per acre irrigated is the sum of Section 14, item 1b regardless of the value reported in item 1a, hired irrigation labor; divided by the sum of total acres irrigated in Section 2, column 2, item 5. In 2003, hired contract irrigation labor average expense per acre irrigated was the sum of hired contract irrigation labor reported in Section 14, item 1b when an individual report form's item 1b was greater than zero and item 1a, hired irrigation labor, was zero; divided by the sum of total acres irrigated in Section 2, column 2, item 5. Data are not comparable.

- In 2008 potato acres are included with Land in vegetables in Tables 27 - 29. Irrigated yield and non-irrigated yield are not published in 2008. Potato acres were not included in Land in vegetables in 2003. Data are not comparable. All other potato data are comparable with 2003.

- In Table 28 for crops with only two methods of distribution, the 2003 column header "Sprinkler system only" was changed to "Pressure systems" to match the system code categories listed on the report form. In 2008 pressure systems includes data for system codes 01 through 14. For crops with three primary methods of distribution, the 2003 column header "Sprinkler system only" was changed to "Sprinkler system" to improve the description. The data include system codes 01 through 12 and 14. System code 13 is summarized separately.

DEFINITIONS AND EXPLANATIONS

This section provides definitions and explanations of specific terms and phrases used on the reports forms or in the 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 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 generally exceeded 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 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, or 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. Chapter 1, Table 1 provides a comparison with the 2008 general FRIS data and the 2007 Census of Agriculture data. Table A in this appendix also provides census data for the leading irrigation States for 1997, 2002, and 2007.

All other crops. Data relate to any non-vegetable crops not having a specified code on the 2008 Farm

and Ranch Irrigation report form. Crops such as grass seed, sunflower seed, sugarcane, etc. were included in other field crops. Data are comparable.

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.

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. Review of the 2008 data suggests that some operators may have missed the question on the report form and left it blank while others reported the entire acreage on which fertilizer and pesticides were applied, not just the acres on which fertilizer and pesticides were distributed through irrigation systems.

Area under protection - square feet irrigated. In Chapter 2 irrigated square feet is the total area used to grow horticultural crops under protection, whether harvested or not.

Area in the open - Acres irrigated. In Chapter 2 acres in the open irrigated is the total area irrigated for horticultural crops grown in the open, whether harvested or not.

Artesian wells. Artesian or flowing 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 in Tables 15 and 16. This should be taken into consideration when using data from these two tables since the depths, capacities, pressures, engine size, and hours operated for pumped wells used in 2008 exclude artesian wells. Data are comparable with 2003 data.

Average hours of operation. The average hours of operation for pumped wells was calculated from the reported hours operated for up to three individual wells and the average hours for the remaining wells, if any. Artesian wells were not included in the average hours calculation. Some data collected exceeded 8,760 hours, the maximum number of hours in a year, meaning that some respondents entered their total pump operating hours rather than the average hours used. Records exceeding the 8,760 hour threshold were edited by the analyst to a lower value or imputed.

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 2004 to 2008. The information was tabulated as reported. No imputation was made for a blank response.

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, 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 used only for pasture or grazing. 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 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.

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.

Estimated quantity of water applied. Most water used for irrigation is not metered or measured accurately. 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 equipment, facilities, land improvement, and computer technology and Expenses for maintenance and repairs of irrigation equipment and facilities. Some respondents found it difficult to separate expenses for new and replacement irrigation construction, facilities, and equipment requested on the report form in Section 7 from expenses for maintenance and repairs of irrigation equipment and facilities requested in Section 13. Data were reviewed for consistency versus the size of the operation. Users are reminded that the distinction between the two expenditure categories was left to the respondent.

Farms using off-farm water. Respondents were asked to report the amount (none, some, all, or unknown) 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 U.S. Bureau of Reclamation, other federal agencies, and all other suppliers may be understated.

Flowing wells. See Artesian wells.

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

Horticultural crops. In Chapter 2 the horticultural data are published in the following categories:

Christmas trees and short rotation woody crops. Includes all trees to be cut in 2008 or later years. Irrigated live Christmas trees were reported in nursery crops.

Floriculture and bedding crops. Includes annual bedding/garden plants, herbaceous perennials, 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. Includes all mushroom species that were irrigated in 2008. 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 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. Includes all irrigated sod, sprigs, or plugs.

Other horticultural crops. Other horticultural crops includes all crops that are primarily considered ornamental or horticultural and are not listed anywhere in the general version or the horticulture version of the FRIS. Fruit, nut, and vegetable crops grown in the open are not considered horticultural crops and the irrigation data for these crops are presented in Chapter 1.

Improvements to irrigation systems that reduce energy and/or conserve water used in irrigation. This item shows the results farms experienced after implementing new resource-conserving irrigation systems. Respondents were asked to respond for the period covering 2004 to 2008. The information was tabulated as reported. No imputation was made for a blank response.

Institutional, research, and experimental farms. In the 2007 and 2002 Censuses of Agriculture, data for these farms were combined with American Indian reservation farms into one category. However, in the 2008 and 2003 Farm and Ranch Irrigation Surveys, only American Indian reservation farms were included in the sample while institutional, research, and experimental farms were excluded.

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." No attempt was made to define the degree or intensity of irrigation. 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 reported in Tables 17 and 18 include reserve pumps not actually used in the survey year.

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 operator's total operation. Large acreages of woodland or wasteland held for nonagricultural purposes were removed from individual reports during the data review process. 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. All land in American Indian reservations used for growing crops or grazing livestock was included as land in farms. Land in reservations not reported by 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 operators 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.

Nonirrigated crop yields. The nonirrigated crop yield averages in Table 27 are for nonirrigated crops harvested from irrigated farms and are not comparable with nonirrigated crop yield averages for total farms in the State.

Yields for sweet corn, tomatoes, lettuce, and potatoes were asked. However, some respondents left yields blank which required that the yield be imputed. In many cases, yields that were reported covered an extremely large range indicating respondents did not always use the hundredweight unit requested on the form. Therefore it was decided

that yields for these four crops would not be published.

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 2007 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.

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.

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 cropland. Other cropland includes cropland not harvested and not grazed. This includes land for cover crops or soil-improvement crops, land on which all crops failed, land in cultivated summer fallow, idle cropland, and land planted in crops that were to be harvested after the survey year.

Other pastureland and rangeland. This land use category encompasses all grazable land that does not qualify as 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 grazable and is only marginally better than wasteland.

Pumps by average operating pressure. See Average operating pressure.

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

Reason for discontinuance of irrigation since 2007. These data reflect the expanded number of operations that irrigated in 2007 but not in 2008 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. No imputation was made for a blank response.

Reclaimed water. Reclaimed water is wastewater that has been treated for non-potable reuse purposes. Sources include municipal, industrial, or livestock operations.

Recycled water. Recycled water is the reuse of surface or ground water that has already been used to irrigate a crop on the operation.

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. Sprinkler irrigation is divided into four areas to reflect current trends in irrigation. The center pivot and mechanical-move methods are classified 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. The mechanical-move systems are 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. Since all big guns operate at high pressure, pressure was not asked.

Hand move systems include distribution systems laid out in the spring, moved through the field as needed during the season by hand labor, and removed at the end of the season. This includes other sprinkler systems which are moved without mechanical assistance.

Solid set and permanent systems are sprinklers placed in the ground permanently and used mostly for perennial crops.

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.

Water management practices. These practices refer to gravity irrigation systems only. The respondent reported whether they used any of the 10 techniques listed on the report form and the number of acres on which they applied this technique to save water or improve efficiency. Some respondents answered "Yes" to the screening question, item 1 in Section 17, but did not indicate which technique they used or the number of acres for any technique. No imputation was made for a blank response.

Water Resources Regions (WRR). Data from FRIS 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 resources 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 affects 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 affect of the Mississippi River, the Red River above the point of highest backwater affect of the Mississippi River, and the White River above the point of highest backwater affect 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, Magdelena, 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. 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 covered by sagebrush or mesquite was reported as Other pastureland and rangeland or Other land. Land planted for Christmas tree production and short rotation woody crops was reported in Cropland harvested and land in tapped maple trees was reported as Woodland.

Table A. **Leading Irrigation States: 2007, 2002, and 1997 Censuses**

[For meaning of abbreviations and symbols, see introductory text]

Geographic area	Acres irrigated			Rank			2007 cumulative percent of United States total
	2007	2002	1997	2007	2002	1997	
United States	56,599,305	55,311,236	56,289,172	(X)	(X)	(X)	100.0
20 Leading States	51,745,677	50,812,487	52,266,055	(X)	(X)	(X)	91.4
Nebraska	8,558,559	7,625,170	7,065,556	1	2	2	15.1
California	8,016,159	8,709,353	8,886,693	2	1	1	29.3
Texas	5,010,416	5,074,638	5,764,295	3	3	3	38.1
Arkansas	4,460,682	4,149,766	3,785,338	4	4	4	46.0
Idaho	3,299,889	3,288,522	3,543,805	5	5	5	51.8
Colorado	2,867,957	2,590,654	3,374,233	6	7	6	56.9
Kansas	2,762,748	2,678,277	2,695,816	7	6	7	61.8
Montana	2,013,167	1,976,111	2,101,548	8	8	8	65.4
Oregon	1,845,194	1,907,627	1,963,478	9	9	9	68.6
Washington	1,735,917	1,823,155	1,787,120	10	10	11	71.7
Florida	1,552,118	1,815,174	1,873,823	11	11	10	74.4
Wyoming	1,550,723	1,541,688	1,749,908	12	12	12	77.2
Mississippi	1,368,661	1,175,530	1,110,145	13	13	14	79.6
Missouri	1,199,981	1,032,973	921,113	14	15	17	81.7
Utah	1,134,144	1,091,011	1,218,474	15	14	13	83.7
Georgia	1,017,773	870,810	773,066	16	18	19	85.5
Louisiana	954,353	938,841	960,831	17	16	16	87.2
Arizona	876,158	931,735	1,075,336	18	17	15	88.7
New Mexico	830,048	844,799	851,735	19	19	18	90.2
Nevada	691,030	746,653	763,742	20	20	20	91.4

Table B. **Estimated Total Acres Irrigated and Total Water Applied for All Irrigated General FRIS Farms and Horticultural Operations: 2008**

[Totals may not add due to rounding. Excludes institutional, research, and experimental farms. For meaning of abbreviations and symbols, see introductory text]

Geographic area	Total			General FRIS (Chapter 1)			Horticultural operations (Chapter 2)		
	Farms and operations	Acres irrigated	Acre-feet applied	Farms	Acres irrigated	Acre-feet applied	Operations	Acres irrigated [1]	Acre-feet applied [2]
United States	235,715	55,540,978	91,956,721	206,834	54,929,915	91,235,036	28,881	611,063	721,685
Alabama	1,040	95,647	62,153	665	75,023	42,512	375	20,624	19,641
Alaska	101	1,631	335	23	1,589	327	78	42	8
Arizona	3,172	869,908	4,656,299	2,997	861,496	4,622,309	175	8,412	33,990
Arkansas	4,312	4,500,947	8,637,450	4,119	4,493,435	8,631,781	193	7,512	5,669
California	47,702	7,387,214	22,719,227	45,136	7,329,245	22,599,659	2,566	57,969	119,568
Colorado	13,121	2,877,839	4,562,868	12,778	2,865,840	4,541,276	343	11,999	21,592
Connecticut	526	5,093	4,417	147	2,337	1,536	379	2,756	2,881
Delaware	422	106,513	76,007	309	104,620	74,379	113	1,893	1,628
Florida	8,044	1,303,172	1,798,674	5,250	1,222,797	1,701,120	2,794	80,375	97,554
Georgia	4,204	1,044,858	908,631	3,584	1,007,763	876,884	620	37,095	31,747
Hawaii	1,938	102,030	456,197	1,077	99,577	453,547	861	2,453	2,650
Idaho	14,140	3,330,598	6,236,396	13,834	3,319,827	6,228,403	306	10,771	7,993
Illinois	1,708	475,381	239,187	1,091	457,078	231,390	617	18,303	7,797
Indiana	1,598	411,828	201,691	1,089	404,399	198,880	509	7,429	2,811
Iowa	794	166,372	80,329	527	162,838	78,939	267	3,534	1,390
Kansas	4,738	2,573,242	3,148,730	4,508	2,570,003	3,146,607	230	3,239	2,123
Kentucky	1,476	34,595	17,081	822	32,380	15,698	654	2,215	1,383
Louisiana	2,042	938,341	975,932	1,692	932,712	972,164	350	5,629	3,768
Maine	575	19,635	8,184	196	18,151	6,946	379	1,484	1,238
Maryland	1,001	94,563	60,147	597	85,552	55,259	404	9,011	4,888
Massachusetts	1,196	19,083	19,450	677	17,421	18,894	519	1,662	556
Michigan	3,493	550,255	307,294	2,121	531,927	298,440	1,372	18,328	8,854
Minnesota	2,007	511,948	338,027	1,546	504,330	333,669	461	7,618	4,358
Mississippi	1,507	1,455,963	1,404,384	1,277	1,451,652	1,402,099	230	4,311	2,285
Missouri	2,330	1,239,948	1,000,897	1,877	1,232,354	996,875	453	7,594	4,022
Montana	8,776	1,948,960	2,662,184	8,507	1,947,159	2,660,677	269	1,801	1,507
Nebraska	15,060	8,369,512	6,702,173	14,812	8,365,545	6,699,545	248	3,967	2,628
Nevada	1,762	686,091	1,438,347	1,734	685,261	1,436,932	28	830	1,415
New Hampshire	366	1,526	736	86	720	193	280	806	543
New Jersey	1,416	81,841	61,966	608	59,412	45,305	808	22,429	16,661
New Mexico	9,000	838,497	1,898,710	8,878	835,639	1,896,349	122	2,858	2,361
New York	1,691	29,414	17,534	596	20,158	14,800	1,095	9,256	2,734
North Carolina	3,134	170,710	102,527	1,975	148,999	83,847	1,159	21,711	18,680
North Dakota	631	248,148	224,557	601	248,070	224,462	30	78	95
Ohio	1,377	26,634	14,064	379	18,548	9,398	998	8,086	4,666
Oklahoma	1,725	481,137	540,729	1,454	461,235	524,638	271	19,902	16,091
Oregon	13,692	1,812,325	3,394,583	12,156	1,758,602	3,276,679	1,536	53,723	117,904
Pennsylvania	2,661	22,955	16,699	1,090	17,359	13,000	1,571	5,596	3,699
Rhode Island	232	3,094	2,243	61	681	674	171	2,413	1,569
South Carolina	1,038	122,663	96,463	712	104,091	86,236	326	18,572	10,227
South Dakota	1,232	361,048	272,134	1,165	360,071	271,274	67	977	860
Tennessee	1,321	85,129	51,060	582	72,862	42,271	739	12,267	8,789
Texas	13,727	5,404,180	6,879,099	12,673	5,356,876	6,819,783	1,054	47,304	59,316
Utah	11,049	1,073,723	2,439,180	10,876	1,068,929	2,430,148	173	4,794	9,032
Vermont	355	748	428	66	488	235	289	260	193
Virginia	1,153	53,442	32,560	657	44,818	24,796	496	8,624	7,764
Washington	13,456	1,695,474	3,819,879	12,712	1,675,898	3,781,371	744	19,576	38,508
West Virginia	249	1,289	1,318	90	906	975	159	383	343
Wisconsin	2,221	407,909	326,579	1,261	396,123	322,377	960	11,786	4,202
Wyoming	5,204	1,497,926	3,040,984	5,164	1,497,119	3,039,481	40	807	1,503

[1] Irrigated square feet under protection were converted to acres and added to irrigated horticultural crop acreage in the open.
[2] Total gallons applied were converted to acre-feet.

DUE FEBRUARY 17, 2009

OMB No. 0535-0234: Approval Expires 12/31/2011

2008 FARM AND RANCH IRRIGATION SURVEY

Form Number: 08-A621
(12/03/08)

USDA

AGRICULTURE COUNTS NASS

National Agricultural Statistics Service

Please return your completed report to:

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

OFFICE USE ONLY

0009	0010	0011

08-A621

Please make corrections to name, address, and ZIP code if necessary.

Everyone who receives a form must return one by mail or via the Internet at **www.agcensus.nass.usda.gov**. Your report is due by **February 17, 2009**. To fill out the paper form, use a black or blue ballpoint pen. **Duplicate forms?** If you received extra report forms for the SAME farming operation, return all report forms in the same envelope with this completed report.

Questions? Call us toll-free at **1-888-424-7828**. Thank you for your cooperation.

SECTION 1 ACREAGE IN 2008

Report land owned, rented, or used by you, your spouse, or by the partnership, corporation, or organization named on the label above. Include ALL LAND, REGARDLESS OF LOCATION OR USE - cropland, Conservation Reserve Program (CRP) and Wetlands Reserve Program (WRP) land, pastureland, rangeland, woodland, idle land, farmsteads, etc.

	None		Number of Acres
1. All land owned	☐		0025
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 all land (i.e., private, federal, state, railroad, etc.) used on a per-head or animal unit month (AUM) basis under a grazing permit	☐	+	0026
3. All land rented or leased **to others,** including land worked on shares by others and land subleased	☐	-	0027
4. **TOTAL ACRES** in this operation (Items 1 + 2 - 3 = item 4)		=	0028

PENALTY FOR FAILURE TO REPORT

NOTICE: Response to this inquiry is required by law (Title 7, U.S. Code). By the same law, YOUR REPORT IS CONFIDENTIAL and it will only be used for statistical purposes. Your report CANNOT be used for purposes of taxation, investigation, or regulation. The law also provides that copies retained in your files are immune from legal process.

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SECTION 2 LAND IN 2008

Report all acres in this operation (SECTION 1, item 4) in column 1. If the same land had more than one use in 2008, report that land only once in the first use listed below that applies.

For column 2, report all irrigated land in this operation for items 1 and 3. In addition to fully irrigated land, report as irrigated any land to which partial, supplemental, or semi-irrigation was applied. 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 canals, ditches, spreader dikes, pipes, or other works.

	None	Column 1 Number of Acres	None	Column 2 Acres Irrigated
1. Cropland – Report acres only once in one of the following categories:				
a. Cropland harvested – Include all land from which crops were harvested or hay was cut, all land in orchards, citrus groves, vineyards, berries, nursery and greenhouse crops, Christmas trees, and short-rotation woody crops	☐	0029	☐	0030
b. Cropland used only for pasture or grazing – Include rotation pasture and grazing land that could have been used for crops without additional improvements	☐	0031	☐	0032
c. Other cropland – Include cropland used for cover crops, cropland on which all crops failed, cropland in cultivated summer fallow, and cropland idle	☐	0033	☐	0034
2. Woodland – Include woodland pastured and woodland not pastured	☐	0035		
3. Other pastureland and rangeland – Include any pastureland other than cropland and woodland pastured	☐	0037	☐	0038
4. All other land – Include land in farmsteads, buildings, livestock facilities, ponds, roads, wasteland, etc	☐	0039		
5. TOTAL ACRES – Add acres in each column and enter the totals. (Column 1 total should be the same as SECTION 1, item 4.)		0041		0042

NOTE: If the total acres irrigated in item 5, column 2 is "0", go to SECTION 21.

6. For this operation, what state and county had the most irrigated acres?

State	County
0951	0950

SECTION 3 GOVERNMENT PROGRAMS IN 2008

1. During 2008, did this operation receive direct payments, counter-cyclical payments, loan deficiency payments, or marketing loan gains or participate in any quota programs or buy-out programs?

0691 1 ☐ **Yes** 3 ☐ **No**

2. Does this operation currently participate, or has it participated in the past five years, in a government payment program or technical assistance program for irrigation and/or drainage improvements? Payment programs may include cost-share or incentive payments or only technical assistance for system design or on-farm management.

0795 1 ☐ **Yes –** Continue 3 ☐ **No –** Go to SECTION 4

a. Mark (X) all programs that apply –

0698
- 1 ☐ USDA – Environmental Quality Incentive Program (EQIP) – Please check program →
- 2 ☐ Other USDA conservation payment programs (CSP, CRP, WRP, FWP, GRP, etc.)
- 3 ☐ USDA-NRCS Conservation Technical Assistance program
- 4 ☐ Non-USDA Federal programs – Include EPA, Bureau of Reclamation, or other programs
- 5 ☐ State programs (including CREP), local water management programs, or supply district programs
- 6 ☐ Other – Specify →

0794
- 1 ☐ EQIP – general
- 2 ☐ Klamath River Basin
- 3 ☐ Ground and Surface Water Conservation

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SECTION 4 METHOD OF WATER DISTRIBUTION ON THIS OPERATION IN 2008

Report acres irrigated by each type of ON FIELD distribution or delivery system listed below. If the same land was irrigated by more than one method of distribution, report acres irrigated by each method used.

DO NOT report information for the delivery system used to convey water from the source to the field. Report information for the field distribution system.

	None	Acres Irrigated by Gravity System (Field Water Conveyance System)					
1. Gravity irrigation		Total	Open Un-lined Ditch	Open Lined Ditch	Poly Tubing (or other single-year-use, lay-flat tubing)	Above-Ground pipe (except poly-tubing)[1]	Under-Ground Pipe[2]
a. Down rows or furrows	☐	0855	0859	0857	0056	0057	0858
b. Controlled flooding (between borders or within basins)	☐	0865	0869	0867	0066	0067	0868
c. Uncontrolled flooding (rangeland, pastureland, etc.)	☐	0875	0879	0877	0076	0077	0878
d. Other	☐	0885	0889	0887	0086	0087	0888

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

	None	Acres Irrigated by Sprinkler System			
2. Sprinkler irrigation – Inlet pressure		Very Low Pressure (Under 15 PSI)	Low Pressure (15 to 29 PSI)	Medium Pressure (30 to 59 PSI)	High Pressure (60 PSI or more)
a. Center pivot systems (circle)	☐	0569	0576	0575	0570
b. Linear move tower systems (and other linear continuous move drive systems)	☐	0571	0577	0578	0579
c. Solid set and permanent systems (except low-flow micro systems)	☐	0568	0565	0566	0567

	None	Acres Irrigated (All pressures)
d. Mechanical move systems –		
(i) Side roll, wheel move, or other mechanical move systems and other discrete move systems	☐	0240
(ii) Big gun or traveler systems	☐	0241
e. Hand-move systems	☐	0242

		Acres Irrigated (All pressures)
3. Drip, trickle, or low-flow micro irrigation – except poly and lay-flat tubing		
a. Surface drip (on or above ground)	☐	0248
b. Sub-surface drip (root zone)	☐	0246
c. Low-flow micro sprinklers, sprays (apply water at low pressure and are not self-propelled or easily moved)	☐	0247

		Acres Irrigated
4. Subirrigation – Water seepage, or use of a drainage system to maintain aquifer water table at a predetermined depth. Exclude methods reported above	☐	0249

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SECTION 5 ACRES IRRIGATED, ESTIMATED QUANTITY OF WATER USED, AND OFF-FARM SUPPLIED WATER USED ON THIS OPERATION BY SOURCE IN 2008

Report quantity of water in the unit or units of measure used most on this operation. If exact measurements are not available, give your best estimate for quantity of water used. If total or average acre-feet cannot be estimated, give combined pumping capacity and duration in days, or total depth of water applied, or flow quantities and duration of flow in days.

	Water Source		
	Ground Water (from wells)	Surface Water	
		On Farm	Off-Farm (All Suppliers)
1. Acres irrigated – Include cropland and pastureland	0444 acres	0449 acres	0454 acres
2. Estimated quantity of water used on this operation in 2008. Report for only one of the following options, items a through e, in the unit used most on this operation			
	Total Acre-Feet		
a. Total acre-feet	0955 .—	0960 .—	0965 .—
OR			
	Acre-Feet Per Acre		
b. Average acre-feet per acre irrigated (One acre-foot covers one acre one foot deep)	0445 .—	0450 .—	0966 .—
OR			
	Inches Per Acre		
c. Average inches applied per acre	0448	0453	0967
OR			
	GPM		
d. Average gallons of water applied per minute (GPM)	0446	0451	0968
	Duration		
(i) Total number of 24-hour day equivalents water was applied	0447 days	0452 days	0969 days
OR			
	CFS		
e. Average flow in cubic feet per second (CFS)	0956	0961	0970
	Duration		
(i) Total number of 24-hour day equivalents water flow was applied	0957 days	0962 days	0971 days

3. Did this operation receive any water from an off-farm source?

0457 1 ☐ **Yes –** Continue 3 ☐ **No –** Go to SECTION 6

a. Was there a fee for the off-farm water received on this operation?

0675 1 ☐ **Yes –** Continue 3 ☐ **No –** Go to item 4 below

	Dollars
b. Total cost of off-farm supplied water	0456 $ .00

(i) Did the cost per unit of water (check one) –

0667
1 ☐ Increase as the amount of off-farm supplied water used increased?
2 ☐ Remain the same as the amount of off-farm supplied water used increased?
3 ☐ Decrease as the amount of off-farm supplied water used increased?

4. Supplier of off-farm water – 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	0664 1 ☐ None 2 ☐ Some 3 ☐ All 4 ☐ Unknown
b. Other Federal agencies such as the U.S. Army Corp of Engineers, Bureau of Indian Affairs, USDA small watershed project, etc.?	0665 1 ☐ None 2 ☐ Some 3 ☐ All 4 ☐ Unknown
c. All other suppliers? – Specify →	0666 1 ☐ None 2 ☐ Some 3 ☐ All 4 ☐ Unknown

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SECTION 6 WATER TRANSFERS IN 2008

Report water leased or rented on an annual or multi-year basis for use off this operation when the permanent right to the water was maintained by the operator. Include water rented or leased directly by this operation or this operation's irrigation provider.

1. Did this operation rent or lease water to others for use off this operation in 2008? Include both agricultural and non-agricultural purposes.

0531 1 ☐ **Yes** – Continue 3 ☐ **No** – Go to SECTION 7

2. Report the quantity of water transferred to others in 2008 for each source listed –

	None	Water Quantity (Acre-Feet)
a. Ground water from on-farm wells	☐	0532
b. Surface water from on-farm sources	☐	0533
c. Water normally received from an off-farm supplier	☐	0534

3. Mark (X) below all uses or recipients of transferred water –

0535 1 ☐ Other agricultural producers
2 ☐ Municipal or industrial water users
3 ☐ Environmental uses (water quality, in-stream flow, habitat improvement)
4 ☐ Unknown use of transferred water – If unknown, check Item (a) or (b) below
0536 1 ☐ (a) Water was part of a pool used by several producers
2 ☐ (b) Water rented or leased was arranged by this operation's irrigation provider

SECTION 7 EXPENDITURES FOR IRRIGATION FACILITIES AND EQUIPMENT ON THIS OPERATION IN 2008

Report expenditures, purpose, and sources of funding assistance in 2008 for the construction of irrigation facilities on this operation and purchase of irrigation equipment and machinery for this operation. Include estimates of expenditures made by or shared with others (landlords or government agencies), including programs such as Environmental Quality Incentive Program (EQIP). Report the cost of maintenance and repairs in SECTION 13.

	None	Total Expenditures (Dollars)	Principal Purpose of Expenditures (Mark (X) principal purpose only)	Primary Source of Funding Assistance (Mark (X) primary source only)
1. Purchase of new or replacement irrigation equipment and machinery – Include sprinklers, pipes, siphons, nozzles, pumps, motors, engines, etc. Do not include computers	☐	0511 $ .00	0512 1 ☐ Replacement 2 ☐ Water conservation 3 ☐ New expansion	0513 1 ☐ No funding assistance 2 ☐ EQIP 3 ☐ Other USDA cost-share program 4 ☐ Non-USDA cost-share program
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. Do not include cost of pumps or motors	☐	0515 $ .00	0516 1 ☐ Replacement 2 ☐ Water conservation 3 ☐ New expansion	0517 1 ☐ No funding assistance 2 ☐ EQIP 3 ☐ Other USDA cost-share program 4 ☐ Non-USDA cost-share program
3. Construction or improvement of permanent storage and distribution systems – Include dams, ponds, reservoirs, permanent ditches, canals, flumes, etc.	☐	0519 $ .00	0520 1 ☐ Replacement 2 ☐ Water conservation 3 ☐ New expansion	0521 1 ☐ No funding assistance 2 ☐ EQIP 3 ☐ Other USDA cost-share program 4 ☐ Non-USDA cost-share program
4. Land clearing and leveling for irrigation purposes	☐	0523 $ .00	0524 1 ☐ Replacement 2 ☐ Water conservation 3 ☐ New expansion	0525 1 ☐ No funding assistance 2 ☐ EQIP 3 ☐ Other USDA cost-share program 4 ☐ Non-USDA cost-share program
5. Computers, control panels, and software for irrigation water management	☐	0544 $ .00	0545 1 ☐ Replacement 2 ☐ Water conservation 3 ☐ New expansion	0546 1 ☐ No funding assistance 2 ☐ EQIP 3 ☐ Other USDA cost-share program 4 ☐ Non-USDA cost-share program

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SECTION 8 ACRES HARVESTED, CROP YIELDS, AND PASTURE ON THIS OPERATION IN 2008

For each crop listed, report separately irrigated land and non-irrigated land. Report acreage as irrigated if any water was artificially applied either before planting or during the growing season in 2008.

Crops and Pastureland	Irrigated Land (Include preplant and supplemental or semi-irrigation)					Non-Irrigated Land	
	Irrigated Acres Harvested	Average Yield Per Irrigated Acre	Average Estimated Quantity of Water Applied Per Acre			Non-Irrigated Acres Harvested	Average Yield Per Non-Irrigated Acre
			Acre-Feet Per Acre	OR	Inches Per Acre		
1. Corn for grain or seed – Exclude popcorn and sweet corn . . . . . None ☐	0050	0051 Bu.	0052 .____	or	0053	0054	0055 Bu.
2. Corn for silage or greenchop – Exclude popcorn and sweet corn . . . . . ☐	0060	0061 Tons	0062 .____	or	0063	0064	0065 Tons
3. Sorghum for grain or seed . . . . . ☐	0070	0071 Bu.	0072 .____	or	0073	0074	0075 Bu.
4. Wheat for grain or seed . . . . . ☐	0080	0081 Bu.	0082 .____	or	0083	0084	0085 Bu.
5. Barley for grain or seed . . . . . ☐	0090	0091 Bu.	0092 .____	or	0093	0094	0095 Bu.
6. Soybeans for beans. . . . . ☐	0106	0101 Bu.	0102 .____	or	0103	0104	0105 Bu.
7. Beans, dry edible. . . . . ☐	0110	0111 Cwt.	0112 .____	or	0113	0114	0115 Cwt.
8. Rice . . . . . ☐	0120	0121 Cwt.	0122 .____	or	0123		
9. Other small grains (oats, rye, etc.) ☐	0130		0132 .____	or	0133	0134	
10. Alfalfa and alfalfa mixtures (dry hay, greenchop, and silage) ☐	0140	0141 .____ Tons, dry	0142 .____	or	0143	0144	0145 .____ Tons, dry
11. All other hay, including small grain, other tame, and wild hay (dry hay, greenchop, and silage). . . . . ☐	0150	0151 .____ Tons, dry	0152 .____	or	0153	0154	0155 .____ Tons, dry

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SECTION 8 Continued –

Crops and Pastureland	Irrigated Land (Include preplant and supplemental or semi-irrigation)					Non-Irrigated Land	
	Irrigated Acres Harvested	Average Yield Per Irrigated Acre	Average Estimated Quantity of Water Applied Per Acre			Non-Irrigated Acres Harvested	Average Yield Per Non-Irrigated Acre
			Acre-Feet Per Acre	OR	Inches Per Acre		
None ☐ 12. Peanuts	0550	0551 Lbs.	0552 .	or	0553	0554	0555 Lbs.
13. Cotton ☐	0160	0161 Lbs. lint	0162 .	or	0163	0164	0165 Lbs. lint
14. Sugarbeets for sugar ☐	0170	0171 Tons	0172 .	or	0173	0174	0175 Tons
15. Tobacco, all types ☐	0180 .	0181 Lbs.	0182 .	or	0183	0184 .	0185 Lbs.
16. All land from which vegetables, potatoes, and melons were harvested ☐	0186 .		0187 .	or	0188	0189 .	
Report for selected vegetable crops: a. Sweet corn ☐	0850 .	0851 Cwt.	0852 .	or	0853	0854 .	0975 Cwt.
b. Tomatoes in the open ☐	0860 .	0861 Cwt.	0862 .	or	0863	0864 .	0985 Cwt.
c. Lettuce and romaine ☐	0870 .	0871 Cwt.	0872 .	or	0873	0874 .	0995 Cwt.
d. Potatoes – Exclude sweet potatoes ☐	0190 .	0191 Cwt.	0192 .	or	0193	0194 .	0195 Cwt.
17. All berries ☐	0560 .		0562 .	or	0563	0564 .	
18. Land in bearing and non-bearing fruit orchards, citrus or other groves, vineyards, and nut trees ☐	0210 .		0212 .	or	0213	0214 .	
19. All other crops – Specify ☐	0220		0222 .	or	0223	0224	
20. Pastureland, all types ☐	0230		0232 .	or	0233	0234	

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SECTION 9 PRIMARY METHOD OF WATER DISTRIBUTION, APPLICATION OF AGRICULTURAL CHEMICALS IN IRRIGATION WATER, AND WATER SOURCE BY IRRIGATED ACRES HARVESTED ON THIS OPERATION IN 2008

Report only irrigated acres harvested. Report separately the primary distribution method, chemigation, and water source. Refer to the Pressure and Gravity Irrigation Systems ID codes listed below for column 1.

PRESSURE AND GRAVITY IRRIGATION SYSTEMS ID CODES FOR COLUMN 1 BELOW

Pressure Systems

01 = Hand-move System
02 = Solid or Permanent Set System
03 = Side Roll or Wheel Line System
04 = Big Gun System
05 = Linear Move System (PSI less than 15)
06 = Linear Move System (PSI 15 to 29)
07 = Linear Move System (PSI equal to or greater than 30 and less than 60)
08 = Linear Move System (PSI equal to or greater than 60)
09 = Center Pivot System (PSI less than 15)
10 = Center Pivot System (PSI 15 to 29)
11 = Center Pivot System (PSI equal to or greater than 30 and less than 60)
12 = Center Pivot System (PSI equal to or greater than 60)
13 = Low-Flow Irrigation (drip, trickle, or micro sprinkler systems)
14 = Other Pressure System – Specify type ¬

Gravity Systems

15 = Siphon-Tube System (from unlined ditches)
16 = Siphon-Tube System (from lined ditches)
17 = Portal- or Ditch-Gate System (from unlined ditches)
18 = Portal- or Ditch-Gate System (from lined ditches)
19 = Poly-Pipe or Lay-Flat Tubing System
20 = Gated-Pipe System (not poly-pipe)
21 = Improved Gated-Pipe (surge flow or cablegation system, but not poly-pipe)
22 = Subirrigation
23 = Open Discharge from well or pump
24 = Other Gravity System – Specify type ¬

Irrigated Crops and Pastureland	Primary Method of Water Distribution (Enter Irrigation System ID Code from above.)		Chemigation Using Irrigation System		Water Source (Column totals may exceed irrigated crop acres reported in Section 8 when more than one water source was used.)		
	Column 1 System ID Code	Percent of Irrigated Crop Using This System	Commercial Fertilizer (Acres)	Pesticide Application (Acres)	Ground Water from Wells (Acres)	On-Farm Surface Water (Acres)	Water from Off-Farm Suppliers[1] (Acres)
1. Corn for grain or seed – Exclude popcorn and sweet corn . . . . . None ☐	0250 ID	0251 %	0252	0253	0255	0254	0256
2. Corn for silage or greenchop – Exclude popcorn and sweet corn . . . . . ☐	0260 ID	0261 %	0262	0263	0265	0264	0266
3. Sorghum for grain or seed . . . . . ☐	0270 ID	0271 %	0272	0273	0275	0274	0276
4. Wheat for grain or seed . . . . . ☐	0280 ID	0281 %	0282	0283	0285	0284	0286
5. Barley for grain or seed . . . . . ☐	0290 ID	0291 %	0292	0293	0295	0294	0296
6. Soybeans for beans. . . . . ☐	0300 ID	0301 %	0302	0303	0305	0304	0306
7. Beans, dry edible. . . . . ☐	0310 ID	0311 %	0312	0313	0315	0314	0316
8. Rice . . . . . ☐	0320 ID	0321 %	0322	0323	0325	0324	0326
9. Other small grains (oats, rye, etc.) ☐	0330 ID	0331 %	0332	0333	0335	0334	0336
10. Alfalfa and alfalfa mixtures (dry hay, greenchop, and silage) ☐	0340 ID	0341 %	0342	0343	0345	0344	0346
11. All other hay, including small grain, other tame, and wild hay (dry hay, greenchop, and silage). . . . . ☐	0350 ID	0351 %	0352	0353	0355	0354	0356

[1] 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.

80621089

SECTION 9 Continued –

PRESSURE AND GRAVITY IRRIGATION SYSTEMS ID CODES FOR COLUMN 1 BELOW

Pressure Systems

01 = Hand-move System
02 = Solid or Permanent Set System
03 = Side Roll or Wheel Line System
04 = Big Gun System
05 = Linear Move System (PSI less than 15)
06 = Linear Move System (PSI 15 to 29)
07 = Linear Move System (PSI equal to or greater than 30 and less than 60)
08 = Linear Move System (PSI equal to or greater than 60)
09 = Center Pivot System (PSI less than 15)
10 = Center Pivot System (PSI 15 to 29)
11 = Center Pivot System (PSI equal to or greater than 30 and less than 60)
12 = Center Pivot System (PSI equal to or greater than 60)
13 = Low-Flow Irrigation (drip, trickle, or micro sprinkler systems)
14 = Other Pressure System – Specify type ↴

Gravity Systems

15 = Siphon-Tube System (from unlined ditches)
16 = Siphon-Tube System (from lined ditches)
17 = Portal- or Ditch-Gate System (from unlined ditches)
18 = Portal- or Ditch-Gate System (from lined ditches)
19 = Poly-Pipe or Lay-Flat Tubing System
20 = Gated-Pipe System (not poly-pipe)
21 = Improved Gated-Pipe (surge flow or cablegation system, but not poly-pipe)
22 = Subirrigation
23 = Open Discharge from well or pump
24 = Other Gravity System – Specify type ↴

Irrigated Crops and Pastureland	Primary Method of Water Distribution (Enter Irrigation System ID Code from above.)		Chemigation Using Irrigation System		Water Source (Column totals may exceed irrigated crop acres reported in Section 8 when more than one water source was used.)		
	Column 1 System ID Code	Percent of Irrigated Crop Using This System	Commercial Fertilizer (Acres)	Pesticide Application (Acres)	Ground Water from Wells (Acres)	On-Farm Surface Water (Acres)	Water from Off-Farm Suppliers[1] (Acres)
None	0580 ID	0581 %	0582	0583	0585	0584	0586
12. Peanuts ☐							
13. Cotton ☐	0360 ID	0361 %	0362	0363	0365	0364	0366
14. Sugarbeets for sugar ☐	0370 ID	0371 %	0372	0373	0375	0374	0376
15. Tobacco, all types ☐	0380 ID	0381 %	0382 .__	0383 .__	0385 .__	0384 .__	0386 .__
16. All land from which vegetables, potatoes, and melons were harvested ☐	0474 ID	0475 %	0476 .__	0477 .__	0479 .__	0478 .__	0480 .__
Report for selected vegetable crops:							
a. Sweet corn ☐	0900 ID	0901 %	0902 .__	0903 .__	0905 .__	0904 .__	0906 .__
b. Tomatoes in the open ☐	0910 ID	0911 %	0912 .__	0913 .__	0915 .__	0914 .__	0916 .__
c. Lettuce and romaine ☐	0920 ID	0921 %	0922 .__	0923 .__	0925 .__	0924 .__	0926 .__
d. Potatoes – Exclude sweet potatoes ☐	0390 ID	0391 %	0392 .__	0393 .__	0395 .__	0394 .__	0396 .__
17. All berries ☐	0590 ID	0591 %	0592 .__	0593 .__	0595 .__	0594 .__	0596 .__
18. Land in bearing and non-bearing fruit orchards, citrus or other groves, vineyards, and nut trees ☐	0410 ID	0411 %	0412 .__	0413 .__	0415 .__	0414 .__	0416 .__
19. All other crops – Specify ↴ ☐	0420 ID	0421 %	0422	0423	0425	0424	0426
20. Pastureland, all types ☐	0430 ID	0431 %	0432	0433	0435	0434	0436

[1] 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.

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SECTION 10 NUMBER OF IRRIGATION WELLS ON THIS OPERATION IN 2008, INCLUDING WELL DEPTH AND PUMPING CAPACITY

1. Did this operation irrigate with water from wells in 2008?

0760 1 ☐ **Yes** – Continue 3 ☐ **No** – Go to SECTION 11

2. How many wells were used in 2008? . . . . . | Number: 0460 |

	Well #	Depth of Well (Feet)	Depth to Water at Start of Irrigation Season (Feet)	Depth to Bowls or Impellers (Feet)	Pump Capacity – Discharge From Well (GPM)	Operating Pressure at Well Head (PSI)	Size of Engine for All Motors, Including Electric (HP)	Total Hours Operated For the Season
a. Report for the first 3 primary wells pumped in 2008 →	1. . . .	0461	0462	0463	0464	0676	0761	0762
	2. . . .	0465	0466	0467	0468	0677	0763	0764
	3. . . .	0469	0470	0471	0472	0678	0765	0766
		Average Depth of Well (Feet)	Average Depth to Water at Start of Irrigation Season (Feet)	Average Depth to Bowls or Impellers (Feet)	Average Pump Capacity – Discharge From Well (GPM)	Average Operating Pressure at Well Head (PSI)	Average Size of Engine for All Motors, Including Electric (HP)	Average Hours Operated For the Season
b. Report for all other wells pumped in 2008		0481	0482	0483	0484	0681	0767	0768

3. How many pumping stations (wells from item 2 above with associated piping systems) used backflow prevention devices (check valves) in 2008? . . . . . None ☐ | Number: 0770

a. In 2008, how many acres were irrigated with these (item 3) wells? . . . . . ☐ | Acres: 0771

4. How many wells from item 2 above had flow meters or other flow measurement devices? . . . . . ☐ | Number: 0683

a. In 2008, how many acres were irrigated with these (item 4) systems? . . . . . ☐ | Acres: 0772

5. Has the average depth to water for the wells supplying this operation changed in the last five years?

0773 1 ☐ **Yes** – Continue 3 ☐ **No** – Go to item 6 below

a. If yes, check one. . . . . 0487 1 ☐ Increased depth 2 ☐ Decreased depth

6. How many of the wells used in 2008 are free flowing (artesian wells)? . . . . . None ☐ | Number: 0486

7. How many wells were not used in 2008, but were capable of being used? Exclude abandoned wells. . . . . ☐ | Number: 0485

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SECTION 11 PUMPS, OTHER THAN WELL PUMPS, USED FOR IRRIGATION ON THIS OPERATION IN 2008

Report for all surface water pumps on this operation, whether or not they were used in 2008.

	None	Number of Pumps	Vertical Lift (Average Feet)	Discharge Capacity (Average GPM)	Discharge Operating Pressure (Average PSI)
1. Tailwater pits	☐	0490	0774	0491	0687
2. Ponds, lakes, reservoirs, rivers, canals, etc.	☐	0492	0775	0493	0688
3. Relifting or boosting water within system	☐	0494	0776	0777	0778

SECTION 12 ENERGY USE ON THIS OPERATION IN 2008 FOR PUMPING WATER BY POWER SOURCE

Report the expenditures for fuel and power used in 2008 for irrigation pumping by each type of energy used on this operation. Include the cost of any additional charges such as a fuel adjustment charge or any other type of charge which was based on the amount of power or fuel purchased. Include landlord's share.

Power Source	None	Number of Pumps	Total Cost of Energy Used (Dollars)	Acres Irrigated by Water Source: Ground Water From[1] Wells (Acres)	Acres Irrigated by Water Source: On-Farm Surface[2] Water (Acres)
1. Electricity	☐	0495	0496 $ .00	0497	0781
2. Natural gas	☐	0498	0499 $ .00	0500	0782
3. LP gas, propane, or butane	☐	0501	0502 $ .00	0503	0783
4. Diesel and biodiesel fuel	☐	0504	0505 $ .00	0506	0784
5. Gasoline and gasohol – Include ethanol blends	☐	0507	0508 $ .00	0509	0785
6. Solar and other renewable	☐	0779		0780	0786

[1] Include only acres for wells reported in Section 10, items 2a and 2b.
[2] Include only acres for pumps reported in Section 11.

SECTION 13 MAINTENANCE AND REPAIR COSTS FOR IRRIGATION EQUIPMENT AND FACILITIES ON THIS OPERATION IN 2008

Report all expenses in 2008 for keeping irrigation equipment and facilities in working order. Include expenses for tune-ups, oil changes, ditch and canal cleanout, repairs to pumps, motors, pipes, canals, and sprinkler systems, etc. Exclude construction or improvement costs reported in SECTION 7.

	None	Dollars
1. Amount spent for maintenance and repairs of irrigation equipment and facilities in 2008 including maintenance of on-farm ditches. Include payments made by landlords. Give estimate if actual figures are not available	☐	0510 $ .00

SECTION 14 LABOR COSTS FOR IRRIGATION ON THIS OPERATION IN 2008

Report gross cash payments to employees, including family members, before deductions for social security, taxes, insurance premiums, etc. and payments for contract labor. Exclude customwork.

1. Wages paid for –	None	Dollars
a. Hired irrigation labor	☐	0787 $ .00
b. Contract irrigation labor	☐	0788 $ .00

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SECTION 15 IRRIGATION PRACTICES IN 2008

1. How did this operation decide when to schedule water use in 2008? Mark (X) all that apply –

0527
- 1 ☐ Condition of crop (observation)
- 2 ☐ Feel of the soil
- 3 ☐ Use of soil moisture-sensing devices such as moisture blocks or tensionmeters
- 4 ☐ Use of plant moisture-sensing devices such as pressure (chamber) bombs or infrared (IR) thermometer
- 5 ☐ Use of irrigation scheduling service, including commercial and government
- 6 ☐ Reports on daily crop-water evapo-transpiration (ET) use (Internet, newspapers, radio, TV, fax, and email)
- 7 ☐ Water delivered by irrigation organization in turn (no choice by water user)
- 8 ☐ Personal calendar schedule
- 9 ☐ Computer simulation models (not from a commercial service)
- 10 ☐ When neighbors began to irrigate
- 11 ☐ Other – Specify → _____

2. Did this operation have to discontinue irrigation during 2008 long enough to affect crop yields?

0669
- 1 ☐ **Yes –** Continue
- 3 ☐ **No –** Go to SECTION 16

a. Mark (X) all reasons that apply –

0670
- 1 ☐ Shortage of surface water (water from reservoirs, lakes, streams, water supply organizations, etc.)
- 2 ☐ Shortage of ground water (lowering water level of wells or depletion of ground water)
- 3 ☐ Irrigation equipment failure
- 4 ☐ Energy price increases or energy shortage
- 5 ☐ Poor water quality
- 6 ☐ Loss of water rights not due to voluntary transfers
- 7 ☐ Cost of purchased water
- 8 ☐ Other – Specify → _____

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SECTION 16 OTHER USES OF IRRIGATION WATER ON THIS OPERATION IN 2008

1. Report irrigation used for any of the following purposes –

	None	Acres on Which Applied
a. Prevent freeze damage	☐	0440
b. Crop cooling to delay early budding, blooming, or to reduce heat stress (cool crop canopy)	☐	0441
c. Leaching to remove salts from the soil (salinity control)	☐	0442
d. Disposal of liquid livestock waste	☐	0488
e. To provide wildlife or waterfowl habitat	☐	0439
f. Other – Specify →	☐	0443

SECTION 17 WATER MANAGEMENT PRACTICES FOR GRAVITY IRRIGATION SYSTEMS

1. Did this operation use gravity irrigation systems to irrigate any of the acres on this operation (SECTION 4, item 1) in 2008?

0671 1 ☐ **Yes** – Continue 3 ☐ **No** – Go to SECTION 18

2. On how many acres did you use the following techniques?

	None	Number of Acres
a. Irrigation water captured for further use (tailwater pits)	☐	0672
b. Water restricted from running off by diking end of field	☐	0789
c. Surge flow or cablegation technique	☐	0673
d. Shortening of furrow length	☐	0684
e. Limited irrigation set time or number of irrigations, to reduce water applied	☐	0685
f. Alternate row irrigation	☐	0686
g. Water-soluble polyacrylamide (PAM)	☐	0699
h. Mulch or other types of row covers	☐	0790
i. Gravity system with laser leveling	☐	0791
j. Special furrowing techniques, such as wide-spaced bed furrowing, compacted furrowing, or furrow diking – Specify technique used →	☐	0674

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SECTION 18 IMPROVEMENTS TO IRRIGATION SYSTEMS ON THIS OPERATION SINCE 2003 THAT REDUCED ENERGY USE AND/OR CONSERVED WATER

Consider as an improvement changes in equipment or management practices. For example, retrofitting a sprinkler system for low pressure operation or adopting irrigation scheduling as a management practice.

1. Has this operation implemented improvements to its irrigation system on existing irrigated acres since 2003?

0693 1 ☐ **Yes –** Continue 3 ☐ **No –** Go to item 3 below

2. What were the results of these improvements on a per-acre basis? Mark (X) all that apply –

0694
1 ☐ Improved crop yield or quality
2 ☐ Reduced energy costs
3 ☐ Reduced water applied
4 ☐ Reduced labor costs
5 ☐ Reduced fertilizer or pesticide losses
6 ☐ Reduced soil erosion
7 ☐ Reduced tailwater
8 ☐ Other – Specify →

3. What are barriers to implementing improvements that might reduce energy and/or conserve water in this operation's irrigation system? Mark (X) all that apply –

0695
1 ☐ Investigating improvements is not a priority at this time
2 ☐ Risk of reduced yield or poorer quality crop yields from not meeting water needs
3 ☐ Physical field/crop conditions limit system improvements
4 ☐ Improvement(s) will reduce costs, but not enough to cover installation costs
5 ☐ Cannot finance improvements
6 ☐ Landlord(s) will not share cost of improvements
7 ☐ Uncertainty about future availability of water
8 ☐ Will not be farming this operation long enough to justify new improvements
9 ☐ Other – Specify →

SECTION 19 SOURCES OF IRRIGATION INFORMATION

1. 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 –

0696
1 ☐ Extension agents or university specialists
2 ☐ Private irrigation specialists or crop consultants hired by owner or operator
3 ☐ Irrigation equipment dealers
4 ☐ Local irrigation district employees or others hired by the water supplier
5 ☐ Government specialists from the Natural Resources Conservation Service, local conservation district, Bureau of Reclamation, or other federal and state agencies
6 ☐ Media reports or information in the press
7 ☐ Neighboring farmers
8 ☐ Electronic information services (Internet, DTN, Internet links to private or public data sources, etc.)
9 ☐ Other – Specify →

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SECTION 20 RECYCLED AND/OR RECLAIMED WATER USE ON THIS OPERATION IN 2008

Report recycled and reclaimed water use in 2008 separately. **Recycled water** is the reuse of surface or groundwater that has already been used to irrigate a crop on the operation (i.e. water recycled from a tailwater reuse pit).
Reclaimed water is wastewater that has been treated for non-potable reuse purposes. Include any reclaimed water used from livestock operations or from off-farm wastewater sources such as municipal or industrial wastewater.

RECYCLED WATER

1. Did this operation use recycled water to irrigate any crops in 2008?

0600 1 ☐ **Yes** – Continue 3 ☐ **No** – Go to item 2 below

a. How many acres on this operation were irrigated with one or more applications of recycled water during 2008? . . . . . | Acres 0601 |

RECLAIMED WATER

2. Did this operation use reclaimed water to irrigate any crops in 2008?

0603 1 ☐ **Yes** – Continue 3 ☐ **No** – Go to SECTION 22

a. How many acres on this operation were irrigated with one or more applications of reclaimed water during 2008? . . . . . | Acres 0604 |

b. How much reclaimed water was used on this operation for irrigation during 2008? . . . . . | Acre-Feet 0605 .____ | or | Gallons 0606 |

3. Identify the sources of reclaimed water used on this operation in 2008. Mark (X) all that apply –

0607
- 1 ☐ Municipal
- 2 ☐ Industrial
- 3 ☐ On-farm livestock operation
- 4 ☐ Off-farm livestock operation
- 5 ☐ Other – Specify → ____

4. Was any reclaimed water purchased for use on this operation in 2008?

0608 1 ☐ **Yes** – Continue 3 ☐ **No** – Go to item 5 below

a. How much reclaimed water was purchased in 2008? . . . . | Acre-Feet 0609 .____ | or | Gallons 0610 |

b. What was the average price **paid** for reclaimed water in 2008? . . . . . | Dollars Per Acre-Foot 0611 $ .00 | or | Dollars Per 1,000 Gallons 0612 $ .00 |

5. Did this operation receive payment for reclaimed water used on this operation in 2008?

0613 1 ☐ **Yes** – Continue 3 ☐ **No** – Go to SECTION 22

a. How much reclaimed water did this operation receive payment for in 2008? . . . . . | Acre-Feet 0614 .____ | or | Gallons 0615 |

b. What was the average price **received** for using reclaimed water in 2008? . . . . . | Dollars Per Acre-Foot 0616 $ .00 | or | Dollars Per 1,000 Gallons 0617 $ .00 |

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SECTION 21 IRRIGATED LAND IN 2007

Complete this section ONLY if you DID NOT irrigate any land in 2008

1. Was any land irrigated on this operation in 2007?

0528 1 ☐ **Yes** – Continue 3 ☐ **No** – Go to SECTION 22

2. Reasons for not irrigating in 2008 – Mark (X) all that apply

0529
- 1 ☐ Sufficient soil moisture – no irrigation needed
- 2 ☐ Surplus soil moisture or flooding
- 3 ☐ Shortage of surface water (water from reservoirs, lakes, streams, water supply organizations, etc.)
- 4 ☐ Shortage of ground water (lowering water level of wells or depletion of ground water)
- 5 ☐ Irrigation uneconomical due to high fuel and power costs and/or low commodity prices
- 6 ☐ Abandoned irrigation because of land degradation (soil erosion, soil salinity, etc.)
- 7 ☐ Loss of water rights (not due to voluntary transfers)
- 8 ☐ Restrictions on water use
- 9 ☐ Sold or leased water rights or annual water allocation
- 10 ☐ Converted to non-agricultural use
- 11 ☐ Converted to an agricultural enterprise not requiring irrigation
- 12 ☐ Available surface water too salty due to drought conditions
- 13 ☐ Other – Specify →

3. Do you consider the discontinuance of irrigation on this operation to be permanent?

0530 1 ☐ **Yes** 3 ☐ **No**

SECTION 22 VALUE OF SALES IN 2008

1. What was the gross value of all agricultural products sold from this operation in 2008? Include 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

	Percent
2. What percent of total sales were from **irrigated** crop sales?	0981
3. What percent of total sales were from **non-irrigated** crop or livestock sales?	0982
	100%

SECTION 23 PERSON COMPLETING THIS FORM – Please print

Name	Date (MM-DD-YYYY)	Telephone with Area Code
	9910 __ __-__ __-__ __ __ __	

Would you like to receive a free copy of the results of this survey in the mail? 0099 1 ☐ **Yes** 3 ☐ **No**

The survey results will also be available on the Internet at http://www.nass.usda.gov in the fall of 2009.

Thank you for your response

OFFICE USE

Response		Respondent		Mode		Enum.	Eval.	Optional Use	
1-Comp 2-R 3-Inac	9901	1-Op/Mgr 2-Sp 3-Acct/Bkpr 4-Partner 9-Oth	9902	1-Mail 2-Tel 3-Face-to-Face 4-CATI 5-Web	9903	0098	0100	0002	0003

S/E Name

80621162

DUE FEBRUARY 17, 2009

OMB No. 0535-0234: Approval Expires 12/31/2011

2008 HORTICULTURAL IRRIGATION SURVEY

Form Number: 08-A622
(12/03/08)

USDA

AGRICULTURE COUNTS NASS

National Agricultural Statistics Service

Please return your completed report to:

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

OFFICE USE ONLY

0009	0010	0011

08-A622

Please make corrections to name, address, and ZIP code if necessary.

Everyone who receives a form must return one by mail or via the Internet at **www.agcensus.nass.usda.gov**. Your report is due by **February 17, 2009**. To fill out the paper form, use a black or blue ballpoint pen. **Duplicate forms?** If you received extra report forms for the SAME farming operation, return all report forms in the same envelope with this completed report.

Questions? Call us toll-free at **1-888-424-7828**. Thank you for your cooperation.

SECTION 1 HORTICULTURE OPERATION

1. Were any nursery, floriculture, or greenhouse crops, including ornamental plants, mushrooms, aquatic plants, Christmas trees, short rotation woody crops, vegetable or tobacco transplants, sod, food crops under protection, vegetable seeds, flower seeds, or other propagative materials grown for sale on this operation in 2008?

   0001 1 ☐ **Yes –** Continue 3 ☐ **No –** Go to SECTION 9

2. Did retail and wholesale sales (total gross sales) of horticultural crops grown or produced on this operation total $10,000 or more during 2008?

   0004 1 ☐ **Yes –** Continue 3 ☐ **No –** Go to SECTION 9

3. Did this operation IRRIGATE or WATER any horticultural crops in 2008?

   0005 1 ☐ **Yes –** Please complete this report form 3 ☐ **No –** Go to SECTION 8

PENALTY FOR FAILURE TO REPORT

NOTICE: Response to this inquiry is required by law (Title 7, U.S. Code). By the same law, YOUR REPORT IS CONFIDENTIAL and it will only be used for statistical purposes. Your report CANNOT be used for purposes of taxation, investigation, or regulation. The law also provides that copies retained in your files are immune from legal process.

80622012

SECTION 2 IRRIGATION AREA, METHODS, AND WATER APPLIED TO HORTICULTURAL CROPS GROWN UNDER PROTECTION IN 2008

1. Were any irrigated nursery, greenhouse, floriculture, mushrooms, propagative materials, or other horticultural crops grown under protection on this operation in 2008?

0627 1 ☐ **Yes** – Continue 3 ☐ **No** – Go to SECTION 4

2. Report total area and irrigated area for horticultural crops grown under protection. . . . . .

Square Feet Under Protection	
Total Area	Irrigated Area
0628	0629

3. For horticultural crops under protection, enter the total area and irrigated area by horticultural crop category on this operation in 2008.

Horticultural Crops	None	1 Total Area (Square Feet)	2 Irrigated Area (Square Feet)
a. Floriculture and bedding crops	☐	0630	0631
b. Nursery crops	☐	0632	0633
c. Propagative materials	☐	0636	0637
d. Food crops grown under protection	☐	0638	0639
e. Mushroom crops	☐	0640	0641
f. Other – Specify → _____ . . .	☐	0642	0643

4. For horticultural crops under protection, report area irrigated or watered in 2008 by method used. If more than one method was used, report all that apply. Report quantity of water in the unit or units of measure most used on this operation. If total quantity of water (column 2a) and the unit of measure (column 2b) are known, then skip column 3.

Irrigation Methods	None	1 Total Area Irrigated or Watered (Square Feet)	2 a. Quantity of Water Applied	2 b. Unit of Measure [Enter unit code] 1 Acre Feet 2 Gallons 3 Gallons/Sq Feet 4 Inches/Sq Feet 5 Other – Specify	OR 3 a. Average Flow Rate (Gallons per Minute)	3 b. Number of Hours per Week Method Used	3 c. Number of Weeks Method Used
a. Hand watered	☐	0701	0702	0703	0704 . ___	0705	0706
b. Gravity irrigation.	☐	0707	0708	0709	0710 . ___	0711	0712
c. Sprinkler	☐	0713	0714	0715	0716 . ___	0717	0718
d. Drip, trickle, or low-flow micro irrigation	☐	0719	0720	0721	0722 . ___	0723	0724
e. Subirrigation.	☐	0725	0726	0727	0728 . ___	0729	0730

80622020

SECTION 3 IRRIGATION OF HORTICULTURAL CROPS GROWN UNDER PROTECTION BY WATER SOURCE IN 2008

1. For each method used to irrigate or water horticultural crops grown under protection, report water sources by percent of 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 a. If this operation applied ground water by gravity half the time and surface from on-farm by gravity the other, then report 50 percent in column a, row b and 50 percent in column b, row b.

Irrigation Methods	None	Water Source		
			Surface Water	
		a. Ground Water From Wells (Percent)	b. On-Farm (Percent)	c. Off-Farm (All Suppliers) (Percent)
a. Hand watered	☐	0646	0647	0648
b. Gravity irrigation	☐	0649	0650	0651
c. Sprinkler	☐	0652	0653	0654
d. Drip, trickle, or low-flow irrigation	☐	0655	0656	0657
e. Subirrigation	☐	0658	0659	0660

For each irrigation method used, columns a + b + c must equal 100 percent.

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SECTION 4 IRRIGATION AREA, METHODS, AND WATER APPLIED TO HORTICULTURAL CROPS GROWN IN THE OPEN IN 2008

1. Were any irrigated nursery, greenhouse, floriculture, sod, propagative materials, or other horticultural crops grown in the open (including natural shade) on this operation in 2008?

0751 1 ☐ **Yes** – Continue 3 ☐ **No** – Go to SECTION 6

2. Report total acres and irrigated acres for horticultural crops grown in the open (including natural shade). . . . . .

Acres In The Open	
Total Acres (Nearest Tenth)	Irrigated Acres (Nearest Tenth)
0737 .__	0738 .__

3. For horticultural crops in the open, enter the total acres and irrigated acres by horticultural crop category on this operation in 2008.

Horticultural Crops	None	1 Total Acres (Tenth Acre)	2 Irrigated Acres (Tenth Acre)
a. Floriculture and bedding crops	☐	0739 .__	0740 .__
b. Nursery crops	☐	0741 .__	0742 .__
c. Sod	☐	0743 .__	0744 .__
d. Propagative materials	☐	0745 .__	0746 .__
e. Christmas trees and short rotation woody crops . .	☐	0747 .__	0748 .__
f. Other – Specify → _____ . . .	☐	0749 .__	0750 .__

4. For horticultural crops in the open, report acres irrigated or watered in 2008 by method used. If more than one method was used, report all that apply. Report quantity of water in the unit or units of measure most used on this operation. If total quantity of water (column 2a) and the unit of measure (column 2b) are known, then skip column 3.

Irrigation Methods	None	1 Total Acres Irrigated or Watered (Tenth Acre)	2 a. Quantity of Water Applied	2 b. Unit of Measure [Enter unit code] 1 Acre Feet 2 Gallons 3 Inches/Acre 4 Other – Specify	OR 3 a. Average Flow Rate (Gallons per Minute)	3 b. Number of Hours per Week Method Used	3 c. Number of Weeks Method Used
a. Hand watered	☐	0796 .__	0797	0798	0799 .__	0800	0801
b. Gravity irrigation	☐	0802 .__	0803	0804	0805 .__	0806	0807
c. Sprinkler	☐	0808 .__	0809	0810	0811 .__	0812	0813
d. Drip, trickle, or low-flow micro irrigation	☐	0814 .__	0815	0816	0817 .__	0818	0819
e. Subirrigation	☐	0820 .__	0821	0822	0823 .__	0824	0825

80622046

SECTION 5 IRRIGATION OF HORTICULTURAL CROPS GROWN IN THE OPEN BY WATER SOURCE IN 2008

1. For each method used to irrigate or water horticultural crops grown in the open, report water sources by percent of 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 a. If this operation applied ground water by gravity half the time and surface from on-farm by gravity the other, then report 50 percent in column a, row b and 50 percent in column b, row b.

Irrigation Methods	None	Water Source		
			Surface Water	
		a. Ground Water From Wells (Percent)	b. On-Farm (Percent)	c. Off-Farm (All Suppliers) (Percent)
a. Hand watered	☐	0832	0833	0834
b. Gravity irrigation	☐	0835	0836	0837
c. Sprinkler	☐	0838	0839	0840
d. Drip, trickle, or low-flow micro irrigation	☐	0841	0842	0843
e. Subirrigation	☐	0844	0845	0846

For each irrigation method used, columns a + b + c must equal 100 percent.

80622053

SECTION 6 RECYCLED AND/OR RECLAIMED WATER USE IN 2008

Report recycled and reclaimed water use in 2008 separately. **Recycled water** is the reuse of surface or groundwater that has already been used to irrigate a crop on the operation (i.e. water recycled from a tailwater reuse pit).
Reclaimed water is wastewater that has been treated for non-potable reuse purposes. Include any reclaimed water used from livestock operations or from off-farm wastewater sources such as municipal or industrial wastewater.

RECYCLED WATER

1. Did this operation use recycled water to irrigate any horticultural crops in 2008?

0935 1 ☐ **Yes** – Continue 3 ☐ **No** – Go to item 2 below

	Area Under Protection (Square Feet)	Acres In The Open (Nearest Tenth)
a. How much of the horticultural area on this operation was irrigated with one or more applications of recycled water during 2008?	0936	0937 . ___

RECLAIMED WATER

2. Did this operation use reclaimed water to irrigate horticultural crops in 2008?

0939 1 ☐ **Yes** – Continue 3 ☐ **No** – Go to SECTION 7

	Area Under Protection (Square Feet)	Acres In The Open (Nearest Tenth)
a. How much of the horticultural area on this operation was irrigated with one or more applications of reclaimed water during 2008?	0940	0941 . ___

	Total Gallons
b. How much reclaimed water was used to irrigate horticultural crops on this operation during 2008?	0938

3. Identify the sources of the reclaimed water used on this operation for horticultural crops during 2008. Mark (X) all that apply.

0942
1 ☐ Municipal
2 ☐ Industrial
3 ☐ On-farm livestock operation
4 ☐ Off-farm livestock operation
5 ☐ Other – Specify → _____

4. Was any reclaimed water purchased for horticultural crops on this operation in 2008?

0943 1 ☐ **Yes** – Continue 3 ☐ **No** – Go to item 5

	Total Gallons
a. How much reclaimed water was purchased in 2008?	0944

	Dollars Per 1,000 Gallons
b. What was the average price **paid** for reclaimed water in 2008?	0945 $ .00

5. Did this operation receive payment for reclaimed water used on this operation for horticultural crops in 2008?

0946 1 ☐ **Yes** – Continue 3 ☐ **No** – Go to SECTION 7

	Total Gallons
a. How much reclaimed water did this operation receive payment for in 2008?	0947

	Dollars Per 1,000 Gallons
b. What was the average price **received** for using reclaimed water in 2008?	0948 $ .00

80622061

SECTION 7 OTHER USES OF IRRIGATION WATER ON THIS OPERATION IN 2008

1. Report the horticultural areas on this operation that were irrigated for the following purposes:

	None	Area On Which Applied: Area Under Protection (Square Feet)	None	Area On Which Applied: Acres In The Open (Nearest Tenth)
a. Prevent freeze damage	☐	0619	☐	0620 ▪ ___
b. Crop cooling to delay early budding, blooming, or to reduce heat stress (cool crop canopy)	☐	0621	☐	0622 ▪ ___
c. Leaching to remove salts from the soil (salinity control)	☐	0623	☐	0624 ▪ ___
d. Other – Specify →	☐	0625	☐	0626 ▪ ___

2. **Skip Section 8 and go to Section 9.**

SECTION 8 IRRIGATED LAND IN 2007

Complete this section ONLY if you DID NOT irrigate or water any horticultural crops in 2008.

1. Was any land used to grow horticultural crops, irrigated on this operation in 2007?

0528 1 ☐ **Yes** – Continue 3 ☐ **No** – Go to SECTION 9

2. Reasons for not irrigating horticultural crops in 2008 – Mark (X) all that apply.

0529
1 ☐ Sufficient soil moisture – no irrigation needed
2 ☐ Surplus soil moisture or flooding
3 ☐ Shortage of surface water (water from reservoirs, lakes, streams, water supply organizations, etc.)
4 ☐ Shortage of ground water (lowering water level of wells or depletion of ground water)
5 ☐ Irrigation uneconomical due to high fuel and power costs and/or low commodity prices
6 ☐ Abandoned irrigation because of land degradation (soil erosion, soil salinity, etc.)
7 ☐ Loss of water rights (not due to voluntary transfers)
8 ☐ Restrictions on water use
9 ☐ Sold or leased water rights or annual water allocation
10 ☐ Converted to non-agricultural use
11 ☐ Converted to an agricultural enterprise not requiring irrigation
12 ☐ Available surface water too salty due to drought conditions
13 ☐ Other – Specify →

3. Do you consider the discontinuance of irrigation of horticultural crops on this operation to be permanent?

0530 1 ☐ **Yes** – Continue 3 ☐ **No** – Continue

80622079

SECTION 9 VALUE OF SALES IN 2008

1. What was the gross value of all agricultural products sold from this operation in 2008? Include 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

	Percent
2. What percent of total sales were from **irrigated horticultural crop** sales?	0983
3. What percent of total sales were from **all other crop or livestock** sales? Include non-irrigated horticultural sales	0984
	100%

SECTION 10 PERSON COMPLETING THIS FORM – Please print

Name	Date (MM-DD-YYYY)	Telephone with Area Code
	9910 __ __ - __ __ - __ __ __ __	

Would you like to receive a free copy of the results of this survey in the mail? . . . . . 0099 1 ☐ **Yes** 3 ☐ **No**

The survey results will also be available on the Internet at http://www.nass.usda.gov in the fall of 2009.

Thank you for your response

OFFICE USE

Response		Respondent		Mode		Enum.	Eval.	Optional Use	
1-Comp 2-R 3-Inac	9901	1-Op/Mgr 2-Sp 3-Acct/Bkpr 4-Partner 9-Oth	9902	1-Mail 2-Tel 3-Face-to-Face 4-CATI 5-Web	9903	0098	0100	0002	0003

S/E Name

80622087

Form Number: 08-A621(I)

INSTRUCTION SHEET
2008 FARM AND RANCH IRRIGATION SURVEY (FRIS)

Completing the 2008 FRIS Questionnaire

Make all entries clear and easy to read. Use a **blue** or **black** ball point pen.

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. Because it 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.

If you did not irrigate or water any cropland, pastureland, or rangeland in 2008, go to Section 21 on the back page and complete the remainder of the questionnaire. If you operated no land in 2008, go to Section 23 on the back page and complete the remainder of the questionnaire.

Partial Year Operation
If you stopped farming at any time during 2008, complete the questionnaire for the portion of 2008 that you did farm. Write "Stopped farming in 2008" and the date you stopped farming below the address area. Mail the completed questionnaire in the return envelope.

If You Receive More Than One Questionnaire for the Same Operation
Return any duplicate questionnaires in the same envelope with the completed questionnaire(s). In the address area of the questionnaire(s) you complete, write the 11-digit ID number from the label of the extra questionnaire(s).

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 Receive More Than One Questionnaire For The Same Operation" above.

How to Enter Your Responses on the Questionnaire
Please enter your answers in the proper spaces 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

Section 1 - Acreage in 2008

Report land owned, rented, or used by the respondent, spouse, partnership, corporation, or organization identified on the questionnaire. **Include** all land, regardless of location or use; Conservation Reserve Program (CRP), Wetlands Reserve Program (WRP) land, Farmable Wetlands Program (FWP), Conservation Reserve Enhancement Program (CREP), cropland, pastureland, rangeland, woodland, idle land, house lots, etc. **Exclude** land used under a grazing permit. All responses in this section should be rounded to whole acres. Small horticulture operations less than one acre should be reported as one acre.

Item 1 **-** Report all land owned in 2008 by you and/or your spouse, or by the partnership, corporation, or organization named on the questionnaire. Include all fields and tracts of cropland, pastureland, woodland, wasteland, idle land, farmsteads, etc.

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 for part of the year. **Exclude** land used on a per head basis under a grazing permit or animal unit (AUM) basis.

Item 3 **-** Report all land rented or leased to others for cash or for a share of the crops, if the acres were part of the acreage reported in items 1 or 2.

Item 4 **-** The acres in item 4 should equal item 1 plus item 2 minus item 3. All responses to this questionnaire should refer these **total acres in this operation**. It is necessary that this number is correct as it is used in editing to establish consistency throughout the questionnaire. The acreage of this operation must equal the acreage reported later in Section 2, item 5, column 1.

Section 2 - Land in 2008

Distribute all acres in **this operation** in column 1 and all irrigated land in **this operation** in column 2. If the same land had more than one use in 2008, report that land only once in the first use listed that applies.

In addition to fully irrigated land, in column 2 report as irrigated any land to which partial, supplemental, or semi-irrigation was applied. 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 distributed by a sprinkler or flood system.

Report 2008 conservation program land such as CRP, WRP, FWP, and CREP use as follows. 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 is cropland used for pasture. Except for disaster designation uses, almost all conservation program land will be reported in item 1c, other cropland.

Item 1a **-** Include land from which crops, including hay and forage, were harvested and land in groves, vineyards, berries, orchards, Christmas trees (whether harvested in 2008 or not), short rotation woody crops, nursery and greenhouse crops.

For winter wheat, report the 2008 acres harvested.

For double cropped acres if more than one crop was harvested from the same land in 2008, report those acres only once as cropland harvested. If all or part of your crop acreage was double cropped, the sum of acres of crops harvested and irrigated crops harvested in sections 8 and 9 may exceed item codes 0029 and 0030, respectively.

Item 1b **-** Include rotation pasture and grazing land that could have been used for crops without additional improvements. Exclude land used under a grazing permit.

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. Most conservation program land should be reported here in item 1c, but conservation program land cut for hay or forage should be in item 1a, and those acres that were grazed should be reported in item 1b. Report conservation program acres in only one category in Section 2.

Land on which sugarcane and pineapples were grown but not harvested in 2008, are reported as other cropland, item 1c.

Item 2 **-** Include woodland pastured and woodland not pastured. Report the acres in Christmas trees and short rotation woody crops that were cut in 2008 and will be cut in later years as "cropland harvested." A short rotation woody crop is a tree that is harvested in 10 years or less. These trees are used by the paper or pulp industry or as engineered wood.

Item 3 **-** Include any pastured land other than cropland and woodland pastured.

Item 4 - Any land that does not fit into one of the above categories. Include land in roads, buildings, farmsteads, wasteland etc.

Item 5 - This should equal the sum of all land uses listed in items 1 through 4. Also, Section 2, item 5 acres must equal acres in "this operation" reported in Section 1, item 4.

Anyone who irrigated any land in 2008 should complete the entire report form. **Note**: If acres irrigated in column 2, item 5, equals zero, skip to Section 21.

Item 6 - Report the state and county with the largest amount of irrigated land for "this operation." If you irrigate in more than one county and the amount irrigated happens to be the same, then report the county that includes your farmstead.

Section 3 - Government Programs in 2008

If you received any government payment, you should answer this section for those questions that apply.

Section 4 - Method of Water Distribution on this Operation in 2008

This section refers to the method used to distribute irrigation water. 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 1 - 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 1a - Row crops are generally irrigated by water flowing down furrows.

Item 1b – 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 1c - 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 1d - Report acreage here if not reported in any of the above categories.

Item 2 - Sprinkler irrigation is separated into five categories: center pivot, linear move tower, solid set and permanent systems, mechanical move systems, and hand move systems. Report the pressure at the nozzle.

Item 2a - 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 2b - Linear move tower systems and other linear continuous move drive systems are self-propelled systems that travel in straight lines across the field.

Item 2c - Report for solid set and permanent systems. Exclude low-flow micro systems.

Item 2di - Mechanical move systems include side roll, wheel move, other mechanical move systems, and other discrete move systems.

Item 2dii - Big gun or Traveler systems use large pulsating sprinklers and travel across the area being watered.

Item 2e - Hand move systems are any non-self-propelled system which must be moved manually.

Item 3 - 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 near the plant's roots.

Item 3a - Report acres which on or above ground surface drip irrigation was used.

Item 3b - Report acres which sub-surface, root zone, drip was used.

Item 3c - Report acres 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 4 - Subirrigation is sometimes referred to as water seepage. It is used to maintain a water table at a predetermined depth. These systems may be permanently in place below the rootline. Water is usually applied by using emitters. Subirrigation includes ebb and flow, trough, flooded floor, or other hydroponic methods.

The total acres, by method of water distribution, should be equal to or greater than Section 2, column 2, item 5, total acres irrigated, code 0042. Every acre reported as irrigated in Section 2 needs to be reported by method of irrigation in Section 4. If you use multiple methods of water distribution for the same acres, this sum may be larger than item code 0042.

Section 5 - Acres Irrigated, Estimated Quantity of Water Used, and Off-farm Supplied Water Used on This Operation by Source in 2008

One method of estimating pumped water is to multiply the hours recorded on the pump engine by the gallons per minute (G.P.M.). Estimate, if exact figures are not known.

Water usage for this survey will be published in acre-feet. This is the quantity of water needed to cover one acre to the depth of one foot, or 326,000 gallons.

The sum of acres irrigated from all water sources in Section 5, item 1 must be equal to or greater than item code 0042, total acres irrigated, in Section 2, item 5, column 2. If you use multiple sources of water for the same acres, the sum of acres in Section 5 may be larger than item code 0042.

Item 1 - Report acres irrigated by ground water, on farm surface water, and off farm surface water.

Definitions for Water Sources

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

Item 2 - Report estimated quantity of water used on this operation by only one of the following units:
(a) total acre feet; or
(b) average acre feet per acre; or
(c) average inch applied per acre; or
(d) average gallons of water applied per minute (GPM) and duration in total number of 24 day equivalents; or
(e) average flow in cubic feet per second (CFS) and duration in total number of 24-hour day equivalents.

Item 3 - Report if this operation received any off-farm water and total cost, if any was purchased. Report in whole dollars.

Item 4 - Report the supplier of off-farm water, if any was received.

Section 6 - Water Transfers in 2008

Item 1 - If you rented or leased part or all of the 2008 water allotment for the farm operation to others for use off the farm, then record a YES for item 1 and continue with item 2. If your response to Item 1 is NO, check the NO response box and then go to Section 7.

Item 2 - Record your best estimate of the quantity of water (in acre-feet) transferred to others in 2008 by water source. Include only the water you rented or leased to others for either agricultural or non-agricultural use off this operation.

Item 3 - Water that is transferred off-farm may be put to one or more alternative uses. To the best of your knowledge, indicate the uses of the transferred water. Be sure to check only those uses that apply. Your response may include from 1 to 3 checks (for options 1 - 3). If the use of the transferred water is unknown, check option 4 and then check one of the reasons, (a) or (b), why the use of the transferred water was unknown.

Section 7 - Expenditures for Irrigation Facilities and Equipment on This Operation in 2008

For the construction and improvement categories report the expenditures in column 1, the principal purpose of the expenditure in column 2, and the primary source of funding assistance or whether funding assistance was needed. Report any expense incurred in **maintaining** the irrigation system in Section 13.

Section 8 - Acres Harvested, Crop Yields, and Pasture on This Operation in 2008

Report the acres of each crop harvested and its corresponding average yield per acre separately for irrigated acres and for non-irrigated acres. Report acres of each crop harvested, even when

multiple crops have been harvested off the same land. In addition, for each irrigated crop harvested, report the estimated average
quantity of water applied per acre for the 2008 irrigation season. Report water applied in average acre-feet per acre or in inches per acre (but not both). Acre-feet per acre should be reported to the
nearest tenth of a foot (for example, 1.6 or 2.3 acre-feet per acre), while acre-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 8 should be equal to or greater than Section 2, item 5, column 2, item code 0042, total acres irrigated, less any acres reported in column two, item 1c, other cropland irrigated that do not relate to Section 8.

Any harvested crop not pre-listed should be entered under item 19 'all other crops.' Report the crop name in the 'specify' area. **Note:** For winter wheat, report the acres harvested in 2008.

Section 9 - Primary Method of Water Distribution, Application of Agricultural Chemicals in Irrigation Water, and Water Source by Irrigated Acreage Harvested on This Operation in 2008

For each crop with irrigated acres harvested reported in Section 8, report the primary type of irrigation system in column 1 by selecting the appropriate irrigation system ID code from the system ID code list above the table. Report the percent of the crop acres irrigated using this system in the second column.

Then, for each irrigated crop, report the number of acres that were irrigated applying chemigation, that 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 crop, an irrigated acre harvested 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 8.

Report the acres of the irrigated crop by water source.

Section 10 - Number of Irrigation Wells on This Operation in 2008, Including Well Depth and Pumping Capacity

Item 1 - Please report if this operation irrigated any land with water from wells on this operation at any time during 2008.

Item 2 - Report the total number of wells used on this operation in 2008. Any well not used will be reported later in item 7.

Item 2a - Report the well characteristics and use for up to 3 primary wells pumped on this operation in 2008. **Note**: The 3 primary wells should include those wells with the greatest quantity of water pumped in 2008. Report the individual well characteristics and use even if these values are similar across wells. If less than 3 wells were pumped in 2008, then only report for those wells used.

Item 2b - If you used more than 3 wells in 2008, then for all other wells (excluding the 3 primary wells), report the average value for each well characteristic and use.

Item 3 - Report the number of pumping stations for all wells reported in item 2 above that used backflow prevention devices (check valves) in 2008.

Item 3a - Report the number of acres irrigated in 2008 with water pumped from wells with backflow prevention devices.

Item 4 - Report how many wells reported in item 2 above used flow meters or flow measuring devices.

Item 4a - Report the number of acres irrigated in 2008 with water from wells with flow measurement devices.

Item 5 - 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 2008.

Item 6 - Free flowing wells refers to artesian wells that do not require pumping the water to the surface. Water flows to the surface under natural pressure. These are most commonly found in Florida and some western states. Pumps may be used to distribute the water from a holding pond or other type of basin to the field and/or to create sufficient pressure for the field-level
irrigation system. Report the number of free-flowing (artesian) wells used in 2008.

Item 7 - Report the number of operational wells that could have been used in 2008 but were not used. This includes any well that was not used due to needed repairs but only if the respondent plans to repair the well in the future and continue to use the well. Any well which is not operational, and for which the respondent has no plans to ever use again, should be considered abandoned. If all operational wells were in use check the "none" box.

Section 11 - Pumps, Other Than Well Pumps, Used For Irrigation on This Operation in 2008

These are pumps that were or could be used for lifting surface water from rivers and streams, irrigation channels, ponds and other water holding systems. Tailwater pits hold water that was recovered from irrigated land for recycling.

Some irrigation systems using water from wells may also have pumps in places other than their wells to provide additional lift, especially on farms with large distribution systems or irregular terrain. These pumps are often referred to as booster pumps. Do not include pumps here that were reported in Section 10.

Vertical lift refers to the average surface-level feet-of-lift the pumps must raise the water in order 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

Section 12 - Energy Used on This Operation in 2008 for Pumping Water by Power Source

For each energy source report the number of well pumps and other pumps, the cost of the energy used to power pumps (include the landlord's share of pumping costs), and the

number of acres irrigated by water source. 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 5, column 2, item code 0042. The difference should equal those acres irrigated using no pumps to supply water to the field.

Section 13 - Maintenance and Repair Costs for Irrigation Equipment and Facilities on This Operation in 2008

Report any expense incurred in maintaining the irrigation system including landlord's share. For this section do not include payments made for expanding the system, increasing efficiency, or new construction reported in Section 7.

Section 14 - Labor Costs for Irrigation on This Operation in 2008

Report hired labor expenses for irrigation activities in item 1a and report contract labor expenses for irrigation activities in item 1b. Labor costs here should pertain only to the operation and maintenance of the irrigation system and facilities. **Include** the landlord's share of irrigation labor costs. **Exclude** cost for custom work and contract labor for harvesting.

Section 15 - Irrigation Practices in 2008

Item 1 - Report on the method or approach used to decide when to schedule water applications in 2008. Mark all that apply. If "other," is marked, report the practice in the "specify" response area.

Item 2 - Report in item 2 whether this operation had to discontinue irrigation in 2008 long enough to affect crop yield. 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.

Section 16 - Other Uses of Irrigation Water on This Operation in 2008

Report acres on which irrigation water was used for other than crop consumptive use. Report the area only once, regardless of how many applications were applied to the same area. If acres are reported in the "other" technique, report the technique in the "specify" response area.

Section 17 - Water Management Practices for Gravity Irrigation Systems

If you reported gravity irrigation in Section 4, then complete this section. For each item a through j, report the number of gravity irrigated acres using the specific technique.

Section 18 - Improvements to Irrigation Systems on This Operation Since 2003 that Reduced Energy Use and/or Conserved Water

Report results of improvements made to existing irrigation systems since 2003 listed in item 2. Any changes to the system to increase its size and bring more acres under irrigation should not be included here. Report in item 2 all the results of improvements on existing irrigation systems. For example, if a farmer installs new equipment on 200 acres of existing irrigated land that reduced energy use, and at the same time increases his irrigation by another 100 acres, the responses should only be for the original 200 acres. Report in item 3 any barriers to implementing improvements to existing irrigation systems.

Section 19 - Sources of Irrigation Information

Mark all that apply. If "other" is marked, report the source of information in the "specify" response area.

Section 20 - Recycled and/or Reclaimed Water Use on This Operation in 2008

Report recycled and reclaimed water use separately. 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. Include any water obtained from off-farm suppliers or from livestock operations.

Item 1 - Report whether this operation used recycled water to irrigate any crops in 2008.

Item 1a - Report the area which one or more applications of recycled water for irrigation were made in 2008. Report the acres only once even if multiple applications were made to the same acreage.

Item 2 - Report whether this operation used reclaimed water to irrigate any crops in 2008.

Item 2a - Report the area which one or more applications of reclaimed water for irrigation were made in 2008. Report the acres only once even if multiple applications were made to the same acreage.

Item 2b - Report how much reclaimed irrigation water was used on this operation in 2008. Report the quantity of reclaimed water to the nearest tenth acre-foot or total gallons.

Item 3 - Identify the source(s) of reclaimed water used on this operation by marking an 'X' in all the sources that apply.

Item 4 - Report whether this operation purchased any reclaimed water to irrigate any crops in 2008.

Item 4a - Report the quantity of reclaimed water purchase for irrigation in acre-feet or gallons.

Item 4b - Report the average price paid for the quantity of reclaimed water reported in item 4a. Report the average price paid as either dollars per acre-foot or dollars per 1,000 gallons.

Item 5 - Report whether this operation **received any payments for using** reclaimed water for irrigation in 2008.

Item 5a - Report the quantity of reclaimed water that his operation received payment for in 2008. Report the quantity in either acre-feet or gallons.

Item 5b - Report the average price received for using the quantity of reclaimed irrigation water in item 5a. Report the average price received as dollars per acre-foot or dollars per 1,000 gallons.

Section 21 - Irrigated Land in 2007

Complete this section ONLY if you did not irrigate in 2008.

This section references both 2007 and 2008 irrigation. Report in item 1 whether any land was irrigated on this operation in 2007. Report in item 2, the reasons for not irrigating in 2008. Mark all that apply in item 2 and if 'other' is marked, report the reason in the "specify" response area. In item 3, report whether the discontinuance of irrigation is permanent.

Section 22 - Value of Farm Sales in 2008

Item 1 - Select the appropriate category for the gross value of sales of all agricultural products sold from this operation in 2008. Agricultural products include all crop 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 23- Person Completing this Form

Please print the name of the person completing this form, the date completed, and telephone number. Please indicate if you would like a free copy of the survey results in the mail.

Form Number: 08-A622 (I)

INSTRUCTION SHEET
2008 HORTICULTURAL IRRIGATION SURVEY

Completing the 2008 Horticultural Irrigation Survey Questionnaire

Make all entries clear and easy to read. Use a **blue** or **black** ball point pen.

General

This is supplemental sample of the 2008 Farm and Ranch Irrigation Survey (FRIS). A horticultural operation is an operation growing and selling horticultural crops: greenhouse crops; floricultural crops; nursery crops; mushrooms; sod; cuttings; seedlings; liners and plugs; greenhouse produced food crops; vegetable and flower seeds; Christmas trees; short rotation woody crops; unfinished plants or propagation materials; and other horticultural crops during 2008. Operations producing food crops, such as fruit or berries, grown in the open are not considered horticultural establishments.

Refer to the instructions below for completing the questionnaire. The enclosed census follow-on questionnaire was mailed to producers and growers throughout the United States. Because it 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 at any time during 2008, complete the questionnaire for the portion of 2008 that you did farm. Write "Stopped farming in 2008" and the date you stopped farming below the address area. Mail the completed questionnaire in the return envelope.

If You Receive More Than One Questionnaire For The Same Operation

Return any duplicate questionnaires in the same envelope with your completed questionnaire(s). In the address area of the questionnaire(s) you complete, write the 11-digit ID number from the label of the extra questionnaire(s).

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 Receive More Than One Questionnaire For The Same Operation" above.

How to Enter Your Responses on the Questionnaire

Please enter your answers in the proper spaces and in the units requested, i.e., square feet, gallons per minute, dollars, etc. Mark all applicable Yes/No boxes with an "X".

Instructions by Section

Section 1 - Horticulture Operation

This section determines whether or not your operation is within the scope of this survey. The screening questions listed below will guide you through the questionnaire.

Item 1 - Report whether any of the following crops were grown for sale on this operation in 2008. Include deciduous shade and flowering trees, broadleaf and coniferous evergreen trees and shrubs, deciduous shrubs, vines and climbing plants, ground covers, small fruit plants, and other ornamental plants. Also include, potted flowering plants for indoor or patio use, cut flowers, cut cultivated greens, foliage plants for indoor or patio use, plants for further growing on or propagation materials such as cuttings, liners, plug seedlings, tissue cultured plantlets, and prefinished plants. Turfgrass sod, sprigs or plugs, dry bulbs, corms, rhizomes or tubers, cultivated mushrooms, greenhouse produce food crops, transplants for commercial truck crop production, vegetable seeds, flower seeds, aquatic plants, and tobacco transplants sold for transplant are all included. If your operation produces any of these horticultural crops, mark the "Yes" box and continue to item 2. Otherwise, mark the "No" box and go to Section 9 on the back page of the questionnaire.

Item 2 - Report whether sales of horticulture crops grown on this operation were $10,000 or more in 2008.

Item 3 - Report whether this operation irrigated or watered any horticultural crops in 2008. If your operation did not irrigate or water horticultural crops in 2008, then go to page 7, Section 8.

Section 2 - Irrigation Area, Methods, and Water Applied to Horticultural Crops Under Protection in 2008

Report whether this operation irrigated 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. If any horticultural crops on your operation were grown under protection, then complete this section.

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 the one or more applications of water to land or crops by any artificial or controlled means.

Item 3 - Report the area irrigated in square feet for each horticultural category listed. Report the area of each horticulture crop, even when multiple crops were harvested off the same land. For example, if two crops 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. For each category, enter the total area under protection that was irrigated.

Report crops grown on this operation in the appropriate category:

- Floriculture and bedding crops - Bedding/garden plants, cut flowers and cut florist greens, indoor foliage plants, potted flowering plants
- Nursery crops - Ornamentals, shrubs, shade trees, fruit and nut trees, vines, palms, ornamental grasses, evergreens not for Christmas trees, deciduous trees and shrubs, aquatic plants
- Propagative materials - Bulbs, corms, rhizomes, and tubers; cuttings, seedlings, linings, and plugs; flower and vegetable seeds; tobacco transplants; vegetable transplants
- Food crops grown under protection
- Mushrooms
- Other - 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 2008 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. Subirrigation – this is sometimes referred to as water seepage. It is used to maintain a water table at a predetermined depth. Normally these systems are permanently in place below the rootline. Water is usually applied by using emitters.

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

Section 3 - Irrigation of Horticultural Crops Under Protection by Water Source in 2008

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 or on a neighboring 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 4 - Irrigation Area, Methods, and Water Applied to Horticultural Crops in the Open in 2008

Report whether this operation irrigated and nursery, greenhouse, floriculture, mushrooms, propagative materials, or other horticultural crops grown **in the open** in 2008. 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 land. Irrigation refers to the application of water to land or crops by any artificial or controlled means.

Item 3 - Report 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 land. 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 in grown in the open and irrigated acres.

Report crops grown on this operation in the appropriate category:

- Floriculture and bedding crops - bedding/garden plants, cut flowers and cut florist greens, indoor foliage plants, potted flowering plants
- Nursery crops - ornamentals, shrubs, shade trees, fruit and nut trees, vines, palms, ornamental grasses, evergreens not for Christmas trees, deciduous trees and shrubs, aquatic plants
- Sod
- Propagative materials - bulbs, corms, rhizomes, and tubers; cuttings, seedlings, linings, and plugs; flower and vegetable seeds; tobacco transplants; vegetable transplants
- 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.
- Other - 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 in the open in 2008 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. Subirrigation - this is sometimes referred to as water seepage. It is used to maintain a water table at a predetermined depth. Normally these systems are permanently in place below the rootline. Water is usually applied by using emitters.

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

Section 5 - Irrigation of Horticultural Crops in the Open by Water Source in 2008

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).

Section 6 - Recycled and/or Reclaimed Water Use on This Operation in 2008

Report recycled and reclaimed water use separately. Report the use of recycled and reclaimed water for horticulture crops only. For this survey, recycled water is the reuse of irrigation water that was previously used to irrigate a crop on this operation. Reclaimed water is treated wastewater used for irrigation. Include any water obtained form off-farm suppliers or from livestock operations.

Item 1 – Report whether this operation used recycled water to irrigate any horticulture crops in 2008.

Item 1a - Report the area of horticulture crops which one or more applications of recycled water for irrigation were made in 2008. Report the area under protection in square feet and area in the open to the nearest tenth acre. Report the area

only once even if multiple applications were made to the same area.

Item 2 - Report whether this operation used reclaimed water to irrigate any horticulture crops in 2008.

Item 2a - Report the area which one or more applications of reclaimed water for irrigation to horticulture crops were made in 2008. Report the area under protection in square feet and the area in the open to the nearest tenth acre. Report the area only once, even when multiple application were made to the same area.

Item 2b - Report how much reclaimed irrigation water was used on this operation for horticulture crops in 2008. Report the quantity of water in total gallons.

Item 3 - Identify the source(s) of reclaimed water used on this operation for horticulture crops by marking an 'X' in all the sources that apply.

Item 4 - Report whether this operation purchased any reclaimed water to irrigate any horticulture crops in 2008.

Item 4a - Report the quantity of purchased reclaimed water for horticulture crops.

Item 4b - Report the average price paid per 1,000 gallons for the reclaimed water reported in item 4a.

Item 5 - Report whether this operation **received any payments for using** reclaimed water for irrigating horticulture crops in 2008.

Item 5a - Report the quantity of reclaimed water that his operation received payment for in 2008 to irrigate horticulture crops. Report the quantity in gallons.

Item 5b - Report the average price received for using the quantity of reclaimed water reported in item 5a to irrigate horticulture crops. Report the average price received as dollars per 1,000 gallons.

Section 7 - Other Uses of Irrigation Water on This Operation in 2008
Report area on which irrigation water was used for other than crop consumptive use. Report the area as square feet under protection or acres in the open. Report the acres in the open to the nearest tenth-acre. Report the area only once, regardless of how many applications were applied to the same area. If acres are reported in the "other" technique, report the technique in the "specify" response area.

Section 8 - Irrigated Land in 2008
Complete this section ONLY if you did not irrigate in 2008. This section references both 2007 and 2008 irrigation. Report in item 1 whether any land was irrigated on this operation in 2007. Report in item 2, the reasons for not irrigating in 2008. Mark all that apply in item 2 and if 'other' is marked, report the reason in the "specify" response area. In item 3, report whether the discontinuance of irrigation is permanent.

Section 9 - Value of Farm Sales in 2008

Item 1 - Select the appropriate category for the gross value of sales of all agricultural products from this operation in 2008. Agricultural products include all crop and livestock sold from this operation.
Item 2 - Report the percent of the total gross value of sales that were from **irrigated horticultural** crops.

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

Section 10 - Person Completing this Form
Please print the name of the person completing this form, the date completed, and telephone number. Please indicate if you would like a free copy of the survey results in the mail.