OVERVIEW OF IRRIGATED AGRICULTURE IN SKAGIT COUNTY

Abstract

Irrigated agriculture in Washington State has been adversely impacted by insufficient water and drought conditions. Competition over water resources from different sectors and water use curtailments have left fields underirrigated. Thus, there is an urgent need to improve irrigation system efficiency. WSU-WISE (Water and Irrigation Systems Efficiency) is a project funded by a United States Department of Agriculture Conservation Innovation Grant (USDA CIG) which evaluates irrigation system efficiency for five counties across Washington State. This publication is part of a series resulting from WISE and provides an overview of irrigated agriculture in Skagit County, a diverse and major agricultural county in the state. Most of the data analyses provided are based on data published by the USDA National Agricultural Statistics Service (USDA-NASS) and the Washington State Department of Agriculture (WSDA).

Geographical Introduction

Skagit County is 60 miles north of Seattle. It is 24 miles wide (north and south) and 95 miles long (east and west). Several islands in the Puget Sound area are included in the county. Snowcapped Mount Baker (in Whatcom County) with an elevation of 10,781 feet dominates the northeastern edge of the county and is the start of the North Cascades Wilderness Area and National Park (see Figure 1).

The Skagit Valley was formed by water-deposited alluvial soils. Most cropland and pastureland in the county is located in the floodplain-delta area. This area covers the valley floor and extends east along the Skagit River and its tributaries. There are five primary soil types in the floodplain-delta area. Three types are located in the floodplain: Skagit (26%), which consists of silt loam, silty clay loam, and a small amount of very fine sandy loam; Sumas (15%); and Field (14%). The other two types are found along the Skagit River: Lorus (17%) and Pilchuck (14%).

Figure 1. Skagit County, Washington.

Floodplain soils are highly productive under dryland farming. Elevation in this area ranges from sea level to 500 feet. The high amount of rainfall makes the soils acidic; therefore, lime is required to grow most crops.

Soil water content is the major limitation for crops in the floodplain area. The Skagit and Samish Rivers have a long history of flooding. The Skagit River is protected from flooding by dikes and levees from just west of the town of Sedro-Woolley to the Puget Sound. The floodplain areas along the lower reaches of the Samish River, below Thomas Creek, are flooded almost every year.

Climate Summary

Skagit County has a temperate maritime climate with increasing precipitation and decreasing temperatures from sea level in the west to the North Cascades in the east. Recent data (2010–2020) from the WSU AgWeatherNet station in Mount Vernon in the

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Skagit floodplain show that the average monthly air temperature ranged from 36 to 75°F. Average annual rainfall was 27 inches. Figure 2 shows the monthly average temperature and precipitation (excluding snowfall) from 2010 to 2020. The growing season in Mount Vernon typically lasts for around eight months (about 239 days), from approximately March 18 to November 13 (NOAA 2020) and corresponds with the period of least rainfall, as shown in Figure 3.

Irrigated Land Survey

In 2017, there were 1,041 farms in Skagit County (USDA-NASS 2017a), a 3% decrease from 2012. Also in 2017, there were 285 irrigated farms with a total irrigated land area of 23,544 acres, equal to 24% of land in farms (USDA-NASS 2017b). The total irrigated land area and the number of irrigated farms grouped by farm size is shown in Figure 4. The average farm size was 94 acres. The majority of the irrigated acres were located on farms greater than 2,000 acres.

Crop Status

Skagit County was historically small grass-fed dairy farms without irrigation. In 2017, cropland accounted for 67% of the total farmland in Skagit County (USDA-NASS 2017a), as shown in Figure 5. Also in 2017, there were 23,544 irrigated acres (24% of total farmland), of which 23,168 were harvested cropland and 376 were pastureland and other land (see Table 1) (USDA-NASS 2017b). In 2020, the top harvested crop categories in Skagit County by acreage were grass hay, potatoes, and field corn (WSDA 2021), as shown in Table 2. The county grows the majority of red potatoes in the state and is a major global producer of vegetable seed, including cabbage, table beet, and spinach seed (McMoran 2018). Over 90 different crops are grown in the county with irrigated crops including corn (silage), barley (grain), berries, bulbs, vegetable seed crops, cauliflower, broccoli, strawberries, and others. A detailed list of the crops grown in 2020 and the corresponding acreage is shown in Table 2 (WSDA 2021).

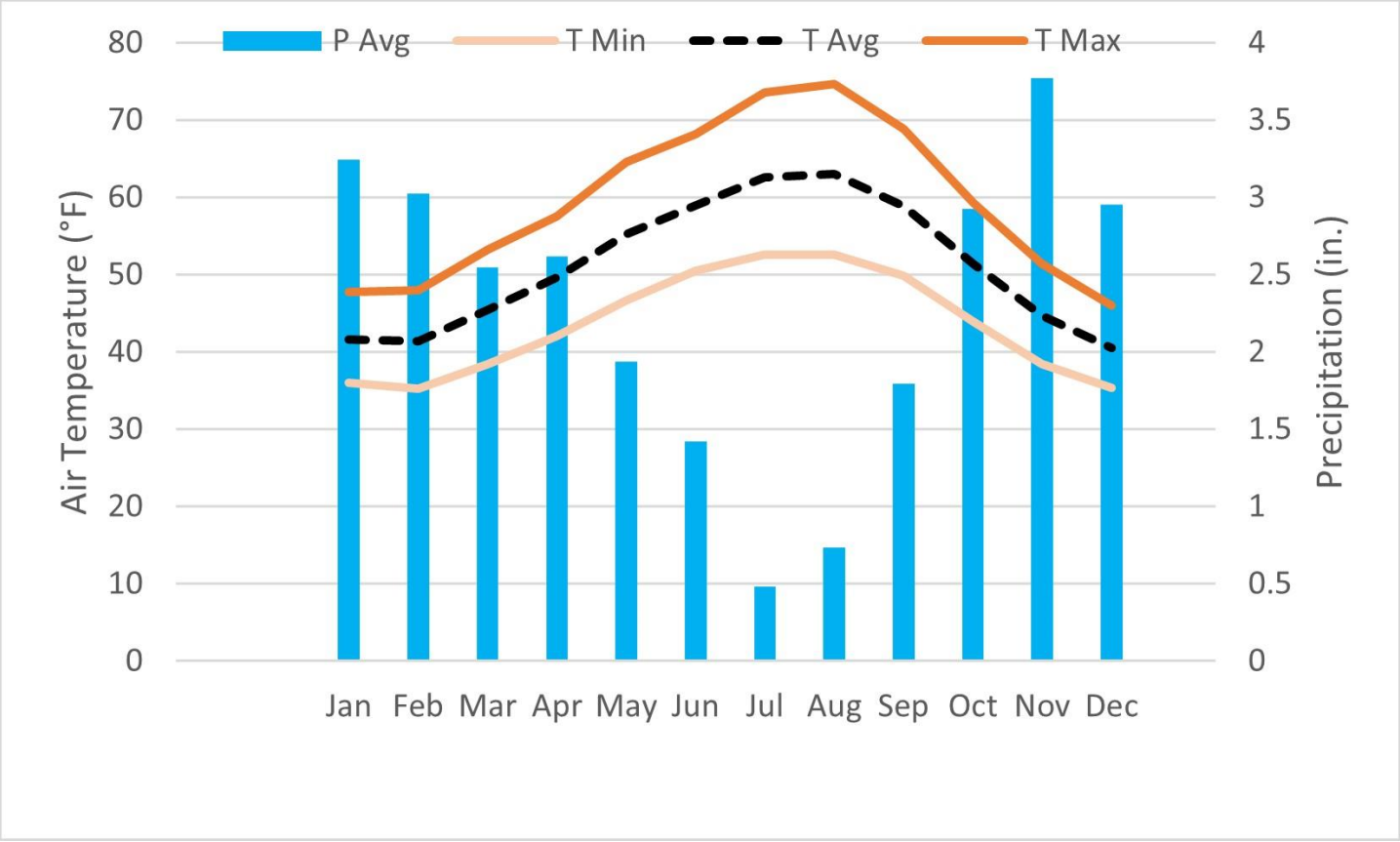

Figure 2. Monthly average air temperature (°F) and precipitation (in.), Mount Vernon, Skagit County, 2010–2020. Source: WSU AgWeatherNet Program (2010–2020).

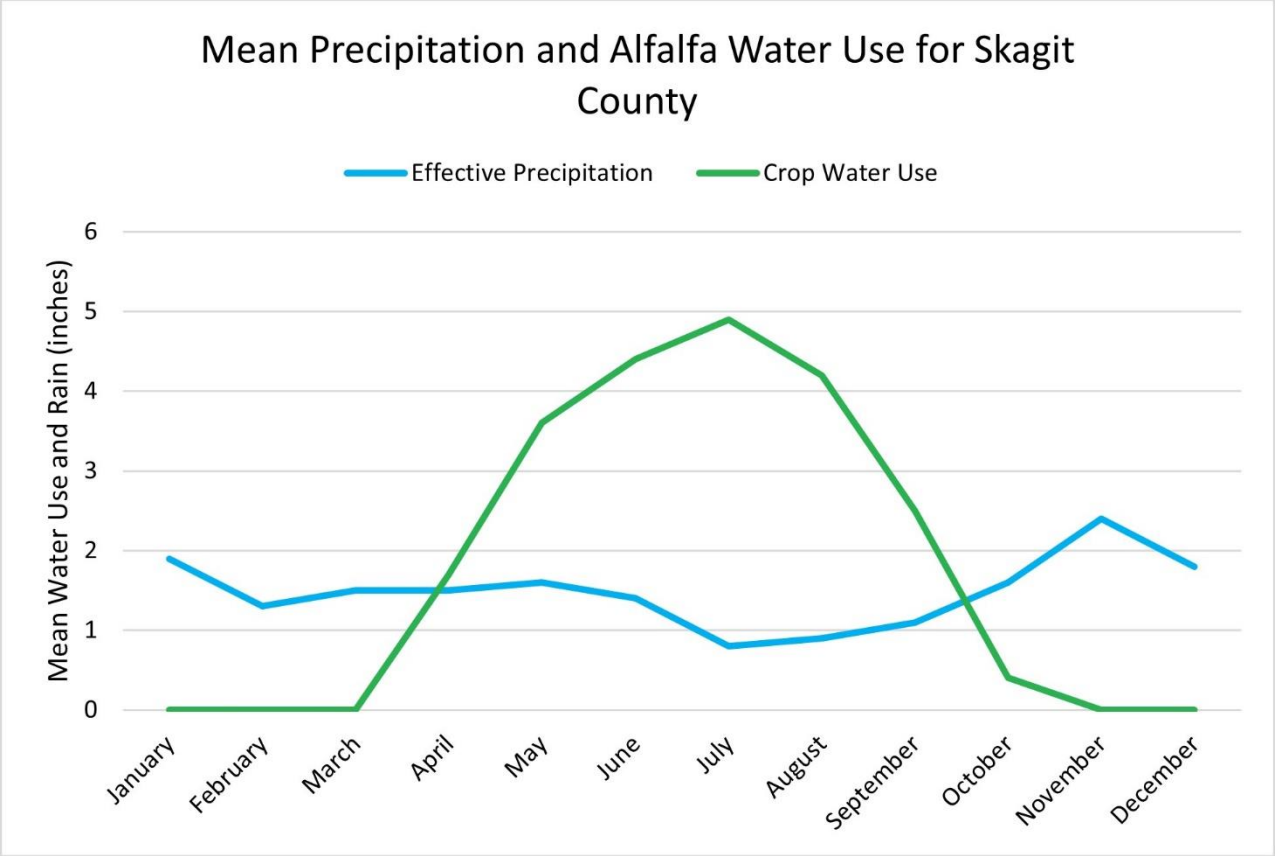

Figure 3. Mean precipitation and alfalfa water use for Skagit County.

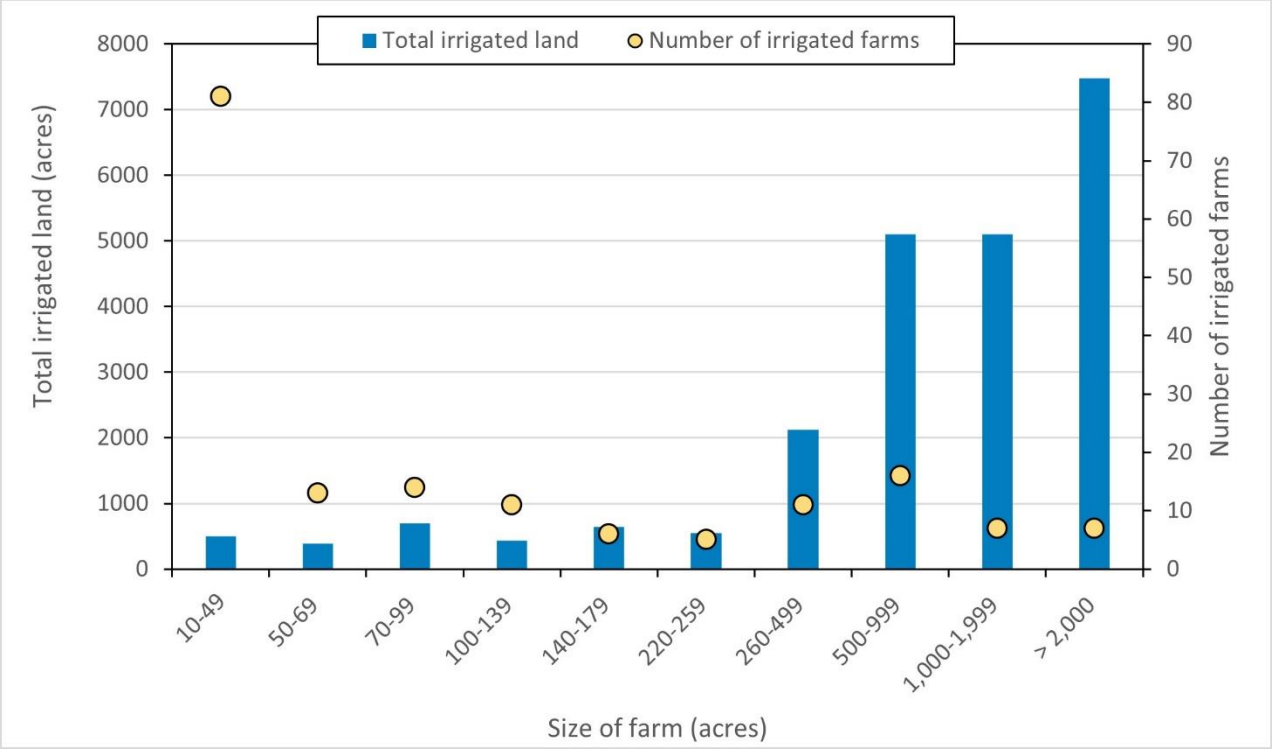

Figure 4. Total irrigated land (acres) and number of irrigated farms by farm size, Skagit County, 2017. Source: USDA-NASS (2017a).

Market Value of Crops

In 2017, Skagit County contributed 3% of total sold agriculture products in Washington State, ranking the 9th county in the state at a total of $287.096 million (USDA-NASS 2017a), a 5% increase from 2012. The top category of crops produced in Skagit County in 2017 in terms of sales was vegetables, melon, and potatoes, accounting for $86.674 million. The second largest category was nursery, greenhouse, floriculture, and sod, at $73.606 million. Table 3 shows the market value of crops sold by Skagit County in 2017.

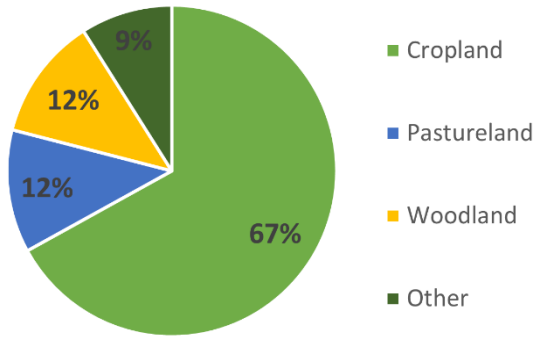

Figure 5. Land in farms by use in Skagit County, 2017.

Table 1. Skagit County total and irrigated farmland acreage, 2017.

Farmland Type	Total Farmland	Total Skagit Farmland	% of Total Skagit Farmland
Irrigated farmland	23,544 acres	97,664 acres	24%
Harvested cropland	23,168 acres	97,664 acres	23.72%
Pastureland and other land	376 acres	97,664 acres	0.38%

Source: USDA-NASS (2017b).

Table 2. Crops grown in Skagit County, 2020.

Crop	Acres
Grass Hay	17,023.7
Pasture	11,522.5
Potato	9,674.1
Corn, Field	8,065.4
Barley	4,896.2
Blueberry	2,212.4
Spinach Seed	2,168.6
Bean, Green	1,868.3
Wheat	1,724.2
Wildlife Feed	1,115.3
Nursery, Ornamental	890.4
Market Crops	718.4
Brussels Sprouts	626.9
Broccoli	619.4
Pumpkin	618.0
Ryegrass Seed	611.5
Cabbage	587.9
Clover/Grass Hay	539.0
Tulip	452.9
Cabbage Seed	415.1
Beet Seed	404.0
Daffodil	398.5

Crop	Acres
Caneberry	392.3
Cauliflower	385.2
Cucumber	369.1
Filbert	313.4
Strawberry	284.0
Alfalfa Hay	232.8
Clover Hay	217.8
Alfalfa/Grass Hay	217.3
Fescue Seed	211.3
Poplar	179.3
Squash	126.1
Sod Farm	102.8
Vegetable, Unknown	96.4
Bean, Dry	81.8
Legume Cover	79.3
Pea, Green	78.3
Oat Hay	72.5
Corn, Sweet	71.1
Nursery, Greenhouse	67.8
Apple	65.3
Rye	38.4
Grape, Wine	31.6

Crop	Acres
Seed, Other	28.6
Christmas Tree	26.8
Green Manure	19.6
Radish	17.4
Onion	17.2
Pepper	16.8
Pear	10.9
Beet	9.7
Carrot	8.4
Parsley	7.6
Rhubarb	7.1
Kale	6.4
Triticale Hay	6.1
Brussels Sprouts Seed	5.5
Berry, Unknown	5.4
Orchard, Unknown	5.1
Asparagus	2.9
Marijuana	1.6
Currant	1.6

Source: WSDA (2021).

Table 3. Market value of crops sold by Skagit County, 2017.

Crops	Sales
Grain, oilseeds, dry beans, dry peas	$5,733,000
Vegetables, melon, and potatoes	$86,674,000
Fruits, tree nuts, berries	$21,905,000
Nursery, greenhouse, floriculture, sod	$73,606,000
Cultivated Christmas trees, short rotation woody crops	$58,000
Other crops and hay	$3,192,000
Total	$191,167,000

Source: USDA-NASS (2017a).

Irrigation Systems

According to a U.S. Geological Survey report, in 2015 the total withdrawals for irrigated crops in Skagit County were 17.65 Mgal/d (million gallons per day), of which 13.77 Mgal/d was groundwater and 3.88 Mgal/d was surface freshwater. The total consumptive use of water for irrigated crops was estimated at 13.93 Mgal/d (Dieter et al. 2018). Water consumption is the lost portion of the withdrawn water due to evaporation, transpiration, or uptake by plants (Carr et al. 1990). Zero reclaimed wastewater was reported for agricultural use in Skagit County in 2015. Big guns (Peters and McMoran 2009) are the most common form of sprinkler irrigation systems in the county (Figures 6, 7, and 8). According to WSDA Crop Data for 2021, the total acreage irrigated in Washington State by big guns was over 38,000, 29% of all big gun irrigation systems in Washington State. Growers prefer big guns in this area because of the many advantages of this system, such as ease of setup and moving easily from one field to another.

Figure 6. Big gun in potato field, Skagit County. Photo: K.A. Seymour.

Figure 7. Big gun wheel. Photo: K.A. Seymour.

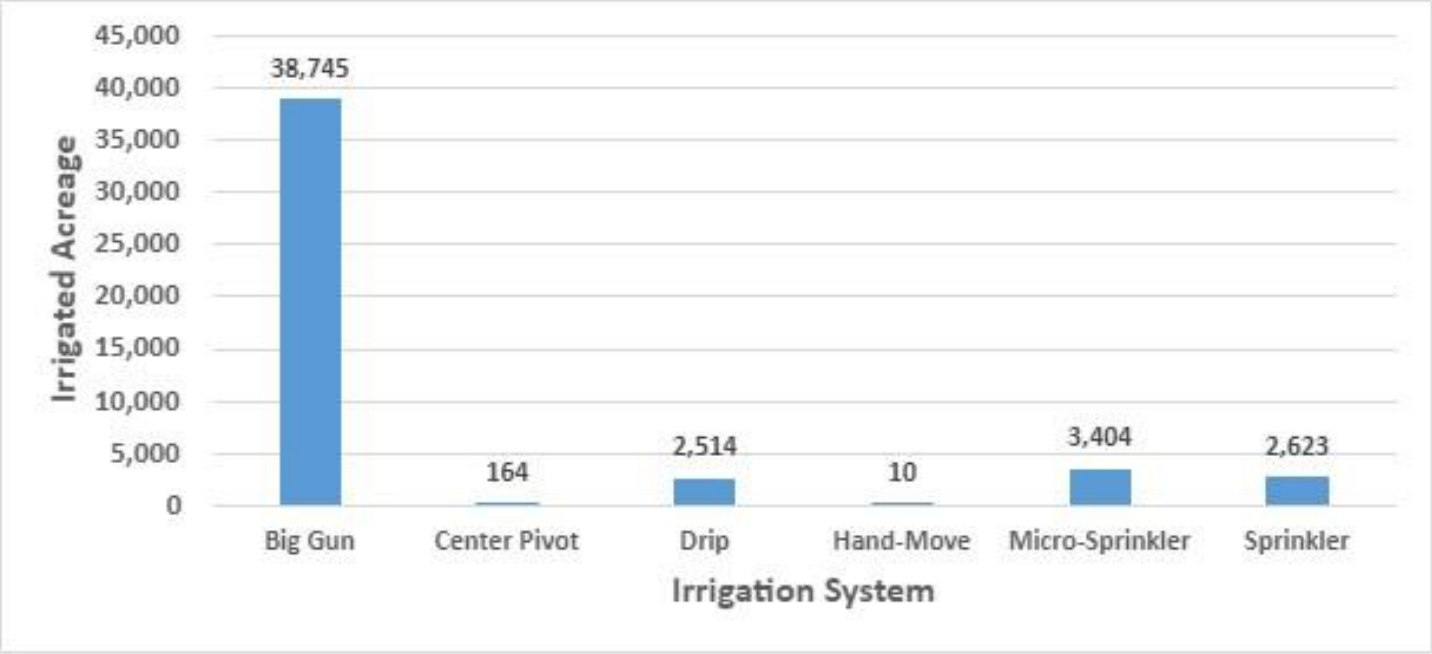

Figure 8. Irrigated acres by irrigation system type in Skagit County, 2020 (excluding mixed irrigation systems used on the same field). Source: WSDA (2021).

Acknowledgements

The authors acknowledge the USDA CIG program for their support.

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