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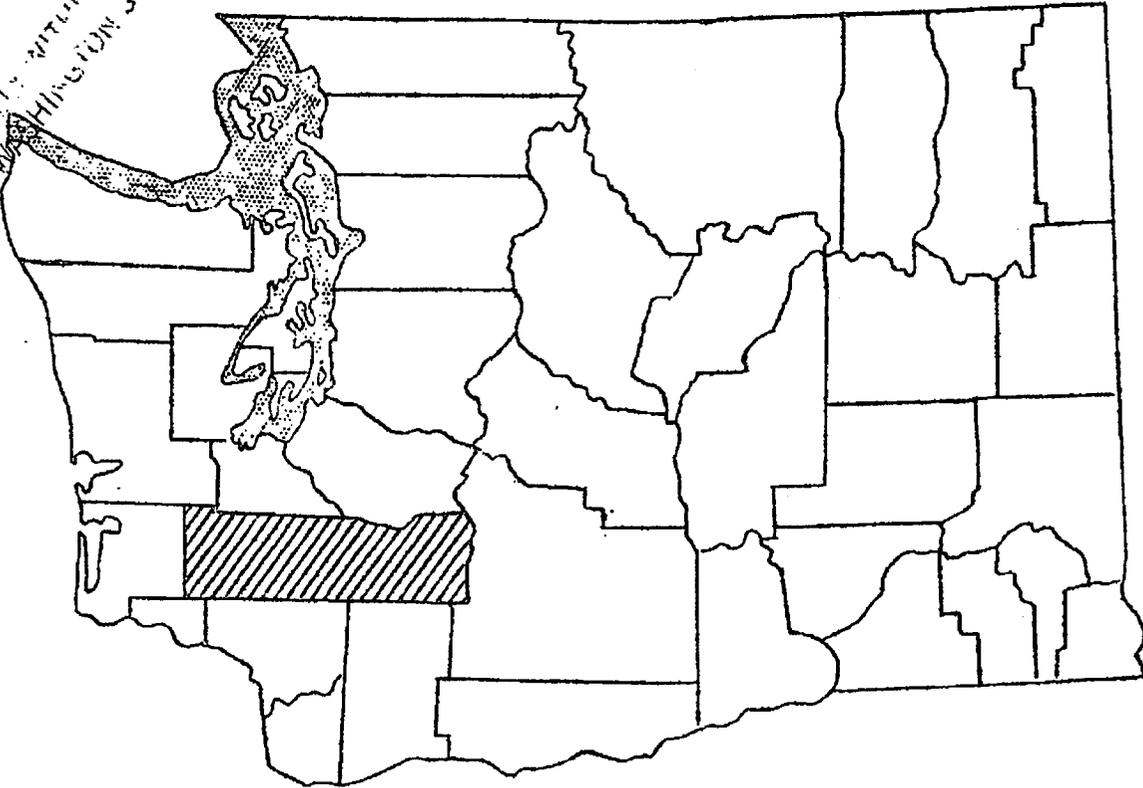
LEWIS COUNTY AGRICULTURE

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COUNTY AGRICULTURAL DATA SERIES
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FOREWORD

This bulletin on Lewis County is one of a second edition series devoted to presenting the history and present nature of agriculture in each of the thirty-nine counties of the State of Washington. The original series was initiated in 1956 by the Washington State Department of Agriculture. State funds were matched by moneys from the United States Department of Agriculture under the Research and Marketing Act of 1946.

County agricultural data books are intended to serve a variety of needs. Continually changing conditions in a dynamic state such as Washington require constant planning by groups and individuals, especially in the field of marketing agricultural products. Knowledge of land resources, population and agricultural-economic trends in a local area such as Lewis County is of great value. This book will be useful for reference in public and private instruction by social studies teachers. It has been devised also to inform adults interested in knowing more about their immediate area.

Selected geographic facts, agricultural history, population trends and statistical data are included to give an over-all appreciation of Lewis County. Enumerations of the United States Censuses of Population and Agriculture since 1870 are summarized to give a perspective of development since the establishment of Lewis County in 1845. Facts on topography, soil, climate and forest which influence farming are integrated from surveys and reports of government agencies. Estimates of leading crops by years since 1939 by the Washington Crop and Livestock Reporting Service provide a measure of the trend in the agriculture of the county farm industry.

Acknowledgment is accorded the professional work of several persons. Immediate direction was under Emery C. Wilcox, Agricultural Statistician in Charge, Field Operations Division, Statistical Reporting Service, United States Department of Agriculture. Research involved in up-dating and revising the original information and the preparation of the manuscript of the second edition of the Lewis County bulletin was performed by George K. Saito, Research Analyst, Washington State Department of Agriculture. Review and editing of the first draft of the present bulletin was done by Emery C. Wilcox. Statisticians of the Washington Crop and Livestock Reporting Service gave valuable assistance. Margaret B. Quiroga, Washington State Department of Agriculture, typed all of the textual and tabular material and prepared the graphs. The bulletins were reproduced and assembled by members of the clerical staff of the Washington Crop and Livestock Reporting Service.

Olympia, Washington
July 1, 1964

J. D. Dwyer, Director
Washington State Department of Agriculture

Funds for this bulletin provided by the Washington State Department of Agriculture were matched by the United States Department of Agriculture under the Research and Marketing Act of 1946.



PART I

HISTORY OF LEWIS COUNTY

Introduction

Lewis County is an area of river valleys, grass-covered prairies, upland plains and forest covered mountains. Located in southwestern Washington, the county lies partly in the Willamette-Puget Sound Lowland and partly on the Cascade Range to the east, and also includes portions of the Coast Range within its boundary on the west. It is the largest county in western Washington with 2,452 square miles (approximately 1,569,280 acres) within its border. In size, it ranks sixth among the 39 counties of Washington. According to the 1959 Census of Agriculture, however, only 16 percent of Lewis County was classed as farm land and less than 4 percent was in cropland. There are a few river valleys, prairies and a limited number of foothills and benchlands suitable for crops and grazing, but the greater part of the county's area is too hilly and mountainous.

In spite of the natural limitations of the area, farming activities play an important role in the total resource base of Lewis County. The economic history of Lewis County has been characterized by a steady growth of agriculture in conjunction with rapid expansion of employment in lumbering, manufacturing and service trades. In little over a century, settlers of varied origins and nationalities have developed over 2,200 farms. A vast forest wilderness was tamed and developed by those with a vision of agricultural enterprise.

History 1/

Before settlement by white men, the present Lewis County area was occupied by the Cowlitz, Chehalis and Klickitat Indians. Numbering several thousand, they lived by fishing in the rivers and streams and by hunting and berry gathering in the forests of the low valleys and in the alpine meadows of the Cascade Mountains. The area was a dense forest with the exception of some bracken fern and wild grass prairies burned over periodically by the Indians for horse ranges. Only in a few areas was there open prairie as a result of continuous burning by the Indians to make wild berry fields and deer hunting grounds.

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The Chehalis and Cowlitz were "canoe" or "river" Indians living on the major streams now bearing their names. They were of Coast Salishan stock and had a similar language and economic culture. When the Hudson's Bay Company trappers moved into the area after 1818, the Cowlitz and Chehalis Indians traded large volumes of furs at the post on Cowlitz Prairie.

The Klickitat were "horse" Indians who frequently invaded the Cowlitz and Chehalis Indian areas by moving westbound over Cascade Mountain trails. Klickitat Prairie, surrounding Mossyrock in central Lewis County, was their main camping and grazing area.

First white settlers were the French-Canadians and Scots employed by the Hudson's Bay Company as trappers, craftsmen and agricultural workers. Simon Flamondon, a French-Canadian with the company, arrived on Cowlitz Prairie in 1818, married a Cowlitz Indian chief's daughter and established friendly trading relations with the tribe. He influenced Hudson's Bay Company to establish a trading post on Cowlitz Prairie near the upper limit of boat navigation on the Cowlitz River. Later (about 1830) Flamondon and other French-Canadians established land claims in the lowlands of western Lewis County.

In 1825 Hudson's Bay Company began developing a large agricultural enterprise on Cowlitz Prairie under the management of the Puget Sound Agricultural Company. Called "Cowlitz Farm" it covered about 4 square miles (2,560 acres). This large ranch, one of three operated by British interests in western Washington before American control was established, produced large amounts of grain and livestock which was sold to various posts and to settlers on the Cowlitz and Columbia Rivers. Some was shipped to California and Alaska. Cattle were brought from California and pigs and sheep were imported from England to stock the farm. Crops included wheat, oats, barley, potatoes and vegetables. From 1846 to 1851 the farm was managed by George Roberts. During this period it is reported to have produced about 10,000 bushels of wheat and 4,000 bushels of oats per year. According to terms of the treaty of 1846, the Hudson's Bay Company relinquished control to Americans. Most of the early settlers working for the company remained in the area and became American citizens.

Earliest missionaries in Lewis County were the Roman Catholic priests, Father Francois Blanchet and Father Modeste. They established a mission on Cowlitz Prairie in 1839.

Early agricultural settlement by Americans began in the 1840's along the Cowlitz Trail which crossed the plains of western Lewis County, being the overland connection between Puget Sound and the upper limit of navigation on Cowlitz

1/ This historical summary has been derived from three sources:

- (1) The Daily Chronicle, Centralia, Washington, Washington Territorial Centennial Edition, June 6, 1953.
- (2) Washington, A Guide to the Evergreen State (American Guide Series). Writers' Program of the Works Project Administration, State of Washington. Sponsored by the Washington Historical Society. Published 1941. See pages 490-495.
- (3) Richard M. Perry, "The Counties of Washington", Secretary of State, State of Washington, Olympia, Washington. 1943 (mimeographed).

River at present Toledo. There were several hundred settlers in southwestern Washington by 1845. The Oregon Territorial Legislature created Lewis County December 18, 1845, the first county of present Washington. It was named after Meriwether Lewis of the famous Lewis and Clark expedition. Lewis has been called "Mother of Washington Counties" because all other counties were formed from it as the area progressed from a territory to a state.

Early American settlers acquired land by squatter's rights and donation land claims. John R. Jackson settled on Jackson Prairie in 1845. Sidney S. Ford also settled on Ford's Prairie at present Centralia that same year. Schuyler S. Saunders took a donation land claim at the site of the present county seat, Chehalis, in 1852. J. G. Cochrane, coming from Missouri with a young Negro slave, filed on the present townsite of Centralia in 1850. The slave, named George Washington, was freed and later became prominent as the founder of Centerville, later renamed Centralia.

Bottom lands in the hilly and mountainous sections were pioneered at a later period. Immigrants from Germany and Scandinavia, and Americans from midwest prairies and the Appalachian Mountains of the southern United States, were attracted by homesteading opportunities in the mountain valleys.

Settlers entered the Willapa Hills to farm and to operate sawmills at an early date. Joe Mauermann, an Austrian immigrant, commenced farming in the Dryad-Doty area in 1852. Joel H. Fay settled at Adna in 1864. J. T. Hundricks and Willard Beam located at Pe Ell in 1873. At Klaber, a German, Herman Klaber, was an early settler--prominent in hop growing. The first settler at Wildwood was T. C. Naylor.

In the eastern Cascade Mountain section, homesteading, shingle bolt driving and sawmilling began attracting settlers to the upper Cowlitz Valley after 1860. Jim Hendricks, George Miller, J. T. Doss, C. T. Landes and Clay Swigert established an important farming section on Klickitat Prairie at Mossyrock. From 1883 to 1890 the Germans, William York and Herman York, and a Tennessean, Rufus T. Siler, homesteaded in the upper Cowlitz Big Bottom district. Another Tennessean, John Randle, founded the town of Randle. Farming in the Morton district was started in 1884 by Henry Clay Temple of Iowa and Edwin Knittle, an immigrant from Holland.

An important agricultural group was the immigrants from Finland who began moving into the logged-over lands around Winlock after 1897. In that year, Gust Nisula purchased 500 acres of land and was influential in getting other Finns to settle on farms. This group played an important role in developing poultry farming, a valuable segment of Lewis County agriculture.

A major turning point in agricultural and general economic history of Lewis County came with the construction of the Northern Pacific Railroad line between Tacoma and Portland. This was completed during 1872 and 1873 and resulted in rapid growth at Winlock, Napavine, Chehalis and Centralia. By 1895 a branch line had been extended westward from Chehalis through the Coast Range to South Bend on Willapa Bay.

Railroads opened new markets for lumber and agricultural products. A large immigration of new settlers from eastern states and European countries arrived in Lewis County to work in mills and logging camps. Most of these became interested in part-time farming on logged-over lands which they could purchase for about 10 dollars per acre or less. Population increased from 888 in 1870 to 15,157 in 1900. Continuing immigration more than doubled the population in the next ten years to 32,127 in 1910. The period between 1900 and 1910 was the greatest in population growth. It could be termed "the lumber and land boom" of its history.

Before 1920 the agriculture of Lewis County was primarily devoted to growing things for home use and producing items of high value which could be transported economically to distant markets. Many farms grew hops, a crop worth \$300 a ton at that time, which could be packed long distances to railroad stations. Others raised cattle, hogs and turkeys which could be driven on foot to the railroad stockyards at Chehalis, Winlock, or Centralia. Before the railroad was built to Morton in 1910, livestock farmers in eastern Lewis County in the Randle area drove cattle, hogs and turkeys 50 to 75 miles to markets in Chehalis and Tacoma. Cream was marketed to Puget Sound by rail. Some farmers specialized in butter, bacon and eggs which found good local markets in milltowns and logging camps. Another important local item was hay and grain sold to feed horses and oxen used in logging.

From 1920 to 1950 Lewis County's population and employment grew steadily. Market outlets expanded as railroads and highways were improved over the Cascades as well as to the north and south. The increase in farming and marketing and in numerous fields of service employment attracted numbers of settlers from other states and from Europe as well as migratory workers. Population increased from 36,840 in 1920 to 41,858 in 1960.

By 1959, the county ranked twenty-first among the counties of Washington in value of farm products sold which amounted to \$9,829,217 during that year. Livestock raising is the most common type of farming and total sales amounted to \$7,935,581 in 1959. Poultry production is valued at over \$3,000,000 annually and the county ranks fourth in this respect. Dairying is Lewis's third most valuable farm industry after poultry and livestock. In 1959, the county's dairy industry ranked eleventh in the state with returns of over \$2,300,000 per year.

Oats and hay are the important crops. In 1959 Lewis ranked second in the state in clover-timothy acreage and production and fourth in oats acreage while it ranked fifth in oat production. The county is also one of the principal berry producing areas of the state.

Large investments in food processing plants have been an important influence in the development of agriculture in Lewis County. There are plants for meat packing, milk and cream, canning, freezing, juicing and concentration of fruits and vegetables. These investments have made the cities of Chehalis and Centralia important centers of food processing and marketing.

PART II

LEWIS COUNTY POPULATION

Geographically, the population of Lewis County is very unequally distributed. A clustered pattern of population is found in the Chehalis River Valley, concentrated largely in the cities of Centralia and Chehalis. The Cowlitz Prairies, extending southward and southeastward from the City of Chehalis, contain a fairly evenly distributed rural and urban population on the river deltas and glacial drift plains. In the eastern part of the county a predominantly rural population extends up the Cowlitz River Valley. Mountainous areas, such as the Willapa Hills and the Cascade Range, have but few people. Upland areas in the Cascade foothills are very thinly settled.

Population Growth

The growth of Lewis County was slow before 1870. Lack of roads and distance from the East kept immigration to a minimum. Early settlers were discouraged by the dense forest growth, damp climatic conditions and remoteness from markets. The Lewis County population was only 888 in 1870 according to the Census. Population grew rapidly from 1870 to 1900. New transcontinental railroads brought waves of immigrants from eastern states and European countries. The extension of the Northern Pacific Railroad through the Chehalis River Valley and Cowlitz Prairies brought new settlers and encouraged rapid expansion. By 1900, the county population was 15,157.

The period 1900 to 1910 was a decade of rapid growth in which the county gained 16,970 people, increasing more than twofold to 32,127. New markets for lumber and agricultural products were opened by the railroads. Large numbers of settlers arrived to work in the mills and logging camps. Many became interested in part-time farming on logged-over lands. Between 1910 and 1940 the population grew at a slower but steady rate. The increase averaged about 309 per year. Reduced employment and a growing scarcity of land were reflected in the slower rate of population growth. The population by 1940 was 41,393.

The 1940-1950 decade brought a slight increase in Lewis County population. Primarily because of the growth of food processing and marketing of farm products, there was an increase of 2,362 people in ten years, raising the county population to 43,755. The rate of population increase for the decade was 5.7 percent. Most of the new growth occurred in the cities and towns of Centralia, Chehalis, Morton, Mossyrock and Toledo. By 1960, however, the total population of Lewis County dropped to 41,858, reflecting a decrease of 1,897 or 4.3 percent for the decade. This was mainly the result of a decline in the local lumber industry.

Urban and Rural Population

In 1870 the entire population of Lewis County was in rural areas either in villages or on farms. Of Lewis's population in 1910, 63.3 percent was rural and only 36.7 percent was urban. After 1910, the percentage of rural population began to increase and urban population (persons living in incorporated places of 2,500 or more) declined steadily. This increasing tendency for people to live in rural areas does not follow the state or national trend. In 1960, according to the Census, 13,785 persons or 32.9 percent, were living in urban areas. Rural population increased to 67.1 percent or 28,073 persons. With farming, forest

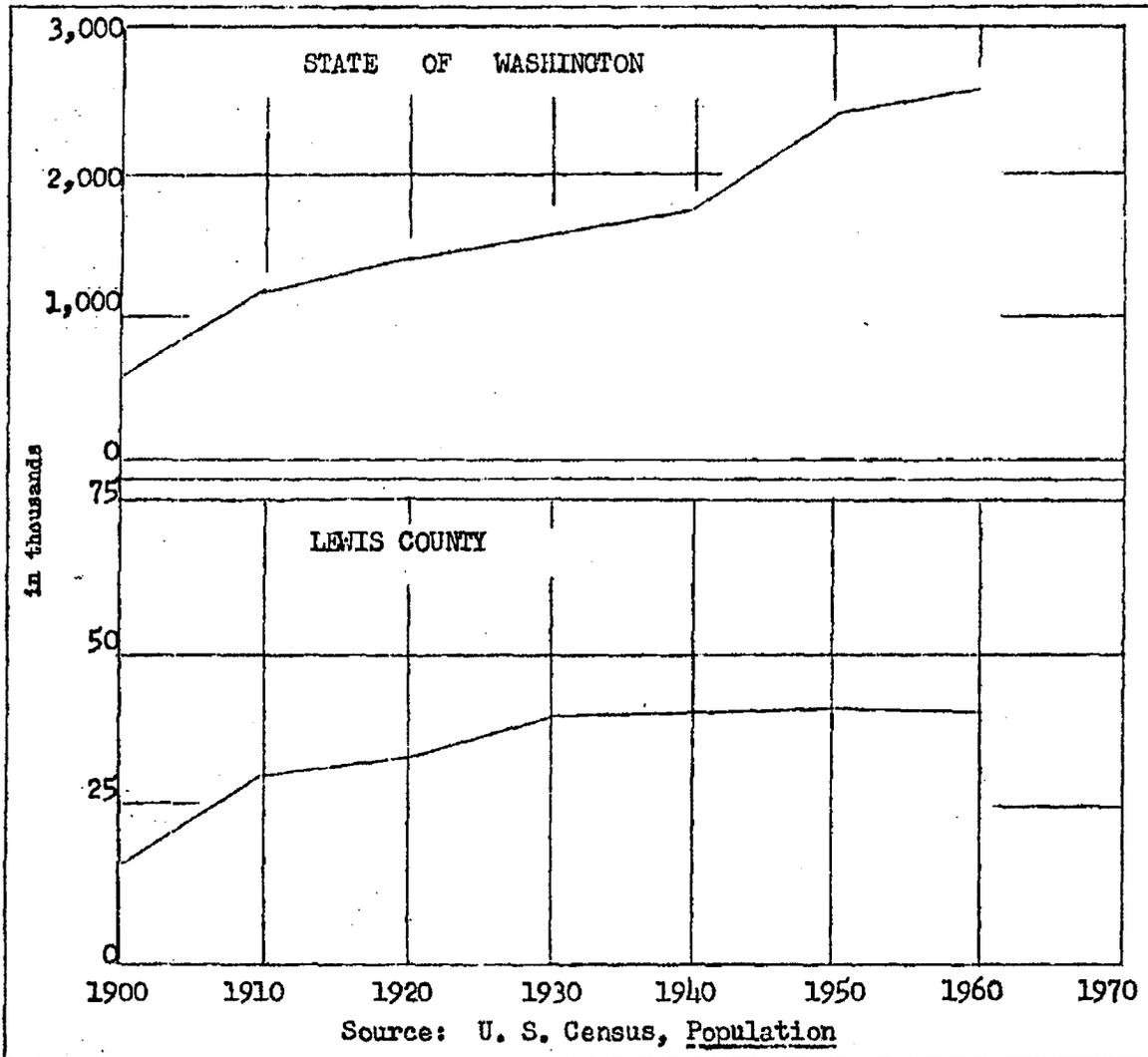


Figure 1. Population Trends: 1900-1960

Table 1. Population of Lewis County, 1870-1960

Year	Population	Percent Rural	Percent Urban
1870	888	100	0
1880	2,600	100	0
1890	11,499	100	0
1900	15,157	100	0
1910	32,127	63.3	36.7
1920	36,840	67.2	32.8
1930	40,034	67.6	32.4
1940	41,393	70.4	29.6
1950	43,755	67.2	32.8
1960	41,858	67.1	32.9

Source: U. S. Census, Population

industries and some mining being the principal occupational outlets, the population has remained predominantly rural.

The rural population is largely rural-nonfarm, consisting of 21,770 persons who live in the country but do not operate farms. Rural-farm population actually has decreased in the last twenty years. Persons living on farms numbered 14,686 in 1930, 15,919 in 1940, then dropped to 13,104 in 1950 and to 6,303 in 1960. Lewis County, however, ranks eighth among the counties of Washington in farm population. Since 1940, the trend in farm population has been clearly downward. The U. S. Census in 1960 counted 6,801 fewer people on farms than in 1950, a decline of 51.9 percent. Both farms and people living on farms are becoming fewer, whereas the production of farm products continues to increase. Lewis County finds itself in a new period where technology fashions great economic and social changes.

The lumber and logging industry has caused local areas and incorporated towns to rise and fall in population as camps and mills moved from deforested areas to other forested sections. Incorporated places in the western section of the county particularly show the influence of shifting forest industries and the mobile labor force. As the Willapa Hills were logged, the towns of Pe Ell, Vader, Napavine and Winlock grew and then declined in population. Several small mill towns such as Doty, Dryad and Walville were almost abandoned. On the other hand, as sawmilling and logging moved into the eastern Cascade Mountain section, population increased at Morton, Mossyrock, Kosmos, Randle and Packwood.

Table 2. Population of Incorporated Cities and Towns
Lewis County, 1910-1960

Incorporated City or Town	1910	1920	1930	1940	1950	1960
Centralia	7,311	7,549	8,058	7,414	8,657	8,586
Chehalis	4,507	4,558	4,907	4,857	5,639	5,199
Morton	--	522	461	778	1,140	1,183
Mossyrock	--	--	--	--	356	344
Napavine	--	340	181	220	242	314
Pe Ell	838	861	891	825	787	593
Toledo	375	324	530	523	602	499
Vader	631	500	465	479	426	380
Winlock	1,140	832	864	861	878	808

Source: U. S. Census, Population

The two major cities, Centralia and Chehalis, have been relatively stable since 1910, each gaining in population during the last 50 years. Chehalis is the county seat. It is a food processing center as well as a commercial center serving farmers. Centralia, the largest city, was started as a lumber and railroad center and has recently become the location of some food processing industries. Centralia and Chehalis are only a few miles apart and are often called the "Twin Cities". Residents of both commute and work in urban area industries.

In 1910, there were six incorporated places in Lewis County comprising a total population of 14,802. By 1960, there were 9 incorporated places with a combined population of 17,906. Only Centralia and Chehalis have populations

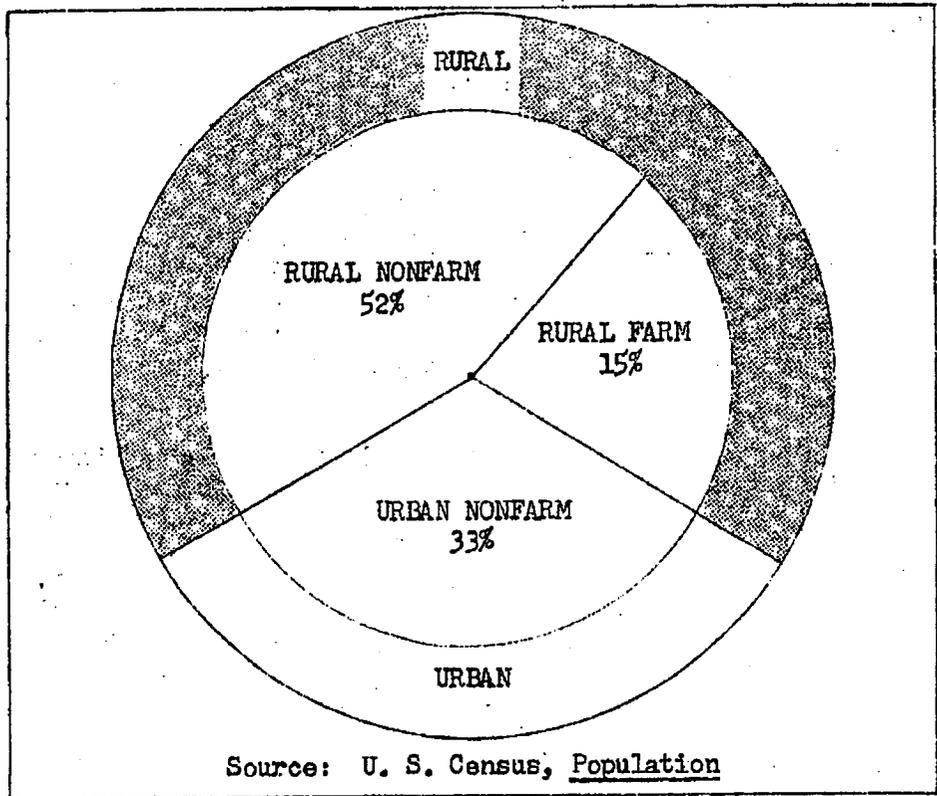


Figure 2. Urban and Rural Population, Lewis County, 1960

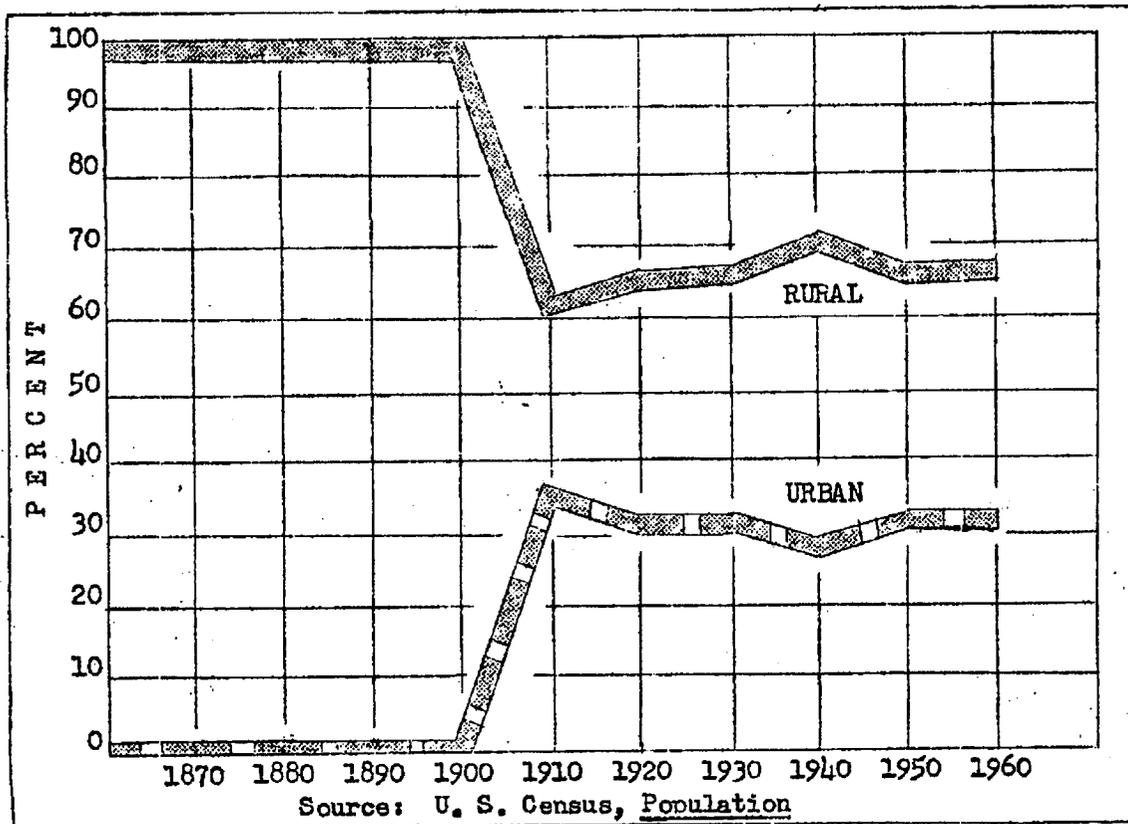


Figure 3. Rural and Urban Population Trends, Lewis County, 1870-1960

exceeding 2,500 persons and, therefore, were the only two incorporated places considered by the Census to be urban population.

Population Characteristics

Agricultural and trade opportunities in Lewis County have attracted settlers of varied origins and backgrounds. Recent overland migrants from eastern states and foreign immigrants from Europe add to a mixture which is typical of many West Coast counties. In 1960, there were 1,708 foreign born, amounting to 4 percent of the county's total population.

In 1960 a total of 14,259 persons were employed in the county. According to Census figures, 3,923, about 27 percent, of all self-employed and employed persons were in manufacturing--in logging camps, lumber mills, dairy food processing plants, etc. The next largest field was in miscellaneous services covering many trades, followed by retail and wholesale trade. Agriculture ranked fourth, employing 1,500 people or 10 percent of all employed persons.

Table 3. Employment of the Population
Lewis County, 1960

Types of Employment	Total Workers
<u>Total employed workers</u>	14,259
Agriculture	1,500
Forestry and Fisheries . . .	127
Mining	17
Construction	804
Manufacturing	3,932
Transportation, Communications and other Public Utilities .	863
Retail and Wholesale Trade .	2,586
Miscellaneous Services . . .	3,143
Public Administration (govern- ment employment)	731
Other employment	565

Source: U. S. Census, Population

Typical of many counties in the western United States, Lewis has been a melting pot of many nationalities who have migrated from Europe to seek new lands and opportunities. Germany and Canada lead as countries of origin of the foreign stock. Major immigrant groups ranked in numerical order were as follows: German, English, Swedish, Finnish and Polish. In 1890, about 15 persons out of each 100 were immigrants from Europe. By 1960, foreign-born persons numbered only 4 in 100. Agriculture and lumbering in the county were influenced and helped considerably by these immigrants.

The nonwhite population of Lewis County was only 154 according to the Census of 1960. The races included 94 Indians, 26 Negroes, 9 Chinese, 8 Japanese and 3 Filipinos, residing mainly in rural places.

According to the 1920 Census, there were 122 males per 100 females in Lewis County. In 1960, Lewis' population consisted of 20,906 males and 20,952 females, which was a ratio of 99.7 males per 100 females. The number of women relative to men tends to increase as the county becomes older and more settled. Other factors such as war and industrialization also tend to increase the proportion of women. In rural-farm and rural-nonfarm areas, however, men still outnumbered the women in 1960. Of the county's rural population in 1930, 11,819 were males and 12,250 were females, a ratio of 121 men per 100 women. In 1960, rural men numbered 11,430 and rural women 13,643—a ratio of 106 males per 100 females. The exodus of women from the farm to the city continues following the state and national trend.

Lewis County's population is aging. The percentage of older people has been increasing steadily since 1870. The 1930 Census showed that only 6.4 percent of the people in the county were 65 and over, whereas in 1960, they accounted for 14 percent of the total. Improved health practices and greater medical knowledge have played an important part in lengthening the life span. In 1960, the largest single age group was that of young people 5 to 9 years of age. Children from 10 to 14 years of age formed the second largest group, while those under 5 years were third. Children under 15 years of age accounted for over 29 percent of the county's population.

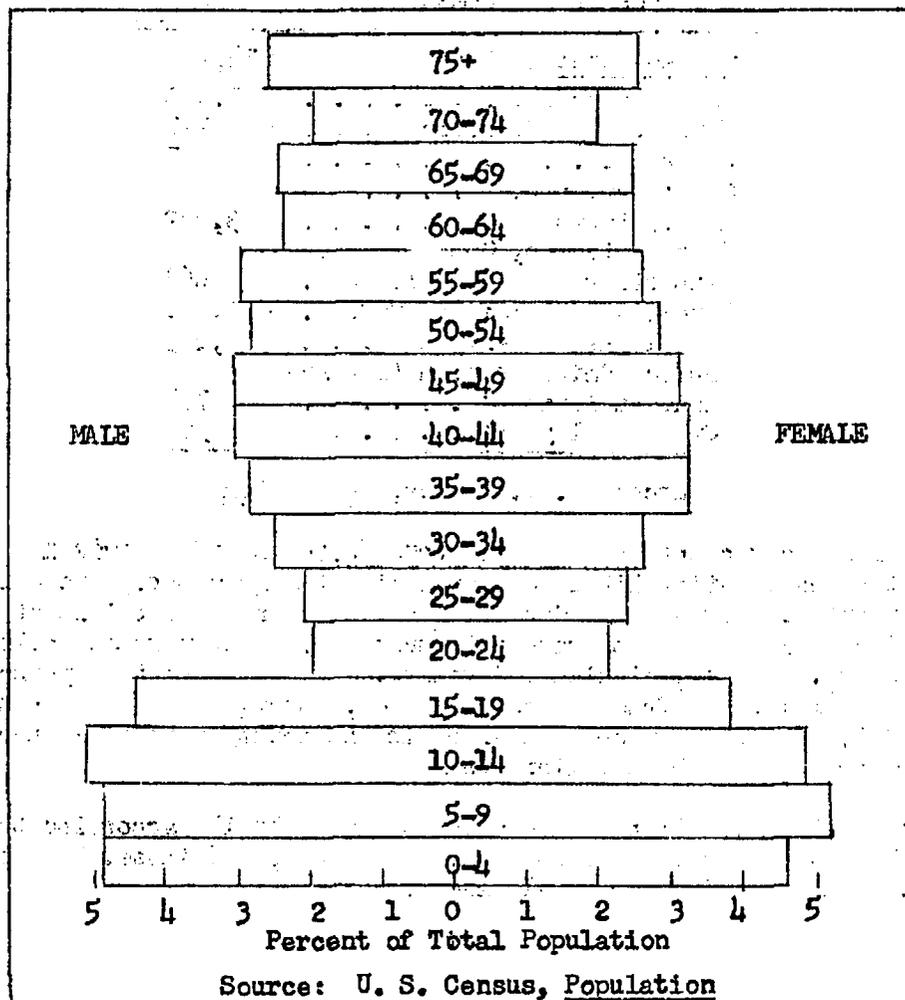


Figure 4. Age Distribution of Population, Lewis County, 1960

PART III.

PHYSICAL DESCRIPTION

Physical Regions of Washington

On the basis of surface features, Washington may be divided into eight general regions. Agricultural settlement is influenced by factors of topography, climate, soil, forest vegetation and water resources distinctive to each of the physiographic regions. Each has become a different type of farming area as settlers have learned to adapt crops and livestock to the conditions, or have improved limitations through drainage or irrigation.

Coastal Plains

A narrow, sandy plain with shallow bays, tidal flats, stream deltas and low headlands lies between the coastline and the Coast Range. It extends from the Columbia River mouth almost to Cape Flattery, being widest and lowest in the Grays Harbor and Willapa Bay districts. The climate is mild and damp with a long growing season, but it is too cool, cloudy and wet for most crops. Originally, this area was covered with heavy forests but much of it is now covered with woodlands. Lumbering and manufacture of wood products is the main industry. Farming is largely livestock and dairying using the low uplands and drained areas in the lower Chehalis River Valley. Cranberry growing is important and well-adapted to numerous, boggy areas in the Grays Harbor and Willapa Bay sections. The shallow bays are also used for oyster culture. Fishing is common in the rivers and coastal banks.

Coast Range

The Coast Range is an uplifted area of sedimentary and metamorphic rocks divided into the Olympic Mountains and the Willapa Hills. The Olympics tower to nearly 8,000 feet in a dome-like structure, carved deeply by rivers. These mountains have the heaviest precipitation in the state. Snowfields and heavy forest cover the mountains. Most of the wilderness area is within the Olympic National Forest and Olympic National Park, being managed for recreation, wildlife and timber. Farm settlement is limited to some foothill river plains and coastal terraces such as the Dungeness and Port Angeles districts along the Strait of Juan de Fuca. Here in the lee of the mountains, rainfall is moderate and irrigation is practiced by some livestock farmers. The Willapa Hills country is wet, heavily forested and carved into numerous narrow valleys. Logging is the main industry, combined with livestock farming in the upper Chehalis River Valley and along the banks of the Columbia River. Wet climate, hilly topography and the difficulty of clearing stump land retards agriculture.

Willamette-Puget Sound Lowland

A broad lowland, described as a trough or valley, lies between the Coast Range and the Cascade Mountains. The northern part is the Puget Sound Lowland which has been glaciated and is occupied by the sea in the lowest section. The continental glacier reached slightly south of Olympia. Under a warming climate it melted and geologists believe it receded about 25,000 years ago, leaving an infertile plain of moraines and outwash gravels, sands and clays known today as the Puget Glacial Drift Plain. Its rolling surface has numerous lakes and bogs.

Most of the major cities--Seattle, Tacoma, Everett, Bellingham and Olympia--have been built on moraines bordering the Sound. Rivers, such as the Nooksack, Skagit, Snoqualmie, White and Puyallup have built up deltas and flood-plains over the older gravelly plains. These narrow valleys are more fertile than the older glacial plains and support numerous small dairy, vegetable and berry farms. Most of the gravelly areas are wooded with a second-growth forest and are used for pastures. In the southern part of the Willamette-Puget Sound Lowland, there are two large valleys--the Cowlitz and Chehalis. They drain a low, hilly area with several flat prairies and bottomlands.

Agriculture is handicapped by poor drainage and flooding of the river deltas and plains, by heavy winter rainfall, by cloudy but dry summers, by coarse, gravelly upland soils and by densely wooded land which is costly to clear. Advantages are mild climate and a location close to major markets for farm products such as milk, poultry and vegetables.

Cascade Mountains

The Cascades are a wide and high topographic and climatic barrier which separates western and eastern Washington. The range is made up of sedimentary, igneous and metamorphic rocks which have been carved by glaciers and streams. High, isolated volcanic cones of lava such as Mt. Adams (12,397 feet), Mt. Rainier (14,408 feet) and Mt. Baker (10,791 feet) appear upon the older Cascade rocks. The Cascade crest varies between 3,000 and 10,000 feet and is higher and more rugged in northern Washington. Roads and railroads have been built across its lower passes in central and southern Washington. The Columbia River has cut a deep gorge and the lowest pass through the barrier. The western slope is wet and heavily forested with Douglas fir. The eastern slope is drier with a less-dense pine forest. Nearly all classified as forest land, most of the area is in Federal ownership in five national forests and Mount Rainier National Park. Tree fruit farming in the eastern slope valleys of Wenatchee, Chelan, Methow, Naches and the Columbia Gorge is most important. Sheep and cattle summer grazing on alpine grasslands is another use. Deep western slope valley bottoms such as the Skagit, Snoqualmie, Nisqually, Cowlitz and Lewis also contain livestock farms. The area is vitally important as a watershed for irrigation and city drinking water and a source of timber. Steep terrain, wet climate, short growing seasons and heavy forest vegetation are main handicaps for agriculture.

Columbia Basin

A low plateau of old lava rocks covered with stream and wind-deposited soils extends in a series of plains, ridges, coulees and hills from the Cascades to the eastern Washington border. The area is basin-like in structure, being higher around its margins and sloping inward to low and level central plains. It has been sharply eroded by the Columbia River and its interior tributaries, the Snake, Yakima, Palouse and Spokane Rivers. The basin has sub-areas created by crustal movements and erosion.

- A. The Yakima Folds are a series of hilly ridges extending from the Cascades eastward into the lower part of the basin. The Yakima and Columbia Rivers have cut gaps through the ridges and have built up plains in the troughs between them. The rich alluvial plain of the Yakima River is an important irrigated valley.

B. The Waterville Plateau is a tableland of thin soils overlaying basaltic rock at an elevation of 2,500 to 3,000 feet. It has gorges cut by the Columbia River and ancient glacial outwash streams once flowing in Moses and Grand Coulees. It is too high for irrigation and is used for dryland grain and livestock farming.

C. The Channelled Scablands is a belt of dry terrain carved by ice-age rivers into a series of coulees. Bare rock is exposed in the coulees. Small plateaus between the old river channels have thin soils used for dryland farming. The Grand Coulee of this region has been developed into a major irrigation reservoir.

D. The Palouse Hills consist of fertile deposits of wind-blown soil overlaying basaltic lava flows. After being deposited in large dunes, the formation was reshaped by streams into an intricate pattern of low, rounded hills. The hills receive 16 to 25 inches of rainfall annually and have deep, porous and fertile soils. It is one of the richest farming areas of the Pacific Northwest.

E. The Central Plains are low and relatively level expanses of soil, deposited by old streams crossing the Channelled Scablands and later by the flooding of the Yakima, Columbia, Snake and Walla Walla Rivers. Climate is desert-like (6-12 inches of precipitation per year). The lower lands of the area, the Quincy and Pasco Basins and the Walla Walla Valley, are irrigated. The Quincy Basin is a new irrigation area watered by Grand Coulee Dam.

Agricultural handicaps in Columbia Basin regions are mainly found in its dry, continental climate. Large irrigation systems built since 1900 have overcome much of the need for water on rich valley and basin soils. Dryland farming in higher areas is practiced widely, although occasional variations in rainfall, lack of snowfall, winter-kill, water and wind erosion inflict damage to field crops and to livestock ranges.

Okanogan Highlands

A portion of the Rocky Mountains, consisting of well-eroded, old granites, lavas and sedimentary rocks, extends across north-central Washington. These are the Okanogan Highlands, the state's richest mineral area. Summit levels reach 4,000 to 5,000 feet with peaks exceeding 7,000 feet. Prominent north-south valleys are occupied by irrigated tree fruit and livestock farms. These are the Okanogan, Sanpoil, Kettle and Colville Valleys. The Columbia River gorge through the Okanogan Highlands is occupied by the large man-made lake behind Grand Coulee Dam--Roosevelt Lake. Higher and wetter portions are forested with pine and larch, and are managed for timber and for livestock ranges by the United States Forest Service and the Bureau of Indian Affairs. Cold winter temperatures, short growing seasons, dry valley climates and remoteness from markets are farming handicaps.

Selkirk Mountains

The Selkirks, a range of the Rocky Mountain system, extend into the northeast corner of Washington. The rocks are old mineralized granites and metamorphics reaching elevations of over 7,000 feet. The Pend Oreille River Valley at the base of the Selkirks is an agricultural area of narrow bottom lands settled by livestock farmers. Nearly all of the uplands are in Kaniksu National Forest. While

climate is cool and growing seasons are short, the Pend Oreille Valley has an advantage of being relatively in close proximity to the Spokane metropolitan market area.

Blue Mountains

The Blue Mountains are an uplifted and eroded plateau extending into the southeastern corner of Washington. The strata are mainly ancient crystalline rocks which contain some minerals. The highest point of the mountains in the Washington section is Diamond Peak (6,401 feet), located on the divide between the Grande Ronde, Tucannon and Touchet Rivers. These rivers, and the Walla Walla River, have cut valleys into the plateau. Extensive pine forest and grassland areas are in the highlands within Umatilla National Forest, where rainfall is 30 to 40 inches. The Snake River has cut a deep valley and gorge across the lower parts of the mountains. The area is well developed agriculturally around its northern foothills where wind-blown soils are deep and irrigation systems are used. The Walla Walla and Tucannon Valleys are rich grain, legume and livestock areas of irrigation and dry farming. Grazing is an important use of the high lands by livestock ranchers in the upper valleys.

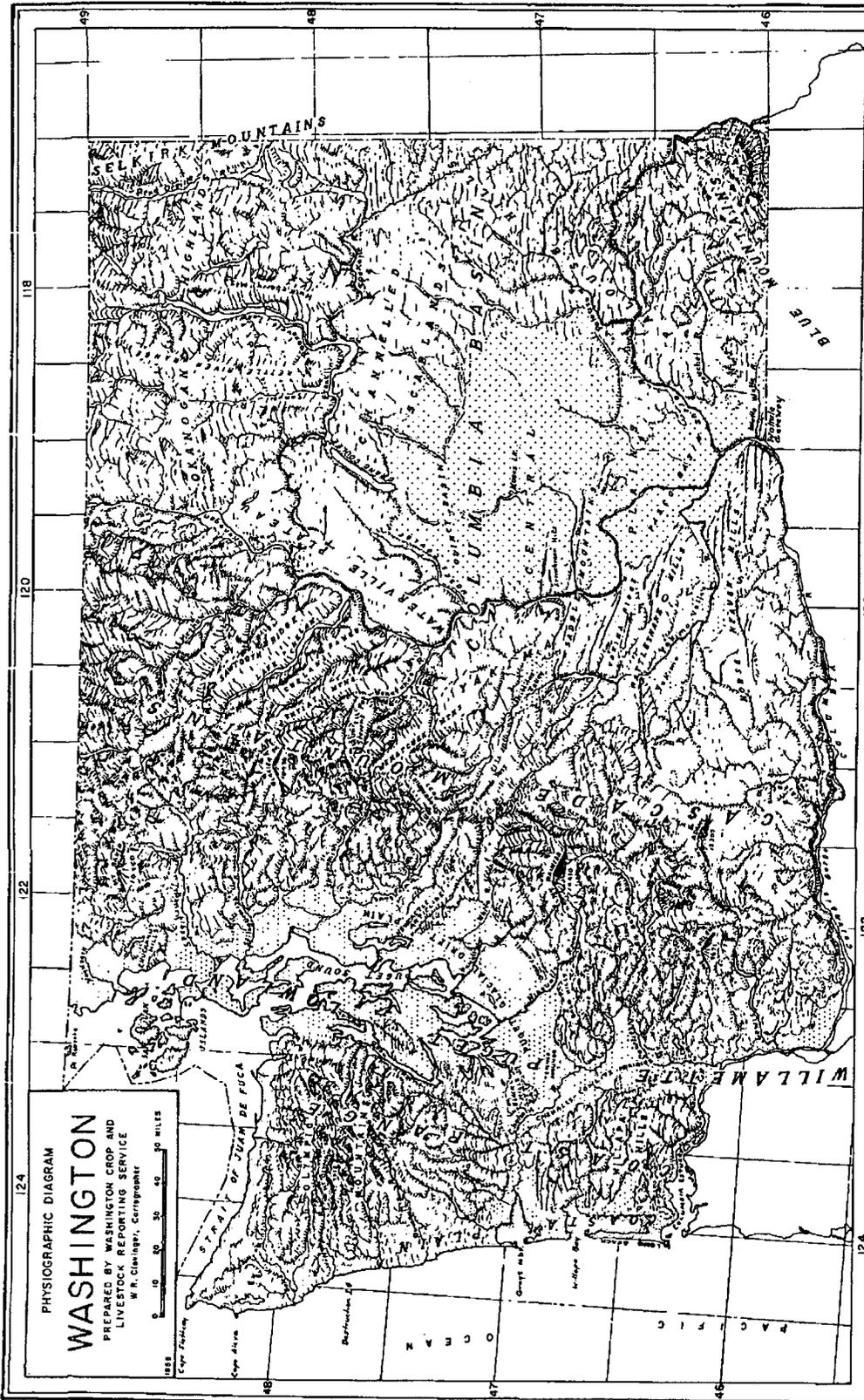
Topography of Lewis County

The land surface of Lewis County varies from the low bottomlands and alluvial plains of the Chehalis and Cowlitz Rivers to the alpine peaks of the Goat Rocks on the crest of the Cascades. The low lands along the Cowlitz in the vicinity of Toledo are only about 80 feet above sea level. Goat Rocks are 7,500 to 8,000 feet above sea level, the highest in the county.

Three major physiographic features characterize the general topography of Lewis County. The first and most important agricultural part of Lewis County is the section containing the Willamette-Puget Lowland which extends north and south through western Oregon and Washington. It is a major valley or trough lying between the Cascade and Coast Ranges. In Lewis County, it consists of the Chehalis-Cowlitz Prairies, a chain of rolling prairies and river bottoms of the Chehalis and Cowlitz Rivers. This lowland is underlain with beds of gravel, sand and clay--materials eroded from the Coast and Cascade Ranges and deposited in past geological time.

The second and third features, the Coast Range and Cascade Range physiographic provinces, cover nearly three-fourths of the county's area. The Coast Range section is well-eroded into numerous narrow valleys by the upper Chehalis River system. It appears as rough, heavily-wooded hill country from the air. They are called locally, the Willapa Hills, their highest point in Lewis County being 3,111 feet.

The eastern two-thirds of the county is in the Cascade Mountain province. Through millions of years of erosion by glaciers and streams of the Cowlitz and Nisqually River systems, this mountainous section has been reduced to numerous creek valleys. The creek bottoms and their benchlands are about 600 to 1,500 feet in elevation and are partially taken up by small farms. The low intervening ridges of 1,500 to 2,000 feet were also homesteaded for timber and some farms are located on the ridge terrain. A major valley lowland of the Cowlitz is "Big Bottom". The valley floor of the upper Cowlitz River reaches far eastward into the Cascades. Bottom lands are made up of thick deposits of stream-deposited



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 PHYSIOGRAPHIC DIAGRAM
WASHINGTON
 PREPARED BY WASHINGTON CROP AND
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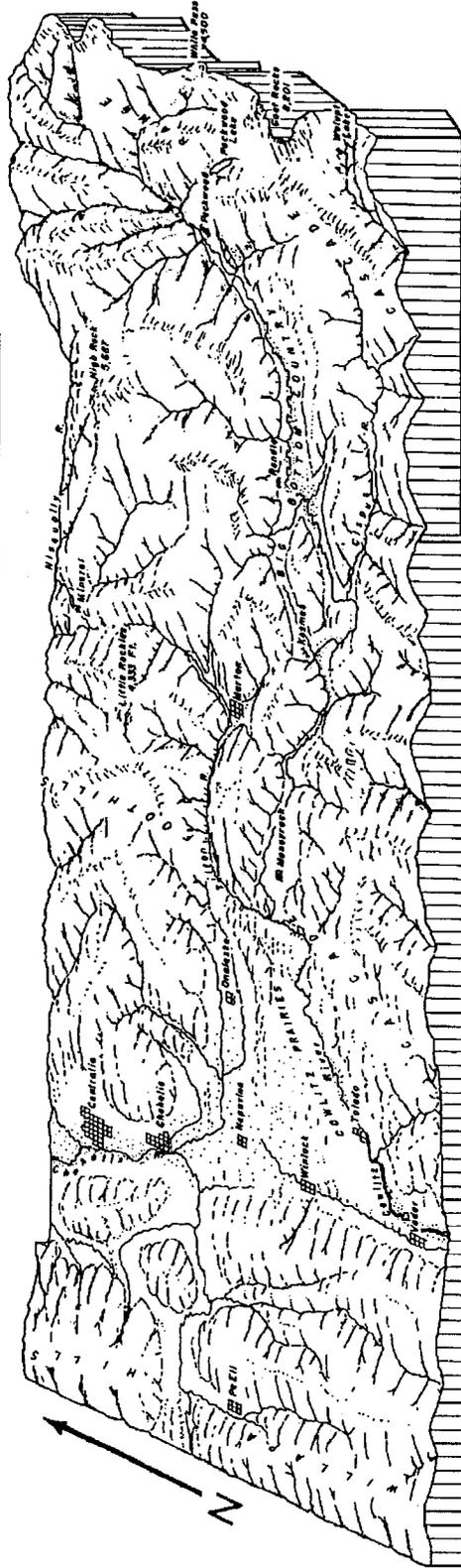
GENERALIZED CROSS-SECTION ALONG 47°30'



(VERTICAL SCALE EXAGGERATED 8 TIMES)

TOPOGRAPHIC DIAGRAM
LEWIS COUNTY

MILES
0 10 20



WASHINGTON CROP AND LIVESTOCK REPORTING SERVICE

W. B. CLEVINGER

gravel, sand, silt and clay, and range from 800 to about 1,100 feet in elevation. The deeper rocks of the Cascade section are mainly coal-bearing sedimentary rocks which are tilted, folded and faulted in a complex manner. An upper layer of rock is made of old lavas (basalt) and some new lavas extruded by volcanic eruptions in the Mt. Rainier and Mt. Adams areas. Much of the area has a mantle of pumice stone or volcanic ash deposited in recent geological time from the cones of Mounts Rainier, Adams and St. Helens.

Most of the county's farms are located on the Chehalis-Cowlitz Prairies between Toledo and Centralia. Alluvial plains called Cowlitz, Newaukum, Klickitat, Drews, Ford, North, Jackson and Boistfort Prairies are the oldest and most developed farmlands. Chehalis River bottoms in the Willapa Hills also have numerous farms. The bottom lands of the upper Cowlitz River extend like a ribbon far back into the mountains. The county has a large amount of steeply-sloped foothill land included in farms. Homesteaders who chose lands in narrow valleys were obliged to take much valley-side and hilly land as part of their claims of square quarter-sections of 160 acres. The steep portions of the homesteads have been cleared for pastures in many places.

Forests and Wildlife

Through fire, clearing and logging, man has greatly modified the natural vegetation. This change started with the burnings by the Indians who are believed to have created the prairies which the first white settlers found. The white man has added land clearing, logging and large forest fires to the forces which have changed the primitive coniferous forest. Prior to 1850 a dense forest of Douglas fir intermixed with western hemlock, western red cedar and white fir covered all of the hilly and mountainous land. Bottom land hardwood forests of alder, broad-leaved maple, cottonwood, willow, Oregon ash and cascara impeded the early traveler and land settler. As late as 1953, the U. S. Forest Service classified 88 percent or 1,372,910 acres of the Lewis County area as forested land. ^{1/}

Logging and lumbering have been major activities since 1860. Forest cutting progressed from the Willapa Hills eastward and by 1955 logging was taking place in high Cascade Mountain forests. The Willapa Hills were mainly logged over by 1940 and today a thick cover of second growth Douglas fir covers the area. Large areas of the Cascade foothills are younger regrowth forests of Douglas fir or alder. However, large primitive forests remain in Snoqualmie National Forest, Gifford Pinchot National Forest and Mount Rainier National Park. These Federal lands comprise about 307,000 acres in Lewis County. In 1953, the principal forest types and the acreage covered were Douglas fir 892,470 acres, western hemlock 111,060, western red cedar 7,120, Alpine firs and hemlock 72,040, and hardwoods 65,010.

According to the U. S. Forest Service there was a net live sawtimber volume of 29,890 million board feet in Lewis County in 1953. This resource supports an active logging and lumbering industry located mainly in the eastern half of the county. Part-time farmers are employed in this industry and some also serve with the U. S. Forest Service on a seasonal basis. A large volume of sawlogs are taken out by rail and trucked to tidewater mills on Puget Sound and the Columbia River. The U. S. Forest Service sells at public auction mature timber in Gifford

^{1/} U. S. Forest Service, Pacific Northwest and Range Experiment Station, Portland, Oregon. Forest Statistics for Lewis County, Washington, 1953.

Pinchot and Snoqualmie National Forests. Twenty-five percent of the revenues from these sales within the boundaries of Lewis County are returned to the county for schools and roads. In 1949 there were 62 mills in Lewis County which produced 194,751,000 board feet of lumber. This was a decline from 1927 when 28 large mills cut 434,993,000 board feet ¹/_. In 1962, however, Lewis County was Washington's top timber producing county by cutting 545,180,000 board feet or about 11 percent of the total state timber harvest.

A sizable amount of forest products is sold from woodlands owned by farmers. In Lewis County, there were 1,628 farms with over 124,000 acres of woodland in 1959. In the same year, 617 farms reported forest products cut and/or sold.

The forest land also contains a rich resource of wildlife. The mountains and lowlands of Lewis County hold large populations of elk and deer. The county is blessed with abundant lakes and streams, which provide excellent trout fishing. Trappers, many of whom are farm boys, generally make an important fur catch each winter. In the 1962-1963 season, 584 muskrat, 88 mink, 78 raccoon, 37 otter, 13 skunk, 10 civet cat, 7 bobcat, 6 marten, 9 red fox and 5 weasel were caught by 20 trappers ²/_.

Land Classification and Soils

Because of its mountainous and hilly topography, Lewis County is divided into seven broad classes of land use capability. The terrain and varied processes of soil formation over many centuries have created a large variety of soil types. Many farms in the hilly areas have two or more classes of land and include several soil types.

Class I and II lands, the best farming areas of the county, are limited for the most part to the Upper Chehalis River bottom lands west and south of Chehalis and the Klickitat Prairie section at Mossyrock. The terrain is level and slightly rolling. Soils are fine textured, fairly well drained, deep and hold moisture well. Bottom lands and terraces have the best soils of the county. They include the Chehalis soil series of two types: silty clay loam and silt loam deposited by the Chehalis River. Mossyrock silt loam covers about 1,500 acres on the prairie at Mossyrock. It was formed under grass on an old terrace of the Cowlitz River. Both the Chehalis and Mossyrock soils are good and their only deficiency is low calcium or lime content. Drainage of winter run-off and topsoil dryness in summer are localized problems.

Class III and IV lands cover about one-fourth of the county and support most Lewis County farms. It includes upland terraces, numerous foothill valleys and major bottomlands along the upper Chehalis, Cowlitz and Nisqually Valleys. Much of this land is covered with forest or stumps, or is poorly drained, and in other places it is hilly. Soil is acid or lime deficient and varies in texture. Soils in the III and IV lands include the Winlock, Melbourne and Salkum loams surrounding Winlock and Toledo, the Spanaway gravelly, sandy loams around Centralia, the Siler silt loams in the Cowlitz Valley around Randle, Riffe peat and Riffe loams

¹/ West Coast Lumbermen's Association, Portland, Oregon. 1949-1950 Statistical Year Book, Douglas Fir Region, 1951.

²/ Washington State Game Department, Olympia, Washington. Report of Trappers' Catch, 1962-1963.

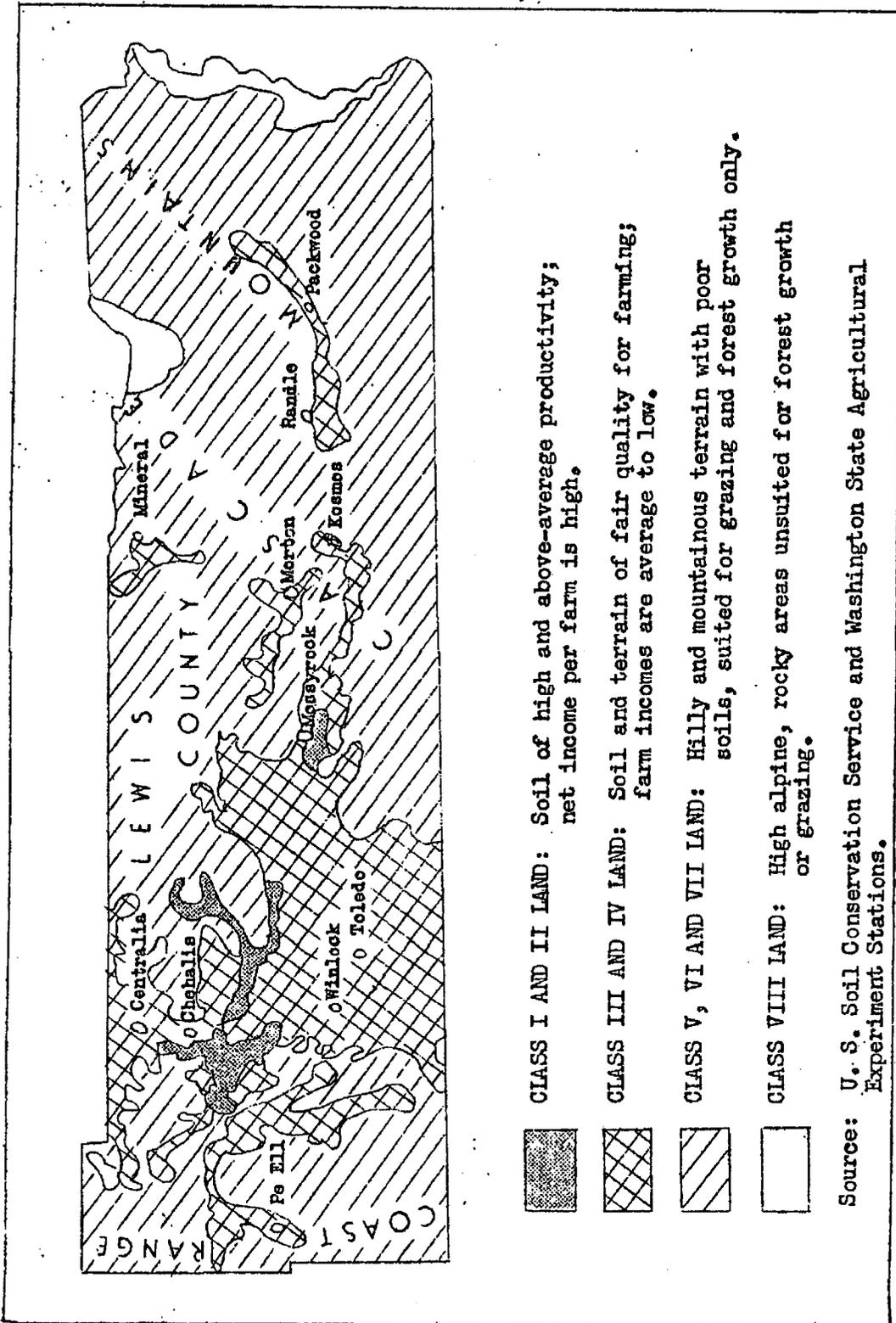


Figure 5. General Quality of Land in Lewis County

at Morton, and the Olequa and Grande Ronde silt loams in the Coast Range valleys between Chehalis and Pe Ell. Glacial and stream deposited soils, peat bog soils, and pumice and volcanic ash from Mt. St. Helens are intermixed, making a complicated soils map.

Classes V, VI and VII lands make up well over half the county area. These classes are hilly and mountainous and are logged-over or are in forest. Several hundred, small part-time farms are located on these lands along narrow creek valleys. Most of these classes are within Snoqualmie and Gifford Pinchot National Forests. Soils of these mountainous uplands include the Olympic, Vader and Melbourne gravelly loams. On the terraces and creek bottoms which are farmed are the Winston; Cispus, Nisqually and Greenwater silty and sandy loams.

Climate

The relation of climate and weather to agriculture is very important as it is almost the ultimate determinant of what shall be grown. Lewis County has a mid-latitude, west coast type climate, which is influenced by the mild, moist air flowing in from the ocean. The county is located in the West Coast Marine Climatic Region of North America. This climatic belt extends along the coast from southeastern Alaska to northern California. Prevailing westerly winds of ocean air rising over the Willapa Hills and Cascade Mountains bring cool, cloudy and wet conditions for about nine months of the year. During the summer, the land is warm and the oceanic winds are heated so they do not bring moisture as frequently as in winter. Thus, there is generally a dry period during July and August with ample sunshine to mature crops and provide good harvesting conditions for hay and grain. Because of changes in elevation from the low bottomlands of the Chehalis and Cowlitz Rivers to the Cascade foothills and mountains, temperatures, precipitation and frost conditions vary considerably.

Throughout the lowlands, the average maximum temperature during the warmest months ranges from 68 to 79 degrees and the nighttime temperatures from 56 to 65 degrees. Heat extremes to 108 degrees and below freezing temperatures have been recorded and occasionally crops are damaged. Temperatures in the highlands are 5 to 15 degrees cooler and decrease considerably from west to east with increase in elevation along the Cascade slope.

Winters are cold with freezing temperatures and snowfall occurs in both the high and low elevations. The average maximum temperature for the valley lowlands in the coldest month ranges from 10 to 13 degrees above freezing. Average minimum temperatures range from 35 to 39 degrees. During a few cold winters, temperatures have dropped to a -9 degrees or lower. Winter extremes of 2 to a -11 degrees have been recorded in the lowlands from Centralia to Kosmos.

The growing season varies greatly in the county. Centralia has a growing season of 178 days as an average, while Kosmos in the Cascade foothills has an average period of 142 days free of killing frost between spring and autumn. In the upper Cowlitz Valley, killing frosts can occur as late as June and as early as September. The risk of freezing temperatures at given locations in Lewis County is given in Table .

The precipitation pattern varies considerably with changes in altitude from the Cascade Range to the Cowlitz Prairies. The Cascade highland section in the eastern part of the county is moist, receiving about 80 inches annually at Longmire

Table 4. Temperature Data
Average Maximum, Average Minimum, Mean, Highest and Lowest Temperature Each Month
Lewis County

Station	Data	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Annual
Centralia (185' elev.) 1931-1960	Av. Max.	45.8	50.1	55.2	62.8	69.5	73.1	79.1	78.4	73.6	63.1	52.4	47.6	62.6
	Av. Min.	32.6	34.0	35.5	39.1	43.5	47.8	51.0	50.3	47.5	42.9	37.2	35.6	41.4
	Mean	39.2	42.1	45.4	51.0	56.5	60.5	65.1	64.4	60.6	53.0	44.5	41.6	52.0
	Highest	68	75	82	91	97	100	104	101	100	90	75	68	104
	Lowest	2	2	16	24	27	31	37	37	30	23	5	5	2
Kosmos (775' elev.) 1933-1960	Av. Max.	42.9	47.4	52.6	60.6	67.4	71.5	79.2	77.6	73.3	62.5	51.4	45.7	61.0
	Av. Min.	28.6	30.8	32.8	36.5	41.4	46.1	48.8	47.3	44.1	39.3	33.4	32.2	38.4
	Mean	35.2	39.1	42.7	48.6	54.4	58.8	64.0	62.5	58.7	50.9	42.4	39.0	49.7
	Highest	72	74	82	92	95	103	105	105	102	95	83	63	105
	Lowest	-11	-12	9	20	23	29	33	33	27	17	1	10	-12
Longmire R. S. (2762' elev.) 1931-1960	Av. Max.	36.2	39.6	44.0	52.5	61.6	66.2	74.9	73.6	68.5	57.4	44.6	38.7	54.8
	Av. Min.	24.3	26.0	27.6	31.6	37.3	42.9	47.4	46.9	43.5	37.7	30.8	28.1	35.3
	Mean	30.3	32.8	35.8	42.1	49.5	54.6	61.2	60.3	56.0	47.6	37.8	33.4	45.1
	Highest	60	64	73	83	95	95	105	100	97	88	72	60	105
	Lowest	-9	-8	-1	12	21	28	35	33	28	17	-3	-1	-9

Source: U. S. Weather Bureau, Climatological Office.

Table 5. Probability of Freezing Temperatures -- Lewis County 1/

STATION	TEMP. (° F.)	PROBABILITY -- SPRING					PROBABILITY -- FALL					Grow- ing Season Mean Length (Days)
		90%	75%	50%	25%	10%	10%	25%	50%	75%	90%	
Centralia	32	Mar 30	Apr 11	Apr 24	May 7	May 19	Sep 26	Oct 7	Oct 19	Nov 1	Nov 13	178
	28	Feb 27	Mar 11	Mar 24	Apr 7	Apr 18	Oct 19	Oct 30	Nov 12	Nov 25	Dec 12	233
	24	—	Jan 30	Feb 17	Mar 4	Mar 16	Nov 12	Nov 24	Dec 8	Dec 30	—	294
Kosmos	32	Apr 18	Apr 30	May 13	May 26	Jun 7	Sep 8	Sep 19	Oct 2	Oct 14	Oct 25	142
	28	Mar 16	Mar 28	Apr 11	Apr 25	May 6	Oct 7	Oct 17	Oct 30	Nov 11	Nov 21	202
	24	Feb 10	Feb 25	Mar 12	Mar 24	Apr 4	Oct 23	Nov 1	Nov 16	Dec 1	—	249
Rainier Longmire	32	Apr 30	May 12	May 25	Jun 8	Jun 19	Sep 8	Sep 19	Oct 1	Oct 14	Oct 24	129
	28	Apr 4	Apr 17	Apr 30	May 13	May 25	Oct 6	Oct 17	Oct 29	Nov 10	Nov 20	182
	24	Mar 11	Mar 23	Apr 5	Apr 18	Apr 30	Oct 25	Nov 5	Nov 17	Nov 29	Dec 10	226

Source: U. S. Weather Bureau, Climatological Office.

1/ To illustrate the data in the table, we find that the 50 percent probability of a 32° spring freeze for Centralia is April 24. But there is also a 25 percent chance (1 year in 4) that a 32° freeze will occur as late as May 7, and 10 percent chance as late as May 19.

Table 6. Precipitation - Lewis County
(inches)

Station	Elevation (ft.)	Period of Record	Average Annual	Greatest Annual	Least Annual	Greatest Monthly	Least Monthly	Greatest Daily
Centralia	185	1931-60	45.53	59.29	28.82	22.12	T	3.97
Kosmos	775	1933-60	62.01	83.17	34.89	28.45	0	4.02
Longmire	2,762	1931-60	82.43	113.60	25.65	36.09	0	6.11
Packwood	1,060	1925-60	53.55	78.50	34.21	33.66	0	4.75

Source: U. S. Weather Bureau, Climatological Office.

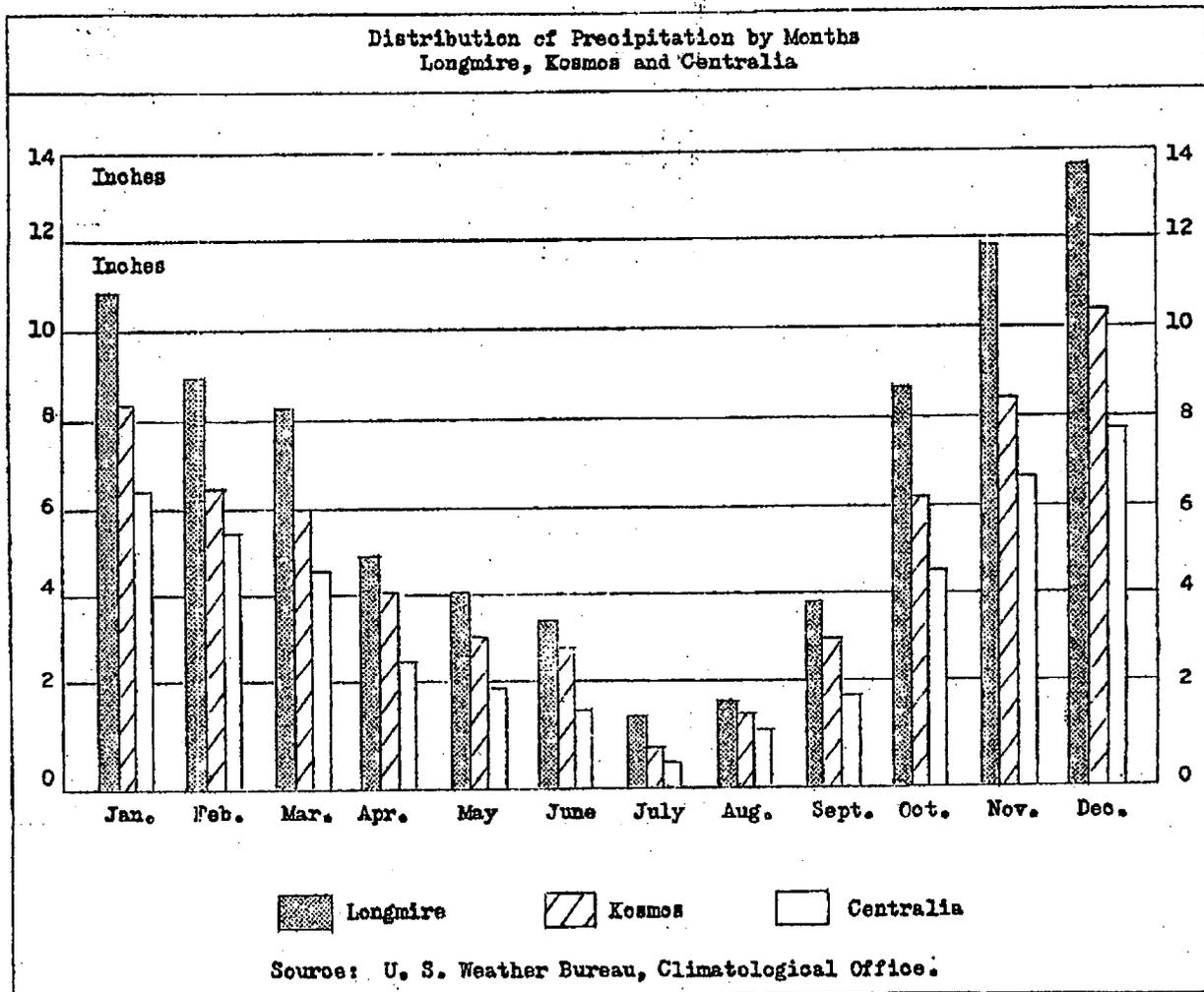


Figure 6. A graph of the rainfall at Longmire, Kosmos and Centralia shows a summer dry season during June, July, August and September. The wet season extends from October to the end of May.

to 62 inches at Kosmos in the lower western slope foothills. Heavy rain and snow in the mountains is essential as the source of irrigation water. The driest area includes the prairies extending from Toledo to Centralia where the average annual precipitation is estimated at about 45 inches. The Coast Range or Willapa Hills to the westward are much wetter, ranging from 50 to over 70 inches.

Based on 30 years of record at Centralia, Kosmos and Longview, there is a wet season extending from the beginning of October to the end of May. During the rainy season, rainfall is usually light to moderate over a period of time, rather than coming as heavy downpours for brief periods. However, occasional rainfall of heavy intensity can be expected. In the lower valleys, snowfall is light, seldom on the ground longer than one or two weeks and seldom exceeding 6-12 inches in depth. Snowfall increases in the mountains with the snow line in mid-winter extending down to about 1,500 feet above sea level. During the spring months, rainfall decreases and the dense snow pack melts rather slowly, thus flooding in the lower valleys is less frequent.

The winter, wet period is followed by a summer dry season during June through September. In July and August, it is not unusual for two or three weeks to pass without measurable rainfall. The dry season is often critical in August for pastures and growing crops often require sprinkler irrigation. It also creates a fire hazard in the forested upland country and generally each summer the forestry services of the Federal and State governments must close large areas to campers and fishermen. Each summer a number of forest fires are started by lightning during thunderstorms. These thunderstorms occur on one to three days each month from March through October. Average number of thunderstorms each year ranges from approximately 5 in the lower elevations to 15 in the mountains. Hail of sufficient size or intensity to result in crop damage is unusual.

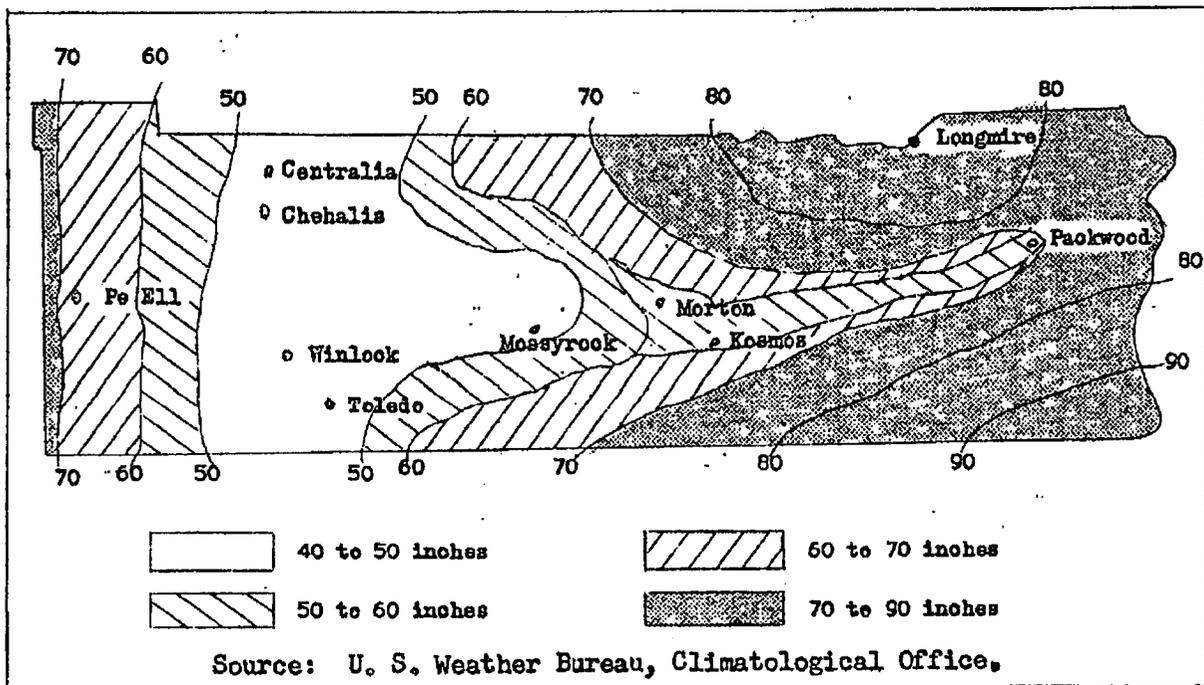


Figure 7. Distribution of Precipitation
Lewis County

Table 7. Lewis County's Rank Compared With
Other Washington Counties, 1959

Item Compared	Rank	Quantity
<u>General</u>		
Land area	6	1,566,080 acres
Number of farms	8	2,230 farms
Land in farms-percent	23	16.3 percent
Average size of farms	24	114.4 acres
Cropland harvested	19	57,492 acres
Irrigated land in farms	22	5,244 acres
Rural farm population	8	6,303 persons ^{1/}
Total county population	16	41,858 persons ^{1/}
<u>Cash farm income</u>		
Value of all farm products sold.	21	9,829,217 dollars
Value of livestock sold	11	7,935,581 dollars
Value of crops sold	26	1,893,636 dollars
<u>Livestock on farms</u>		
All cattle and calves	13	37,600 head
Milk cows	9	9,470 head
Hogs	15	3,166 head
Chickens	4	489,782 birds
Horses and mules	18	936 head
Sheep and lambs	17	3,489 head
<u>Dairy and poultry products sold</u>		
Value of dairy products sold ...	11	2,344,317 dollars
Whole milk sold	10	61,148,465 pounds
Value of poultry products sold .	4	3,152,585 dollars
Chickens sold	4	1,380,185 birds
Eggs sold	4	6,108,363 dozen
<u>Important crops harvested</u>		
Red clover seed	1	726 acres
Clover-timothy hay	2	25,056 acres
Filberts and hazelnuts	2	12,314 acres
Oats	4	11,028 acres
Strawberries	5	658 acres
Grass silage	7	4,199 acres

^{1/} U. S. Census of Population, 1960.

Source: U. S. Census of Agriculture, 1959.

PART IV

THE PATTERN OF AGRICULTURE

Farms - Number and Size

Lewis County is an area of medium and small-size farms. A total of 2,230 farms was reported in the Census of Agriculture taken in 1959. This was 563 less than enumerated in 1954. The definition used for a farm in 1959 is more restrictive than that used in 1954 and part of the changes in the number of farms from 1954 to 1959 resulted from the change in definition. Reduction in number of farms as a result of definition was 339. Census data indicate that a peak number of farms may have been reached in 1945 and that farms are now on the decrease. In 1959, Lewis ranked eighth among the counties of Washington in number of farms.

Farm acreage, since 1945, has been decreasing steadily in Lewis County. In 1900, the 1,786 farms contained 224,755 acres or only 14.4 percent of the total land area within the county. By 1945, 4,055 farms in Lewis were accounting for almost 20 percent of the county area. Farm acreage grew to an all-time high of 312,159 acres that year. In recent years, acreage in farms has decreased to 255,012 acres or only 16 percent of county area.

Table 8. Farms, Number and Average Size, Land in Farms
Lewis County, 1900-1959

Year	Total Farms in the County	Average size of farms in the County (acres)	Total County Area in Farms (acres)	Percent of County area in Farms
1900	1,786	125.8	224,755	14.4
1910	2,261	95.0	214,872	13.7
1920	3,030	74.6	226,162	14.4
1925	3,259	66.0	215,122	13.7
1930	3,380	70.2	237,429	15.2
1940	3,941	69.6	274,275	17.5
1945	4,055	77.0	312,159	19.9
1950	3,396	89.6	304,523	19.4
1954	2,793	104.7	292,394	18.7
1959	2,230	114.4	255,012	16.3

Source: U. S. Census of Agriculture.

Small farms are largely the result of land acquisition and purchase methods and the types of farming. About 70 of the original farms were Donation Land Act (1850) claims of 320 and 640 acres. Several hundred others were 160 acre (quarter sections) obtained as homesteads by pioneers who used the Homestead Act of 1862 to acquire farms. Since 1900 most of these larger units have been subdivided by heirs and owners for sale as smaller farms of 20, 40 and 80 acres. Other farms of 20 to 80 acres were purchased as unimproved, logged-over tracts from land and timber companies. Large numbers of these were sold from the land grant holdings of Northern Pacific Railway Company. The popularity of part-time farming by loggers and mill workers in livestock, poultry and specialty farming has also resulted in many small-scale farming operations.

A grouping of all farms by sizes from the last two censuses shows that the majority were in the small and medium groups ranging from 10 to 99 acres. Farms between 10 and 49 acres in size are the single largest group, numbering 800, according to the 1959 Census of Agriculture. Farms of 50 to 99 acres in size are the second largest group, numbering 495. These two size groups form a present county pattern in which 58 percent of the farms range between 10 and 99 acres. There were only 62 farms out of the county total of 2,230 which were larger than 500 acres. Many of these large farms specialize in growing wheat and hay crops and have large acreages in production. Between 1954 and 1959, the number of small and medium sized farms decreased, while the larger farms of 180 to 259 acres and 500 acres and over increased in number.

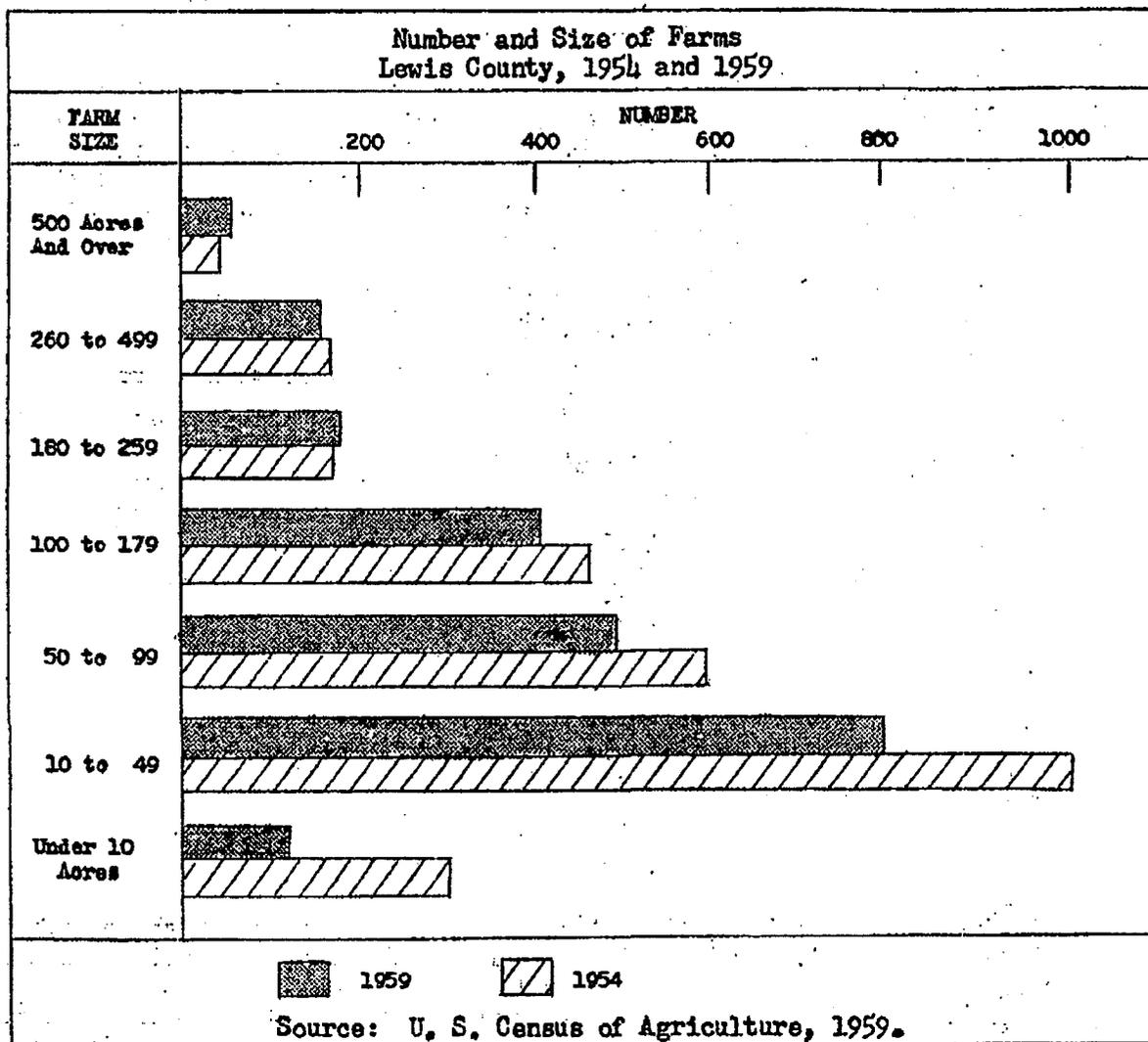


Figure 8. Number and Size of Lewis County Farms, 1954 and 1959.

Types of Farms

Lewis County shows a variety of farms classified by major products according to the 1959 Census of Agriculture. Most common are dairy farms, which comprise 15.8 percent of all Lewis farms. The next most numerous are those raising poultry, accounting for 12.8 percent of all the farms. Third in importance are livestock farms (8.6 percent) with primarily cattle and calves. Over 62 percent of the farms were miscellaneous and unclassified. The pattern is one of diversification between dairy, poultry and a variety of general and specialized farms. Many farmers diversify their operations between two or more cash earning crops and some type of livestock farming.

Table 9. Types of Farms, Lewis County, 1959

Types of Farms	Number of Farms	Percent of all farms in the County	
		1954	1959
Total farms in county	2,230	100.0	100.0
Field crop farms	20	2.1	.9
Cash-grain	20	2.1	.9
Other field-crop	—	—	—
Vegetable farms	—	—	—
Fruit-and-nut farms	10	2.3	.4
Poultry farms	286	12.7	12.8
Dairy farms	352	20.5	15.8
Livestock farms other than poultry and dairy	191	4.8	8.6
General farms	51	4.2	2.3
Miscellaneous and unclassified farms	1,398	54.9	62.7

Source: U. S. Census of Agriculture.

Farm Residence and Operation

Lewis County agriculture is characterized by the fact that over one-half of its farmers do part-time work off their farms. Many persons reside on farms but divide their employment between farm work and other industries. In a forested region such as Lewis County, farmers have numerous seasonal opportunities to work in nearby mills, logging operations or for the state and federal forest services. Construction and maintenance work related to highways and hydroelectric service also provides seasonal work.

During 1959, there were 1,322 farm operators who reported doing some off-farm work. Of this number, 1,115 or 50 percent of all the county's farmers worked more than 100 days per year on jobs away from their farms. Almost two-thirds of the farmers earned more from outside work than they did from sales of dairy, poultry and other farm products.

The Census of 1959 also showed that 56 of the county's farmers did not live on the farm they operated. This was about 2.5 percent of the estimated total of farm operators. In some cases, farm operators live in town removed from the crop or livestock farm which they operate in a remote part of the county.

Farmland Utilization

Crops were harvested from 22.5 percent of the land in farms in 1959. An additional 13.0 percent was in cropland used only for pasture and 4 percent was idle or fallow land. Land is mainly in hay meadows, pastures, pastured woodlands and woodlands covered with Douglas fir, alder and other species and not pastured. Typical of most of western Washington, over 48 percent of farm acreage was un-cleared, remaining in stump land, logged-over land or regrowth timber. The total acreage of such land owned by Lewis County farmers amounted to 124,000 acres in 1959.

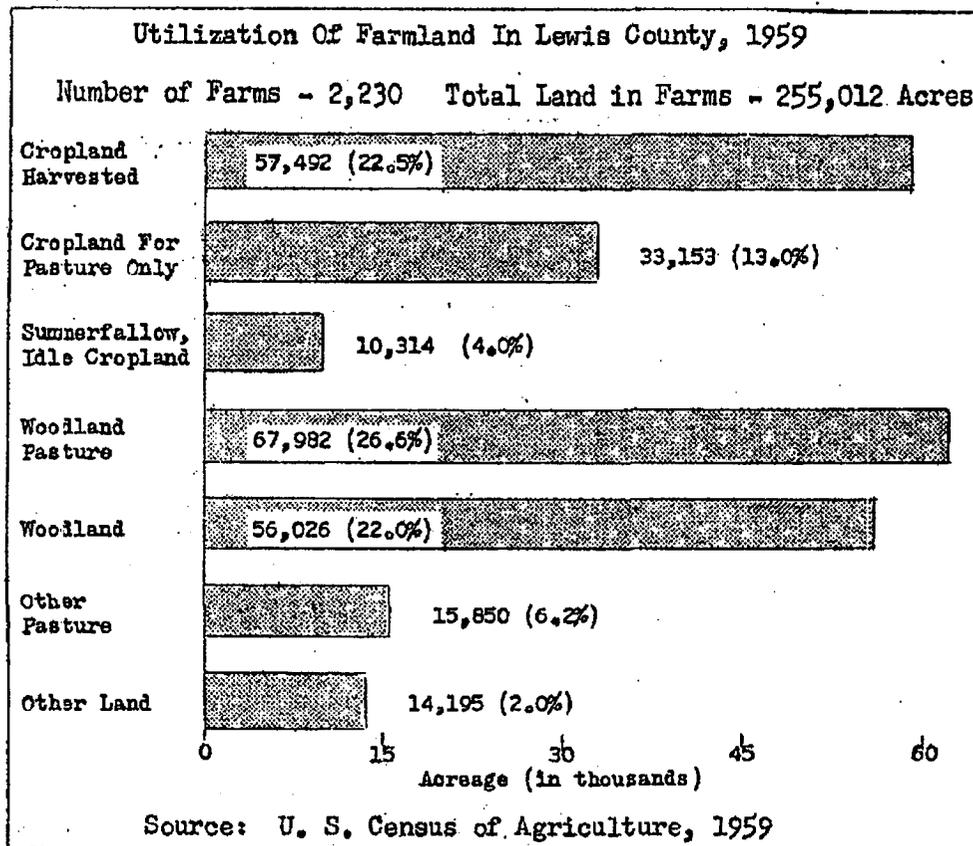


Figure 9. Utilization of Farmland in Lewis County, 1959.

Farm Values

Value of farmland and farms has increased greatly since 1920. After reaching a high point in the 1920's, valuations of farms decreased almost 17 percent during the 1930's. The depression decade from 1930-1940 saw values of land decline considerably, but there was a tremendous increase from the mid-1940's to the present time. By 1959, an average farm of about 160 acres was worth over \$19,400 in Lewis County, although far below the state average of \$44,075. On a per acre basis the county average was \$169.06, a figure above the state average of \$118.74.

The rise in farm and land values has been caused by several factors. One is the general rise of prices in real estate throughout the western United States. Another factor is the large amount of labor and capital Lewis County farmers have

invested in land clearing, drainage and building improvements since 1920. A third reason is the increase of population, many of whom desire small acreages for part-time farming. A fourth factor causing value increases on many timbered farms has been the expansion in values of standing timber and pulpwood.

Table 10. Value of Farm Land and Buildings
Lewis County, 1920-1959

Year	County Average Values	
	Per Farm	Per Acre
1920	\$ 6,464	\$ 86.60
1930	6,380	90.83
1940	4,374	62.86
1950	10,091	114.99
1954	15,338	163.19
1959	19,425	169.06

Source: U. S. Census of Agriculture.

Farm Tenure

A large majority of the farmers in Lewis County own the farm they operate. Many farms have remained in ownership of the pioneer families who established them. Full-owner farms in 1959 constituted 81.1 percent of all county farms and contained 68.5 percent of the farmland. In recent years, part-owner operations have become more important in Lewis County agriculture. Although part-owners account for only 14.3 percent of all farms, they operate 27.6 percent of all the farmland.

Tenancy, or the renting and leasing of entire farms, is not prevalent. Only 96 farms in the county were operated by tenants in 1959. The percentage of farms has declined rapidly since the high of 23.8 percent in 1935. By 1959, the tenant group accounted for only 4.4 percent of all farms in the county and contained less than 4 percent of the farmland. Manager-operated farms contain the smallest acreage of farmland. In 1959, less than 1 percent of the farm operators were managers and they operated only 0.5 percent of the land.

Table 11. Farm Tenancy, Number and Percent of Farms
by Tenure of Operator, Lewis County, 1925-1959

Year	Number of Farms	Full Owners		Part Owners		Managers		Tenants	
		Number	Percent	Number	Percent	Number	Percent	Number	Percent
1925	3,259	2,774	85.1	147	4.5	4	.2	334	10.2
1930	1,074	593	55.2	253	23.5	38	3.6	190	17.7
1935	1,184	638	53.9	244	20.6	20	1.7	282	23.8
1940	3,941	3,062	77.7	312	7.9	12	.3	555	14.1
1945	4,055	3,404	83.9	358	8.8	8	.3	285	7.0
1950	3,388	2,873	84.8	332	9.7	7	.2	184	5.3
1954	2,793	2,368	84.9	302	10.7	3	.1	120	4.3
1959	2,230	1,809	81.1	320	14.3	5	.2	96	4.3

Source: U. S. Census of Agriculture.

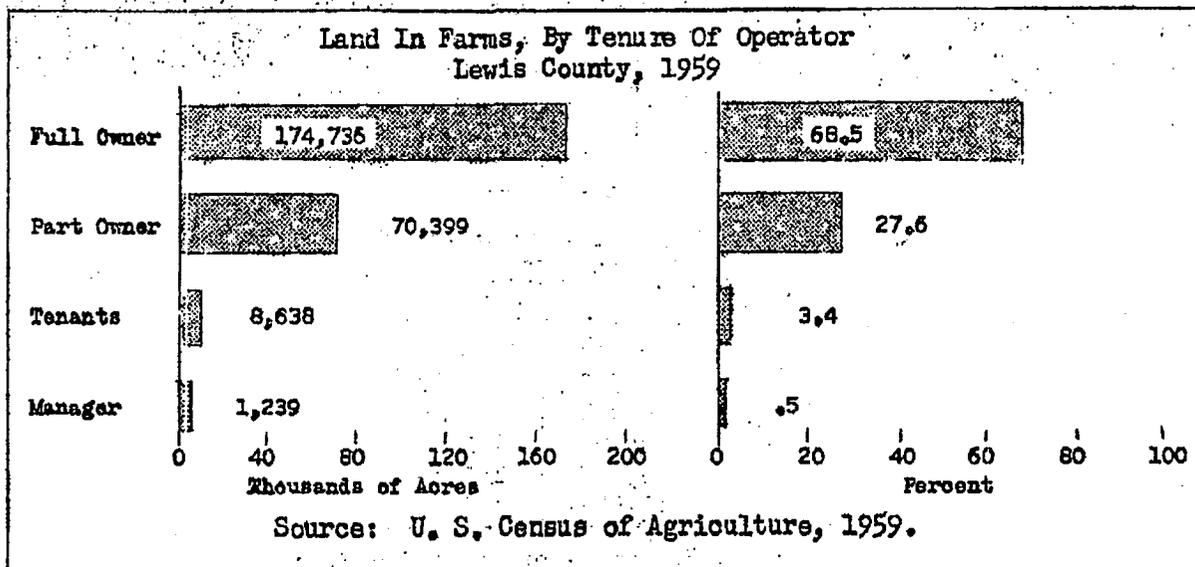


Figure 10. Land in Farms, By Tenure of Operator, Lewis County, 1959.

Irrigation

Irrigation is becoming more important to Lewis County's agriculture. Because of the dry summer climate and the desire to get higher yields of truck crops and pasture grass, there has been an increasing interest in irrigation. The field crop farms are using more irrigation equipment. Dairymen who depend on the upland pastures find that sprinkler irrigation increases their carrying capacity. The gravelly, glacial soils common in Lewis County require considerable irrigation. The top soil dries out severely in mid-summer. As a result, there has been an increasing investment by farmers in land leveling, distribution systems, wells, pumps and sprinklers.

The number of farms with irrigation in Lewis County in 1959 was small. A total of 214 farms reported some irrigation. This was less than 10 percent of all farms. In 1954, irrigated land was reported by 208 farms and in 1950 by 118 farms. The number of irrigated farms increased 81 percent between 1950 and 1959.

Lewis ranks twenty-second among the counties of Washington in irrigated acreage. The acreage irrigated in 1959 was 5,244 acres, according to the Census of Agriculture. This was 15.6 percent greater than the 4,536 acres reported in 1954 and 145 percent greater than the 2,137 acres reported in 1950. Irrigated land makes up only 2 percent of the land in farms, but in some areas of the county, over 10 percent of the farmland is irrigated.

Of the total of 5,244 acres irrigated in 1959, 3,116 acres or 59.4 percent, were irrigated from surface water sources on the farm; 1,721 acres or 32.8 percent, were irrigated from ground water sources; 357 acres or 6.8 percent, were irrigated from combinations of the above sources. Less than 1 percent of the total acreage was irrigated by water received from irrigation organizations.

The acreage of irrigated crops in 1959 was 1,983 acres. Approximately 3.4 percent of Lewis' harvested cropland received irrigation water in 1959. About 38 percent of the irrigated land is devoted to growing crops.

Table 12. Irrigated Farms: Number and Acreage
Lewis County, 1950, 1954 and 1959

Item	1959	1954	1950
Number of irrigated farms	214	208	118
Land irrigated (acres)	5,244	4,536	2,137
Irrigated land in farms according to use:			
Farms irrigating crops	93	98	57
Acres of crops irrigated	1,983	1,943	878
Acres of other land irrigated	3,261	2,593	1,259

Source: U. S. Census of Agriculture.

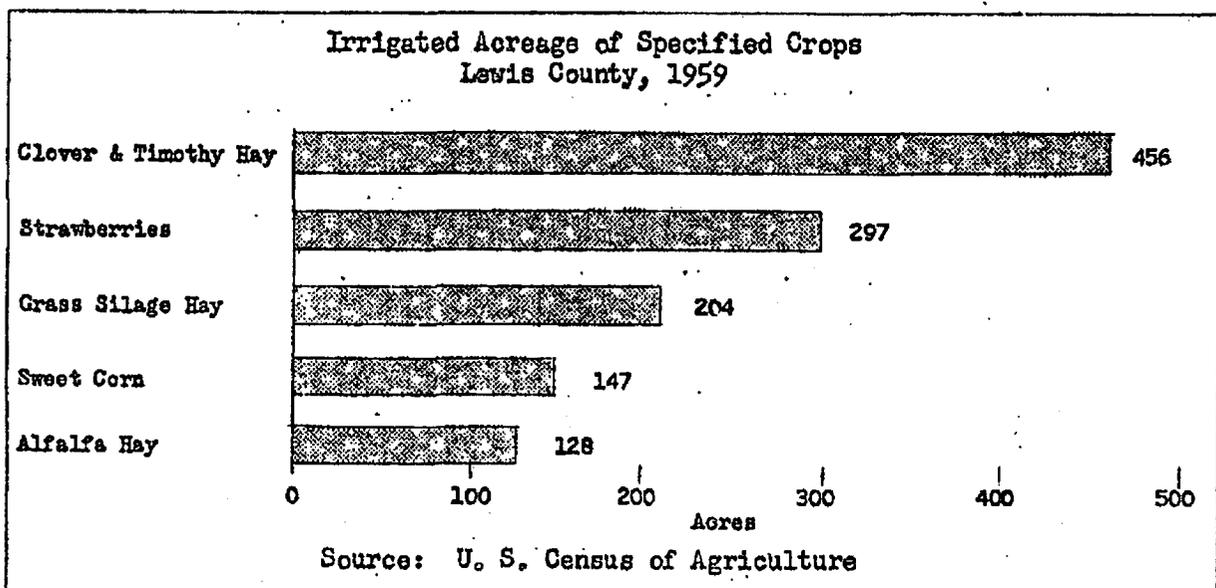


Figure 11. Irrigated Acreage of Specified Crops, Lewis County, 1959.

Farm Facilities

The capacity of the farmer to produce is significantly related to the items of farm equipment and facilities at his disposal. The 2,230 farmsteads of Lewis County are above or nearly equal to state averages in certain items of equipment and convenience. There is a heavy use of modern farm machinery and a high percentage of farm homes enjoying the modern conveniences of telephones, home freezers and other facilities.

Tractors, motor trucks and automobiles provide most of the power and transportation on Lewis farms. In 1959, 85 percent of the farms reported 3,399 tractors. About 70 percent of the farms had motor trucks. Lewis County ranked eighth among the counties of Washington in numbers of tractors and farm automobiles.

Lewis County is well-mechanized for harvesting field crops. The county ranked seventh in the state in number of field forage harvesters, eighth in pick-up balers and tenth in grain combines in 1959. About 8 percent of the farms had field forage

harvesters. The proportion of farms with pick-up balers had almost doubled in the 5 years from 8.4 percent in 1954 to 16.4 percent in 1959. There was a 3.5 percent increase in the number of farms with grain combines during the same 5 year period.

Lewis County farms are well-equipped with chore equipment and home facilities. In 1959, over 10 percent of the farms had electric milk coolers and 27 percent had milking machines. About eight out of every ten farms had telephone service and over one-half had home freezers.

In recent years, much progress has been made in providing all-weather roads for farm families. For example, in 1950 only 38 percent of the farms in Lewis were located on hard-surfaced roads. By 1959, this proportion had increased to 60 percent. Also for Lewis, 39 percent of the farms were on improved roads (gravel, shell or shale), and the remaining (about 1 percent) were on dirt roads in 1959.

Table 13. Specified Equipment and Facilities on Farms
Lewis County, 1959

Facility or Equipment Item	Number of Farms Using	Percent of All Farms in County Equipped
Telephone	1,858	83.3
Home freezer	1,471	66.0
Milking machine	615	27.6
Electric milk cooler	238	10.7
Power operated elevator, conveyor or blower ...	467	20.9
Grain combines	336	15.1
Pick-up baler	365	16.4
Field forage harvester .	176	7.9
Motor trucks	1,542	69.1
Tractors	1,893	84.9
Crawler tractors	319	14.3
Automobiles	2,018	90.5

Source: U. S. Census of Agriculture, 1959.

PART V

CROPS

Major Crops

Although Lewis County is not among the leading Washington counties in terms of the acreage of cropland harvested, it is important in several of the crops grown in the state. Lewis County cropland is mainly devoted to the raising of hay. Nearly two-thirds of the county's hay acreage is in clover-timothy and Lewis County in recent years has ranked second in the state in clover-timothy acreage. Grass silage is another important hay crop grown in the county. Lewis is also among the leading oat growing counties of Washington. Wheat and barley follow oats in number of acres in the county although it is not an important area for these crops as far as the state is concerned. Green peas, sweet corn and broccoli are the leading vegetables of Lewis County while strawberries dominate the berry acreages. Field seed crops, namely red clover and tall fescue, and tree fruits, grapes and nuts complete the list of crops in Lewis County. Along with Clark and Cowlitz, Lewis is an important filbert producing county.

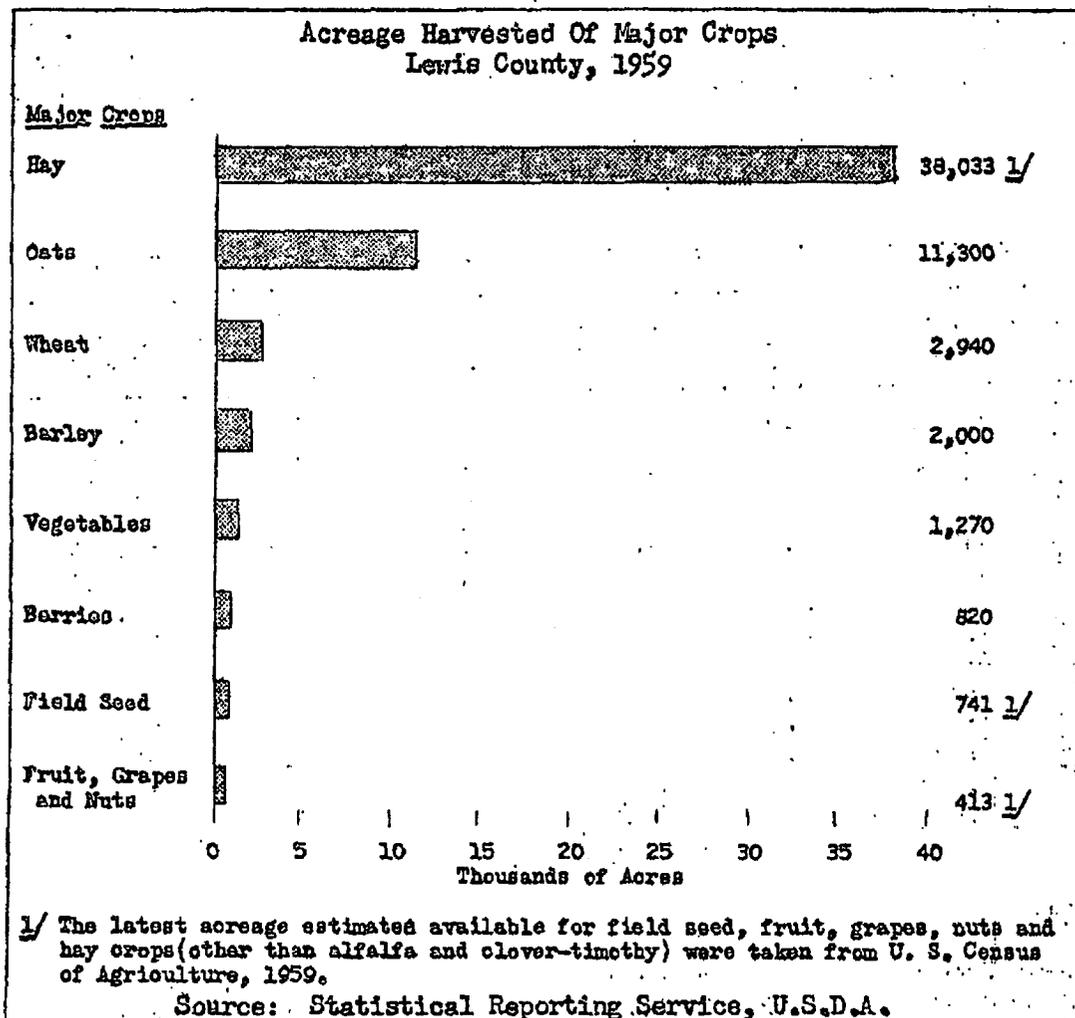


Figure 12. Acreage Harvested of Major Crops, Lewis County, 1959.

Crop Trends

The crop history of any farming region reflects to a large degree the economic changes occurring in the locality. Even a quick glance at the crop statistics of the county over the last few decades reveals a number of changes in the emphasis Lewis County farmers have given to leading crops. These trends show the influence of new market outlets such as food processing plants and also improved rail and truck transportation. Mechanization of agriculture and the resulting decline of horses which consumed large quantities of hay and grain also affected crop trends. Other changes have resulted from farmers' experimentations with various new crops and types of farming as well as from technological changes and discoveries in agricultural science.

The leading hay crops of the county have greatly increased in acreage and production since 1949. Small grains, however, have generally decreased in acreage during the 1949 to 1962 period. Lewis County vegetables have decreased as far as acreage harvested is concerned with the exception of green peas and broccoli. Of the county's berry crop, the only significant change has been the increase in the strawberry acreage from 450 acres in 1950 to 630 in 1962, an increase of 40 percent. Decreases are apparent in field seeds, fruits, grapes and nuts. For the county, all land in harvested crops has decreased since World War II from a figure of 75,811 acres in 1944 to the latest census figure of 57,492 acres in 1959.

Table 14. Alfalfa Hay and Clover-Timothy Hay
Acreage, Yield and Production
Lewis County, 1949-1962

Year	Alfalfa Hay			Clover-Timothy Hay		
	Harvested Acres	Yield (Tons Per Acre)	Production (Tons)	Harvested Acres	Yield (Tons Per Acre)	Production (Tons)
1949	1,500	2.5	3,800	15,100	1.6	24,200
1950	1,500	2.3	3,500	15,000	1.4	21,000
1951	1,550	2.5	3,900	14,100	1.5	21,200
1952	1,660	3.0	5,000	13,300	1.7	22,600
1953	1,920	2.5	4,800	14,600	1.8	26,300
1954	2,000	2.3	4,600	18,300	2.0	36,600
1955	2,250	1.4	3,100	20,800	2.0	41,400
1956	1,660	2.0	3,320	18,300	1.6	29,300
1957	1,700	2.8	4,760	22,300	1.9	42,200
1958	1,400	2.6	3,640	25,000	2.2	54,000
1959	1,300	2.5	3,250	25,000	2.0	50,000
1960	1,400	2.2	3,100	27,400	1.8	50,000
1961	1,600	2.7	4,350	26,500	1.9	50,400
1962	1,200	2.3	2,760	27,700	1.6	45,600

Source: Statistical Reporting Service, U.S.D.A.

Hay Crops

Lewis County is a major producer of clover-timothy hay and was second among Washington counties in 1962 with 27,700 acres. Over one-half of the county's farms in 1959 reported growing this type of hay for feed for their own livestock

or for sale. Clover-timothy hay is used as late fall, winter and early spring feed. Rich in protein and mineral, it is often used for silage. The hay is either stored loose in barns or is baled. Timothy-clover is also important in pasture use. Clover-timothy hay is grown on farms throughout the Chehalis-Cowlitz Prairies from Centralia to Toledo and eastward on the Cowlitz River bottomlands to the vicinity of Ramble. The acreage in Lewis County was 15,100 in 1949 and increased to 27,700 acres in 1962. The upward trend is related to increases in cattle and a more general practice of growing clover to build up soil fertility under soil conservation programs.

Silage cut from clover, alfalfa and grass mixtures is becoming increasingly important in Lewis County as it is particularly well adapted as feed for dairy cows. The county acreage for grass silage increased from 873 acres in 1959 to 3,006 acres in 1954 and to 4,199 acres in 1959. It is grown throughout the farming areas of Lewis County. The remaining types of hay grown in Lewis County have all declined in acreage during the period from 1949 to 1959.

Table 15. Hay Crop Acreages in Lewis County: 1949, 1954 and 1959.

Hay Crops	Acreages		
	1949	1954	1959
Clover-timothy hay ^{1/}	15,100	18,300	25,000
Grass silage made from grasses, alfalfa, clover or small grains	873	3,006	4,199
Vetch or peas alone or mixed with oats or other grains cut for hay plus other hay cut	6,646	5,117	3,901
Oats, wheat, barley, rye or other small grains cut for hay	7,048	2,980	1,919
Wild hay cut	4,941	2,833	1,714
Alfalfa hay ^{1/}	1,500	2,000	1,300
TOTAL	36,108	34,236	38,033

^{1/} Statistical Reporting Service, U.S.D.A.

Source: U. S. Census of Agriculture.

Small Grains (Oats, Barley, Wheat and Rye) and Field Corn

In 1962, Lewis County was tied for second place in oat acreage among the 39 Washington counties. The acreage of oat grain harvested in 1962 was 11,100 acres which produced 654,900 bushels. Acreages have been on a downward trend since the high of 17,100 acres in 1952. Yields have varied from year to year. For example, yields per acre in 1961 were 31.5 bushels compared with 59.0 bushels in the following year. The importance of oats in Lewis County is related to both the cattle and poultry feed markets. Oat production in the county has resulted in an increase in the number of local grain combines. In 1959, there were 348 grain combines in the county compared with 329 in 1954 and 142 in 1950.

Barley was the second most important grain crop in Lewis County in terms of acreage and production in 1962. A total of 1,800 acres were grown which produced 74,700 bushels. About 83 percent of the crop was spring barley. The county barley acreage hit a high of 4,700 acres in 1957, only to be reduced to 800 in 1960.

Since 1960, however, the acreage trend has been upward. The increased use of barley as feed and in poultry rations has maintained the acreage in Lewis County.

Table 16. Oats and Barley: Acreage, Yield and Production
Lewis County, 1949-1962

Year	Oats			Barley		
	Harvested Acres	Yield (bushels per acre)	Production (bushels)	Harvested acres	Yield (bushels per acre)	Production (bushels)
1949	14,200	39.0	553,800	1,460	35.0	51,100
1950	13,500	37.0	499,500	1,520	39.0	59,280
1951	16,200	36.5	591,300	1,440	37.0	53,280
1952	17,100	47.0	804,500	1,260	35.0	44,100
1953	15,400	44.0	677,600	1,460	34.0	49,640
1954	16,500	36.0	594,000	1,760	32.0	56,300
1955	16,500	58.5	965,200	1,950	38.0	74,100
1956	12,900	52.0	670,800	3,300	55.0	181,500
1957	13,000	50.0	650,000	4,700	30.0	141,000
1958	13,400	47.0	629,800	2,100	36.4	76,500
1959	11,300	42.5	480,200	2,000	36.6	73,200
1960	10,200	32.0	326,400	880	32.2	28,300
1961	12,800	31.5	403,200	1,700	26.0	44,200
1962	11,100	59.0	654,900	1,800	41.5	74,700

Source: Statistical Reporting Service, U.S.D.A.

In 1962, only 1,470 acres of wheat were harvested in Lewis County but it ranked second in this crop among the western Washington counties. Since the high of 4,510 in 1949, the wheat acreage trend has been generally downward. The 1962 crop was divided almost equally between winter (770 acres) and spring (700 acres) wheat. Recent winter wheat yields, however, have been much better than those for spring wheat but in total, yields are only fair in Lewis County. A wet climate at harvest time makes wheat less satisfactory than some other crops. Rye has always been a very minor crop in Lewis County. From a high of 370 acres in 1952, it dwindled to a mere 50 acres in 1962. Field corn also has occupied a very minor role in the county. In 1962, only 50 acres were harvested which represented a high for the county.

Table 17. Wheat and Rye: Acreage, Yield and Production
Lewis County, 1949-1962

Year	All Wheat			Rye		
	Harvested acres	Yield (bushels per acre)	Production (bushels)	Harvested acres	Yield (bushels per acre)	Production (bushels)
1949	4,510	24.8	111,900	230	16.1	3,700
1950	1,560	36.8	57,370	160	10.0	1,600
1951	2,530	24.4	61,750	120	24.6	2,950
1952	3,070	27.2	83,390	370	12.2	4,500
1953	3,300	33.9	112,000	190	14.2	2,700
1954	3,380	25.6	86,430	130	21.5	2,800
1955	3,310	34.4	113,720	150	15.3	2,300
1956	2,480	37.5	92,920	none	none	none
1957	2,720	34.3	93,230	90	28.0	2,520
1958	2,730	32.3	88,120	70	32.0	2,240
1959	2,940	35.0	102,920	90	20.0	1,800
1960	2,160	32.0	69,140	60	29.0	1,740
1961	1,520	28.3	42,970	130	32.0	4,160
1962	1,470	38.9	57,120	50	35.0	1,750

Source: Statistical Reporting Service, U.S.D.A.

Table 18. Winter Wheat and Spring Wheat
Lewis County, 1949-1962

Year	Winter Wheat			Spring Wheat		
	Harvested Acres	Yield (Bushels per acre)	Production (Bushels)	Harvested Acres	Yield (Bushels per acre)	Production (Bushels)
1949	2,810	25.0	70,250	1,700	24.5	41,650
1950	1,030	31.0	31,930	530	48.0	25,400
1951	1,230	26.0	31,980	1,300	22.9	29,770
1952	1,560	37.0	57,720	1,510	17.0	25,670
1953	2,300	35.0	80,500	1,000	31.5	31,500
1954	1,930	26.0	50,180	1,450	25.0	36,250
1955	1,970	38.0	74,860	1,340	29.0	38,860
1956	1,480	29.0	42,920	1,000	50.0	50,000
1957	1,590	43.0	68,370	1,130	22.0	24,860
1958	1,490	40.0	59,600	1,240	23.0	28,520
1959	1,460	34.0	49,640	1,480	36.0	53,280
1960	1,160	41.5	48,140	1,000	21.0	21,000
1961	980	32.0	31,360	540	21.5	11,610
1962	770	46.0	35,420	700	31.0	21,700

Source: Statistical Reporting Service, U.S.D.A.

Table 19. Field Corn: Acreage, Yield and Production
Lewis County, 1949-1962

Year	Field Corn		
	Harvested Acres	Yield (Bu. per Acre)	Production (Bushels)
1949	none	none	none
1950	none	none	none
1951	10	27.0	270
1952	20	30.0	600
1953	30	29.0	870
1954	40	34.0	1,360
1955	40	49.5	1,980
1956	40	50.0	2,000
1957	40	50.5	2,020
1958	none	none	none
1959	none	none	none
1960	none	none	none
1961	50	80.0	4,000
1962	50	81.0	2,430

Source: Statistical Reporting Service, U.S.D.A.

Vegetables

Vegetable acreage has averaged around 1,200 acres in Lewis County during the period 1954-1962. In 1959, about 2.2 percent of the harvested cropland was in vegetables although there were no farms specializing in vegetable production. A high of 1,370 acres was reached in 1956 and in 1962 the figure was 1,170. Green peas was the most important vegetable crop in the county in 1962, representing 68 percent of the harvested vegetable acreage that year. Sweet corn was second in acreage with 230 acres the same year. Broccoli, grown on 110 acres, was third. Lewis was the second ranking broccoli county with 16 percent of the state's acreage in 1962. Minor crops of cucumbers and snap beans completed the list of vegetables in the county in 1962. Prior to 1959, small acreages of lettuce and tomatoes were grown but none have been reported since then.

Table 20. All Vegetables, Green Peas and Sweet Corn
Acreage and Production
Lewis County, 1954-1962

Crop Year	All Vegetables		Green Peas		Sweet Corn	
	Harvested Acres	Production (Tons)	Harvested Acres	Production (Tons)	Harvested Acres	Production (Tons)
1954	995	3,070	450	900	300	1,200
1955	920	2,165	500	600	100	340
1956	1,370	3,415	940	2,000	80	240
1957	1,345	3,190	1,000	2,000	60	200
1958	1,370	3,020	1,000	1,500	70	280
1959	1,270	3,110	800	1,200	230	1,150
1960	1,260	2,920	800	1,120	300	1,350
1961	1,150	2,780	700	1,100	320	1,300
1962	1,170	2,540	800	1,400	230	650

Source: Statistical Reporting Service, U.S.D.A.

Vegetables are grown for both the fresh market and for processing with the latter receiving the major share of the crops. The crop goes to local processors in Centralia and Chehalis as well as to those outside the county.

Table 21. Vegetable Crops; Broccoli, Cucumbers and Snap Beans
Acreage and Production
Lewis County, 1954-1962

Year	Broccoli		Cucumbers		Snap Beans	
	Acres	Prod. (Tons)	Acres	Prod. (Tons)	Acres	Prod. (Tons)
1954	none	none	125	500	100	300
1955	100	300	100	450	100	300
1956	130	270	100	410	100	350
1957	100	200	70	300	100	400
1958	150	550	60	270	80	360
1959	170	510	40	110	20	80
1960	110	270	30	100	20	80
1961	110	290	10	40	10	50
1962	110	370	20	80	10	40

Source: Statistical Reporting Service, U.S.D.A.

Berries

In 1962, Lewis was the sixth ranking Washington county in value of berry production. Berries were harvested from around 700 acres during that year. Strawberries accounted for over 90 percent of the berry acreage in the county in 1962. From 450 acres in 1950, strawberries reached a peak in 1957 of 980 acres and has since then ranged between 600 to 700 acres. In 1959, Lewis County ranked twenty-seventh among all United States counties both in terms of acreage and production of strawberries. Yields have increased in recent years so production has been on an upward trend. Several varieties of strawberries are grown, with the Northwest variety predominating. Other varieties include Columbia, Puget Beauty and Marshall. Strawberry acreages are mainly concentrated in the Centralia-Chehalis area with scattered acreages near Mossyrock.

Table 22. Berry Crops: Strawberries, Red Raspberries,
Black Raspberries and Blueberries
Lewis County, 1950-1962

Year	Strawberries		Red Raspberries		Black Raspberries		Blueberries	
	Acres	000 Lbs.	Acres	000 Lbs.	Acres	000 Lbs.	Acres	000 Lbs.
1950	450	1,500	110	410	5	5	5	10
1951	600	1,500	165	640	5	8	10	30
1952	750	3,250	135	580	5	20	20	45
1953	750	3,200	120	630	5	5	25	55
1954	700	3,000	90	515	5	10	30	70
1955	750	2,700	100	550	5	10	30	60
1956	500	900	35	50	—	—	35	90
1957	980	5,600	80	575	10	41	40	135
1958	950	4,720	70	340	10	30	45	170
1959	710	3,200	65	255	10	25	35	195
1960	700	2,960	45	250	10	30	35	230
1961	650	4,080	35	140	10	9	30	222
1962	630	4,347	35	144	.	.	30	231

* Less than 10 acres grown but county figure not available.

Source: Statistical Reporting Service, U.S.D.A.

Lewis County harvested red raspberries from 35 acres in 1962. The red raspberry acreage has declined since the early 1950's and at present is a minor crop in the county. In 1962, about 70 percent of the acreage was of the Willamette variety while the remaining 30 percent represented the Canby type. Red raspberries are grown mainly in the area between Winlock and Mossyrock. The harvested acreage of Lewis County's blueberries has ranged between 50 to 45 acres since 1954. From only 5 acres in 1950, it reached a high of 45 acres in 1958. Yields have steadily increased so that production has been on an upward trend in spite of acreage differences from year to year. Black raspberries are grown on Lewis County farms but has remained a very minor crop with annual acreages under 10. The same situation is true for the county's blackberry crop.

Field Seed

In 1959, Lewis was the number one ranking red clover seed county in the state with 726 harvested acres grown on 45 farms. The production figure was 82,855 pounds during that year. The only other field seed crop reported by the Census of 1959 was fescue. Fescue seed was taken from some 15 acres which produced 2,500 pounds. The acreage declined greatly from 258 acres in 1954 to 15 acres in 1959. Red clover seed acreage, on the other hand, increased 24 percent during the same period.

Table 23. Red Clover Seed and Fescue Seed
Lewis County, 1949-1959

Year	Red Clover Seed		Fescue Seed	
	Acres	Lbs. Produced	Acres	Lbs. Produced
1949	1,773	171,296	121	29,175
1954	587	66,660	258	49,000
1959	726	82,855	15	2,500

Source: U. S. Census of Agriculture

Fruit, Grapes and Nuts

In recent years there has been less interest in tree fruits in Lewis County. Without exception, the number of fruit trees in the county has been reduced greatly from 1950 to 1959. The number of farms reporting fruit trees (more than 5 acres) in 1950 was 2,539 compared to only 227 (more than 20 fruit trees and grape vines) in 1959. Apples led all fruits in the county in 1959 with only 3,567 trees of bearing age. Prunes, pears, cherries and peaches were grown on even a lesser scale. Grape vines of bearing age decreased from a high of 2,510 in 1954 to only 270 in 1959. Fruit and grape production, therefore, is a very minor part of Lewis County's agricultural economy.

Table 24. Number of Fruit Trees and Grape Vines of Bearing Age
Lewis County, 1920-1959

Year	Apples	Plums & Prunes	Pears	Cherries	Peaches	Grape
1920	79,815	21,969	10,915	9,030	1,080	403
1930	50,796	15,069	9,326	29,886	669	892
1940	33,730	12,560	7,712	13,288	389	2,141
1950	23,465	7,701	4,721	9,256	4,425	2,510
1959	3,567	1,223	804	684	329	270

Source: U. S. Census of Agriculture.

Table 25. Fruit and Grape Production
Lewis County, 1919-1959

Year	Apples (bushels)	Plums & Prunes (bushels)	Pears (bushels)	Cherries (bushels)	Peaches (bushels)	Grape (pounds)
1919	112,516	16,673	6,849	3,321	393	3,597
1929	64,301	16,092	11,910	8,280	312	12,518
1939	87,217	5,714	19,588	12,787	355	13,085
1949	16,451	5,167	4,640	5,814	1,338	17,501
1959	2,883	750	1,440	369	102	1,345

Source: U. S. Census of Agriculture.

In 1959, Lewis County was second in the state in filbert nut growing with 12,314 trees which produced 97,823 pounds of nuts. Filbert culture has decreased sharply in recent years because of increased competition from abroad as well as damages from winter freezes during the 1950-1955 period.

Table 26. Nuts: Trees of All Ages and Production
Lewis County, 1940-1959

Year	Filberts	
	Trees of All Ages	Production (pounds)
1940	17,977	48,160
1945	30,259	125,618
1950	22,436	117,000
1954	15,302	83,442
1959	12,314	97,823

Source: U. S. Census of Agriculture.

Nursery Plants and Flowers

Lewis County has a nursery, shrub and flowering plant industry which was worth over \$30,000 in sales in 1959. Ten years earlier the same industry was worth \$113,000. Flowers and flowering plants are the most valuable items. Fourteen farms reported growing cut flowers, potted plants, florist greens and bedding plants with total sales worth nearly \$25,000 in 1959. Nurseries and greenhouses are mainly located in the Chehalis-Centralia districts.

Potatoes, Mint and Hops

In recent years, potatoes have remained relatively unimportant among the crops of Lewis County. Only 200 acres were harvested in the county in 1962. This is in contrast to the annual harvest of over 2,000 acres in the early 1920's.

Other crops which have lost prominence in Lewis County are hops and mint. In earlier years, hops were one of the most valuable crops in Lewis County. In 1929, there were two hop farms with a total of 170 acres which produced 194,000 pounds. In 1949, one hop farm was reported by the Census which harvested 33,500 pounds from 24 acres. Hops declined because of loss of markets following 1917. Other factors in reducing hop acreage were the problems of controlling disease, wet weather during picking seasons and producing good quality hops. Hop growing shifted to the Yakima Valley. At present, no hop yards remain in Lewis County.

Peppermint and spearmint farming was introduced during the early 1940's. Expansion of this crop was not great and production decreased after 1949. In 1949, there were five growers who harvested a total of 2,828 pounds of oil with a sales value of \$11,314. By 1955, the growing of mint was virtually abandoned.

Table 27. Potatoes: Acreage, Yield and Production
Lewis County, 1949-1962

Year	Potatoes		
	Harvested Acres	Yield (Tons Per Acre)	Production (Tons)
1949	45	5.0	225
1950	30	5.0	150
1951	10	5.0	50
1952	20	4.0	80
1953	15	4.0	60
1954	25	6.8	170
1955	25	7.2	180
1956	25	7.2	180
1957	20	7.5	150
1958	60	8.0	480
1959	30	4.7	140
1960	40	6.3	250
1961	40	5.0	200
1962	20	5.0	100

Source: Statistical Reporting Service, U.S.D.A.

PART VI

LIVESTOCK, DAIRYING AND POULTRY

General Importance

The primary farming activity of Lewis County involves livestock and livestock products. In 1959, livestock and livestock products sold represented 81 percent of the total value of all farm products sold within the county. The 81 percent was composed of the following: poultry and poultry products sold, \$3,152,585 (32 percent); livestock and livestock products other than poultry and dairy, \$2,438,679 (25 percent); and dairy products, \$2,344,317 (24 percent). Also in 1959, dairy farms numbered 352; poultry, 286; and livestock farms other than poultry and dairy, 191. These farms made up over 36 percent of the total number of farms in Lewis County in 1959.

On the state level, Lewis ranked eleventh among the counties in sales value of livestock and/or livestock products including dairy products in 1959. The county's importance in the state's poultry industry is emphasized by the fact that it ranked fourth among the 39 counties that same year. Nationally, Lewis ranked eightieth among U. S. counties in number of chickens 4 months and older in 1959. Also in the same year, it ranked sixty-second in the number of eggs sold and seventy-seventh in the number of turkey hens kept for breeding for the nation.

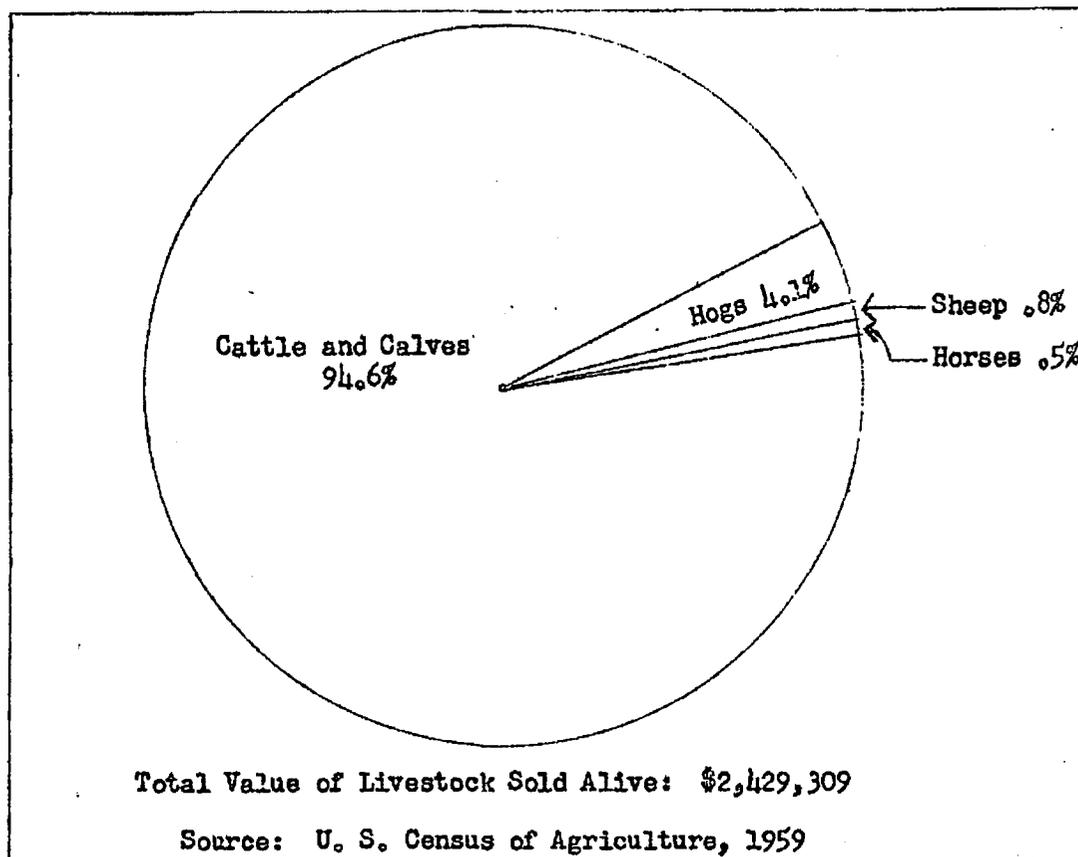


Figure 13. Value of Livestock Sold Alive
Lewis County, 1959

Livestock Trends

Significant changes have occurred in livestock farming since 1940 in Lewis County. The value of livestock and livestock products sold has gone up nearly four times from \$2,059,933 in 1940 to \$7,935,581 in 1959. The number of all cattle on farms has steadily been on the increase since 1951. This increase has been attributed to recent interest in raising of more beef cattle. Dairy cattle, on the other hand, have been on a downward trend along with hogs, horses and mules. Lewis County's dairy industry has tended to decline because of distance from the large urban fluid milk markets as well as the development of local interest in beef cattle. Turkey and sheep numbers reached a peak in 1954 and have declined since then, especially turkeys. Lewis's chicken numbers have been on an upward trend since 1949 and this has kept the county among the leaders in the Washington poultry industry.

Cattle: Beef and Dairy Farming

Cattle, including both dairy and beef animals, are the most valuable items in Lewis County agriculture. In terms of livestock sold alive, cattle and calves accounted for about 95 per cent of the value of sales in 1959. Cattle and calves also accounted for about 29 percent of the total 1959 sales of livestock and livestock products sold and 23 percent of the value of all farm products sold for the year. Since pioneer times, farmers have found cattle well suited for the local climate and topographic conditions and an effective way to use the woodland pasture, logged-over land and grass meadows of the valley clearings. In 1959, over 1,700 Lewis County farms raised cattle which were sold alive.

There has been a general increase in number of cattle since 1920. All cattle and calves numbered 25,156 in 1920 and reached an all-time high of 44,500 in 1962. Cattle numbers fluctuated during the 1920 to 1962 period with highs during World War II and the mid-1950's. Since 1957 there has been a steady annual increase in Lewis County cattle. Beef cattle herds have expanded and many new ones established by farmers and breeders. At the same time, dairy herds and milk cows numbers have been reduced. During high levels of employment from 1940 to 1950, many part-time farmers in the lumber industry abandoned dairying for beef raising because it required less labor. High prices for beef during the war also resulted in many new beef herds being established. Herefords and Angus have been the principal beef breeds in the county.

About two-thirds of Lewis County cattle are located in the western portion of the county. Both beef cattle and milk cows are found throughout the Chehalis-Cowlitz Prairies and also eastward up into the Big Bottom Country around Randle. Milk cows are little more concentrated in the areas around Centralia and Chehalis. Most cattle herds (over 90 percent) numbered under 50 head each in 1959.

Dairying has remained relatively important in Lewis County agriculture although the number of dairy cows has been on the decline since World War II. Also declining in the post-World War II period has been the number of dairy farms in the county. Dairy farms numbered 1,224 in 1945 in contrast to 352 in 1959. There were still more dairy farms in 1959, however, than any other farm type in Lewis County. Dairy farms are of many sizes but increasing costs in recent years have resulted in larger operations. Also, tremendous progress in milk production has been made. Despite the reduction in dairy cattle after World War II, the value of milk or cream sold remained comparable to 1945. In 1945, dairy products

sold were valued at \$2,485,907 as compared with \$2,344,317 in 1959. There has been a trend away from farm separation and selling of cream. Improved transportation by truck into milk producing areas enables whole milk to be delivered daily to Chehalis, Centralia, Winlock and Toledo for processing or distribution and there is less demand for butter. Lewis County's dairy industry is at some disadvantage as far as its location with respect to large fluid milk markets are concerned since distance-cost factors favor farms closer to the large metropolitan areas both to the north (Seattle-Tacoma) and south (Portland).

Table 28. Livestock Numbers on Farms
Lewis County, 1949-1962

Year	All Cattle (head)	Beef Cattle (head)	Dairy Cattle (head)
1949	31,700	5,900	25,800
1950	30,500	8,500	22,000
1951	30,000	8,900	21,100
1952	31,100	9,800	21,300
1953	34,700	14,100	20,600
1954	37,400	16,900	20,500
1955	38,800	18,300	20,500
1956	37,200	14,000	23,200
1957	32,500	10,900	21,600
1958	32,700	11,300	21,400
1959	33,700	12,900	20,800
1960	37,600	17,100	20,500
1961	41,500	19,700	21,800
1962	44,500	23,000	21,500

Source: Statistical Reporting Service, U.S.D.A.

Table 29. Dairy Products Sold From Farms
Lewis County, 1939-1959

Year	Any Milk or Cream Sold	Whole Milk Sold	Cream Sold (butterfat)
	(dollars)	(pounds)	(pounds)
1939	\$ 931,397	56,909,898	617,745
1944	2,485,907	83,420,998	144,332
1949	1,858,639	49,529,939	159,200
1954	1,784,011	50,234,203	113,472
1959	2,344,317	61,148,465	25,580

Source: U. S. Census of Agriculture

Hogs

Hog raising in Lewis County is a sideline enterprise. In 1959, over 400 farms reported having hogs. The majority of the farms had less than 10 head. Hogs are raised as a sideline to use table waste and farm by-products and are slaughtered for home use. In earlier years, dairy farms kept numerous hogs which were fed skim milk.

Hog numbers have been on the decline but are still an important segment of the farm economy. In 1959, Lewis ranked fifteenth among Washington counties with 3,166 head of hogs. A total of 3,030 head were sold by 156 farms for nearly \$100,000 in 1959. Hog numbers have declined over threefold since 1920 when Lewis County had 10,310 hogs. One major factor causing the decline is the newer marketing practice of selling whole milk and consequent abandonment of cream separating on dairy farms which yielded skim milk for feed. At present, hogs are evenly distributed in the farm areas of the county.

Table 30. Hogs, Sheep, Horses and Mules
Lewis County, 1939-1959

Year	Hogs (head)	Sheep (head)	Horses and Mules (head)
1939	5,201	2,332	4,380
1944	5,043	2,515	3,564
1949	3,991	2,503	2,114
1954	3,068	3,954	957
1959	3,166	3,489	936

Source: U. S. Census of Agriculture

Sheep

In 1959, Lewis County ranked seventeenth in the state in sheep and lambs with 3,489 head. In 1930, sheep numbered 8,763 but the numbers have been on the decline ever since. The sheep industry has always been of a minor nature in Lewis County. In 1959, the value of sheep and lambs sold was less than 1 percent of the total value of livestock sold. About 76 farms sold 1,525 head for \$19,825 that year.

Lewis County is not ideal sheep country. Handicaps to sheep raising are the long wet season, heavy snows in the mountains, heavily forested terrain, numerous predators and high costs of wintering in sheds and barns. Most of the sheep are raised in the drier farmlands of western Lewis County near Chehalis, Centralia, Winlock and Toledo. High mountain ranges within the county are used for summer grazing by some of the large range sheep operators headquartered east of the Cascades.

Horses and Mules

Horses and mules used as work animals have decreased since 1920. Tractors, trucks and other mechanical devices have replaced draft horses on most farms and logging operations. Numbers have decreased steadily from 5,633 head in 1920 to only 936 head in 1959. Most of the present horses are used for pleasure riding and packing in the forested mountain areas of eastern Lewis County.

Poultry Farming

Lewis County has long been a major poultry industry area. With over 280 poultry specialty farms and over 570 farms which marketed poultry and eggs, it ranked fourth in the state for the value of poultry and poultry products sold, number of chickens sold and number of eggs sold in 1959. The value of the poultry and poultry products sold increased 6 percent since 1949, going from \$2,960,726 to \$3,152,585 in 1959.

From the standpoint of all farm products sold, poultry is the major item of Lewis County agriculture. In 1959, it accounted for 32 percent of the cash received for all farm products sold. The number of chickens in Lewis in 1959 was 489,782, an increase of about 88 percent from the low of 260,129 in 1949. The general trend in both chicken numbers and egg production during the decade between 1949 and 1959 was upward. Number of poultry farms, however, declined during the same period from 397 to 286.

The industry is generally located in the lowland prairie area and in numerous small farms on cut-over land lying between Chehalis and Toledo. An area of poultry farm concentration is found around Winlock.

The sale of eggs during 1959 totaled 6,108,363 dozen, nearly double the sales of a decade before. Over 480 farms sold 6,108,363 dozen eggs in 1959. This is in contrast to over 1,200 farms which sold 3,123,446 dozen eggs in 1949. Also in recent years, growers have been selling more broilers for the fresh and frozen market. In 1959, the output of broilers and fryers numbered 1,119,779 birds, more than 23 percent of the 1954 figure. Twenty-eight farms reported having sold broilers in 1959, while 358 farms sold other chickens numbering 260,406. All chickens sold totaled 1,380,185 in 1959.

Table 31. Chickens, Eggs and Turkeys
Lewis County, 1939-1959

Year	Chickens (birds) 1/	Egg Production (dozens)	Turkeys Raised (birds)
1939	298,692	3,404,235	31,962
1944	331,970	3,528,048	45,143
1949	260,129	3,123,445 2/	80,221
1954	363,499	4,113,216 2/	113,278
1959	489,782	6,108,363 2/	41,400

1/ 4 months and over. 2/ Eggs sold.

Source: U. S. Census of Agriculture.

Lewis County was the state's second most important turkey raising area in 1954. Turkeys and turkey fryers raised numbered 113,278 during that year. By 1959, however, the figure was reduced to 41,400 and the county dropped to sixth in state rank. Only 25 farms reported raising turkey in contrast to 85 in 1954. Most of the farms with turkeys have small flocks of 50 or less. In 1959, only 8 farms reported having 400 or more birds. The large-scale turkey farms at that time were located near Chehalis.

Table 32. Lewis County Agricultural Rankings Among
All United States Counties, 1959

Item	Rank
Chickens, 4 months old and over (number of birds)	80
Chicken eggs sold (dozens of eggs)	62
Chicken eggs sold (value in dollars)	65
Turkey hens kept for breeding (number of birds)	77
Strawberries harvested for sale (number of acres)	27
Strawberries harvested for sale (quantity) . .	27

Source: U. S. Census of Agriculture, 1959.

PART VII

FARM MARKETING AND EXPENDITURES

Location For Marketing

Most Lewis County farm areas are well served by transportation facilities for marketing crops, livestock and livestock products within and outside the county. Farm production is marketed in three general trade areas. These are as follows: (1) western Lewis County lowlands where the majority of the food processing industries and rural nonfarm and urban populations are located, (2) the Seattle-Tacoma metropolitan area and (3) the Portland, Oregon-Vancouver, Washington metropolitan area. Lewis County is located about mid-way between the two major population centers of the Pacific Northwest, namely Seattle and Portland. The Tacoma metropolitan area is the nearest, being 57 miles by truck and rail from Chehalis. The Seattle area is an additional 30 miles beyond Tacoma. Portland to the south is 90 miles away from Chehalis by rail and highway.

A multiple lane highway (U. S. 99) which connects Seattle and Portland passes through the main farming areas of Lewis County. Both Seattle and Portland are less than three hours away from Chehalis by truck--the main carrier of agricultural products. State and county roads feed into the major transportation channels from the eastern end of the county. State highway 5 crosses the Cascades through White Pass to Yakima and also connects eastern Lewis County with Tacoma. Chehalis, Centralia and Winlock are located on the joint railroad line between Seattle and Portland operated by Northern Pacific, Union Pacific and Southern Pacific Railways. A branch line of the Chicago, Milwaukee, St. Paul and Pacific connects eastern Lewis County with Tacoma.

Income: Value of Products Sold

Census of Agriculture data on the value of farm products sold in Lewis County show the trend of gross farm income has been upward in recent years. All Lewis County farms marketed agricultural products valued at \$9,829,217 in 1959 compared with \$7,895,962 in 1949 and \$2,405,860 in 1940. Gross returns to farmers increased nearly 25 percent during the decade between 1949 and 1959. Lewis County ranked twenty-first in the state in value of farm products sold for 1959.

The total value of all crops sold (i.e. fruits and nuts, field crops, vegetables, forest products and horticultural specialties) amounted to \$1,893,636 for Lewis County in 1959. This total was 5 percent below the corresponding figure for 1954 and represented almost 20 percent of the total value of all agricultural products sold in 1959 compared with 23 percent for 1954.

Total value of sales of livestock and poultry and their products for 1959 was \$7,935,581, or 34 percent greater than the \$5,911,966 reported in 1954. This total represented 81 percent of the value of all farm products sold in 1959 compared with 77 percent in 1954.

Farm incomes vary by type and size of farms. In 1959, more than 44 percent of the county's 2,230 farms were commercial (i.e. sold products valued at over \$2,500 per year). Low income farms (with sales of under \$2,500) were considered commercial by the Census if the farm operator was under 65 years of age, did not work off the farm 100 or more days during the year and if the income received by

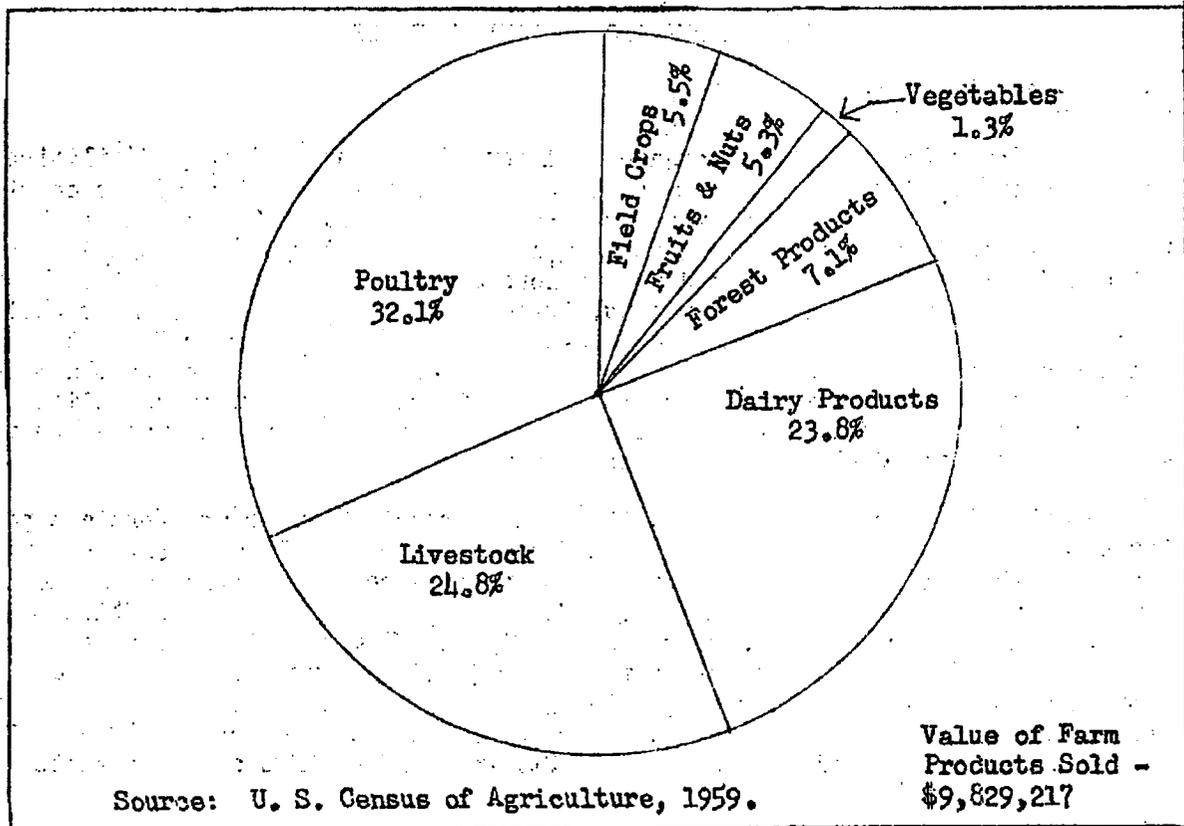


Figure 14. Sources of Cash Farm Income, Lewis County, 1959

Table 33. Crops Marketed From Lewis County Farms, 1959

Crops Marketed	Amount Received By Farmers (Dollars)	Percent All Crops Sold
Fruits (Tree fruits, berries, nuts)	\$ 521,480	27.5
Field Crops (Small grains, hay and silage, etc.)	543,568	28.8
Vegetables (Green peas, sweet corn, broccoli, etc.)	126,511	6.7
Forest Products and Horticultural Specialties	702,077	37.0
Total amount received by farmers for cash crops	\$1,893,636	100.0

Source: U. S. Census of Agriculture, 1959.

the operator and members of his family from nonfarm sources was less than the value of all farm products sold. On this basis, about 1,242 farms were classed as noncommercial in 1959 with no significant receipts from farm production. In 1959, about 3.8 percent of all commercial farms in the county were in Economic Class I--sales of over \$40,000. Nearly 9 percent of the farms were in the class that received between \$39,999 and \$20,000 per year. About 16 percent of the commercial farms made sales that varied between \$19,999 and \$10,000. Over one-fourth of the farms were in the class that received between \$9,999 and \$5,000 per year. Almost 30 percent of the farms ranged in value of products sold from \$4,999 to \$2,500 for the year of 1959. Low income commercial farms that took in less than \$2,500 but more than \$50 from sales of farm products in 1959 numbered 155 or over 15 percent of all commercial farms.

Marketing Field Crops

Crop income in Lewis County comes mainly from the sale of field crops. Field crop sales were valued at \$543,568 in 1959 which made up 5.5 percent of the total value of farm products sold and accounted for over 28 percent of all crops marketed.

Clover-timothy hay sales from farms amounted to 7,172 tons and accounted for 78 percent of the total hay sold in the county during 1959. More than 260 growers sold clo-tim hay mainly to local feeders of livestock and to truckers. Alfalfa hay sales accounted for only 6.5 percent of the total hay sales. Remaining sales were made up of small grains, wild hay, vetch mixed with grains and minor hay crops. The bulk of the hay crop harvested remains within the county for local use. The rest go to farming areas in the surrounding counties.

Lewis County had nearly 304,000 bushels of wheat, oats, barley and rye in 1959. Oats as the predominant grain crop showed 199,776 bushels sold off the farms in 1959. Wheat sales involved 75,572 bushels. Barley was third in grain crop sales with 25,566 bushels for 1959. Remaining grain sales which included rye only amounted to 3,080 bushels.

Marketing Fruits, Berries and Nuts

Sales from fruits, berries and nuts totaled \$521,480 in 1959, making up 5.3 percent of the value of all farm products sold in the county and 27.5 percent of all crops marketed. Tree fruit and grape production of Lewis County is not enough to be of any commercial importance. Most of the fruit harvested is used on the farm itself or sold locally.

Over 4,722 tons of berries were harvested in Lewis County in 1962, the bulk being strawberries with 4,347 tons. Berries are marketed mainly to local processors as well as to those located in Pierce and Clark Counties.

Nearly 50 tons of nuts were harvested from the county's filbert trees in 1959. Filbert nuts find market outlets largely in Portland, Oregon.

Marketing of Vegetables

Vegetables for processing and fresh markets from Lewis County farms were valued at \$126,511 in 1959, making up a little over 1 percent of the value of all farm products sold in the county and accounted for 6.7 percent of all crops

marketed. Green peas, sweet corn, broccoli, cucumbers and snap beans make up the commercial vegetables grown in the county. Most harvested vegetables go to local processors in Chehalis and Centralia and to those in Pierce and Clark Counties.

Marketing Forest Products and Horticultural Specialties

In recent years, farm forest products have become increasingly important in agricultural marketing. During 1959, the Census showed that about 254 Lewis County farms sold forest products. Farm woodland owners sold products worth \$670,483 in 1959. This was a 66 percent increase over the \$404,118 reported in 1954. The 1959 sales value of farm forest products represented nearly 9 percent of the total value of farm products sold in the county.

Standing timber accounted for \$320,276 or 48 percent of the value of all forest products sold. Items such as firewood, pulpwood, fence posts, sawlogs and Christmas trees accounted for the remaining percentage. Good rail and road access to the timber and pulp industry on the Puget Sound and the Columbia River enables farmers to market pulpwood, veneer and sawlogs. Local markets for forest products are found in Centralia and Chehalis.

Table 34. Forest Products on Farms
Lewis County, 1959

Type of Product	Farms Reporting	Quantity
Firewood and fuelwood cut.....	459	3,709 cords
Fence posts cut	65	17,985 posts
Sawlogs and veneer logs cut	105	4,712 M bd. ft.
Pulpwood cut (fir, alder, maple, etc.)	22	5,904 cords
Christmas trees cut	24	13,405 trees
Value of standing timber sold	136	\$320,276
Value of firewood, fence posts, logs, lumber, pulpwood, piling, poles & other forest products sold	166	\$350,207
Total value products sold	254	\$670,483

Source: U. S. Census of Agriculture, 1959.

The value of sales of all horticultural specialties for Lewis County was \$31,594 in 1959. This was about 40 percent less than the \$52,244 reported in 1954. For 1959, the value of sales represented less than one-half of a percent of the total value of farm products sold and accounted for only 1.7 percent of the value of all crops marketed.

Nursery products, such as trees, shrubs, vines and ornamentals, accounted for only \$2,491 or about 8 percent of the sales of all horticultural specialties in 1959. Cut flowers, flowering and foliage plants, bedding plants and cultivated florist greens accounted for 78 percent of the total, and sales of bulbs, flower seeds and greenhouse vegetables amounted to approximately 14 percent of the value of all horticultural specialty crops. There were 21 farms reporting horticultural specialty crops in 1959. Nine farms reported sales in excess of \$2,000 from sales of these products.

Table 35. Livestock and Livestock Products Marketed
Lewis County, 1959

Class of Livestock and Products Sold	Amount Received By Farmers (dollars)	Percent of the Total Value
Livestock Sold Alive (cattle and calves, horses and mules, hogs, sheep)	\$2,438,679	30.7
Dairy Products (whole milk, butterfat)	2,344,317	29.5
Poultry and Poultry Products (chickens, eggs, turkeys, ducks, etc.)	<u>3,152,585</u>	<u>39.8</u>
Total amount received for Livestock and Livestock Products	\$7,935,581	100.0

Source: U. S. Census of Agriculture, 1959.

Marketing Poultry and Eggs

Major farm marketing activity in Lewis County involves poultry and poultry products. The total value of poultry and eggs sold was \$3,152,585 for 1959, or 2 percent above the \$3,091,339 reported for 1954. Sales of poultry products in 1959 represented 40 percent of the total value for all livestock and their products sold and 32 percent of the value of all farm products sold. Some 738 poultry producers in Lewis County sold chickens, eggs and turkeys during 1959.

In 1959, 6,108,363 dozen eggs were sold, or 48 percent above the 4,113,216 dozen reported for 1954. Number of chickens sold in 1959 totaled 1,380,185, an increase of 23 percent over the 1,124,240 reported for 1954. Broilers comprised 81 percent of the number of chickens sold in 1959. It was the same percentage in 1954. Turkeys, ducks, geese, other miscellaneous poultry and their eggs returned \$227,058 to farmers in sales for 1959.

Outlets for poultry, eggs and turkeys are well established in Chehalis, Centralia and Winlock. The Western Farmers Association has a plant in Centralia which processes fryers. Local eggs are also marketed by the Association within the county as well as in Seattle and Tacoma. Farmers also sell poultry and poultry products directly to hatcheries and retailers.

Marketing Livestock: Cattle, Sheep and Hogs

The second largest agricultural marketing activity in the county after poultry is the sale of livestock and livestock products involving meat packers, feed yards and breeders. This accounted for 25 percent of the value of all farm products sold in Lewis County for 1959. Total sales amounted to \$2,438,679, placing Lewis fourteenth among Washington counties in livestock and livestock products sold (i.e. other than poultry and dairy). About 31 percent of all livestock and livestock products marketing were made of this sales activity.

Cattle and calves are the major livestock items marketed. The value of sales of cattle and calves for 1959, \$2,298,694, was over two and one-half times the \$904,136 reported in 1954. The 1959 total represents 23.4 percent of the county's farm sales economy as compared with 11.7 percent in 1954. About 10,278 head of cattle worth \$1,793,769 were marketed as slaughter cattle in 1959. Calves sold to feeders and stockers numbered 7,652 with a sales value of \$504,925.

Livestock, including breeding stock, are marketed at auction centers in Centralia and Chehalis. Some are trucked to stockyards in Auburn, Washington and Portland, Oregon. Others are sold by the cattle breeders themselves from their own farms. Local meat wholesalers, packers, slaughter houses and frozen food locker operators located in Chehalis and Centralia provide a good market.

The 1959 value of hogs and pigs sold alive was \$99,990 for Lewis County. This was 6 percent above the \$93,850 of sales for 1954. Around 3,000 hogs and pigs were sold alive by 156 farmers in 1959. Sheep produce two sources of income per year for the farmer: meat and wool. For 1959, the value of sheep and lambs sold was \$19,825, or about 18 percent below the \$24,280 for 1954. Only about 1,500 head were sold by 76 farms in 1959. Lewis County sheepmen also sold 22,853 pounds of wool the same year. Both hogs and sheep are shipped to slaughter houses in Tacoma and to auction yards in Auburn as well as to those located within the county.

Sales of horses brought \$10,800 to farmers of Lewis County in 1959. Around 80 horses were sold from 50 farms.

Marketing Dairy Products

The total value of dairy products (milk and cream) sold was \$2,344,317 for 1959, or 31 percent above the \$1,784,011 recorded for Lewis County in 1954. Sales of milk and cream in 1959 represented 29 percent of the total value of all livestock and their products sold, and 24 percent of the value of all farm products sold.

In 1959, there were 738 milk producing farms in Lewis County which shipped 61,148,465 pounds of whole milk and 25,580 pounds of cream. Whole milk is purchased by dairy product plants in Centralia and in Chehalis. Milk is processed locally into various manufactured dairy products as well as distributed as fluid milk to homes and retail stores. Dairy products from the farm are also shipped north to Seattle-Tacoma and south to Portland.

Specified Farm Expenditures

Expenditures connected with operating a farm reduce considerably the net income a farmer receives as profits from the sale of crops and livestock. Lewis County farmers who reported expenditures in 1959 spent about \$6,557,742 for feed, supplies, equipment, labor and livestock which represented about 67 percent of the value of all farm products sold in 1959. Feed for livestock and poultry was the major single cost. Nearly 2,000 farms paid out \$4,181,386 for feed and averaged \$2,126 per farm. The second largest expense was for the purchase of livestock and poultry. Expenditures for this purpose amounted to \$1,158,123 in 1959. Hired labor ranked as the third major expense, costing \$530,401 to the county farmers. Gasoline and oil for use in tractors, trucks and combines cost around \$473,169 as reported by 2,237 farmers. A fifth major cost expenditure was for machine hire, referring to the many types of custom farm work such as tractor hire, combining,

plowing, etc. Nearly 890 farms averaged \$143 each for machine hire and in total expended \$126,703 for this item. Expenditures for seeds, bulbs, plants and trees were the smallest, amounting to \$87,960 for 1959. The six major items for farm expense averaged \$2,847 per farm for all farms. Compared with 1954, costs for essential farm labor and supplies enumerated by the Census were less in 1959. Servicing and supplying the farms is an important basis of employment and local business for the cities and communities of Lewis County.

Table 36. Specified Farm Expenditures in 1959
Lewis County

Type of Expenditure	Number of Farms Reporting	Expenditure of All Farms	Average Per Farm
Feed for livestock and poultry ..	1,967	\$4,181,386	\$2,126
Purchase of livestock and poultry	884	1,158,123	1,310
Machine hire	887	126,703	143
Hired labor	802	530,401	661
Gasoline, petroleum fuel and oil	2,237	473,169	211
Seeds, bulbs, plants and trees ..	531	87,960	166
Total expended		\$6,557,742	

Source: U. S. Census of Agriculture, 1959.

Fertilizer and Lime

Fertilizer was used on about a fourth of all Lewis County farms in 1959. Some 554 farms used 1,691 tons of fertilizer on 17,822 acres. All fertilizers used were of the dry variety.

More fertilizer was used on hay and cropland pasture than any other crop. In 1959, hay and cropland pasture accounted for 73 percent of all fertilizer used and for 67 percent of the acreage fertilized. Wheat ranked second with 1,115 acres fertilized. Other pasture and barley followed wheat, in that order.

In 1959, there were no reports of any use of lime or liming materials by Lewis County farms. In 1954, however, 50 farms reported using 200 tons of lime on 2,095 acres.

Table 37. Use of Commercial Fertilizer On Crops and Pasture
Lewis County, 1959

Crops and Pasture Fertilized	Farms Reporting Use of Fertilizer	Acres Fertilized		Amount Used	
		Total (Acres)	Percent of Acreage Fertilized	Total (Tons)	Pounds Per Acre
Total Commercial Fertilizer Used	554	17,822	100	1,691	21,000
Hay and Cropland Pasture	437	12,020	67.4	1,236	19,400
Other Pasture	60	745	4.2	43	34,600
Wheat	75	1,115	6.3	63	35,400
Barley	30	240	1.3	17	28,200
All Other Crops	158	3,702	20.8	332	22,400

Source: U. S. Census of Agriculture.

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