

OVERVIEW OF IRRIGATED AGRICULTURE IN LEWIS COUNTY



Abstract

Irrigation is an essential practice for profitable farm production in western Washington State given the typical summer drought. Efficient irrigation system management can result in water and energy savings and increase profitability while minimizing environmental impacts. It also requires understanding the current state of irrigated agriculture and limitations to improving 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) to evaluate 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 Lewis County, Washington. 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). This publication is intended for use by farmers, agencies, and elected officials.

Geographical Introduction

Located in southwestern Washington, Lewis County (Figure 1) spans 95 miles from the South Cascades in the east (with major peaks Mt. Rainier, Mt. St. Helens, and Mt. Adams just outside the county's borders) to the Doty and Willapa Hills in the Coast Range in the west. One-third of the county is part of the Gifford Pinchot National Forest, and the county includes a portion of Mt. Rainier National Park. Most of the county is mountainous and forested, as characterizes "southwest Washington [where] sedimentary materials interspersed with old basalt flows support mountain forests" (Steury 2011). The topography is more moderate in the west-central part of the county in the Puget Sound and Willamette Lowlands where most of the farmland is located at an elevation below 1,000 feet, including the most productive alluvial flood plain areas. Soils which are predominantly on flood plains and terraces and which formed

primarily in mixed alluvium include the Reed-Chehalis, the Ledow-Cloquato, and the Siler-Schooley-Greenwater. Prime farmland in the county is located mostly in these soil units and several units on plains, terraces, uplands, and bottom lands, as well as on uplands and high terraces. All county soils surveyed are deep to very deep and vary in their drainage capabilities (Evans and Fibich 1987).



Figure 1. Lewis County, Washington State.

Lewis County occupies the Upper Chehalis and Cowlitz watersheds, with a small portion in the Deschutes, Nisqually, and Willapa watersheds. The Cowlitz River originates on Mt. Rainier and "flows nearly the length of the county, from the extreme northeastern to the southwestern part. With its tributaries, [. . .] it drains most of the eastern, central, and southwestern parts of the county before flowing south to the Columbia River" (USDA NRCS 1954). The Chehalis River watershed at the southern end of the Puget Sound Basin drains the north, northwest, and western parts of the county, including the Doty and Willapa Hills to the west, and flows north into Thurston County and west into the Pacific Ocean at Grays Harbor.

Flooding and related drainage issues are a major limitation to crop growth in Lewis County. Historically, the Chehalis and Cowlitz Rivers flooded, causing erosion which has been documented along the Chehalis River for nearly a century. Major flood and landslide events in the Chehalis River Basin occurred in 1972, 1986, 1990, 1996, 2007, and 2009.



Subsequently, the Newaukum River, which empties into the Basin, has also flooded regularly, but contemporarily the Chehalis Basin has seen higher rates of erosion (Lewis County Conservation District 2016; Nailon 2016).

Weather Summary

Lewis County has a temperate maritime climate with increasing precipitation and decreasing temperatures from the lowlands in the west to the South Cascades in the east. Four years (2017–2020) of climate data were downloaded from the WSU AgWeatherNet station in Chehalis (WSU AgWeatherNet Program 2015–2019). Average annual rainfall was 54.0 inches concentrated outside of the growing season. Figure 2 shows the monthly average air temperature and precipitation (excluding snowfall) over 2017–2020. As recorded in Chehalis, the growing season lasts for approximately six months or 190 days, typically from around April 18 to October 25 (NOAA 2021).

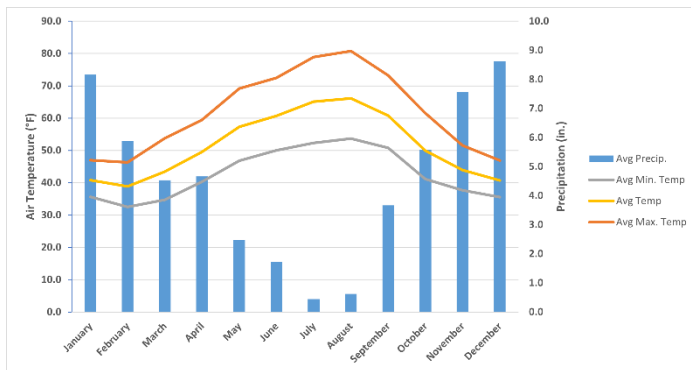


Figure 2. Monthly average air temperature and precipitation, Chehalis, Lewis County, 2017–2020.

Irrigated Land Survey

In 2017 there were 1,723 farms in Lewis County (USDA-NASS 2017a), a 5% increase from 2012. Of these, 321 farms were irrigated, with a total irrigated land area of 10,004 acres, equal to 8.14% of the total land in farms (Table 1). The total irrigated land area and the number of irrigated farms categorized by farm size is shown in Figure 3. The average farm size in 2017 was 71 acres. The majority of the irrigated acres were located on farms between 260 and 499 acres. In 2017, irrigated land in orchards was estimated at a total of 227 acres across 81 farms, an approximate doubling in the number of farms with irrigated orchards since 2012.

Crop Status

The top harvested crop category in Lewis County in 2020 was grass hay at 32,778.5 acres. Other major crop categories included cultivated Christmas trees, other silviculture, and blueberries. In 2017, cropland accounted for 42% of land in farms (Figure 4). Crops grown in Lewis County and

corresponding acreage in 2020 is shown in Table 2 (WSDA 2021).

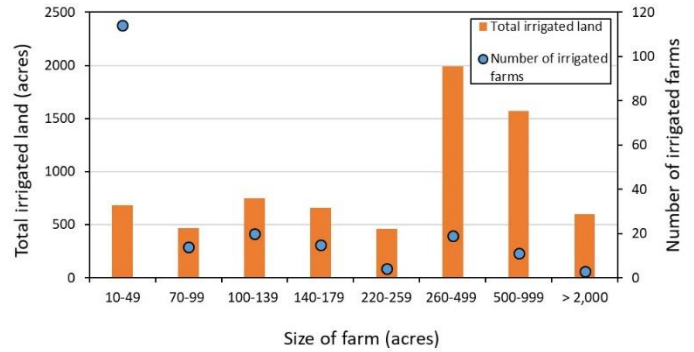


Figure 3. Total irrigated land and number of irrigated farms by farm size in Lewis County, 2017.

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

		% of total land in farms
Total land in farms	122,870 acres	-
Irrigated farmland	10,004 acres	8.14%
Harvested cropland	8,470 acres	6.89%
Pastureland and other land	1,543 acres	1.26%

Source: USDA-NASS (2017b).

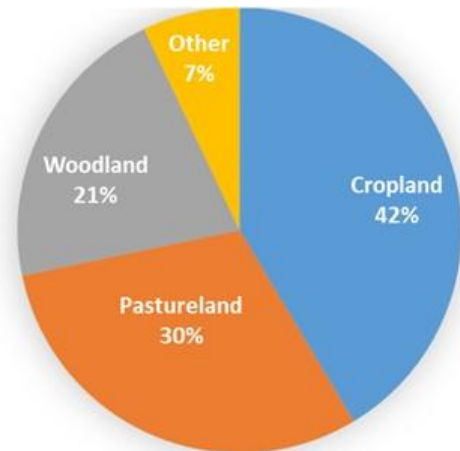


Figure 4. Land in farms by use in Lewis County, 2017.

Table 2. Crops grown in Lewis County, 2020.

Crop	Acres	Crop	Acres
Alfalfa Hay	287.8	Market Crops	154.0
Alfalfa/Grass Hay	207.2	Nursery, Greenhouse	15.3
Apple	19.7	Nursery, Holly	6.8
Barley	639.7	Nursery, Lavender	4.0
Blueberry	877.7	Nursery, Orchard/Vineyard	1.6
Bulb, Unknown	11.7	Nursery, Ornamental	249.2
Caneberry	12.3	Nursery, Silviculture	218.5
Canola	55.4	Oat	501.8
Christmas Tree	4,306.9	Orchard, Unknown	0.9
Clover Hay	30.1	Pasture	26,368.7
Clover/Grass Hay	91.5	Poplar	187.4
Corn, Field	673.6	Pumpkin	30.7
Corn, Sweet	16.5	Silviculture	2,366.4
Daffodil	3.9	Strawberry	22.7
Fescue Seed	272.8	Triticale	12.9
Filbert	135.6	Tulip	10.2
Grape, Wine	8.8	Turnip	12.6
Grass Hay	32,778.5	Unknown	10.9
Green Manure	4.5	Walnut	5.2
Kiwi	0.7	Wheat	313.0

Source: WSDA (2021).

Market Value of Crops

In 2017, Lewis County ranked 15th in Washington State for total sold agricultural products, valued at \$136,345,000 (USDA-NASS 2017a), a 3% increase from 2012. The top crop category produced in the county in 2017 in terms of sales was nursery, greenhouse, floriculture, and sod at \$12,707,000. The second top crop category was cultivated Christmas trees and short-rotation woody crops at \$7,556,000. Table 3 shows the market value of crops sold by Lewis County in 2017.

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

Crops	Sales (\$)
Total	35,620,000
Grain, oilseeds, dry beans, dry peas	377,000
Vegetables, melon, potatoes, sweet potatoes	4,909,000
Fruits, tree nuts, berries	4,734,000
Nursery, greenhouse, floriculture, sod	12,707,000
Cultivated Christmas trees, short-rotation woody crops	7,556,000
Other crops and hay	5,338,000

Source: USDA-NASS (2017a).

Irrigation Systems

The main source of irrigation in Lewis County is groundwater. According to a U.S. Geological Survey report, in 2015 the total groundwater withdrawal in the county was approximately 6.02 Mgal/d, while only 1.05 Mgal/d withdrawal was from surface water (Dieter et al. 2018). The total consumptive water use for irrigation was 5.7 Mgal/d. Many irrigated farms in Lewis County pump water from wells to pressurized irrigation systems. In 2020, big gun (Figures 5 and 6) was the most common irrigation system in Lewis County, accounting for 10,228.2 acres (Figure 7), 7.65% of all big gun systems statewide (WSDA 2021).



Figure 5. Big gun wheel. Photo: K. Seymour.



Figure 6. Big gun in potato field. Photo: K. Seymour.

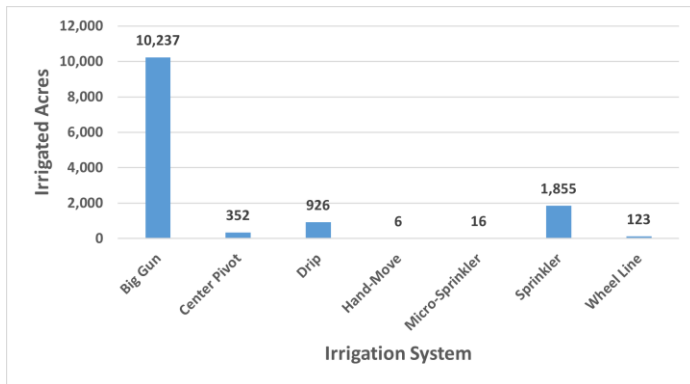


Figure 7. Irrigated acres by irrigation system type in Lewis County, 2020.

Acknowledgments

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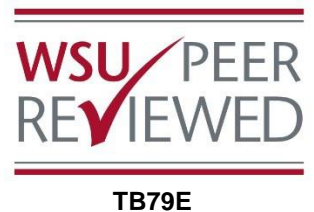
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By
Don McMoran, Agriculture and Natural Resources Extension Faculty, County Extension Director,
Washington State University Skagit County Extension
Abdelmoneim Z. Mohamed, Irrigation Engineer, Washington State University Skagit
County Extension
Kate Seymour, Grants Coordinator, Washington State University Skagit County Extension
Sylvi Thorstenson, Agriculture and Natural Resources Program Support,
Washington State University Skagit County Extension
Gary Fredricks, Director at Cowlitz County Extension, Washington State University



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