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Title: SPATIAL EXPRESSIONS OF FARM SIZE CHANGES IN POLK AND LINN COUNTIES OF OREGON

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Abstract approved: _____

Richard M. Highsmith, Jr.

The spatial organization of farm units in Polk and Linn counties in the mid-Willamette Valley has undergone significant change over the past 30 years. Whereas most study areas operations in the 1930's and 1940's consisted of small family owned farms with contiguous land bases, present mid-Willamette Valley units vary considerably in spatial organization, tenure patterns, and size.

The purposes of this research are to determine the magnitude of farm size changes in the study area over the past 30 year; determine the spatial organization strategies underlying operator's choices of particular means of farm size changes; determine the means of farm size changes; assess the effects of farm size changes on the characteristics of agricultural land use in the study area; and determine the spatial characteristics of farm size changes.

Approximately ten percent of the farmers in the study area (280) were interviewed concerning the spatial organization and evolution of their operations. Eight farms were selected for indepth case studies. The results of the farmer interviews were statistically treated by the Statistical Package for the Social Sciences program at Oregon State University.

The results of farmer interviews indicate that full time commercial operators have steadily increased their land bases over the past 30 years. Interview data also reveal a large increase in the numbers of small part-time units and rural residences in the post World War II era.

Renting and leasing of farm land is common in the study area, and as commercial farm operators continue to seek to enlarge the areal extent of their land, the competition for rental or lease land is increasing. There is also strong demand for suitable farm land by prospective buyers.

Farmers have enlarged their land bases primarily because they believe they must if they are to achieve satisfactory economies of scale. The study suggests that this is the dominant effect.

The need to enlarge the spatial component of their operations has forced many commercial farmers to purchase, rent, or lease land that is not joined to their headquarters. In some cases they must move equipment up to 25 miles to work their scattered parcels.

Such farmers are well aware of the liabilities associated with farming non-contiguous land bases, but accept these problems in order to enlarge.

The trends in agricultural land use in the study area are toward larger commercial units on the one hand and toward small part-time farm/rural residences on the other. The full-time commercial operators generally make effective use of their land base whereas, the part-time farmers are usually less concerned with maintaining optimal land use. The increasing numbers of rural residences and the increasing population of the study area lead to the conclusion that the mid-Willamette Valley is becoming an urbanized area with attending suburban sprawl, rural residences, small acreages, hobby or part-time farms, and relatively few large commercial farm units.

Spatial Expressions of Farm Size Changes in the Polk and Linn Counties of Oregon

by

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CHAPTER I

INTRODUCTION

Introduction to the Problem

At its inception as an independent nation two hundred years ago, the United States was primarily agrarian. Agriculture was seen as the most natural and wholesome pursuit, and the growth and prosperity of the new nation was thought to be best assured by the continued development of an agrarian society. Therefore, governmental policy was designed to settle the vast newly acquired public domain with independent farm families. Until the 1880's, agriculture remained the fundamental means by which the majority of the people derived support. By this time the greater portion of public lands well suited to agriculture had been sold or granted to private farmers (Johnston, 1940, p. 111-118).

The growth of American manufacturing in the last quarter of the 19th century gave rise to increased demands for labor in factories, construction work, and service occupations, while advances in farm technologies reduced employment opportunities on farms. Successful American farmers have, from the beginning, been receptive to technological developments which have increased yields and

decreased the need for human labor and draft animal power. As more efficient equipment and other farm technologies have been developed, each farm worker has been able to increase productivity. Moreover, advanced farm technologies have been a positive factor in maintaining high levels of production and relatively low farm produce prices (Johnson and Kilby, 1975, p. 196-207). In general, commercial farmers have responded to the effects of advanced technologies and changing economic conditions by organizing larger and more efficient farm units. This has resulted in a drastic decrease in the farm population, so that by 1975, only 4.2 percent of the nation's population lived on farms (United States Bureau of the Census, Sept., 1976).

Literature Review

In the post World War II era, geographers have shown relatively less interest in agricultural research as their efforts have been increasingly directed toward urban problems. In this more recent period, the greatest interest in farm size and the spatial characteristics of American farm operations has been shown by agricultural economists who have published considerable research dealing with farm size and economies of scale. Agricultural economists have generally approached research dealing with the spatial characteristics of farm organizational strategies exclusively from an economic

perspective. Two articles are illustrative of this observation.

Philip M. Raup discusses farm size in his article "Societal Goals in Farm Size." He notes that farm size changes in the United States have been directly influenced by economic factors. Mr. Raup focuses on the concept of economies of scale and touches on the spatial characteristics of American farms in only the most general terms (Raup, 1972, p. 3-15).

Gordon Ball and Earl O. Heady in "Trends of Farm Enterprize Size and Scale" also approach the topic of farm size from an economic perspective. They discuss the economic efficiencies associated with various farm sizes and conclude that as conditions change the economic efficiencies associated with a given farm size change. Spatial relationships are not addressed in the article (Ball and Heady, 1972, p. 40-45).

Some relatively general discussions of farm size in the United States have been published in Environment magazine. Kevin Shea and Michael Perelman, for example, discuss farm size in their article "The Big Farm." They idealize the small family farm and attack the government, modern technology, and big business as the major contributors to the alleged elimination of the family farm. In general, the article is an emotional and nostalgic plea to return to a rural society, and provides few insights into the spatial characteristics of modern farm operations (Shea and Perelman, 1972, p. 10-14).

In the past decade little has been published by geographers that deals with the spatial characteristics of American agriculture. Because little recent geographic literature on the topics of farm size and the spatial characteristics of farms could be identified through normal library research techniques, the computerized Library Information Retrival Service at the Oregon State University Library was utilized. The resultant computer print out listed a number of publications by agricultural economists which, when examined, were found to focus on the economic characteristics of farms, but only one geographic publication was identified.

Everett G. Smith, Jr., in his article "Fragmented Farms in the United States," published in March of 1975, notes that large and successful farm operations in the United States often consist of scattered parcels of land. He identifies some possible motives for the enlargements of farm operations with noncontiguous parcels of land, but does not support his notions with extensive field research. His treatment of the topic, while appropriate for a short article, is highly generalized. Mr. Smith concludes his article by identifying the need for more specific research to examine the spatial characteristics of modern farm organizational strategies (Smith, Mar., 1975, p. 58-70).

In the earlier part of the post World War II era, several articles were published by geographers that dealt with urban growth and

technological impacts. In September, 1958, Paul F. Griffin and Ronald Chatham published an article entitled "Urban Impact on Agriculture in Santa Clara County, California," in which they discussed the effects of rapid urban growth on commercial agriculture. Their research primarily focused on the relationship between urban growth and agricultural land use changes, and did not touch upon the spatial characteristics of farms in other than general terms (Griffin and Chatham, Sept., 1958, p. 195-208).

Walter Kollmorgen and George F. Jenks published two articles which examined farm organization strategies in 1958. In "Sidewalk Farming in Toole County, Montana and Trail County, North Dakota," they found that a significant number of Great Plains farmers lived in towns and commuted to their farms. This phenomena was attributed to land tenure patterns in which the commuting farmers rented land upon which no suitable home existed and to the ammenities associated with urban residences (Kollmorgen and Jenks, Sept., 1958, p. 195-231).

Kollmorgen and Jenks noted in their article, "Suitcase Farming in Sully County, South Dakota" that some Great Plains farmers produce grain on fields scattered over several states. These farmers utilized the services of custom harvest teams that began harvesting on the Texas Plains and moved northward with the harvest season (Kollmorgen and Jenks, Mar. 1958, p. 27-40).

These articles focus on the farm organization strategies in the Great Plains; land tenure factors in the case of "Sidewalk Farmers," and climatic factors in the case of "Suitcase Farmers" rather than on the spatial manifestations of farm organizational strategies.

Jack H. Blok's research, completed at Oregon State University in 1973, examined the evolution of farm organizational strategies in the Willamette Valley, but did not include extensive field research on the present spatial manifestations of farm organizational strategies. His work provides a significant amount of the background information upon which this dissertation builds (Blok, 1973).

Problem Statement

This dissertation is designed to contribute to the understanding of changes in the areal extent of farm operations. It is an assessment of the spatial expressions of farm size changes in the mid-Willamette Valley of Oregon in the post World War II era (Figure 1).[1]

Research Objectives

The research objectives are:

1. Determine the magnitude of farm size changes in the study area in the post World War II era.

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[1] Spatial expressions of farm size changes refers to the ways in which farmers have enlarged the areal extent of their operations.

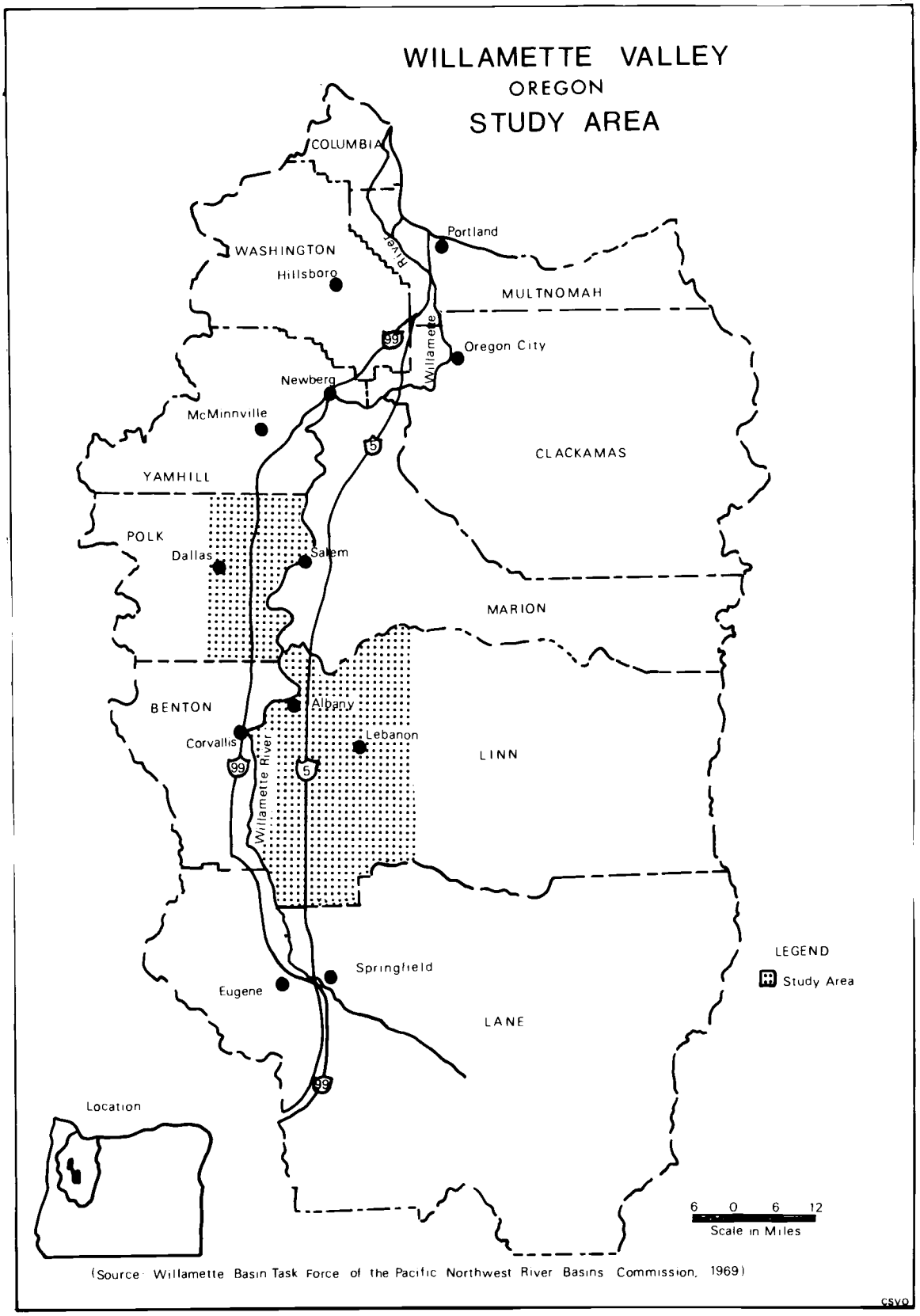
WILLAMETTE VALLEY
OREGON
STUDY AREA
COLUMBIA
WASHINGTON
Hillsboro
Portland
Willamette River
MULTNOMAH
Oregon City
Newberg
McMinnville
CLACKAMAS
YAMHILL
POLK
Dallas
Salem
MARION
BENTON
Albany
Corvallis
Lebanon
LINN
Willamette River
Springfield
Eugene
LANE
99
5
Location
LEGEND
Study Area
6 0 6 12
Scale in Miles
(Source: Willamette Basin Task Force of the Pacific Northwest River Basins Commission, 1969)
CSYO

Figure 1

2. Determine the spatial organization strategies underlying operator's choices of particular means of farm size changes.
3. Determine the means of farm size changes.
4. Assess the effects of farm size changes on the characteristics of agricultural land use in the study area.
5. Determine the spatial characteristics of farm size changes.

Justification for the Research

As the demand for land has increased in recent years, while the numbers of people directly controlling the land resource have declined, Americans have shown increasing interest in the ways in which land is used. Rural land use decisions are no longer left entirely to land owners and developers, but are now regulated to some degree by law (Reilly, 1973, p. 13-30). Since 1973 there has been considerable emphasis in Oregon placed upon assuring prudent use of land resources and the preservation of prime agricultural lands.[2] This points to the need for understanding the characteristics of rural land use, land organization, and land tenure forms. This dissertation is intended to contribute to this information.

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[2] Prime Agricultural Lands are considered to be those lands suitable for farm use taking into consideration soil fertility, suitability for grazing, climatic conditions, existing and future availability of water for farm irrigation purposes, existing land use patterns, technological and energy inputs required or accepted farming practices. Statewide Planning Goals and Guidelines, Oregon Land Conservation and Development Commission, Salem, Oregon (April, 1977), p. 4.

Research Design

This study combines existing information with new data assembled through field research. Particularly helpful printed material included Jack H. Blok's dissertation on the evolution of agricultural resource use strategies, histories of the Willamette Valley by a number of authors, soils and geomorphic studies, and census data. Personnel of the Polk and Linn counties Agricultural Stabilization and Conservation Service offices, the Soil Conservation Service, and a Real Estate firm also provided useful information. The primary source of information, however, was the farmers of the study area.

Approximately ten percent of these farmers were interviewed concerning the ways in which they have organized the land base of their operations. The strategies underlying their decisions were determined, and their perceptions of the effects of their decisions were recorded. Each farmer interviewed was asked to provide a basic description of his farm unit, including the amount of acres he leased, rented, or owned. Additionally, each farm operator was asked to describe the farm size changes in his unit since World War II. The reasons for and effects of each change, as the farmers expressed them, were recorded and the spatial organization of each farm operation was mapped. In all 280 farm operators, chosen by means of a

uniform sampling technique, were interviewed (Appendix I).[3]

Once the interviews were completed, the data was transferred to punch cards and statistically treated by the Statistical Package for the Social Sciences (S.P.S.S.) program at Oregon State University. The treated data provide the basis for the greater part of the analysis and conclusions.

Eight farm operations in the study area were chosen for case studies. Together these selections are intended to provide a composite view of mid-Willamette Valley farming systems and characteristics. These first-hand studies serve to increase understandings of spatial patterns and strategies by which modern farmers organize their uses of the land.

Organization

The organization of this dissertation is intended to establish the geographic framework against which results of field research can be analyzed. Chapter Two presents the physical setting of the research

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[3]The uniform sampling technique consisted of totalling the number of sections in the study area, and dividing that number by the number of interviews to be completed. The sections were numbered from east to west and north to south, and every third section in Polk County and every fourth section in Linn were utilized as initial sample sections. The nearest farm unit to the center of each sample section was visited for the purpose of obtaining an interview. If no interview could be obtained, the next nearest unit was visited until an interview was completed.

and identifies the important physiographic characteristics that are unique to the study area.

The evolution of the mid-Willamette Valley farming system is discussed in Chapter Three. This brief appraisal of farm organizational strategies from the early years of settlement to the present in relationship to changing economic and societal factors provides a sequential background that leads logically to the presentation and analysis of field research data.

The presentation and analysis of field research data derived from the 280 farms comprising the sample is accomplished in Chapter Four. Changes in the areal organizational systems of study area farms in the post World War II era, and the economic, technological and societal factors which have influenced these changes are discussed and analyzed in this chapter.

Chapter Five presents eight case study farms that are representative of farm types in the study area. These case studies provide an analysis of a variety of actual mid-Willamette Valley farm areal organizational strategies at a micro-scale.

Chapter Six summarizes data and evaluations, and discusses the implications of the findings of this dissertation.

CHAPTER II

THE RESEARCH AREA

The study area is located in the mid-Willamette Valley of Oregon in Polk and Linn counties. The agricultural parts of these two counties include the valley floor and the lower foothills (Figure 2).

Orientation to the Willamette Valley

The Willamette Valley is a structural depression bounded by the Coast Range on the west, the Cascades on the east, and the Calapooia Mountains on the south. In the north, the Valley is bounded by the Columbia River, but it merges beyond with the Cowlitz-Puget lowland of Washington.

The Willamette River, which forms at the confluence of its Coast and Middle Forks, meanders northward through the Valley for approximately 187 miles to its juncture with the Columbia River near Portland, Oregon. The river descends from an elevation of 440 feet to about 20 feet at its confluence with the Columbia. Its gradient averages around 2.3 feet per mile, but ranges between 12 feet to 0.2 foot per mile. The Willamette River and its tributaries have formed a generally flat to rolling alluvial plain approximately 130 miles long with an average width of 28 miles. The larger part of the Willamette Valley consists of an alluvial plain which stretches the

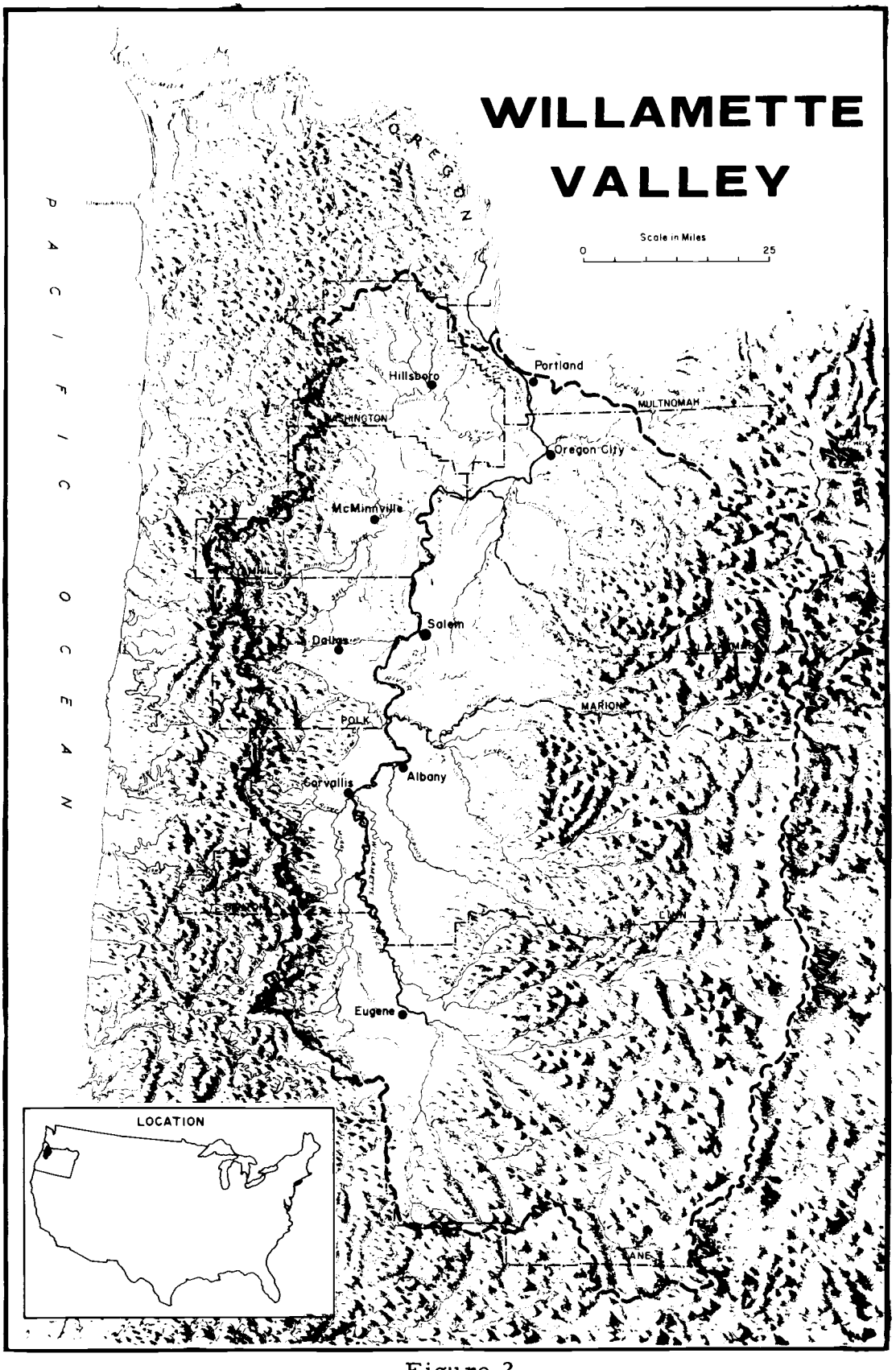

WILLAMETTE VALLEY
Scale in Miles
0
25
PACIFIC OCEAN
OREGON
Portland
Hillsboro
MULTNOMAH
Oregon City
McMinnville
Salem
Dallas
POLK
MARION
Albany
Corvallis
Eugene
LANE
LOCATION

Figure 2

length of the river from north to south and to the foothills on the east and west. Excluding the foothills, the only other breaks in the plain are scattered buttes and the Salem-Eola Hills complex in the central part of the Valley (Balster and Parsons, 1968, p. 1-13).

The Pacific maritime climate of the Willamette Valley is typified by mild wet winters and warm dry summers. Extremes of weather phenomena are rare and seasons tend to blend with one another in gentle transition. The wet season begins near the first part of October and continues until the middle of May. Approximately 80 percent of the total precipitation falls during this period, whereas July and August are almost without measurable precipitation in most years. Nevertheless, considerable variability in the timing of precipitation does take place, and damp summers or dry winter days are not entirely unknown (National Oceanic and Atmospheric Administration Environmental Data Service, 1975, p. 3-4).

The Mid-Willamette Valley

The study area is situated in the central part of the Valley and covers about 1,120 square miles. The agricultural portion of Polk County contains approximately 200,000 acres and is bounded on the east by the Willamette River and is terminated on the west at 123°15' west longitude with the occurrence of the Coast Range. The part of Linn County included in the study area consists of approximately

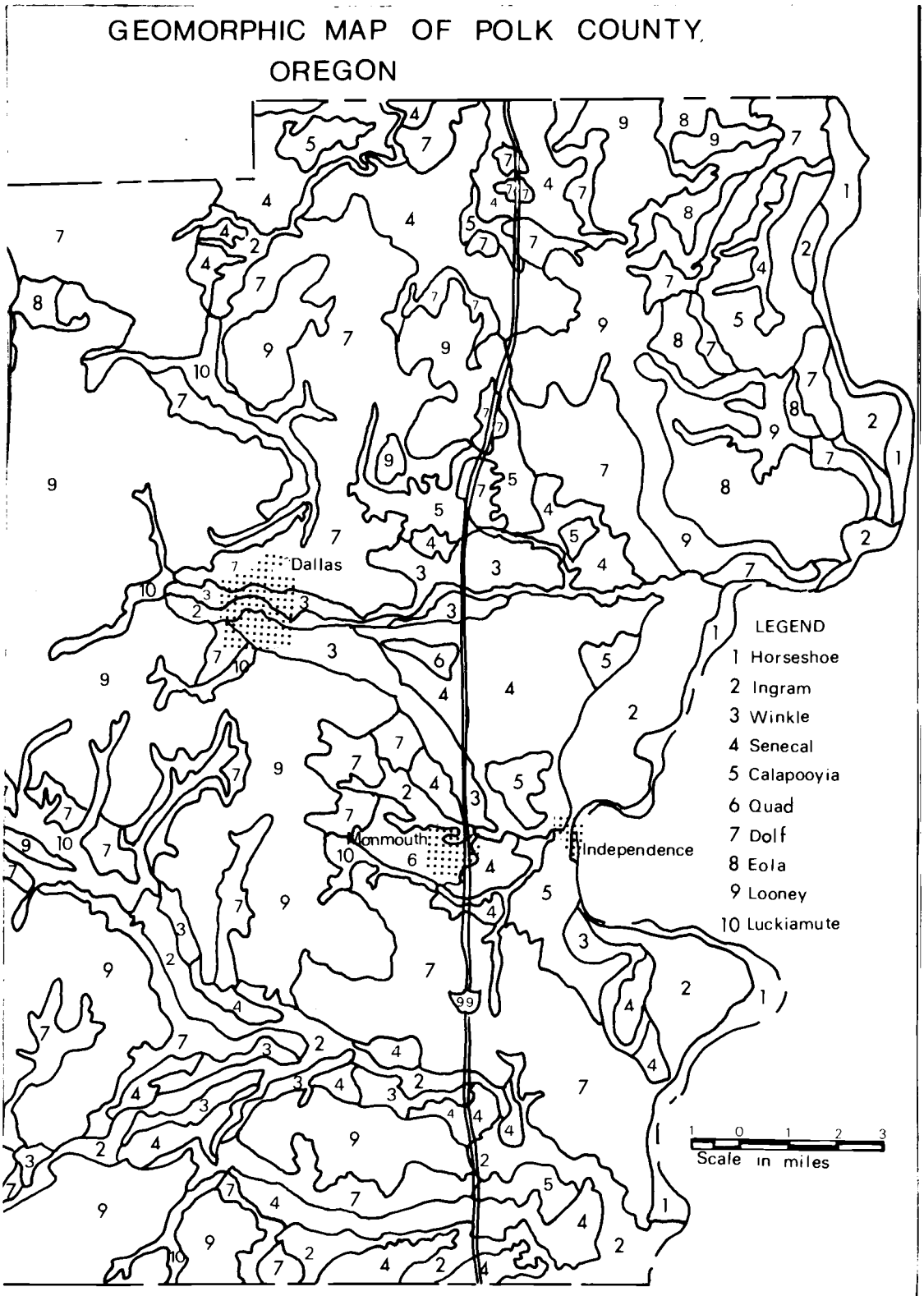
518,000 acres bounded by the Willamette River on the west and the Willamette Meridian on the east.

Geomorphic Surface

The physical characteristics of the study area typify the entire Willamette Valley. All major types of topographic features found in the Willamette Valley are represented in the cross section provided by the study area.

Broadly generalized, the following geomorphic surfaces characterize the mid-Willamette Valley: (1) a lower and higher flood plain of the Willamette River, (2) the flood plains of the tributary streams that flow out of the Coast Range and Cascade highlands, (3) the alluvial deposits of the main valley floor, and (4) uplifted areas of the main valley floor.

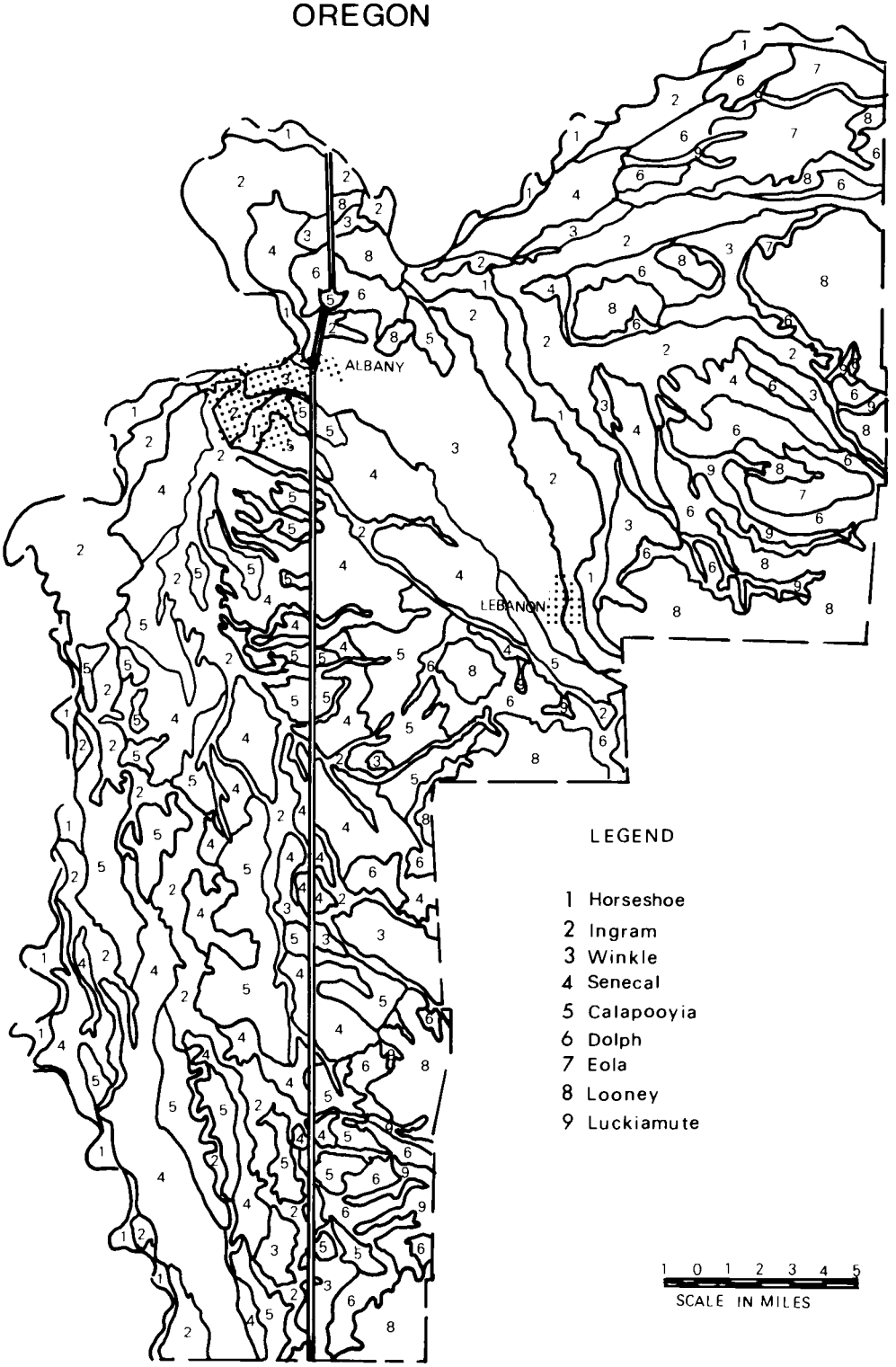
The soil characteristics associated with these geomorphic surfaces are primary variables in regard to agriculture and other land uses. Whereas other physical factors remain fairly uniform throughout the study area, the geomorphic surfaces and associated soils vary widely thereby offering differing land use possibilities and limitations from one site to another (Balster and Parsons, 1968, p. 10). (Figures 3, 4, 5, and 6)



(Source "Geomorphology and Soils, Willamette Valley, Oregon" by C. A. Balster and R. B. Parsons September 1967.)

Figure 3

GEOMORPHIC MAP OF LINN COUNTY, OREGON

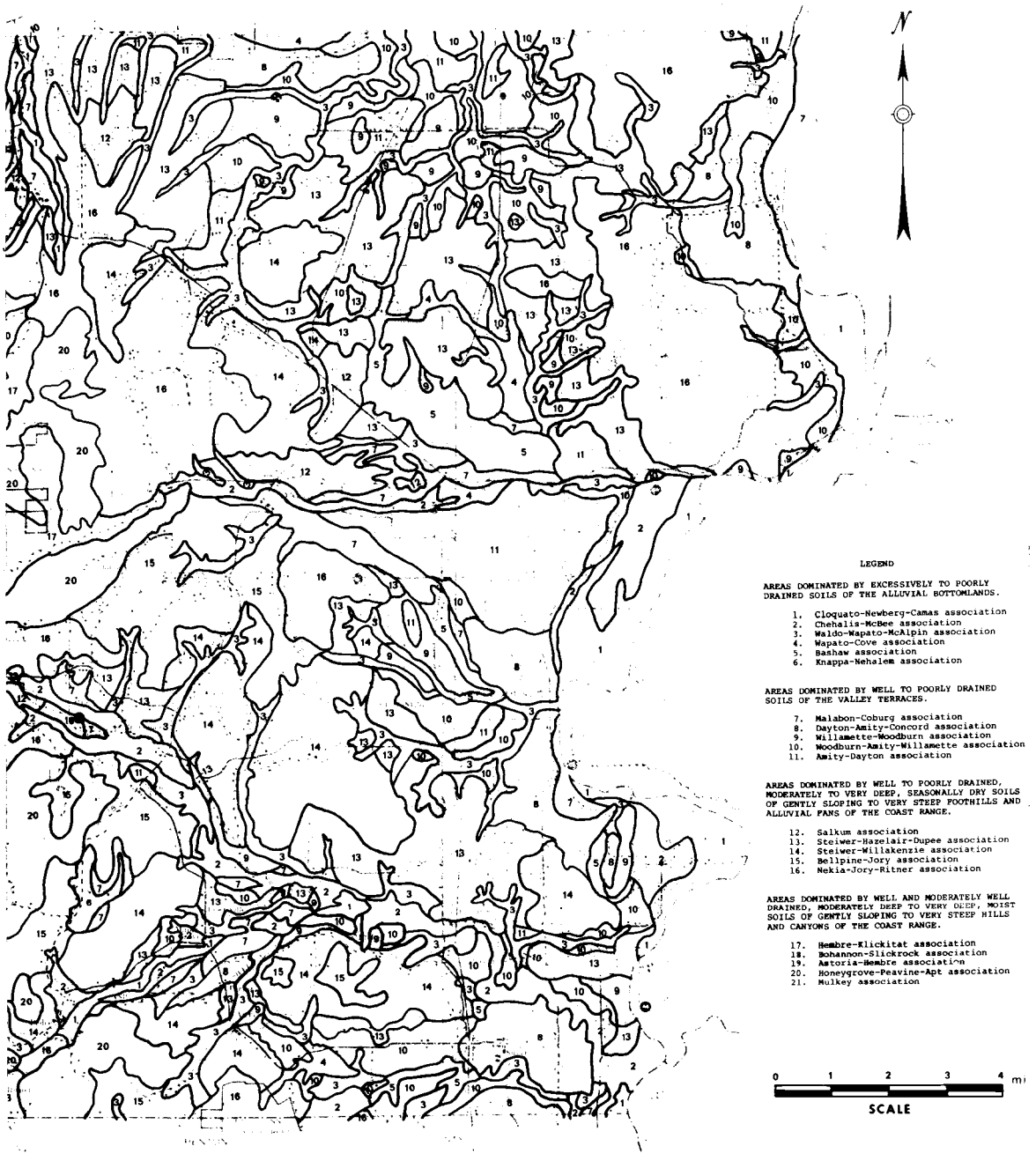


(Source: "Geomorphology and Soils, Willamette Valley, Oregon" by C. A. Balster and R. B. Parsons September, 1967)

CSVO

Figure 4

Polk County — Soils



Source: Soil Conservation Service, 1970.

Figure 5

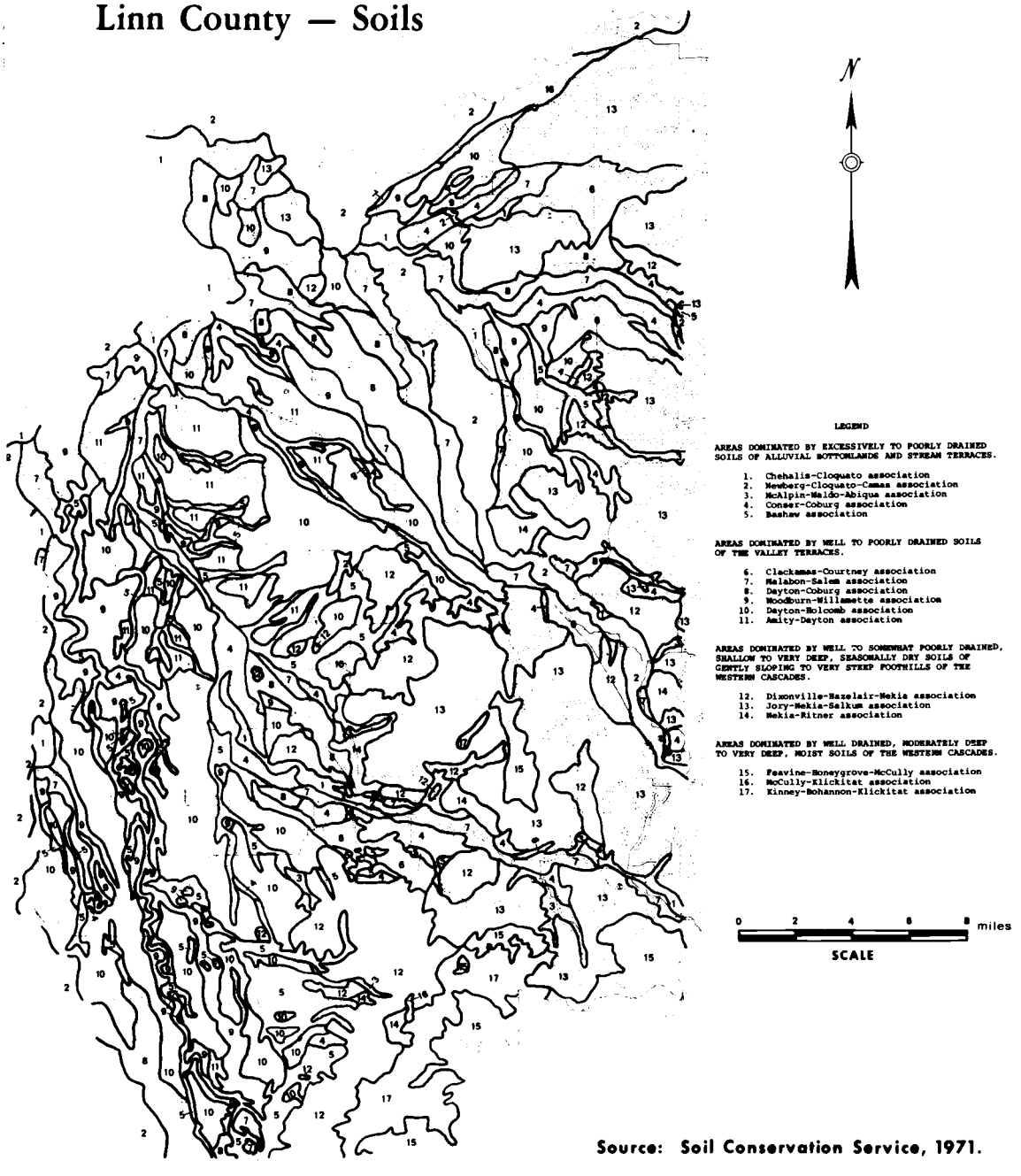

Linn County — Soils
N
LEGEND
AREAS DOMINATED BY EXCESSIVELY TO POORLY DRAINED SOILS OF ALLUVIAL BOTTOMLANDS AND STREAM TERRACES.
1. Chehalis-Cloquato association
2. Newberg-Cloquato-Camas association
3. McAlpin-Waldo-Abiqua association
4. Conser-Coburg association
5. Bashaw association
AREAS DOMINATED BY WELL TO POORLY DRAINED SOILS OF THE VALLEY TERRACES.
6. Clackamas-Courtney association
7. Malabon-Salem association
8. Dayton-Coburg association
9. Woodburn-Willamette association
10. Dayton-Holcomb association
11. Amity-Dayton association
AREAS DOMINATED BY WELL TO SOMEWHAT POORLY DRAINED, SHALLOW TO VERY DEEP, SEASONALLY DRY SOILS OF GENTLY SLOPING TO VERY STEEP FOOTHILLS OF THE WESTERN CASCADES.
12. Dimonville-Hazelair-Nekia association
13. Jory-Nekia-Salkum association
14. Nekia-Ritner association
AREAS DOMINATED BY WELL DRAINED, MODERATELY DEEP TO VERY DEEP, MOIST SOILS OF THE WESTERN CASCADES.
15. Peavine-Honeygrove-McCully association
16. McCully-Klickitat association
17. Kinney-Bohannon-Klickitat association
0 2 4 6 8 miles
SCALE
Source: Soil Conservation Service, 1971.

Figure 6

The Horseshoe Surface

The lower flood plain of the Willamette River is designated the Horseshoe unit. It varies in width from a few feet to around a mile, and is a surface of low relief mainly composed of the channels and associated features of the Willamette and Santiam Rivers. Typical features include abandoned meanders, bar deposits, and old channel fillings which are frequently underlain by moderately coarse alluvium. Horseshoe areas are often void of vegetation or are covered with stands of willows and cottonwoods. Abandonment of channels, cutting of new channels, flooding and meanders annually add more area to the Horseshoe unit (Balster and Parsons, 1968, p. 5-10).

The soils of the Horseshoe unit are composed of recent deposits of silt and organic accumulation. Soil series associated with the lower flood plain of the Willamette and Santiam Rivers include the Cloquato, Camas, and Newberg soils. The soils of the Camas series developed in gravelly alluvium (Soil Conservation Service, Feb., 1973), while the Newberg soils have a sandy loam texture (Soil Conservation Service, May, 1973). All of these soils are common to flat or gently undulating bottomlands of zero to three percent slope. Because of frequent flooding, they are not practical for other than agricultural or recreational uses. The Newberg and Cloquato soil series are adaptable to the production of a variety of crops but are used in the study area primarily for row crops and mint (Soil

Conservation Service, Feb. and Mar., 1973). Camas soils are best suited to pasture uses because the effective rooting depth is only about 12 to 20 inches (Soil Conservation Service, Feb., 1973).

The Luckiamute Surface

The tributary flood plains of the Willamette form the Luckiamute surface. This surface is primarily flat and usually quite narrow except when it spreads out on the main valley floor in the form of small alluvial fans. The Luckiamute surface is widely scattered throughout the study area and its soils are derived from many different parent materials. Luckiamute soils include the Chehalis, McBee, Wapato, Cove, Bashaw, Abiqua, McAlpine, and Waldo soil series.

The Abiqua, Chehalis, McBee, and McAlpine series are well drained silty clay loam soils usually found on flat to slightly rolling bottomlands of small stream flood plains. These soils are adaptable to a wide variety of agricultural crops but have moderate to high shrink/swell characteristics and are subject to yearly flooding. These are the major restrictions to non-biotic uses (Balster and Parsons, 1968, p. 9).

The Waldo, Bashaw, Cove, and Wapato series are poorly drained silty clays on slopes of zero to seven percent. Low permeability results in surface water ponding in wetter months. Because of seasonal flooding, poor drainage and severe shrink/swell

characteristics, these soils are not desirable as construction sites. Agricultural activities also are limited because of wetness. Therefore, these soils are best utilized for hay, grass, and pasture production (Soil Conservation Service, June, 1971; Mar., 1973; Apr., 1973; June, 1973; Feb., 1973; Mar., 1975).

Ingram Surface

The higher flood plain level of the Willamette River is designated the Ingram unit. This surface is slightly undulating with a relief of about eight feet. The rolling or corrugated relief is the result of Willamette River and tributary overbank channeling. In some parts of the study area, the Ingram surface, which borders the Horseshoe lower flood plain, is nearly five miles wide, but for the most part, it averages two miles in width (Balster and Parsons, 1968, p. 9).

The well drained silty clay loams of the Chehalis and McBee series typify the Ingram soils. Wapato and Cloquato soils are also prominent. Generally the soils of the Ingram surface are flat to gently rolling with about zero to three percent slope. They are best suited to a diversified agricultural use, but because of periodic flooding, are not particularly good construction sites. Nevertheless, part of the town of Independence in Polk County is on this surface (Soil

Conservation Service, June, 1971; Mar., 1973; Apr., 1973; May, 1973).

The Winkle Surface

One of the most prominent surfaces in the mid-Willamette Valley is the Winkle unit. The Winkle surface is particularly important in the Linn County area, but also occurs to the west of the Willamette River. Some of the Winkle surfaces were formed by the Willamette River while others were formed by smaller streams. In most cases, the Winkle unit surface was formed upon the abandoned flood plains of rivers and streams, but the unit also includes the remains of old lakebeds. Often a thin band of pumis, probably from Mt. Mazama's erruption, occurs within the upper levels of the underlying alluvium. The Winkle surface occurs at slightly higher elevations than does the Ingram (Balster and Parsons, 1968, p. 8).

Soils of the Winkle surface include the Malabon, Coburg, and Salkum units. These soils generally occur on one to three percent slopes and are moderately well drained silty clay loams. Winkle soils are well suited to the production of numerous agricultural crops and can be utilized for construction with only moderate limitations (Soil Conservation Service, Feb., 1973).

The Senecal Surface

The Senecal surface in the study area is typified by little relief and an incised drainage pattern. In general it slopes gently to the northwest at about 4.9 feet per mile (Balster and Parsons, 1968, p. 7). In the northern part of Polk County, the Senecal unit consists of a flat plain deeply cut by the incised valleys of major streams. The unit is most prominent in the southern part of Linn County, and is also important in the central part of Polk County.

Soil series associated with the Senecal surface include the Woodburn, Willamette, Amity, Holcomb, Dayton, and Concord series. These soils are mainly silt loams, and vary in slope from 0 to 20 percent. Willamette soils are well drained silt loams which are capable of producing nearly all agricultural crops that can survive in the Willamette Valley climate. They vary in slope from 0 to 12 percent and can be used for construction with almost no limitations. Woodburn soils are similar in most respects to Willamette soils and are suitable for both agricultural production and construction (Soil Conservation Service, Feb., 1973). Amity soils which have slopes of three to seven percent are somewhat poorly drained but are an important agricultural resource. Small grains and grass seed do well on Amity soils, but construction is severely limited because of wetness (Soil Conservation Service, Dec., 1972). Concord soils occupy level or concave areas and are poorly drained. Their use is

limited because of wetness, but grass seed and pasture can be produced. Construction is severely limited because shrink/swell characteristics are extreme and drainage is poor (Soil Conservation Service, Dec., 1974). Dayton soils rest on flat surfaces, are poorly drained, and are used primarily for grass seed production. Construction activities are severely limited because of wetness and excessive shrink/swell characteristics (Soil Conservation Service, July, 1972).

In general, Senecal soils are among the most productive and versatile in the study area, and with the exception of the Amity and Dayton series, afford a large range of land use choices.

The Calapooyia Surface

The Calapooyia unit is an extensive landscape surface in the Willamette Valley but is not as important as the Winkle or Senecal surfaces in the study area. In the mid-Willamette Valley, it is most prominent in southern Linn County. Calapooyia topography has almost no relief and is usually poorly drained. In the Polk County portion of the study area, the unit is dissected by drainage patterns. The surface is the result of the deposition of a thin layer of silt materials on the valley floor. Areas of the Calapooyia unit vary in size from less than a square mile to around 40 square miles (Balster and Parsons, 1968, p. 6).

The Dayton and Concord soils discussed under the Senecal unit make up the soils of the Calapooyia unit. In the study area, these soils are mostly used for grass seed farming and pasture as a result of poor drainage. Grasses do well on wetter sites while grains require those of better drainage (Soil Conservation Service, July, 1972 and Dec., 1974).

The Quad Surface

The Quad unit is prominent near Monmouth in Polk County. It is the result of uplifting of the Calapooyia surface (Balster and Parsons, 1968, p. 6).

Quad soils are the most productive and versatile in the study area. They include the Willamette, Woodburn, and Amity series discussed under the Senecal unit.

The Dolf Surface

This surface is generally well above the level of the Valley floor and is common to the low foothills. The topography of the Dolf surface is composed of extensive dissected flats that form a rolling landscape. It is most important in Polk County but also occur throughout Linn County. Dolf surfaces are usually underlain by weathered gravel, sand, and clay (Balster and Parsons, 1968, p. 6).

Dolf soils in the study area consist of the Salkum, Willakenzie,

Steiwer, and Hazelair series. With the exception of the Hazelair series these soils are well drained clay loams of fairly steep slopes which range from about 5 to 50 percent. Grains, orchards, and pastures are often grown on these soils, and with the exception of the Hazelair soils, there are only moderate limitations to construction. The Hazelair soils are somewhat poorly drained and are best suited to pasture, hay production, and wildlife habitat. Construction on Hazelair soils is severely limited because of wetness (Soil Conservation Service, June, 1971; June, 1972; Apr., 1973; Dec., 1972).

The Eola Surface

The crests and upper parts of the Eola Hills in northeast Polk County make up the Eola unit. The Eola surface is typical of rounded hill and valley topography with local relief of up to 200 feet. Slope gradients are as high as 90 percent in some areas (Balster and Parsons, 1968, p. 5-6).

In the study area, the Jory soils are prominent in the Eola surface. The Jory soils are deep, well drained silty clay loams best suited for hay, orchard, berry, grain, and grass seed production. These soils present few limitations to construction although in some cases slopes are excessively steep (Soil Conservation Service, June, 1971).

The Looney Surface

The Looney surface borders the Dolf and Eola units. It consists of a complex group of valleys and ridges that make up a steeply sloping terrain. In some cases, slope gradients may exceed 100 percent. This surface is generally found bordering the Coast and Cascade ranges and the Eola Hills (Balster and Parsons, 1968, p. 5).

The soils of the Looney surface show wide variations in climate, slope, vegetation, and parent material. Looney soils include the Peavine, McCully, and Kinney series. These well drained clay loams are upland soils of moderately steep slopes of 12 to 20 percent. They are most often left in woodland but can be built upon if septic tank drain fields are not required. Agriculture is usually quite limited on Looney surfaces as a result of steep slopes and poor workability (Balster and Parsons, 1968, p. 5).

Mid-Willamette Valley Agro-Climate

The warm dry summers and cool moist winters which typify the Willamette Valley climate enhance the suitability of the study area for agricultural production. These mild climatic qualities also help to provide a pleasant environment in which to live.

In general, the temperature regimen is mild. The average daily maximum in January, the coldest month, is 44.4^{o} F., and the

average daily January minimum is 32.1° F. Summer temperatures are rarely excessively high, and human discomfort from heat is rare. The daily average maximum in July, normally the warmest month, is 81.2° F, and the average daily minimum is 51.6° F (Table I).

Precipitation in the Willamette Valley is ample for many agricultural endeavors, especially for fall planted and early maturing annuals, deep rooted perennials, and livestock enterprises. The bulk of the precipitation occurs between October and March, whereas the months of July and August are almost free of moisture. January, the month of greatest precipitation, receives an average of 7.06 inches, whereas July, the month of least precipitation, receives only .33 inches (Table II).

The mild qualities of the study area climate are associated with a relatively long frost-free season of approximately 200 days. Crop types, of course, vary considerably in their temperature tolerance, but in general, the frost-free period of the Willamette Valley is of sufficient length to meet the requirements of a wide variety of short and long cool and mild season crops.

In the growing season, temperatures that exceed 85° F are rare, and most early summer nights are cool with temperatures in or below the low sixties. Therefore, soil temperatures remain relatively cool throughout the growing season and crops that require warm soils and humid summer nights for optimal growth, such as feed corn, are not

Table I. Mid-Willamette Valley Temperature Regimen

Month	Temperature						
	Normal			Extremes			
	Daily Max	Daily Min	Monthly	Record Highest	Year	Record Lowest	Year
(Length in years of record)	30	30	30	80		80	
January	44.4	32.1	38.8	64	1940	-1	1950
February	49.5	34.7	43.1	69	1916	-5	1899
March	54.0	36.8	45.5	78	1947	13	1891
April	61.0	40.5	50.1	91	1926	24	1968
May	67.7	45.5	55.7	99	1922	28	1915
June	72.9	49.2	61.0	102	1925	32	1929
July	81.2	51.6	65.9	107	1946	36	1921
August	81.1	51.2	65.8	105	1972	35	1910
September	75.8	48.3	62.0	103	1944	26	1919
October	64.2	43.0	53.2	90	1936	13	1919
November	52.2	37.2	45.3	73	1890	10	1896
December	46.8	35.1	41.0	66	1950	-14	1919
Year	62.6	42.1	52.3	107	1946	-14	1919

Source: Bates and Wheeler, June, 1976, p. 7-8.

Table II. Mid-Willamette Valley Precipitation Regimen

Month	Inches of Precipitation						
	Normal Total	Max Monthly	Year	Min Monthly	Year	Max 24 hours	Year
(Length in years of record)	30	80		80		66	
January	7.06	15.51	1970	1.99	1920	4.28	1965
February	4.63	15.23	1904	.12	1920	2.76	1961
March	4.20	11.70	1904	.43	1926	1.89	1916
April	2.50	7.99	1937	.22	1939	2.06	1937
May	1.77	5.71	1896	.16	1947	2.23	1941
June	1.15	3.84	1952	0	1918	2.14	1952
July	.33	2.72	1947	0	1967	1.75	1947
August	.55	5.24	1968	0	1955	1.35	1968
September	1.31	5.40	1920	0	1975	2.18	1969
October	3.78	9.70	1950	0	N/A	2.26	1924
November	6.04	18.28	1973	.22	1890	3.16	1921
December	6.83	14.47	1968	2.33	1930	3.58	1941
Yearly	39.70	18.28	1973 Nov.	0	1967	4.28	1965 Jan.

Source: Bates and Wheeler, June, 1976, p. 7-8.

commonly produced in the study area.

The wet winter, droughty summer precipitation pattern of the Willamette Valley is ideal for the growth and harvest of grain and grass seed crops. The needed moisture is available during the growth period, and the dry summer months make ripening and harvest possible. The dryness of the summer months, however, make irrigation necessary for the production of most vegetable crops and summer pastures (Bates, Mar., 1977).

The climate cf the Willamette Valley is unique in that no other part of the nation experiences such a precipitation distribution pattern. The relative rarity of climatic conditions which cause creature discomfort and outdoor work interuptions increase the attractiveness of the Willamette Valley as a population center. Therefore, the unique qualities of the study area climate enhance the potential for agricultural production, but also serve to attract increasing numbers of people thereby putting pressure on agricultural lands for conversion to other uses.

CHAPTER III

EVOLUTION OF THE AGRICULTURAL SYSTEM

Early Years

Settlement of the Willamette Valley began in 1829. For the most part, early settlers were drawn to the Valley by its agricultural potential. Even missionaries, such as Jason Lee, who settled near the present location of Salem, Oregon, were as interested in establishing productive farms as they were in spreading the gospel (Johnason and Gates, 1967, p. 206-224).

Settlement and the Establishment of Agriculture

Early settlers who established self-sufficient farm units in the Willamette Valley prior to 1840 provided the example and information necessary to encourage others interested in agriculture to migrate to the Valley. Accounts of abundant natural resources were widespread and as early as the 1820's Congressmen, such as Thomas Benton and Lewis Linn, were pushing legislation that would award each settler free land. Perspective immigrants to the Pacific Northwest felt assured that they would receive free land when they arrived. In 1850, the Donation Land Claims law was passed by Congress. Under the provisions of the law, each married settler already farming in Oregon was awarded 640 acres, while those who arrived after

December 1, 1850 were entitled to 320 acres. Single individuals already settled prior to 1850 received 320 acres, while later arrivals were awarded 160 acres (Dick, 1970, p. 128). The lure of free land was a strong inducement to people interested in the farm life. As a direct consequence the population of the Willamette Valley grew from 11,631 people in 1850 to 39,000 by 1860 (United States Bureau of the Census, 1872, Vol. 1, p. 84).

Early Agricultural Strategies

The early settlers to the Willamette Valley were primarily of Mid-Western origin, and brought with them agricultural resource strategies suited to the Middle West. Once established in the Willamette Valley, their basic organizational strategies were changed to suit local conditions. Transportation systems had not yet been developed in the Valley and commercial activities, with the exception of limited trade with the Hudson's Bay Company, were almost non-existent. Early influxes of settlers kept the demand for wheat and other agricultural products high, but often farm produce was traded for labor and goods. Self-sufficiency was the dominant agricultural strategy during the early years of settlement.

The market created by the California gold strike of the late 1840's afforded farmers the opportunity to establish some degree of commercial orientation to their agricultural strategies. Nevertheless,

the dominant goal of most farm operators was to develop self-sufficient units.

Given the technologies of the time, the early claims were too large for farm families to operate efficiently. The goal of self-sufficiency could usually be accomplished on much less land than that granted to earlier settlers. Therefore, as more people interested in purchasing land arrived in the Willamette Valley, settlers with holdings larger than could be efficiently handled began to sell surplus land to recent immigrants (Blok, 1973, p. 33-51).

Commercial Agriculture, 1860-1900

Transportation and Market Factors

Prior to the 1850's transportation facilities in the Willamette Valley were limited and farmers were isolated from important markets. Except for the commodities that could be sold in California, farm products were primarily consumed locally by those who produced them. Prior to the introduction of steamboats on the Willamette River, farmers had to haul grain to market via nearly impassable roads. The development of steamboat runs on the Willamette River in the 1850's allowed some agricultural produce to be shipped from numerous points along the river to Portland, where it could be loaded on ships and transported to markets (Corning, 1947, p. 24-31).

The construction of a railroad through the Willamette Valley was of great importance to the establishment of a commercially oriented agricultural strategy. As the railroad was pushed up the Valley from Portland in the 1870's, the commercial aspects of agricultural strategies intensified and trade patterns, land values, and population distributions changed in direct response. As the railroad services became available, land values increased substantially, in some cases by 400 percent in less than ten years (Blok, 1973, p. 64-67). By 1887 the rail line to San Francisco had been completed and a linkage to the Eastern markets was established (Works Projects Administration, 1940, p. 71-72).

Market Orientation

With the continued development of transportation networks and population growth in the study area, the general trend in agricultural strategies moved toward the production of a number of cash crops. In the early years most of the land holdings were too large to be farmed by one family. As land prices increased with the new possibilities for commercial farm operations, many owners of larger parcels sold some of their land. Therefore, the number of farms increased substantially from 1860 to 1900, while average farm size decreased. In the study area in 1860, there was 1,404 farms with an average size of approximately 400 acres; by 1900 the numbers of

farms had increased to 3,609 and average size had decreased to 209 acres.

In the early years, there had been very little renting or leasing of farm land within the Willamette Valley. With the beginning of commercial agriculture, however, some farmers began to rent or lease as a means by which to gain access to the services of the land without having to invest the capital needed to purchase it. Of the 3,606 farms in the study area in 1900, 1,030 were composed of at least some rented or leased land.

In 1860, wheat was the most important crop produced in the study area although some diversification was starting to take place. For example, small amounts of hops, dairy products, and wool were produced for the market. By 1900, however, the production of dairy products, including cheese and butter, had increased by approximately 60 percent as commercial dairy operations were being established, and the number of sheep had increased by 70 percent (United States Bureau of the Census, 1864, p. 120, and United States Bureau of the Census, 1902, Vol. 5, Part 6, p. 116). Other new crops were also being added. In 1900, for example, approximately 2,000 acres were planted to flax seed whereas none had been produced in 1860. In 1860, Polk County had grown no commercial grass seed and Linn County harvested only 357 bushels. By 1900, however, 11,158 bushels of grass seed were produced in the study area. Only 176 pounds of

hops were harvested in the study area in 1860, but by 1900 the output had increased to 3,085,454 pounds. Other cash crops, such as potatoes, oats, barley, and fruits were also being produced in greater quantities by 1900 (United States Bureau of the Census, 1864, p. 120, and United States Bureau of the Census, 1902, Vol. 5, Part 6, p. 180-674).

By 1900, the family farm was still the basic farm unit, but the orientation was geared toward the production of a greater variety of cash crops. Paralleling the commercial orientation of agriculture was a substantial increase in the non-land resource inputs in farming operations. Farm operations were becoming business enterprises more than ways of life as they developed commercial orientations aimed at gaining economic independence (Blok, 1973, p. 82).

Diversified Agriculture, 1900-1945

Agriculture in the Willamette Valley experienced positive growth throughout the commercial development stage and after 1900 the numbers of farms continued to increase. Furthermore, land values in the state increased by 300 percent in the ten years between 1900 and 1910 (Johanson and Gates, 1967, p. 445-446). Whereas these trends were continuations of those established earlier, the period from 1900 to 1945 was characterized by distinctive shifts in agricultural resource strategies.

In the early decades of settlement, urban growth was stimulated by the success of the agricultural system. By 1900, the commercial ties between agriculture and the non-agricultural sectors of the economy exerted strong influence over the ways in which farms were organized. The goal of self-sufficiency that had been an integral part of the earlier strategies was based upon the frontier farmer's desire to be independent. With the development of commercial farms the goal was changed to financial interdependence and a greater reliance upon the market system resulted (Blok, 1973, p. 83-101).

Improved transportation systems made the commercial orientation of farms possible in that both local and distant markets were accessible. These markets favored the movement toward diversified agricultural production and small farm units. Small dairies, based often on less than 50 acres, typified many study area farms in the 1920's and 1930's. Diversification allowed farmers to almost always have something ready for market so as to assure a continuous cash flow. In this way, it was believed, economic independence could be achieved (Blok, 1973, p. 83-101).

Specialization

Although the dominant agricultural strategy of the period between 1900 and 1945 was diversification, some farmers were moving toward specialization. Hop farms, for example, were generally

specialized and often engaged in no commercial activity other than hop production (Sulerud, 1931, p. 28). Grass seed operations too were becoming specialized as the demand for seed crops became more intense in the 1940's (United States Bureau of the Census, 1942, Vol. 1, Part 6, p. 656-657).

From 1900 to 1945 a gradual increase in the number of commercial crops produced in the study area took place. Toward the end of the period, specialization began to become an important covariant trend. (Table III)

Farm Size

During the first 30 years of this century, the number of farm units in the mid-Willamette Valley increased dramatically. The greatest increase was in the smaller farms of less than 50 acres. In 1900 only 18 percent of the farms in the study area were less than 50 acres in size, whereas by 1940, 40 percent of the mid-Willamette Valley farms were smaller than 50 acres. Furthermore, the average farm size had decreased from 209 acres in 1900 to 127 acres by 1935 (United States Bureau of the Census, 1900, Part III, p. 116). (Table IV)

Prior to World War II, many small farms of less than 50 acres were viable economic units. During the 1930's, however, some of the smaller farm owners were already finding it necessary to work off

Table III. Changes in Farm Commodity Production

Crop	1900		1925		1945	
Barley	1,030 acres	29,160 bus	6,269 acres	131,399 bus	34,459 acres	1,017,196 bus
Corn	831	17,930	8,570	74,501	1,318	36,110
Threshed Oats	60,028	1,414,830	70,332	1,623,572	50,068	1,593,684
Threshed Rye	93	1,590	832	13,269	140	2,438
Wheat	121,217	2,211,540	47,510	908,324	16,584	406,116
Hay	26,037	41,829 tons	20,445	n/a	22,651	42. 121 tons
Grass Seed	n/a	11,158 bus	n/a	n/a	31,850	230,052 bus
Vegetables	2,038	$ 40,676	171	n/a	3,085	$ 816,392
Flax Seed	1,515	6,280 bus	n/a	n/a	558	4,784 bus
Hops	3,157	3,085,454 lbs	n/a	n/a	4,485	4,641,394 lbs
Fruits	839,874 trees	286,366 bus	1,177,051 trees	293,654 bus	1,066,298 trees	3,341,538 bus
Small Fruit	n/a	$ 17,127	n/a	n/a	No fig. given	$ 94,184
Nuts	72 trees	n/a	n/a	n/a	935,028 trees	1,680,556 lbs
Cattle	36,926 head	n/a	42,314 head	n/a	44,187 head	n/a
Dairy Cows	11,743 head	n/a	20,999	n/a	20,386 head	n/a
Milk Sold	n/a	772,055 gals	n/a	1,148,895 gals	n/a	8,903,465 gals
Chickens	175,079 fowl	n/a	414,977 fowl	n/a	378,626 fowl	n/a
Turkeys	4,069 fowl	n/a	n/a	n/a	299,190	n/a
Sheep	89,937 head	n/a	72,363 head	n/a	78,554 head	n/a
Swine	30,950 head	n/a	21,832	n/a	14,826	n/a

Source: 1900 Census, 1925 Census of Agriculture, 1945 Census of Agriculture.

Table IV. Changes in Mid-Willamette Valley Farm Sizes: 1900-1974

Year	Mean Size (acres)	Total Acres of Farmland	Total No. of Farms
1900	209	754,281	3,609
1910	168	722,704	4,308
1920	149	712,090	4,802
1930	144	714,069	4,956
1940	139	707,422	5,068
1950	138	718,008	5,202
1954	156	747,220	4,801
1959	185	722,743	3,902
1964	186	682,330	3,669
1969	211	588,934	2,790
1974	187	561,349	3,000

Sources: 1900 Census, 1910 Census, 1920 Census, 1930 Census of Agriculture through 1969 Census of Agriculture, and 1974 Census of Agriculture Preliminary Report

the farm in order to secure adequate income (Blok, 1973, p. 109-117).

Agriculture at the End of World War II

At the end of World War II farm organizational strategy was primarily oriented toward relatively small diversified farms. In 1950, for instance, there were 5,202 independent farm units in the mid-Willamette Valley (United States Bureau of the Census, 1952, Vol. 1, Part 32, p. 270-272). The social, economic, and technological trends of the post World War II period, however, did not favor small diversified farms. Economies of scale rapidly shifted in favor of larger farm units as technology made it possible for one person to farm more acres. Moreover, the desire of farm families to share in rising standards of living as well as the turn of government policies also favored the larger units. Therefore, farmers in the study area had only three viable options: (1) they could move with the trends of the times and expand their operations, (2) they could farm on a part-time basis and work off the farm, or (3) they could sell out and find another means of support (Blok, 1973, p. 152).

Agriculture in the Post World II Era

Mid-Willamette Valley farm organizational strategies have changed significantly in the post World War II era. Prior to 1945, Willamette Valley farmers sought to establish small diversified

commercial units. In 1940 approximately 70 percent of the farms in the study area were organized as diversified units (United States Bureau of the Census, 1942, Vol. 1, Part 6, p. 612). Since World War II, however, there has been a dramatic shift away from the strategy of diversification in favor of specialization. In 1976 specialized operations account for about 79 percent of the sample farms, with 17.8 percent specializing in grain farming, 17.5 percent in grass seed production, 39.2 percent in livestock, 2.8 percent in orchard crops, 1.7 percent in vegetable production, and 8.2 percent in miscellaneous commodities. Only 12.8 percent of the sample farms are diversified.

Concurrent with the growth in the strategy of specialization has been two contrasting trends in farm size. Full-time commercial farm operators have increased significantly in size and decreased in number. At the same time there has been an increase in part-time units which are comprised of comparatively small acreages. From 1950 until 1969 the net result was a decrease in farm numbers and an increase in average farm size. Between 1969 and 1974, however, these patterns were reversed, the number of farms increased from 2,798 to 3,000 and the average farm size decreased from 210 acres to 187 acres (United States Bureau of the Census, 1976). This large variation between the size of full-time commercial farms and part-time

units diminishes the utility of average farm size data of the Census of Agriculture.

Agricultural commodities produced in the study area include livestock, grain, grass seed, hay, vegetables, and orchard products. Of these, grass seed, grain, and livestock are the most important (Table V).

Table V. 1974 Farm Commodity Statistics for Farms in the Mid-Willamette Valley with Sales of Over $2,500

Commodities Sold	Number of Farms Reporting	Value
Fattened Cattle	208	
Dairy Products	149	$16,875,000
Sheep and Lambs Shorn	323	
Broilers	15	
Turkeys	6	$ 6,593,000
Barley	177	
Wheat	678	
Alfalfa Hay	166	
Sweet Corn	95	
Apples	25	$64,777,000
Grass Seed	458	
Green Peas	5	
Vegetables	140	

Source: 1974 Census of Agriculture, Preliminary Report, Polk and Linn counties.

Grass Seed Production

The Willamette Valley provides an excellent grass seed environment. Grass seed is produced commercially in both counties, but approximately 84 percent of the 170,300 grass seed acres in the study area occurs in Linn County (United States Bureau of the Census, 1972, Vol. 1, Part 47, p. 177-219).

In general, the less well drained soils of the Senecal and Calapooyia surfaces are utilized for producing grass seed. Dayton, Waldo, Coburg, Bashaw, Amity, Concord, and Woodburn soils are well suited to the grass crops. Other soils such as the Willamette series could be utilized for grass seed but are better drained and can produce other crops more profitably.

The most important grass seed types include annual rye grass, perennial rye grass, highland bent grass, Kentucky bluegrass, fine fescue, tall fescue, and orchard grass. Almost all of the nation's rye grass, 80 to 90 percent of the bent grass and fine fescue, 40 to 50 percent of the orchard grass and 10 to 25 percent of the Kentucky bluegrass and tall fescue seeds are produced in the Willamette Valley. The Linn County portion of the study area accounts for about half of the total Willamette Valley grass seed production (Conklin and Fisher, 1973, p. 1-5).

Modern grass seed farming is technologically intensive and spatially extensive. The use of large equipment and intensive

chemical technologies to increase yields and decrease labor requirements have been widely adopted in the study area.

Grain Production

The fertile soils, plentiful early season moisture supply, sunny and dry weather of summer, and long growing season provide highly satisfactory conditions for grain farming on the better drained soils. The exception to this is that the soil moisture supply of the grain forming period is excessive for hard wheat. Nonetheless, wheat is the leading grain crop with the concentration on soft, non-bread wheat varieties. Slightly over 6,000 acres in the study area are given over to wheat production (United States Bureau of the Census, 1976).

The principal distribution of wheat is on well-drained Senecal, Quad, and Dolf soils, but the Willamette, Amity, Willakenzie, and Woodburn series are also included in the grain producing soils associations. Polk County, having the greater concentration of the first group, produces about 85 percent of the study area total (United States Bureau of the Census, 1976).

Grain farming in the mid-Willamette Valley is based upon the intensive utilization of chemical technologies and the extensive use of modern equipment. When the excellent natural agricultural conditions are coupled with modern agricultural technologies and management

techniques, the study area provides some of the highest crop yields in the nation (De Jong, Feb., 1977).

Vegetables and Orchard

While not extensive, vegetables and orchard crops are produced in the study area. Vegetables are grown in the sandy bottom lands along the streams while orchards are found along some of the hillsides of the Eola and Looney surfaces.

Vegetable crops are often irrigated in response to the dry summers and rapid drainage of the bottom land soils. Included in these are the soils of the Horseshoe, Luckiamute, Ingram, and Winkle surfaces. Soil associations such as the Newberg are typical.

Orchards, most prominent in Polk County, are generally found in the foothills. Here soils such as the Salkum and Steiwer associations that are not well suited to grain or grass production because of excessive slope, provide favorable conditions for cherry and prune orchards. Root zones are adequate, drainage is good and the frost-free season is longer than on the valley floor (Fishback, Feb., 1977).

Diversified Farms

Approximately 85 percent of the diversified farms in the sample are made up of a combination of grain and grass farming. The remaining 15 percent consist of a combination of varying mixes of grain,

grass, animal, orchard, vegetable, poultry, and tree production. Since the mix of different commodities vary considerably from farm to farm, there is no typical diversified farm unit. Nevertheless, most diversified operations are organized so as to minimize extra equipment requirements. This is a major factor in the popularity of grain and grass combinations.

Generally those farmers who have diversified have utilized diversification as an organizational strategy in order to cope effectively with a variety of soils and other physical conditions on their farm land. When soil conditions allow, most farmers indicated a preference for specialized agriculture because the strategy of specialization makes management easier, simplifies the operation, and reduces equipment requirements (Scharf, Feb., 1977).

Livestock Production

The majority of the livestock produced in the study area consists of sheep and cattle. Of these, sheep are the most significant.

Sheep and lambs are produced in both counties; but because sheep can be pastured during part of the year on grass fields, it is natural for the two to co-vary. Therefore, Linn County accounts for the bulk of grass seed and sheep production in the study area. Approximately 78 percent of the sheep and lambs in the mid-Willamette Valley are found in Linn County (United States Bureau of the

Census, 1972, Vol. 1, Part 47, p. 144-219).

In the mid-Willamette Valley, sheep are raised for wool, meat, and breeder stock, but most are for the dual purpose of meat and wool production. Because sheep production is complimentary to grass seed farming, many grass seed farmers own sheep. A number of people who own small parcels of ground near urban areas or in the more hilly parts of the study area also raise sheep as a means of utilizing acreages. In the mid-Willamette Valley there are very few full-time farmers who specialize in sheep (Ohling, Feb., 1977).

A few cattle ranches are found in the low foothills. The parts of the study area, not well suited to grain, grass, or vegetable production, are often satisfactory for pasturage. These primarily consist of the rougher country of the Looney surface (Kampher, Feb., 1977). There are also a number of farmers who raise some cattle along with their major specialty. Linn County has about 65 percent of the cattle and calves.

CHAPTER IV

THE CHARACTERISTICS OF FARMERS AND FARMS IN 1976

As an approach to the identification and assessment of changes in the areal extent of farms, organizational strategies, and the means, effects, and characteristics of farm size changes, a sample of approximately ten percent of the farm operators were interviewed. Relevant characteristics of the farmers also were included. This farmer generated information provides the basis for the following presentation and analysis.

Study Area Farm Operators

Most farm operators in the study area have had considerable experience in farming. The average length of time established in agriculture in the mid-Willamette Valley by the farmers interviewed is 24.1 years. This seems to support the opinion of many farmers that it is increasingly difficult for young people to become farm owner/operators.

The average age of the sample farmers is 51.3 years. Full-time commercial farm operators represent the oldest group with a mean age of 54.7 years while part-time farmers, as a group are somewhat younger with an average age of 47.4 years. This data

provides further evidence of the highly capital intensive nature of contemporary agriculture in that the younger members of the population generally do not have access to enough capital to get started as full-time commercial farmers.

Most of the sample farm operators have achieved a relatively high level of education. The majority are high school graduates and 32.4 percent have had at least some college work. College graduates accounted for 16.2 percent of the farmers interviewed, whereas only four percent have achieved less than an eighth grade education (Table VI).

Table VI. Education Level of Mid-Willamette Valley Farmers

Education Level	Percentage of Sample	Number
College Graduates	16.2	45
Some College	16.2	45
High School Graduates	44.8	126
Eighth Grade Graduates	22.4	63
Less than Eighth Grade	.4	1
	100	280

When the educational levels of sample farmers are broken down by farm type, no particular pattern is apparent. Livestock and orchard operators, however, include the largest number of college graduates (Table VII).

Table VII. Education Levels by Farm Types

Education Level	Percentage by Farm Type						
	Grain	Grass	Livestock	Orchard	Vegetable	Diverse	Other
College Graduate	16	10	18	25	20	20	20
Some College	20	16	13	12	60	15	10
High School Graduate	48	55	40	50	20	41	40
Eighth Grade Graduate	14	18	28	12	0	15	20
Less Than Eighth Grade	2	1	1	1	0	9	10

Indepth interviews conducted with eight mid-Willamette Valley farmers in February, 1977, concerning the organization of their farm units indicated a strong belief in the need for a high level of education by farm operators if they are to adequately deal with the complexities of modern commercial agriculture. Interview data for the total sample tend to bear this out, showing that the better educated commercial farm operators generally farm larger units (Table VIII).

Table VIII. Relationships to Farm Size and Educational Levels

Educational Level	Mean Farm Sizes Over Time			
	1946	1956	1966	1976
College Graduate	556	571	540	518
Some College	386	413	433	537
High School Graduate	389	399	439	438
Eighth Grade Graduate	231	243	269	309

The larger farm size associated with higher levels of education may be the result of several factors. For example, better educated farmers may more accurately assess the overall efficiency improvements generally associated with farming larger units, or the parents of better educated farmers may have had larger farms and therefore could afford to send their children to college.

Farm Size Changes

In the last chapter it was noted that census data indicated a recent change in the trend toward fewer and larger farm units. Since 1969, the size of the average farm unit has decreased from 211 to 187 acres (United States Bureau of the Census, 1976).

The results of the farmer interviews provide data which refine and expand upon the most recent census of agriculture. These data reveal that the mean size of the sample farms is 424 acres. The mean size for full-time farmers is 545.8 acres, and 173.7 acres for part-time farmers. The mean size for both categories by enterprise type is presented in Table IX.

Table IX. Mean Farm Size

Farm Type	No. of Farms	Mean Size	Standard Deviation
Grain	50	498.3	621.4
Grass	49	904.2	1005.1
Livestock	110	202.0	453.8
Orchard	8	60.1	64.7
Vegetables	5	457.0	450.9
Diverse	36	632.6	780.3
Other	22	234.8	298.2

The differences in the census data and the results of farmers interviews can be accounted for in part by the delineation of the study area. By limiting the research area to the valley floor and lower

foothills portions of Linn and Polk counties a large number of rural residences located on small acreages in the foothills are excluded. These units, for the most part, have a restricted agricultural potential, owing to adverse slopes and poor soils. Many of these rural residences qualify as farms for census purposes.[4]

The elimination of the non-agricultural portions of Polk and Linn counties from the study area serves to make the interview data more representative of full- and part-time commercial agriculture in the Willamette Valley.

The bulk of the operators interviewed, who have engaged in farming during most of the post war period, indicated that they have enlarged their farm land base. Table X shows the trend of size change by decades since 1946. These data indicate that only the orchard and miscellaneous categories have experienced decrease in size. Moreover, whereas orchards once represented a significant part of agricultural production in the mid-Willamette, only about 13 percent of the study area farmers presently have a commercial orchard component (United States Bureau of the Census, 1976).

The high standard deviation associated with each of the mean farm size figures suggests a wide range in actual farm sizes. This

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[4] According to the 1974 Census of Agriculture Preliminary Report, a farm is an establishment from which $250 or more of agricultural products is sold or would normally be sold during a year (United States Bureau of the Census, 1976).

Table X. Farm Size Changes Since 1946

Year	Farm Type	Mean Size	Standard Deviation
1946	Grain	298.4	212.3
	Grass	593.1	646.1
	Orchard	228.3	322.3
	Vegetable	175.0	106.0
	Diverse	344.6	249.6
	Livestock	204.9	256.0
	Other	344.3	176.2
1956	Grain	383.2	303.2
	Grass	658.0	657.6
	Orchard	228.3	322.3
	Vegetable	175.0	106.0
	Diverse	449.5	354.8
	Livestock	220.1	243.4
	Other	344.3	176.2
1966	Grain	410.7	327,8
	Grass	761.6	715.2
	Orchard	182.6	244.0
	Vegetable	355.2	377.8
	Diverse	501.3	469.8
	Livestock	208.4	373.7
	Other	261.2	163.7
1976	Grain	498.2	621.4
	Grass	901.1	1004.1
	Orchard	62.0	63.3
	Vegetable	457.0	450.9
	Diverse	651.6	790.6
	Livestock	209.8	451.3
	Other	234.0	298.8

is explained largely in terms of the increasing numbers of very large farm units on the one hand and the dramatic increase in the number of small part-time farms and rural residences on the other. The size change by farm types by decades for the sample population is shown in Table XI. This data shows an increase in the number of farm units of 500 acres and more. In 1946 only two farms in the entire sample were over 2,000 acres in size, whereas, in 1976, 18 farms contained over 2,000 acres. In 1946 there were only 12 farms that consisted of over 500 acres, compared to 43 in 1976. Farms of under ten acres in size have also increased in number over the past 30 years. Of the sample farm units that were in operation in 1946, only three consisted of ten acres or less, whereas by 1976 the number had increased to 26. The most significant size increases have been in grain, grass seed, and diversified units. The most prominent increase in the smaller acreage units has been in the livestock operations.

The increase in small livestock units does not indicate a return to small independent family farms but instead is a manifestation of population growth and affluence. Approximately 63 percent of the livestock farmers are part-time operators. The bulk of these own relatively small parcels of land that serve more as rural residences than as a commercial farm. Tax advantages, preference for country living, and land speculation are the common reasons underlying the

Table XI. Farm Types By Size Categories

Size	Grain	Grass	Orchard	Vegetable	Diverse	Livestock	Other
Number of Farms in 1946							
Under 10 acres			1		2		
10 - 49 acres			8		10	1	
50 - 179 acres	20	2	3		20	2	1
180 - 499 acres	19	6	2		8		
500 - 999 acres	5	3			1		
1000 - 1999 acres		1					
2000 acres and over		1				1	
Number of Farms in 1956							
Under 10 acres			1			1	
10 - 49 acres			6		6	3	
50 - 179 acres	16	5	3	1	17	5	4
180 - 499 acres	19	10	2		11	3	1
500 - 999 acres	8	11			1	1	
1000 - 1999 acres		1			1		
2000 acres and over							
Number of Farms in 1966							
Under 10 acres			1			5	1
10 - 49 acres		1	3		1	12	2
50 - 179 acres	18	6	3	3	7	16	6
180 - 499 acres	20	14	2		5	8	4
500 - 999 acres	11	13		1	4	1	
1000 - 1999 acres	6	2			2		
2000 acres and over		1				1	
Number of Farms in 1976							
Under 10 acres			1			22	3
10 - 49 acres		1	3	1		37	7
50 - 179 acres	10	4	2	2	6	31	7
180 - 499 acres	14	15	2	2	11	13	5
500 - 999 acres	15	10			10	3	
1000 - 1999 acres	5	13			5	2	
2000 acres and over	6	6			4	2	

purchases of small parcels of land upon which rural residences and small part-time operations have been established (Van Otten, Mar., 1977).

In Chapter II it was demonstrated that geomorphology and soils have important influence on land use potentials and limitations. In attempting to deal with these factors as they relate to farm size changes, it was found that the more than thirty soil series existing in study were excessively cumbersome for statistical treatment. Accordingly the decision was made to utilize the Soil Conservation Service grouping of associations. There are four categories in the study area (Figures 5 and 6).

Category one soils which comprise approximately 15 percent of the study area include the Cloquato, Newberg, Camas, Chehalis, McBee, Waldo, Wapato, McAlpin, Cove, and Bashaw associations. These soils are found in areas dominated by excessively to poorly drained alluvial bottom lands.

Category two soils which include the Malabon, Coburg, Dayton, Amity, Concord, Willamette, and Woodburn associations comprise about 36 percent of the study area. These soils are located in the well to poorly drained parts of the valley terraces.

Category three soils are found in areas dominated by the well to poorly drained, moderately to very deep, seasonally dry soils of gentle slopes to the very steep foothills and alluvial fans of the

mountains. Approximately 45 percent of the study area is comprised of these soils which include the Salkum, Steiwer, Hazelair, Willakenzie, Bellpine and Jory associations.

Category four soils, which make up only four percent of the study area include the Peavine, McCully, and Kinney associations. These soils are the well drained, moderately deep to very deep moist soils of the mountains.

Of all the changes made in farm size by sample farmers, approximately 46 percent involved category two soils, 33 percent involved category three soils, and 18 percent were made on category one soils. Only about three percent involved category three soils, and no farm size changes were reported on category four soils.

Increases in farm size in the last three decades on category one soils reported by study area farmers average 272 acres. Increases on category two soils average 293 acres, and increases on category three soils average 281 acres. Therefore, while the mean size of increases in total farm size is slightly larger for changes which involve category two soils, the differences between the three categories is insignificant.

Average Farm Size by Soil Category

The dominant soil category of each sample farm unit was determined by utilizing Soil Conservation Service maps and field maps

made during farmer interviews. In general, the dominant soil associations of the various farm types are consistent with utility assessments of the Soil Conservation Service (Soil Conservation Service, Feb., 1971 - March, 1975). Table XII displays the mean sample farm size by farm type and soil category.

Table XII. Mean Farm Size by Soil Categories

Farm Type	Soil Category	Mean Size
Grain	1	184
	2	768
	3	449
	4	0
Grass	1	30
	2	878
	3	363
	4	0
Orchard	1	0
	2	0
	3	62
	4	0
Vegetable	1	465
	2	80
	3	0
	4	0
Livestock	1	119
	2	138
	3	322
	4	307
Other	1	244
	2	150
	3	123
	4	378

Means of Farm Size Changes

The sample of mid-Willamette Valley farmers interviewed lease 24 percent, rent 19 percent, and own 57 percent of the land they farm. In all, 43 percent of the land farmed by the sample operators belongs to other people.

Renting and leasing are used as a means of gaining access to more land for most types of farms (Table XIII). The greatest occurrence is for grass seed farms. The noteworthy exception is for orchard units. This exception is accounted for by the capital investment in the production base of orchard operations.

Table XIII. Mid-Willamette Valley Land Tenure by Farm Type

Farm Type	Leases %	Rented %	Owned %
Grain	22	12	66
Grass	23	22	55
Orchard	0	0	100
Vegetable	4	31	65
Diverse	21	10	69
Livestock	16	16	68
Total Sample	24	19	57

There is close agreement between the 1974 Census of Agriculture Preliminary Report and the sample results with respect to land tenure. The census shows that in 1974 approximately 41 percent of

the land base of farm units with sales of $2,500 and over was secured through renting or leasing.[5]

Reasons for Farm Size Changes

The sample farmers were asked to express the reasons for changing the size of their land base. A summation of these reasons is given in Table XIV and discussed briefly below.

Table XIV. Reasons for Farm Size Changes

Reason	Percentage and Number of Reasons Given	
	%	Number
Economies of scale	38.4	170
Wishes to raise particular crop	9.5	42
Inheritance	8.1	36
Speculation	7.9	35
Water rights	2.9	13
Land was close	9.3	41
Retired	2.7	12
Farm would not support owner	4.5	20
Other	16.7	74
	100	443

[5] For the purposes of this research, leasing is defined as a contract of a specified length of time in which the profits from the land as well as some of the costs of production are shared on an agreed upon ratio by the landlord and tennant. Renting on the other hand is based upon a fixed payment by tenant to the landlord for the use of the land for a specified period of time (Barlowe, 1972, p. 453-485).

Of all the reasons given for farm size changes, economies of scale comprise 38.4 percent.[6] As farmers mechanized their operations and became more market oriented, the fixed costs associated with agricultural production have become of increasing concern. In striving for optimal efficiency farm operators have generally enlarged their land resource bases to spread their fixed costs over a larger production unit. Failure to make size adjustments consistent with the increased fixed costs of production has led to the economic failure of some farms.

Desire to obtain land with a particular set of characteristics accounted for 9.4 percent of the reasons for farm size changes. Farm operators who wish to increase their production of vegetable crops, for example, must gain access to land that has suitable soils and an adequate irrigation water supply, and those who wish to produce grain need land that is well drained and fertile. The special physical requirements of individual crop types, therefore, have considerable influence upon the agricultural land use and resultant size change strategies.

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[6]Improved economies of scale are achieved by adjusting the size of the farm unit to an optimal level so as to secure the highest possible net returns. Cost economies occur when a farm operator better utilizes managerial abilities, and more fully makes use of the capacity of equipment. Farming more land permits job specialization, work simplification and increased use of labor-saving machinery. Larger volume of production may provide improved marketing and processing facilities (Barlowe, 1972, p. 146).

Proximity of available land accounts for 9.3 percent of the reasons given for farm size changes. If at all possible, farmers prefer to enlarge with land close to their headquarters. This minimizes the friction of distance. Availability of nearby land, of course, is a modifier.

Inheritance was given as the reason for farm size change in 8.1 percent of the responses. This traditional means of land acquisition is surprisingly small in the study area.

Land speculation was given as the reason for farm size change in 7.9 percent of the cases. Those responding in this fashion commonly suggested that whereas farm incomes from the acquired land might be minimal, value appreciation over the next few years is likely to be substantial.

Improvement of income accounted for only 4.5 percent of the total responses. The majority of the respondents in this category had decreased the size of their land base. The underlying reason given for this was to improve earning capabilities by enabling the pursuit of careers in other endeavors. Many of these individuals sell all but a small part of their land thereby becoming part-time farmers. In some cases these farmers maintain title to their land and rent or lease to other farmers.

Another 2.7 percent of the reasons given for farm size changes are accounted for by retirement. In these cases retired farmers may

have sold most of their land or may maintain title and lease and rent it to other operators.

Availability of water rights account for 2.9 percent of the reasons given for farm size changes. Miscellaneous reasons accounted for 16.7 percent of the total. Examples in this category includes the sale of land because of a death in the family, divorce, and the purchase of land to secure a view.

Effects of Farm Size Changes

During the interviews farmers were asked to identify the effects of the farm size changes. These were grouped by the author into nine categories and computer sorted and summarized (Table XV).

Table XV. Effects of Farm Size Changes

Effect	Percent	Responses
1. More labor, management and capital required	18.8	96
2. Better utilization of equipment	21.3	109
3. More profit	31.7	162
4. Decreased operation	11.3	58
5. Allowed for better utilization of management activities	3.7	19
6. Allowed owner to retire	2.5	13
7. Allowed other family member to farm	2.2	11
8. Made a particular type of operation possible	6.7	34
9. Allowed owner to irrigate the land	1.8	9
	100	511

The responses given by the farmers to this question are consistent with reasons given for farm size changes (see Table XIII). Approximately 38.4 percent indicated they had changed the size of their operations to achieve greater economies of scale, and 31.7 percent noted increased profit as a result of farm size changes. It could have been expected that economies of scale would have been the dominant reason. This is in agreement with the judgment of most economists that enlargements of the areal extent of farms, up to the optimal point for a given operation, result in increased efficiency and more profit (Morrill, 1970, p. 41).

The strong demand for land to purchase, rent, or lease by commercial farmers in the mid-Willamette Valley, and the continuous growth in the mean size of most commercial farm types, appear to support a conclusion that the most important effect of increased farm size is higher returns for a given investment of capital, labor, management, and time. If increased profits were not realized, rational farm operators would not continue to rent, lease, and purchase more land. In general, farmers are often reluctant to discuss the profits they make from their operations. The effects of government decisions upon farm profits, the complexities of commercial agriculture, and the power of public opinion have brought about a sensitivity on the part of commercial farm operators toward publicly acknowledging that their farms make profits. Some farmers, during the interview

process, expressed a basic distrust of the Federal government and described the structure of the American economic system as working against their interests. This sensitivity toward discussing profits may have caused increased profits to have been less often stated as an effect of farm size change than is actually warranted. Nevertheless, sample farmers suggested directly and indirectly that farm size changes resulted in better returns to scale. If one interprets the responses (1) efficient equipment utilization, (2) allows other family member to farm, (3) allows for better management, and (4) more profit, to indirectly refer to better economic returns, 58.9 percent would indicate profit as the most important result of farm size changes.

Spatial Characteristics of Farm Size Changes

As the demand for farm land has become more intense, farm operators have been buying, renting, and leasing land that is not contiguous to their headquarters farms. Nearly 33 percent (92) of the sample farmers reported that they farm land that is not attached to their headquarters. The mean distance for scattered fields in the sample is 7.5 miles, and the mean size for non-contiguous pieces of land is 521 acres (Table XVI). The numbers of scattered parcels per sample operation range from one to 18. The mean number of scattered parcels for those sample farms that consist of a non-contiguous

Table XVI. Mean Distance from Headquarters and Mean Parcel Size

Farm Type	Mean Distance in Miles	Mean Parcel Size in Acres
Polk County		
Grain	4.8	233
Grass	n/a	n/a
Vegetable	4	145
Orchard	n/a	n/a
Livestock	10	117
Diverse	7	625
Other	n/a	n/a
Linn County		
Grain	14	1,418
Grass	10	570
Vegetable	3	375
Orchard	n/a	n/a
Livestock	10	808
Diverse	5.5	398
Other	n/a	n/a

land base is approximately four with a standard deviation of four and three-tenths.

Most farmers who included scattered parcels of land in their operations expressed their basic objective to be the enlargement of their farm unit with suitable land as close to their headquarters as possible. Analysis of interview data suggest an inverse relationship between parcel size and the friction of distance. Of the sample farms, the largest parcel of non-contiguous land is also the most distant, consisting of 3,500 acres located 25 miles from the operator's

headquarters. The smallest parcel, less than an acre, is under one mile from the farm headquarters.[7]

Farmers in the study area seem well aware of the costs and problems associated with farming scattered plots. Table XVII summarizes the responses of sample farmers to a question concerning the effects of farming scattered parcels upon their operations.

Table XVII. Effects of Farming Scattered Parcels

Effect	Responses of those with Scattered Fields	
	%	Number
Increases time	25	38
Increased operation costs	17	26
More wear and tear on equipment	11	17
More difficulty managing help	5	8
More difficult to plan	8.4	13
Opportunity costs	5.1	9
More hazards in equipment movement	5	8
No effect	23.5	34
	100	153

Although farmers with scattered plots articulated an appreciation of the liabilities associated with farming non-contiguous fields, they continue to purchase, rent, and lease land that is often considerable distance from their headquarters. Several farmers stated that

[7] n/a indicates non-applicable. In these cases the sample included no scattered parcels.

there is keen competition between commercial operators for available land, and that they often bid against one another in order to secure control of more acres. Farm operators do this because they believe they must enlarge the spatial component of their farm units if they are to maintain a viable operation. Given the present complexities of the farm market, high farm operation costs, and the mobility of modern farm equipment, enlargement of the areal extent of commercial farm units is almost a necessity. It is the strong economic pressure placed upon farmers to expand that makes them willing to accept the inconvenience and cost of farming scattered fields.

Corporate Farms

Corporate farming in the Willamette Valley has been a matter of concern to some Oregon residents. Rumors of an invasion of giant corporations directly into the agricultural production sector would appear, however, to be an over statement of the facts. The results of field research indicate that only two percent of the farms in the mid-Willamette Valley are owned by other than private families. A number of the family farms are incorporated for tax purposes and other legal advantages, but there are few farm operations owned by agribusiness corporations. It would seem that there is little danger in the near future of family farms being eliminated by the corporate giants.

Part-Time Farming

Concurrent with the trend toward larger commercial full-time specialized farm operations has been a significant increase in the number of small part-time farms. Approximately 63 percent of the interviewees farm on a part-time basis. Table XVIII presents the results of farmer interviews concerning part-time farming.

Table XVIII. Percentage of Part-Time and Full-Time Farmers by Farm Type

Farm Type	Part-Time Farmers		Full-Time Farmers	
	Number	%	Number	%
Grain	19	38	31	62
Grass	15	31	34	69
Orchard	5	75	3	25
Vegetable	1	20	4	80
Diverse	11	29	25	71
Livestock	69	63	41	37
Other	13	60	9	40

Approximately 38.4 percent of the part-time farmers interviewed are employed in unskilled occupations and another 25 percent are retired. Skilled workers account for 16.6 percent of the part-time operators, and 15.2 percent are professional people. Only four percent of the part-time farmers work on other farm units.

The largest part-time farm units are controlled by retired

people with a mean farm size of 199.4 acres. Skilled laborers have the second largest part-time farms with an average of 186.7 acres, and the farms of unskilled laborers average 155.3 acres. The size of the farms of part-time operators engaged in professional occupations average approximately 127.2 acres, and the mean size of the operations of farm laborers is 121.1 acres. When considered together, the mean farm size operated by part-time farmers interviewed is approximately 175 acres. This is only about nine acres less than the 184 acres average farm size for counties of the study area indicated by the 1974 Census of Agriculture (United States Bureau of the Census, 1976).

Because of the diseconomies generally associated with farming smaller units, and because part-time farmers are unable to devote all their attention to the management of their operations, part-time farm units generally do not produce enough to provide an average family with a reasonable standard of living. One full-time grain farmer indicated that his 350-acre farm requires only approximately six months of farm work each year. He spends the remainder of his time traveling and occasionally takes some classes in adult education. In his case, the farm was inherited and he is in his early sixties. Therefore, he is not concerned with establishing an optimal farm operation. While he does not consider himself to be retired, he gives the impression of one who is at least semi-retired because modern

technology allows him to farm a fairly large unit in a very short time. It is this factor that makes it possible for most part-time farmers to have full-time careers while still operating their small farms.

All the part-time farmers interviewed expressed their dominant reasons for maintaining their farm operations to be the love of country living, and tax as well as speculative advantages associated with investments in small farms. Most of the operators of part-time farms stated that they seldom expect to realize a profit from the farm operation but expect to gain financially as the value of the property increases and by saving money on their income taxes. Because most of these farmers view their land as a rural residence more than as a commercial farm unit, they do not always make optimal use of the land resource they control.

Non-Farm Rural Residences

During the interview process, 68 non-farm rural residences were encountered. The occupants of these rural domiciles were not counted as part of the farm interview sample but were asked to respond to questions concerning their reasons for living in the country as non-farmers. Approximately half of the respondents indicated their reason for living outside city limits to be a preference for country living. Approximately 15 percent were retired farmers and about ten percent indicated their desire to own pets motivated a rural

life style. Other reasons included desire for privacy, clean air and to escape crime. None of these 68 rural residences produced anything commercially on their property, although some home sites consisted of several acres.

CHAPTER V

CASE STUDIES

Introduction

Eight farms were selected for indepth study to accomplish the following purposes:

(1) To develop an understanding of the ways in which operating units have evolved.

(2) To gain an understanding of the organizational strategies employed in actual operating units.

(3) To gain appreciation for the various spatial manifestations of farm organization in the mid-Willamette Valley as exemplified by actual units.

(4) To gain appreciation for the personality of a range of farm units.

The farms chosen illustrate something of the range of these qualities. Additionally they are representatives of the prominent commodity types identified in Chapter Four. They were selected with the assistance of the Agricultural Stabilization and Conservation Service county directors.

The similarities in organizational strategies are the result of farmers adjusting to a similar physical, economic, and social milieu;

the differences in strategies demonstrate the highly individualistic nature of farmers.

The DeJong farm is illustrative of a small well financed, well managed, family grain farm. In a sense it is an anachronism of another era in which small contiguous family farms were the norm. Nevertheless, other similar operations exist throughout the study area, commonly managed by farmers nearing retirement.

The Nofziger operation was selected because it is a large successful grass seed farm based primarily upon scattered parcels which are rented. This unit illustrates the management requirements and complexities associated with land base fragmentation and renting.

The Scharf farm is an exception to the generalization that young people can not break into the business of farming. On the other hand, it shows the prerequisites necessary to establish a commercial unit. Additionally, as a grain, grass seed, livestock operation with a non-contiguous, partially non-owned land base, it embraces in one unit many of the manifestations of mid-Willamette Valley farm characteristics.

The Wheeler farm is a long established unit that has been in the same family since the 1850's. It is a successful modern operation that has maintained some traditional characteristics through the years. Although conservative in some respects, the Wheelers have

enlarged their land base as needed. They illustrate that successful farmers are astute businessmen. The scattered spatial structure of the unit is common to large commercial farms of the area; however, the Wheelers have attempted to minimize the effects of a non-contiguous land base by the purchase of land in large blocks.

The Kampfer ranch was chosen because it provides an example of a highly specialized operation. It also illustrates the reality that some Willamette Valley farms are coupled with non-farm businesses.

The Ohling sheep ranch provides an example of a successful part-time commercial operation in which the owner has developed an operational strategy that allows him to make efficient use of his time and his land. This farm is managed to yield an important component of the family income.

The Fishback farm is included because it illustrates the case of a part-time farm operation in which considerations in addition to income are important. These include family tradition, a retirement activity, and enjoyment of country living.

The Griffin property was chosen to represent a land unit that is utilized primarily as a rural residence. It is indicative of a trend in the mid-Willamette Valley toward the segmenting of the land into small parcels with little intention to take advantage of the agriculture potential.

In the presentation that follows each of the case study farms is

examined separately. Physical, technological, and economic characteristics are described in relation to spatial organizational strategies.

The DeJong Grain Farm

Physical Characteristics

The grain farm of Mr. Richard DeJong consists of 300 contiguous acres located approximately 1.5 miles south of Balston, Oregon, in Section 17 of Range 5 West and Township 6 South in Polk County (Figure 7). The greater part of the farm consists of nearly flat to gently rolling topography of the Senecal surface. Willamette and Woodburn soils dominate the flatter parts and account for approximately 220 acres. The remaining 80 acres consist of a relatively gentle slope which rises approximately 26 feet above the dominant surface of the farm. The soils of this sloping area are primarily of the Steiwer-Hazelair association. The majority of the farm is about 200 feet above sea level. In general, the land resource base of the DeJong farm is well suited to the production of grain crops and could be utilized successfully for the production of a number of other crops as well.

Development of the Operation

Mr. DeJong's father, an immigrant from the Netherlands,

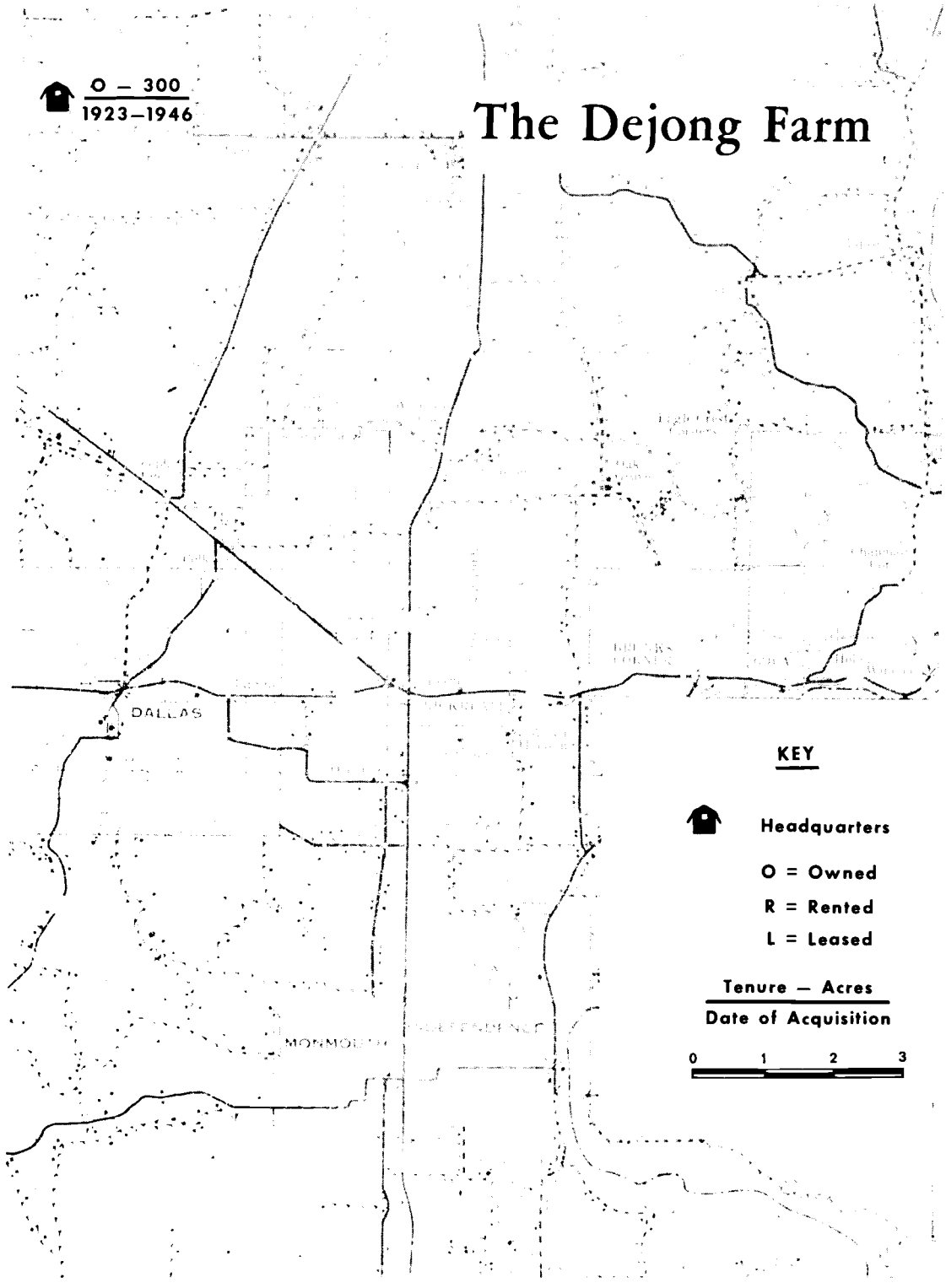

Figure 7
Source: Oregon, Dept. of Trans.

began farming the "home place" which consisted of 192 acres in 1923. At that time the major farm focus was the production of dairy products and the DeJong dairy, with about 70 cows, was one of the largest in the local area. Typical of study area farms in the 1930's, however, the DeJong farm was a diversified operation. Surplus hay and grain was sold as was the yield of a prune orchard.

By 1946 Mr. DeJong had taken over the operation from his father. He recognized the need to enlarge the land base of his farm to expand grain production. This appeared to be necessary if the farm was to remain a viable economic unit. Therefore, he purchased an additional 108 contiguous acres. This additional land required tile to improve the drainage and is now some of the most productive land in the study area. By purchasing this land, Mr. DeJong was able to improve the efficiency of his operation and increase his income.

As grain production became more important, the dairy component became more of a liability than an asset. The cows required constant attention and made it necessary to hire at least one full-time farm worker. Mr. DeJong found it increasingly more difficult to obtain the services of a top quality hired man, and he found his profits from the dairy falling as the costs of operation increased. Accordingly, when his son left the farm for college in 1957, Mr. DeJong sold the cows and concentrated his endeavors on full-time grain production.

In 1964, Mr. DeJong perceived the need to again enlarge his

land base to further improve the efficiency of his operation. Not wishing to commit substantial amounts of capital to the purchase of land, he elected to lease 220 acres adjoining his headquarters. The entire 520 acres were utilized for grain production until 1974 when the decision was made to decrease the size of the operation by giving up the leased land. He did this because he was approaching retirement age and wished to decrease his work load. His land and equipment were free of debt and therefore, he required lower gross returns from his farm to maintain a reasonable income. Presently Mr. DeJong manages 300 contiguous acres entirely committed to grain production.

Commodity Mix

The commodity mix of the DeJong farm varies from year to year but generally consists of about 200 acres of winter and spring wheat, 50 acres of oats, and 50 acres of Austrian peas or crimson clover. The legumes are planted on different fields each year to maintain the fertility of the land.

Farm Equipment

The DeJong farm is well equipped with relatively new machinery in excellent repair. Successful operations must utilize dependable and efficient equipment to avoid breakdowns in the middle of important

planting or harvest periods and to take advantage of optimal weather conditions. Excessive breakdowns or slowness in planting and harvest often lead to the loss of part of the crop. Therefore, dependable equipment is a major part of modern commercial grain farming strategy.

The combine, used for harvest, is a 1966 John Deere model 95 with a 12-foot header. Its present value is estimated by Mr. DeJong to be $25,000, and its replacement value would be approximately $40,000.

Field preparation equipment includes a five bottom Oliver plow, two disks, three harrows, one John Deere grain drill, one roller and one cultivator. The present value of this equipment is estimated to be $25,000 and its replacement value is about $40,000.

Mr. DeJong's tractor is a 1966 John Deere Diesel with about 120 horsepower. While fairly small compared to the 300 horsepower four-wheel drive tractors in use on the larger farms, this tractor is more than adequate for the requirements of a 300-acre unit. Its value is estimated to be approximately $23,000, but it would cost about $33,000 to replace.

Because the DeJong farm is only a short distance from warehouse facilities, few miles are driven in the farm trucks each year. The farm grain trucks, still in excellent repair, consist of a 1945 two ton International and a 1946 one and one-half ton Dodge. Both are

equipped with hoist beds so that loads may be dumped without being placed on a lift. Mr. DeJong places the value of these trucks at a total of $2,500 but estimates a replacement cost of over $20,000.

When totalled, Mr. DeJong's equipment is estimated to be worth approximately $75,000 with a replacement value of about $133,000. Even if one were able to use smaller, less expensive equipment, new equipment prices would still exceed the $75,000 value of Mr. DeJong's machinery.

Buildings and Land Values

In 1962 a windstorm destroyed the dairy barn and Mr. DeJong replaced it with a modern machine shed well suited to the needs of grain farming. This building is valued around $5,000. He has a second machine shed which is valued at about $10,000. There are two older but well maintained homes on the property. The $15,000 investment on farm buildings, according to Mr. DeJong, is considerably less than most study area commercial grain farmers have invested in their operation related buildings. For example, he has no grain storage facilities and would probably double his investment in buildings if he were to construct grain bins.

The land of the DeJong farm is of the best quality and could be sold for at least $1,000 per acre. Therefore, the value of the land

and the farm buildings of the DeJong farm is presently on the order of $315,000, exclusive of the houses.

Farm Calendar

Mr. DeJong's work season begins in February with the preparation of fields in which oats are to be planted. In March the remainder of the land to be committed to spring grains is worked and readied for seeding in April. Winter wheat is fertilized during this period. Barley and spring wheat are planted any time from the last of March until the first of May, depending upon the weather. Fertilizers are also applied during this period. Generally, the dryer the spring, the earlier the planting.

June and the first half of July is usually a slack time. Mr. DeJong takes advantage of this lull to ready his harvest equipment and to take a few days off. Harvest commonly begins in the last week of July with the combining of vetch. The harvest of winter wheat generally follows the vetch and begins around the first of August. Barley and spring wheat follow in early September.

In late September the wheat stubble is chopped and the soil is limed. The lime is used to decrease the acid qualities of the soil and to maximize the effects of fertilizers. In October the fields to be planted to winter wheat are worked and winter wheat is seeded.

A chemical product used to kill grass and weeds is applied to

the winter wheat in the last part of October or the first week in November. Without the use of this chemical, wheat yields would be considerably lower. After this chemical has been applied, Mr. DeJong is essentially finished with farm work until the first part of February.

Management

The management of this well equipped, productive grain farm is relatively simple. However, if Mr. DeJong wished to optimize the returns on his investments and maximize his profits, changes in his management strategies would be necessary. For example, he would need to enlarge the spatial component of his operation with suitable land to improve the efficiency with which labor, management, and equipment are utilized. Grain storage facilities would also improve Mr. DeJong's opportunities to maximize profits. Mr. DeJong is well aware that an increased land base would improve the efficiency of his operation and that adequate grain storage facilities would provide him with greater flexibility in the marketing of his grain. Nevertheless, because he is near retirement and because he is satisfied with his present lifestyle, he does not wish to complicate his operation. Mr. DeJong indicates, however, that a younger person interested in a career as a grain farmer, could not expect to maintain an economically viable grain farm unit on only 300 acres.

Conclusions

Mr. DeJong operates a well managed small grain farm which suits his unique situation and lifestyle. He is making optimal use of his land, but not his labor, time, considerable management skills, and equipment.

If one wished to purchase Mr. DeJong's operation, including buildings and equipment, he would have to invest approximately $390,000. Mr. DeJong believes that someone not already established in farming in the study area could not purchase the farm and operate it successfully. He noted high operation costs, high equipment replacement costs, and high interest rates as major problems. He also indicated that a price of $1,000 per acre for farmland cannot be justified by the economic returns from farming the land (DeJong, Feb., 1977).

The Nofziger Grass Seed Farm

Physical Characteristics

The grass seed operation of Mr. Leo Nofziger consists of 1,644 acres scattered over approximately 100 square miles in northwestern Linn County. The greater portion of the farm's soils are in category two. Dayton soils dominate and account for approximately 1,544 acres. The remaining 100 acres are made up of 60 acres of Malabon

soils and 40 acres of Newberg soils. Almost all of the fields consist of flat to gently rolling topography about 200 feet in elevation. This physical base is typical of the grass seed production area of Linn County. In general, the land resource base of the Nofziger farm is well suited to the production of grass seed. The better drained fields are also satisfactory for the production of grains (Figure 8).

Development of the Operation

Mr. Nofziger grew up on a farm in Linn County and started farming with his brother in 1952. The following year they bought out the interests of the other members of the family and thus acquired ownership of 320 acres committed to grass seed production. They also purchased their father's equipment at that time and added a new combine and tractor. In 1956, the Nofziger brothers began to expand the areal extent of their operation by purchasing, renting, and leasing more land. By 1972, they had increased the scale of their operation to include approximately 3,000 acres scattered over Linn County. Most of this land was committed to the production of grass seed. At this time rye grass was the most important, but some bluegrass, clover, and wheat was also produced each year.

Mr. Nofziger notes that he and his brother expanded their operation because they were able to farm that much land with their available labor, equipment, and capital, and because to farm less

The Nofziger Farm

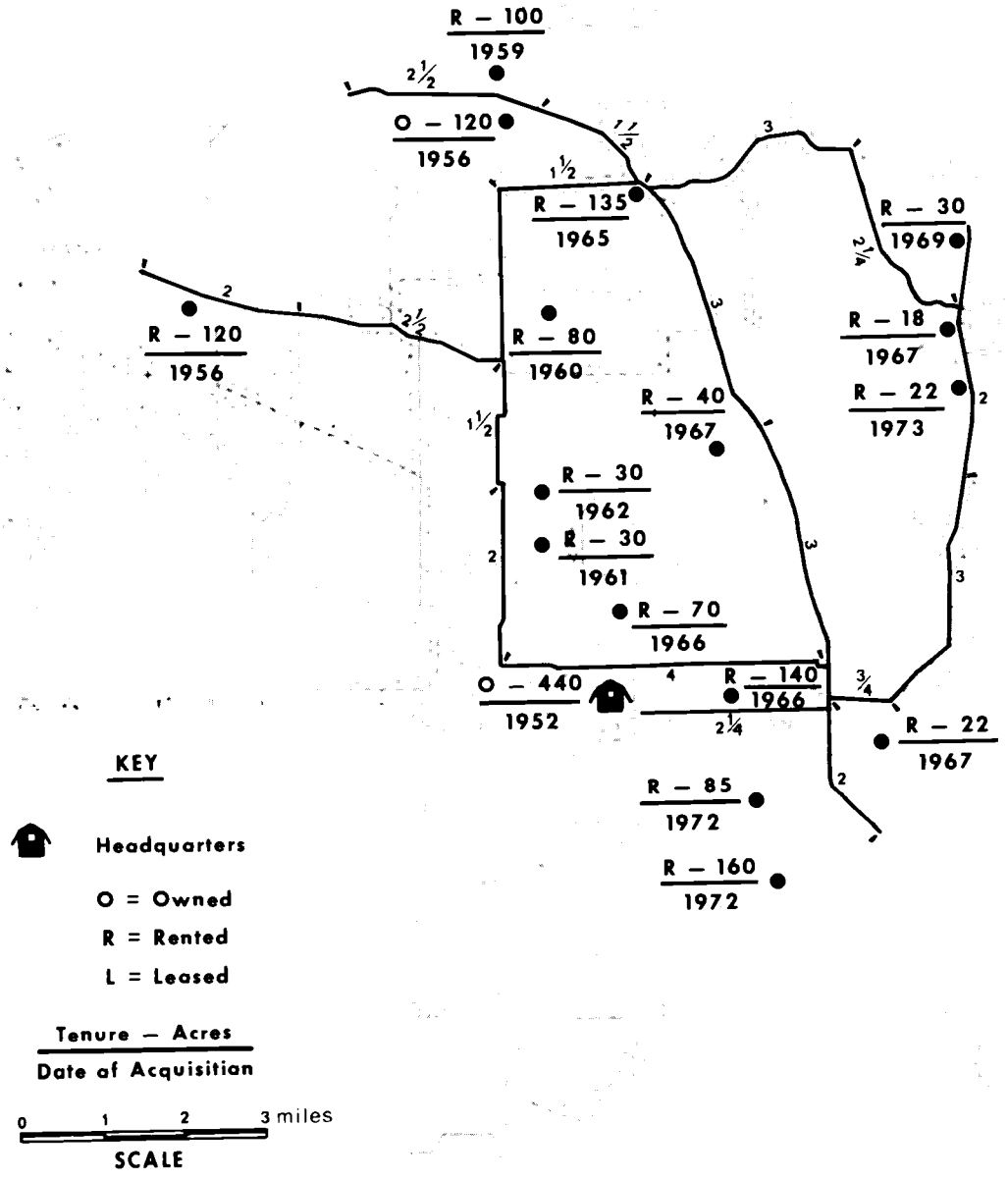

Figure 8
Source: Oregon, Dept. of Trans.

would result in lower returns. He stated that each time they purchased more equipment, they would attempt to rent or lease more land to pay for the new machinery.

During the late 1950's the Nofzigers decided to construct a grass seed warehouse and cleaning facility which would serve their needs and also provide commercial service to other grass seed producers in the Lebanon area. This business venture was highly successful and by 1972 required the full-time management efforts of the brother. By this time the sons of both men had grown to adulthood and were interested in farming. The Nofzigers believed that their partnership would become too complex if their sons were to be included. In consequence the brothers split their farm operation, and Leo Nofziger sold his share of the warehouse to his brother.

Presently Mr. Nofziger and his two sons farm 1,644 acres of which approximately 1,084 acres are rented from 14 different landlords.

Commodity Mix

Nearly 1,200 acres are committed to the production of perennial rye grass, and about 200 acres are usually devoted to the production of other grasses. The remainder of the land is generally planted to grains, with wheat the most dominant.

Farm Equipment

The Nofziger farm is equipped with the latest in farm machinery. Most is well maintained, although machinery that is several years old shows signs of the rugged use to which it is put. The Nofzigers own five nearly new New Holland Model 995 combines valued at $200,000. Mr. Nofziger estimates the replacement value of these machines to be about $215,000.

Field preparation equipment includes one new four-wheel drive 225 horsepower Steiger tractor valued at $55,000, three nearly new 105 horsepower Ford tractors valued at a total of $65,000, one older 127 horsepower Case tractor valued at $20,000, and plows, drills, disks, and other field preparation equipment valued at $50,000. Mr. Nofziger estimates the total replacement cost of field preparation equipment, including tractors, to be somewhat over $200,000.

Because the Nofzigers haul their produce over considerable distance, they need dependable trucks. Their main long haul truck is a White diesel valued at $60,000. Two smaller Chevrolet trucks, valued at $20,000 each, are used for shorter hauls. All three trucks are less than five years old. The trucks would cost an estimated $120,000 to replace.

Other equipment includes six swathers valued at $30,000 and C.B. radios and shop equipment valued at $15,000.

When totalled, Mr. Nofziger has approximately $535,000 invested in farm equipment and the replacement costs of this equipment, of course, would be considerably more. Mr. Nofziger stated that this equipment, despite the huge investment required, is needed to efficiently operate a large grass farm.

Buildings and Land Values

The buildings on the Nofziger farm consist of one shop valued at $5,000, one machine shed valued at $11,000, one grain/grass storage bin valued at $15,000, two comfortable homes, and one mobile home. In all, the farm buildings, not including the houses, are valued at $31,000.

The Nofzigers own a relatively small part of the land they farm. Their total land holdings are 560 acres valued at about $504,000. The total present value of their owned land and buildings is approximately $535,000, exclusive of the houses.

Farm Calendar

The farm work season on the Nofziger farm begins in March with an application of fertilizer to the rye grass and winter wheat. This process takes nearly all of March and April.

May and June are spent getting the equipment ready for grain and grass seed harvest which begins in early July with the swathing

of grass. This allows the grass to become sufficiently dry to be combined. In late July, the grass is combined and the seed is hauled to the warehouse for drying, cleaning, and storage. Wheat is harvested in August and is also hauled to the warehouse for processing and storage.

Fall planting begins in September and continues through November. At this time, sheep growers rent the perennial rye grass fields until April for the fattening of lambs. Generally Mr. Nofziger receives three cents per head per day for the use of his land and usually is able to accommodate 3,000 to 4,000 sheep.

During November and December, Mr. Nofziger and his two sons market their seed and grain wherever they can get the best price. They own a diesel truck capable of hauling large quantities of seed or grain to distant markets, and they often sell their produce in other states. Throughout the months of November, December, and part of January, Mr. Nofziger and his two sons are on the road delivering their produce.

January and February are the least busy time for the Nofzigers. Nevertheless, the large amount of equipment required for their operation requires considerable maintenance. Therefore, the Nofzigers take advantage of their lull in farm activities to build and repair equipment. Vacations are also taken during these months.

Management

The management of this large and widely scattered operation is relatively complex. Renting approximately 60 percent of the land base from 14 different landowners along with the related need to move equipment over a ten square mile area contributes to management problems and uncertainties. Mr. Nofziger noted that the C. B. radios installed on most of his equipment saves time and confusion. He suggested, however, that there are a number of chronic difficulties; these include managing hired help which is often scattered, the continual need to assure the necessary land through rentals from owners who bargain to get higher rent from other farmers or who wish to put the land to other uses, the planning of equipment movement as well as general costs of these movements, and the overall coordination complications. He also noted that he would need less equipment if all his land were contiguous.

Marketing their own grain and grass seed is a complicating but financially rewarding activity for the Nofzigers. Because they deliver their produce directly to buyers, they are generally able to secure higher returns, and they are able to make effective use of their time in what would otherwise be a slack period. Furthermore, the marketing of their produce allows them to sell when prices are highest. Nevertheless, their marketing and delivery activity requires the

purchase and maintenance of the large diesel truck used for hauling produce as well as the control of storage facilities.

The Nofzigers believe that there is little opportunity to simplify their operation by farming only land that is contiguous or at least close to their headquarters because close land is generally not available. They also believe that by doing their own warehousing and selling, they profit. It is their opinion therefore, that they must operate as they do if they are to maintain a viable economic operation that will support three families.

Presently, the Nofzigers have approximately $1,070,000 invested in their operation. If they owned all of their land base, this figure would be significantly higher. It is essential to the Nofzigers that there continues to be a supply of land available for rent. If such land were no longer available, Mr. Nofziger stated he and his sons would have to quit farming (Nofziger, Feb., 1977).

Conclusions

The Nofzigers operate a successful but complex farm unit which supports three families. They make optimal use of their land, labor, equipment, and management skills, but must gamble that their land base will continue to be available for their use.

Mr. Nofziger believes that it would be difficult, if not impossible, for a newcomer to establish a similar operation. The nearly

prohibitive factors are the capital requirements and the need to secure lease and rental arrangements to gain access to the required land base. Know how and established records give the advantage to the long time farmers of the area in the rental market.

The Scharf Grain Farm

Physical Characteristics

The headquarters of the 1,520 acre grain farm of Mr. John Scharf is located approximately one and one-half mile east of Perrydale, Polk County, Oregon, in Sections 24 and 25 of Range 5 West, Township 6 South. The homeplace consists of 750 acres of flat to gently rolling land at an elevation of about 225 feet above sea level. The category two soils of this part of the farm are of the fertile and highly productive Willamette-Woodburn association. Approximately one and one-half miles northeast of Perrydale, Oregon, in Section 12 Range 5 West, Township 6 South, Mr. Scharf farms 450 acres, 330 acres of which he owns and 120 acres of which he leases from his grandfather. This rolling parcel of land at about 250 feet elevation consists of soils of the Woodburn, Amity, Willamette association. Approximately 12 miles southeast of the headquarters farm near Independence, Oregon, in Section 17 of Range 4 West, Township 6 South, Mr. Scharf rents 320 acres of relatively flat land at about 300 feet elevation which consists of Dayton-Amity soils. For the most

part, the land resource base of the Scharf farm could be utilized to produce a wide variety of farm crops (Figure 9).

Development of the Operation

John Scharf grew up on a large diversified farm located near Perrydale that had been established by his grandfather in the 1920's. Mr. Scharf's father and uncle farmed their father's property during the 1950's, but eventually split the operation into two separate units. During the 1950's and 1960's, Mr. Scharf's father continued to build his operation. After Mr. Scharf graduated from high school in 1968, he started farming with his father and his brother. In 1976, when Mr. Scharf's uncle died, Mr. Scharf terminated his business relationship with his father and purchased his uncle's 750 acre farm from the estate. He also purchased another 330 acres nearby and leased 120 acres from his grandfather. In February of 1977, he leased an additional 320 acres near Independence, Oregon.

The purchase of Mr. Scharf's farm from his uncle's estate included a full complement of farm equipment. Mr. Scharf, however, has added to the farm machinery since he began to manage the operation a little over one year ago.

Commodity Mix

Mr. Scharf's land base is primarily utilized for grain production.

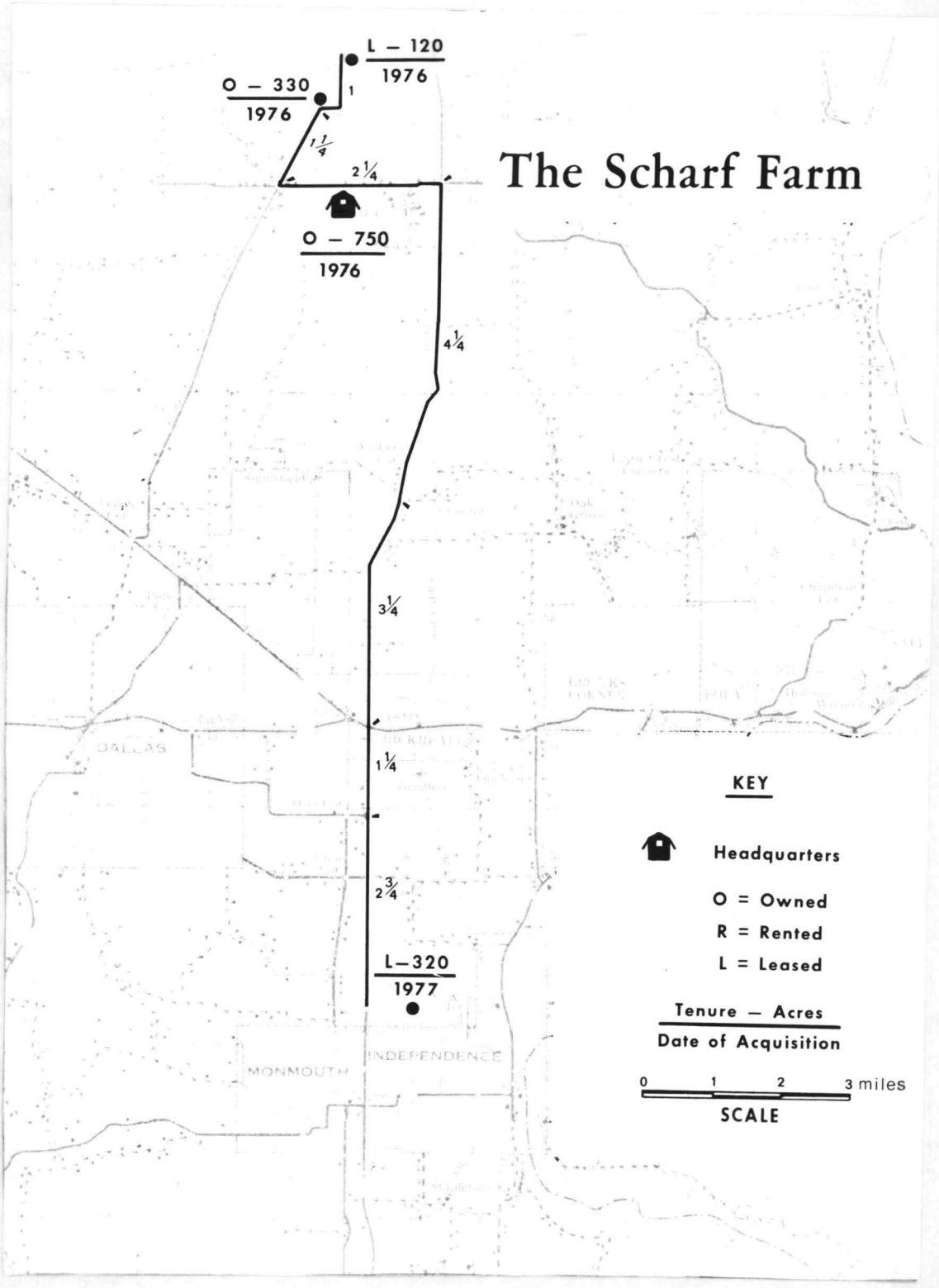

Figure 9
Source: Oregon, Dept. of Trans.

Winter and spring wheat are the most prominent crops and usually are planted on around 600 acres. Approximately 300 acres are usually devoted to grasses, 200 acres to Austrian peas, 200 acres to crimson clover, and around 100 acres to alfalfa.

A flock of about 200 sheep of various breeds is maintained to allow for nearly continuous use of the land base. After the grain and grass fields have been harvested, the sheep are turned out to feed on the aftermath. The close cropping of the rye grass fields in fall improves grass seed yields. The sheep do not account for more than ten percent of the total farm income but increase the efficiency of the operation without significantly increasing operation costs.

For the last four years, wheat has been the most important grain crop produced on the Scharf farm. Nevertheless, the present relatively low price of wheat has encouraged Mr. Scharf to increase the diversity of his commodity mix in the interests of maintaining income and to improve the fertility of his land base. To accomplish this he has increased the planting of legumes, such as Austrian peas and crimson clover, on a rotational basis. If wheat prices rise, he will probably increase wheat production. This flexibility in crop types is made possible by the fertility and versatility of his land base.

Farm Equipment

The Scharf farm is exceptionally well equipped with modern

farm machinery. Mr. Scharf leases one 300 horsepower Steiger four-wheel drive tractor for $14,000 per year. He owns one 200 horsepower John Deere Diesel tractor valued at $19,000, one 175 horsepower Diesel Massey Harris tractor valued at $12,000, one 100 horsepower Massey Harris tractor valued at $9,000, one 250 horsepower John Deere Diesel tractor valued at $9,000, one small Ford tractor valued at $4,000, and one Allis Chalmers Diesel on tracks valued at $9,000. In all, exclusive of the leased tractor, Mr. Scharf has $62,000 tied up in his tractors. Mr. Scharf believes the replacement cost for the owned tractors would be at least $74,000. If he purchased the Steiger four-wheel drive, it would cost about $65,000.

Field equipment on the Scharf farm is valued at $30,000. This includes two eight bottom plows, one cultipaker (a combination spring tooth, roller, harrow, and roder), one 16 foot roller, one 16 foot disk, one chopper, and haying equipment. While this equipment is nearly new, if if were to be purchased presently, Mr. Scharf estimates the cost would be $42,000.

Harvest equipment includes one new Massey Harris combine with one 18 foot header valued at $48,000, one 1971 John Deere combine with a 14 foot header valued at $35,000, and one new John Deere combine with an 18 foot header valued at $48,000. Mr. Scharf also owns one swather valued at $10,000. In all, Mr. Scharf estimates

the replacement cost for his harvest equipment to be approximately $140,000.

There are three trucks in use on the farm. Long distance grain hauling is accomplished by using a 1972 Hoyt Freight Liner Diesel truck valued at $50,000. The other two trucks consist of a 1959 two ton International and a 1953 General Motors Corporation truck valued at a total of $35,000. These smaller trucks are utilized for short hauls and on the farm. The replacement cost of all the trucks is estimated to be about $100,000.

In total, Mr. Scharf has approximately $308,000 invested in his farm equipment, exclusive of the leased tractor.

Mr. Scharf does his own equipment maintenance and has a well equipped shop. The tools are valued at about $10,000.

Buildings and Land Values

The buildings included in the Scharf operation are valued at approximately $297,000, exclusive of houses. The most expensive building is the warehouse/cleaner valued at $200,000. The replacement cost for this facility is estimated to be $275,000. Other structures include a sheep barn worth about $40,000, a machine shed worth $15,000, a shop worth $30,000, and a general storage shed worth $12,000. Mr. Scharf estimates that these buildings would cost about $110,000 to replace.

The land base of the farm consists of some of the most productive soils in the Willamette Valley. Mr. Scharf purchased the land for a "premium" but prefers not to estimate its value. The author, who is familiar with land values in the area, conservatively estimates $900 per acre for the land exclusive of buildings. At $900 an acre, the owned portion of the farm is worth about $972,000. The owned land and buildings on the ranch together are, thus, worth approximately $1,269,000.

Farm Calendar

Field preparation for planting wheat, oats, and rye grass begins in September with disking and dry plowing. September is also the period during which lime is applied to the fields to decrease the acidity of the soil.

In early October, there is a slack period during which Mr. Scharf takes a short vacation. In late October winter wheat is planted. Austrian peas are planted in early November, and herbicides are applied to the wheat and peas.

During December and January, Mr. Scharf works in his warehouse/cleaning facility and markets his grass seed and grain. Considerable time during these months is spent hauling grain and grass seed to various buyers.

The lambing season begins in late January and continues through

the middle of March. The attention given the ewes during this time is not continuous but requires someone to be available at all times. Therefore, other farm work can be accomplished during the lambing season as long as the ewes can be monitored regularly for problems.

In late February oats and crimson clover are planted and herbicides are applied. Some fields are fertilized as needed during this period. The remainder of the fields are fertilized during March.

During the first part of April preparation is made for harvest. Equipment is examined and repaired, and supplies are stocked. In the last part of April, the warehouse/cleaning facility is made ready, and the last of the previous year's harvest is hauled to market.

In early May, the sheep are sheared and the fat lambs are sold. Fences are repaired during May and buildings are repaired and painted as needed. Some hay is cut, bailed, and stored during the last part of May.

Haying is in full swing by the first part of June and is usually finished by the end of the month. In late June the swathing of the peas and rye grass begins. By the end of June, rye grass combining begins. The harvest of barley, wheat, oats, and other grains continue throughout July, August, and into September.

Management

The Scharf grain operation is unusual in that Mr. Scharf, at 28,

is younger than most commercial farmers in the study area. Furthermore, his operation is newly established and he is heavily in debt to his uncle's estate and several lending institutions. Mr. Scharf admits that he is taking a risk by purchasing a large farm and the equipment needed to operate on credit, but he is confident that hard work and sound management will make it work. Moreover, he notes that the reputation of his family as successful farmers has made it easier for him to secure loans and leases than for less well known individuals.

Mr. Scharf has decided to lease as much of his new equipment as possible. For example, leasing the Steiger four-wheel drive tractor allows Mr. Scharf to write off the entire $14,000 per year he pays for the lease against his income taxes. If he were to purchase the tractor, he could write off only interest on the loan and depreciation.

Mr. Scharf farms some scattered land but avoids much of the complexities and difficulties associated with equipment movement by organizing his scattered parcels in large units. For example, the parcel of land located about 12 miles from his headquarters is 320 acres in size. Mr. Scharf states that he prefers closer land but was unable to find anything suitable that was closer. By renting and leasing on two relatively large parcels of land (one is owned by his grandfather), Mr. Scharf avoids the uncertainties and constant changes

associated with farming scattered parcels owned by many different landlords (Scharf, Feb., 1977).

Conclusions

Mr. Scharf operates a modern, well equipped but unproven farm unit. Most of his farm organizational strategy is typical of successful commercial farm operators in the Willamette Valley, although he is testing some relatively innovative ideas, such as the rental of large equipment, and profit-sharing with his employees.

Mr. Scharf's utilization of non-contiguous land is typical of large units in the Willamette Valley, and he experiences some additional operational costs because of the distances involved. Nevertheless, he believes that he must farm a large land base if he is to realize adequate returns.

The level of debt outstanding against Mr. Scharf's farm introduces a degree of uncertainty as to whether or not the operation can endure. Mr. Scharf's enthusiasm, intelligence, and ambition, however, will help to assure the success of his farm unit.

The Wheeler Grass Seed, Grain, Sheep Farm

Physical Characteristics

The diversified farm of the four Wheeler brothers consists of 2,920 acres scattered over 100 square miles of the mid-western part

of Linn County. The headquarters farm is located approximately six miles south of Lebanon, Oregon, and the most distant fields are located about ten miles from the headquarters, near Tangent to the northwest and near Crawfordsville to the southeast (Figure 10).

The soils of the farm are divided between category one, category two, and category three. Category two soils are found on the flat to gently rolling portions at an elevation of approximately 300 feet. Dayton soils account for about 555 acres, Woodburn and Willamette soils account for around 380 acres, and approximately 200 acres in category two consist of Malabon soils. Category three soils are found at higher elevations in the more hilly portions. Approximately 1,380 acres consist of Jory and Salkum soils which occur at elevations between 350 and 650 feet above sea level. Hazelair soils comprise about 25 acres at elevations between 350 and 650 feet. The Coburg soils of category one account for about 380 acres. These soils are found on flood plains of streams at lower elevations around 300 feet. The surface here is flat to gently rolling.

The physical base, like the organization of the farm operation, is diverse. Some parts of the farm, particularly the category two soils, are well suited to grass seed and grain production. The parts of the farm made up of category three soils are utilized for pasture and timber production. Category one soils are relatively versatile and can be utilized for the production of a number of farm crops.

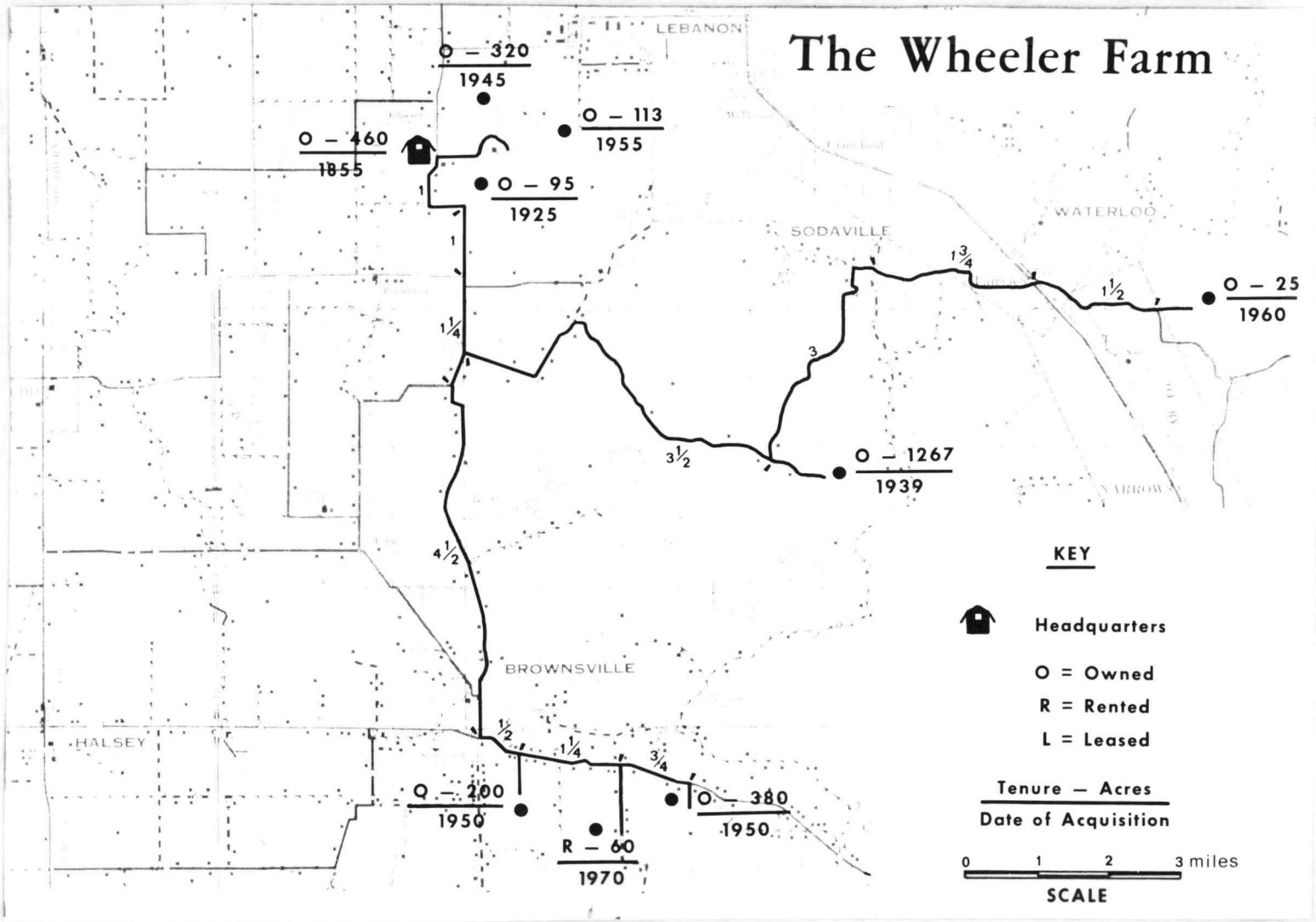

Figure 10
Source: Oregon, Dept. of Trans.

Development of the Operation

The Wheeler family first started farming near Lebanon in the 1850's. They initially established a self-sufficient family farm and later turned to a strategy of diversification. When the four Wheeler brothers were born in the early part of this century, the family farm consisted of around 600 acres. In the late 1930's, the Wheeler brothers took over the operation from their father, and by 1946 had built it to 1,900 acres. During the period from 1946 to 1974 they purchased more land in Linn County bringing their total ownership to 2,860 acres. They also rent 60 acres from a family friend. They prefer to purchase the land because of the uncertainties associated with leasing and renting and because they view the land as an investment. The Wheelers have expanded their land base over the years because they believed that additional land was necessary if the operation were to support four families.

Unlike many of their neighbors, The Wheelers have not completely given up some elements of the diversified operation originally established by their father. For example, they maintain a flock of 500 chickens because their mother has always had chickens on the farm and wants her sons to maintain a small poultry component. Their small orchard is another example of a vestige of the past. The primary organizational strategy of the operation, however, is

specialization in grass seed and grain production with a supplemental sheep component.

Commodity Mix

The Wheelers have 1,200 acres in perennial rye grass and about 365 acres in grain, with wheat being the major crop. Approximately 57 acres are committed to walnut and filbert trees, and around 1,300 acres of the more hilly land are maintained in Douglas Fir and Oak. The woodlands and grass fields are also utilized for sheep pasture.

A flock of 300 Columbia sheep is maintained on the farm. The sale of fat lambs, sheep, and wool account for about ten percent of the total farm income. The Wheelers also keep a flock of 500 chickens which bring in less than one percent of the total farm income.

Farm Equipment

The farm is adequately equipped with modern farm machinery. The Wheelers own three recent model Case combines with ten foot headers. These are estimated to have a present value of about $50,000 but would cost about $110,000 to replace.

The large areal extent of the farm makes it necessary to maintain three tractors. The largest tractor is a four-wheel drive Case with 150 horsepower. This machine is only one year old and cost

$35,000. It would cost about $40,000 to replace. The other two tractors are Fords, one of a 100 horsepower and the other 50 horsepower. Together, these machines are valued at $25,000 but would cost about $35,000 to replace.

Field preparation equipment, including plows, disks, rollers, drills, spring tooths and mowers, is valued at $10,000 and would cost around $20,000 if replaced under current prices.

Because of the large acreage of grass, the Wheelers own three New Holland swathers with ten foot headers. These are valued at $10,000 each and the replacement cost of each is about $12,000.

Three one and one-half ton General Motors trucks are used to haul grain, grass, and animals. These trucks are not new, but are in good condition, and are valued at about $20,000. To replace them would cost around $30,000.

The farm shop is relatively well equipped. The shop equipment is valued at approximately $5,000.

In all, the Wheelers have about $170,000 invested in farm equipment. If they were to replace their present machinery with new implements, however, they would need to spend around $275,000. When the size of the Wheeler operation is considered, and their equipment investment is compared with that of the Nofziger farm, the Wheelers have substantially less invested. Mr. Alfred Wheeler stated that he and his brothers do not believe in buying equipment unless it is

absolutely essential and that he thinks some operators purchase more machinery than they need.

Buildings and Land Values

The buildings on the Wheeler farm represent a substantial investment. There are four large barns with a total value of $40,000, three grain/grass seed storage warehouses and one cleaner valued at $100,000, one machine shed valued at $5,000, one shop valued at $15,000, and one large chicken house valued at $10,000. In all they have approximately $170,000 invested in farm buildings, exclusive of their homes.

About 1,380 acres of the Wheeler farm is timber/pasture land in the hilly parts of Linn County. This has an estimated value of about $1,000 per acre with the timber. The remainder of the farm consists of cultivated land with an average estimated value of about $850 per acre exclusive of buildings. Therefore, according to the Wheeler estimates, the timber/pasture portion of the farm is worth around $1,380,000, and the remainder of the farm is worth about $1,309,000. The total land base of the Wheeler farm is estimated to be worth approximately $2,689,000.

Farm Calendar

Field preparation for spring planting of grass and grain begins

in April. Grains are seeded in May, and harvest equipment is made ready. In April, the walnut orchard is cultivated, and the trees are sprayed in early June.

The harvest begins around the first of July with the swathing of rye grass. The rye grass seed is usually threshed in mid-July, and the harvest of grain and grass seed is normally completed by the end of August. The walnuts are harvested in the last part of August.

In September some grass fields are burned to eliminate weeds, pests, and diseases and some fields are prepared for planting winter wheat and other crops. The grain and grass fields are fertilized and sprayed for weeds in late October and early November. Lambs are turned out on the rye grass fields in October for fattening. They are allowed to graze until April when they are marketed. The sheep are also sheared in October.

In November and December, the Wheelers clean their summer harvest of grass seed and grain that has been stored in their private graineries. By storing and cleaning their own seed and grain, they are able to increase their returns and sell when the market is best.

In January, the ewes begin to give birth to their lambs. Lambing usually continues until March. During lambing the ewes are kept on the lower pastures near the headquarters farm. The Wheelers also market their grain and grass seed during the period between the first of January and the end of March. They generally do not deliver the

grain but sell it to buyers who pick it up at their warehouses. The walnut orchard is pruned and sprayed in the period between the first of January and the middle of March.

Maintenance on buildings, equipment, and fences is a year round activity on the Wheeler ranch. The feeding and care of the chickens and the gathering and marketing of eggs is also a year round farm activity. Therefore, there is no period during the year which can be considered a slack time for the Wheelers. Vacations are taken at different times by the brothers so that there is always enough people available to run the farm.

Management

The Wheeler brothers effectively manage a large, efficient, and profitable diversified farm enterprise. Their reluctance to rent or lease land and their active interest in land purchases of acreages in fairly large plots has kept them free of the complexities associated with farm expansions through renting and leasing large numbers of scattered plots from many landowners. The Wheelers are not plagued with the uncertainties associated with renting or leasing, and they do not continually have to bid against their neighbors for new lands to lease or rent.

By drying, cleaning, and storing their own grain and grass seed, the Wheelers avoid, to some extent, the capricious nature of farm

produce markets. The sale of their animals and animal products is more vulnerable to price fluctuations. The eggs, chickens, and fat lambs cannot be held until prices improve.

The conservative manner in which the Wheelers approach equipment purchases has served to keep their total investment in machinery relatively low. Therefore, they have been able to invest more money in their land base. They reason that the equipment will depreciate while the land will appreciate. Therefore, as long as their equipment meets their needs, they do not purchase new models.

The element of diversity in the farm organizational strategy of the Wheeler farm is more the result of long established traditions than of economic considerations. The poultry and orchard components are maintained primarily because the farm has long produced chickens, eggs, and nuts. Moreover, the Wheelers' mother prefers that these traditional commodities continue to be produced. The sheep are of minor economic importance but supplement the total farm income and make use of rye grass fields and timber lands for grazing.

The large blocks of timber land have been purchased and maintained as an investment. The Wheelers spend little time working on this land, but allow the timber to mature, and then sell the trees. The soils and steep slopes typical of most of the timber land are not suitable for cultivation.

The Wheelers must hire help during the harvest season. Mr.

Alfred Wheeler stated that this is sometimes difficult because farmers cannot pay as much as industry and do not offer comparable benefits or security for workers. Furthermore, he believes that the government has made it more difficult for farmers to hire young people for summer jobs because of the paper work that must be completed. In the peak work periods, the Wheelers sometimes find themselves short of help because of the difficulties associated with hiring seasonal workers.

The scattered spatial arrangement of the Wheeler operation serves to complicate management activities. However, the relative homogenous nature of land uses and the relatively large size of the parcels cut down equipment movement and other difficulties. The farm consists of nine parcels of which the smallest cultivated field is 60 acres located approximately a mile from a 380 acre plot near Brownsville. The next smallest scattered parcel is a 95 acre grass field near Peterson Butte. One part of the farm consists of 1,267 acres of pasture and timber located about one mile north of Cedar Butte. By utilizing these large acreages in a way that minimizes equipment movement, the Wheelers have partially neutralized the complicating effects of farming scattered land (Wheeler, Feb., 1977).

Conclusions

The Wheeler ranch represents a long established commercial

operation that has been steadily expanded as more land has been needed to support four families and as economic conditions have made it necessary to adopt a strategy of enlargement. The Wheelers have not, however, adopted renting and leasing as a means of farm enlargement. They have preferred to purchase land as nearby as possible.

The elements of diversification still evident in the Wheeler operation are not an important part of their organizational strategy. Instead, the production of these commodities are vestiges of the past when diversification represented the basic organization of the operation.

The Wheelers are conservative but perceptive in their management of the farm unit. They have coupled an efficient grain/grass seed operation with an active land investment program and have prospered.

The Kampfer Cattle Ranch

Physical Characteristics

The Kampfer cattle ranch consists of a contiguous area of 5,000 acres located on Diamond Hill in Sections 6, 7, 8, and 17 of Range 2 West and Township 15 South and Sections 1, 12, and 13 of Range 3 West and Township 15 South in Linn County, Oregon (Figure 11).

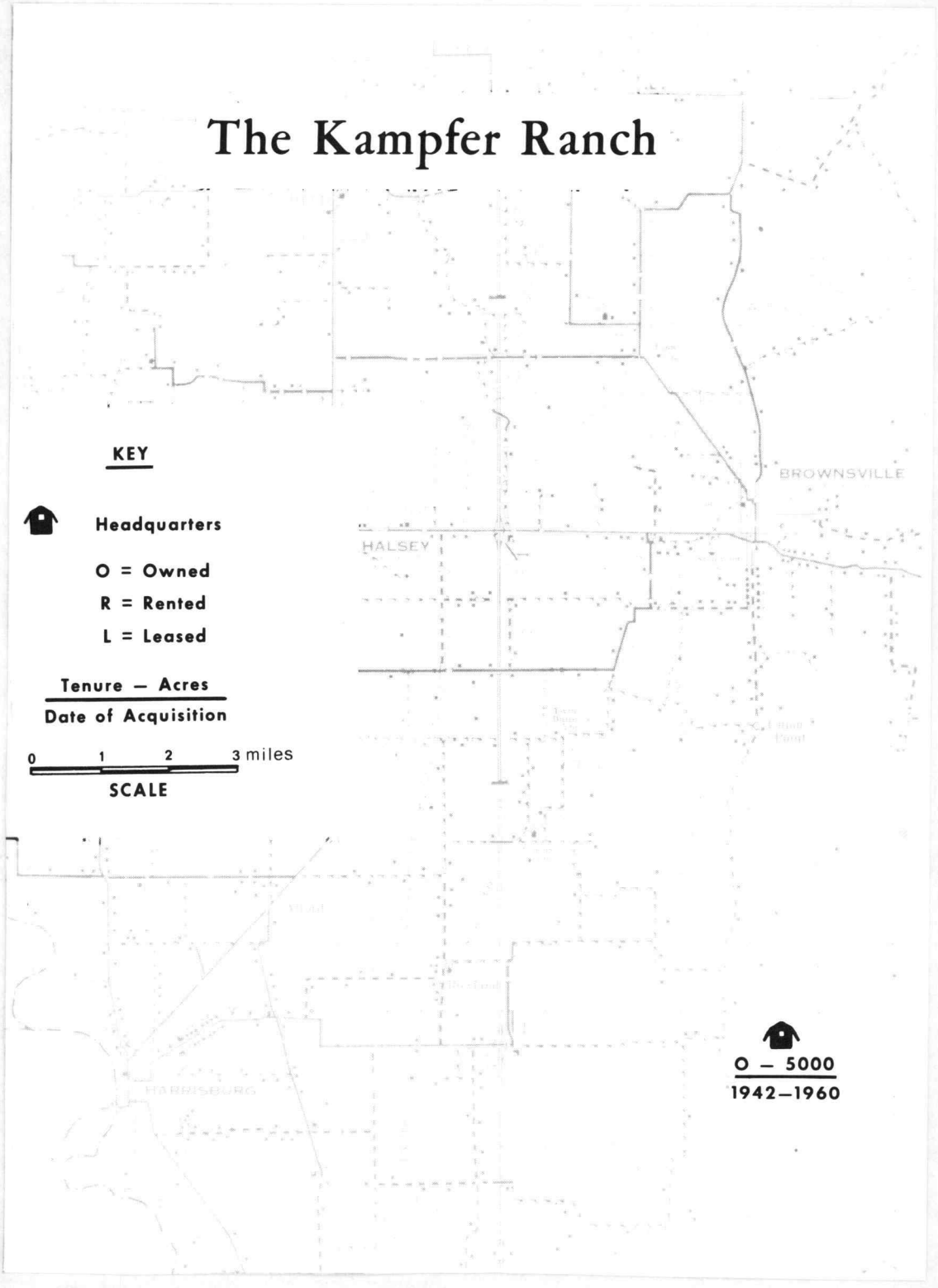

Figure 11
Source: Oregon, Dept. of Trans.

Approximately one half of the ranch consists of the very steep foothills of the Cascades. The Nekia soils of this part of the ranch are best suited to timber production and summer cattle grazing. Here the elevation ranges from about 1,500 feet to about 3,000 feet above sea level. The other 2,500 acres of the ranch consist of lower hills which vary from approximately 300 feet to around 1,500 feet elevation. Here the soils are primarily of the Hazelair series and are utilized for winter pasture.

In general the land base of the Kampfer ranch is not well suited to cultivated cropping, however, some areas can be successfully utilized for hay production. In the main, however, permanent improved pasture at lower elevations and timber production and natural pasture at higher elevations represent appropriate uses of the land.

Development of the Operation

Mr. Kampfer purchases the majority of his land base in 1942. At that time the ranch consisted of 4,400 acres of unimproved pasture and unmanaged timber land. During the 1940's and 1950's he planted permanent pastures on the fields at lower elevations, put up fences, and established a herd of high quality Hereford cattle. He established a cow-calf operation and built a favorable reputation by selling calves of superior quality, some for brood cow stock. In 1960, Mr. Kampfer purchased 600 acres of pasture land contiguous to his original ranch,

and planted Douglas fir trees on some of the higher ground that had been used as summer pasture.

During the past ten years, Mr. Kampfer has gradually turned over the management of the ranch to his two sons who are presently in their late twenties. Mr. Kampfer still works on the ranch most days and is consulted by his sons regarding the management of the operation.

Mr. Kampfer has not needed to rely completely on the returns realized from the cattle and timber. He has long been a successful businessman in the Albany area and has invested in his ranch over the years. Therefore, he has been able to build a beautiful ranch on which buildings, pastures, ponds, animals, and equipment are in excellent condition. The ranch, although definitely a productive commercial unit, has the appearance of a show place.

Commodity Mix

Currently the Kampfer ranch supports 300 Hereford brood cows, 75 replacement heifers, 30 Hereford bulls, and 12 horses. The cattle are of fine stock and are well known to cattle buyers throughout the West.

Horses have been maintained on the ranch to work the cattle and for recreation. They have seldom been used, however, since two Yamaha motor bikes were purchases two years ago. Mr. Kampfer,

while lamenting the passing of the usefulness of horses on his ranch, notes that the Yamahas are a much more effective and efficient means of transportation.

Timber harvest also adds periodically to the ranch income.

Ranch Equipment

Mr. Kampfer stated that the equipment requirements of a cow-calf operation are considerably less than that of grain or grass seed farm. The Kampfers own one relatively new large tractor on tracks for clearing land and pond construction valued at about $100,000. They also own two smaller older tractors on tracks valued at a total of $45,000. These are used for fencing work. Only one wheel tractor is used on the Kampfer ranch; this is an older machine, under 50 horsepower, valued at about $6,500.

Fencing equipment, which includes a fence stretcher and pole-driver, is valued at $3,000. Field preparation equipment for pasture improvement includes disks, plows, and drills and is valued at about $5,000.

The shop on the Kampfer ranch appears to be relatively well equipped with around $2,000 worth of tools. These tools are used for the maintenance of buildings, equipment, and fences.

The Kampfers use only one truck in their operation, a 1950 model Dodge four-wheel drive two ton flatbed with a hoist. This

truck is particularly useful on the mountainous Kampfer ranch because of its four-wheel drive capability. It is valued at about $1,500.

In all, the Kampfers have about $216,500 invested in their equipment. If they were to replace it with new equipment, Mr. Kampfer estimates it would cost about $300,000.

Buildings and Land Values

Exclusive of house, there are four barns on the ranch with a total value of $60,000; additionally there are two machine sheds valued at a total of $10,000, one corral valued at $15,000, three storage sheds valued at $7,500 total, 25 miles of fences valued at $50,000, and 25 ponds worth approximately $25,000. In all the buildings, fences, and ponds are worth about $185,000.

The land of the Kampfer ranch is estimated to average approximately $650 per acre in value. Therefore, in total, the land base is worth about $3,250,000. When the ranch buildings are added to the land value, the entire ranch, exclusive of cattle and equipment, is valued at $3,435,000.

Farm Calendar

In January the cattle are brought down to pastures close to the barns for calving. At this time all the cows that will deliver calves are fed cottonseed supplement to improve their strength. As the cows

come close to delivery they are separated out for special attention. Calving generally continues through the middle of March.

During February and March, fence repairs are completed on the lower pastures and new fences are built as needed. The fencing work continues through May with work on the upper pastures being completed last.

Building maintenance on the ranch is on a fixed schedule so that one or two buildings are painted and repaired each year. Generally the month of July is set aside for building and cattle feeder maintenance.

Tansy Ragwort (Senecio jacobea), a weed that is poisonous to cattle, must be eliminated from the ranch each year. This requires hand pulling. The elimination of this weed from the 5,000 acre ranch usually takes almost all of the month of August.

In September and October, the calves are sold. These calves are generally picked up by the buyers at the ranch prior to the tenth of October. In the last part of October the cows are sprayed to eliminate parasites and put on the upper pastures until the early part of January.

A lull in the work schedule in November and December provides an opportunity for vacations and allow the Kampfers to complete any fence repair or building that was not completed earlier. Machine maintenance is also accomplished during this time.

Management

The Kampfer ranch is particularly well maintained, and it appears to be prosperous. It is the basic simplicity of the operation that facilitates efficiency and avoids the complexities often associated with a large ranch. For example, the Kampfers sell only two farm products--cattle and timber. They do not harvest or haul the timber, and the calves are picked up at the ranch by buyers. Moreover, the relatively small amount of equipment and the contiguous spatial organization of their land base further simplify their management tasks.

The Kampfers have organized their work schedule for maximum efficiency; they are almost always busy, but they seldom need to hire additional help. Furthermore, by doing all their own building and equipment maintenance, as well as a large share of the veterinary work required on the ranch, the Kampfers are able to keep operation costs at a minimum.

The large acreages of excellent pasture allow cattle to be moved from pasture to pasture in a rotation that keeps the pastures in optimal condition. Mr. Kampfer states that they could increase the herd, but that this would serve to overgraze the pastures and eventually require the cattle to be fed with supplemental grain and hay.

The switch from horses to Yamaha motorbikes for cattle

handling is an indication of the flexibility built into the management of the Kampfer ranch. Since the Yamahas are more efficient than horses, the Kampfers do not hesitate to take advantage of their availability.

The use of the land resource is carefully planned and efficient. Where it is feasible, improved pastures are planted, and ponds for water storage are constructed. In areas of steeper relief, trees are planted for timber production. Mr. Kampfer did note that high taxes on the timber land may force him to cut the trees before they have reached proper harvest size. He also lamented that the government makes it difficult for landowners to practice sound land use management because of high taxes.

The Kampfer operation is nearly self-sufficient in terms of supplying its own animals. Each year ten percent of the herd is replaced with new calves. The Kampfers seldom need to purchase a heifer or bull from other ranches.

In the main, the Kampfers, through hard work, careful planning, and attention to detail have established a modern, efficient and simple cow-calf operation. They enjoy a reputation as expert cattlemen who produce quality cattle (Kampfer, Feb., 1977).

Conclusions

The Kampfer ranch is a beautiful and productive operation. It

has been established as a result of the hard work, investment, and interest of Mr. Erwin Kampfer. It continues to be well managed by Mr. Kampfer's sons. Mr. Kampfer's business interests in the Albany area provided him with the necessary economic base to establish the operation on a sound economic footing and to construct the excellent buildings, fences, ponds, and pastures that enhance the appearance and viability of the ranch.

The returns from the timber lands serve to supplement the returns from the cattle and add to the value of the land base. Moreover, the timber lands add to the aesthetic qualities of the ranch.

The Ohling Purebred Sheep Ranch

Physical Characteristics

The Ohling sheep ranch which specializes in producing and selling Dorset and Suffolk breeder stock is located approximately three and one-half miles south of Tangent, Oregon, in Section 31 of Township 13 South, Range 3 West (Figure 12). It consists of approximately 40 contiguous acres. The relatively flat surface and the Dayton soils of the ranch are well suited to pasture production which provides good forage for sheep.

The soils of the Ohling ranch could be utilized for grass seed or grain farming, but Mr. Ohling notes that his fields are too small to be

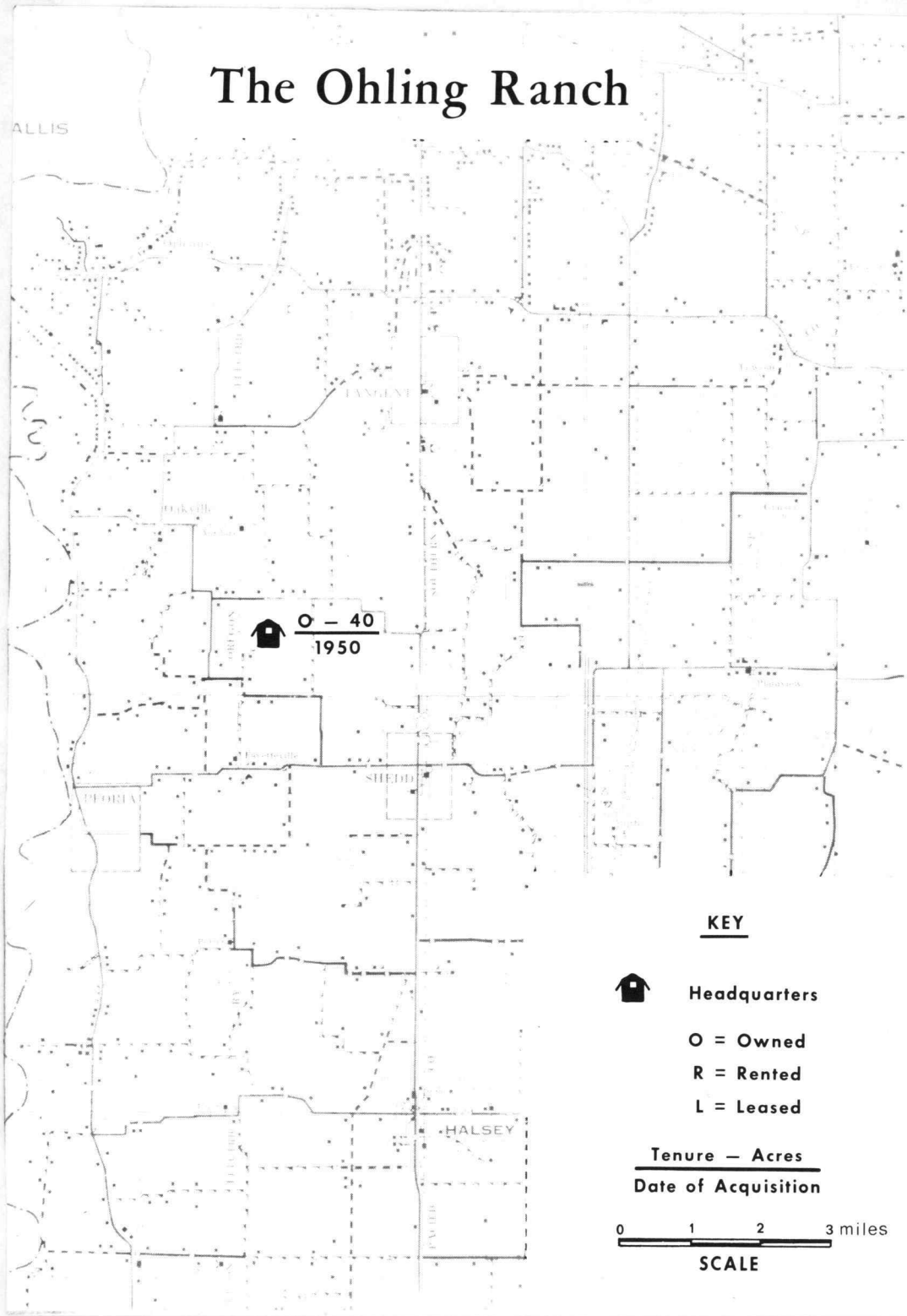

Figure 12
Source: Oregon, Dept. of Trans.

planted and harvested with large modern equipment now used in grain and grass seed farming. Moreover, a 40-acre grass seed or grain operation is not large enough to provide an adequate economy of scale.

Development of the Operation

Mr. Ohling purchased the farm in 1950. He recognized that 40 acres was not large enough to support a family, and therefore worked full time as a Field Supervisor for a seed company. To make his small operation profitable and to make it possible to farm on a part-time basis, Mr. Ohling decided to raise pure bred Dorset and Suffolk sheep for sale as breeder stock.

In 1976 Mr. Ohling's son, who is presently a student at Linn-Benton Community College, decided to become a commercial sheep rancher. He rented 40 acres about one mile from the Ohling ranch and 80 acres about 70 miles away in Lincoln County. The father and son often work together, but the two operations are as yet separate. Nevertheless, Mr. Ohling loans equipment to his son and, therefore, is occasionally involved in moving animals and equipment considerable distance.

Animal Component

Mr. Ohling maintains a total flock of approximately 240 registered purebred sheep. Of these, 120 are Dorset ewes, 40 are Suffolk

ewes, and 80 are carry over lambs from the previous year. He also maintains three Dorset and three Suffolk bucks for breeding purposes. Each year these animals produce about 280 lambs, 120 of which are sold as registered breeder stock, and 80 are marketed as fat lambs. Approximately 80 of the older or non-productive ewes are marketed during the year.

In most years, Mr. Ohling purchases about 1,000 lambs in October and grazes these on his neighbor's grass fields throughout the winter. These lambs are marketed in the spring to meat buyers.

The purebred sheep provide approximately 75 percent of the farm income, and the sale of fat lambs account for about 25 percent. The purchase, grazing, and sale of the fat lambs, however, consume little time, and with the exception of portable fences, require little additional equipment investment.

Ranch Equipment

The small size and the nature of the operation place minimal demands for equipment. The Ohling ranch is, nevertheless, adequately equipped with machinery to accomplish the required farm tasks in a reasonable length of time.

Mr. Ohling has one five-year-old Ford wheel tractor with about 55 horsepower that is capable of pulling a three bottom plow. He estimates the value of this machine to be about $6,000. The field

equipment consists of a disk, a plow, and a harrow/roller. In total, Mr. Ohling estimates the field preparation equipment to be worth about $3,000. Haying equipment is rented from Mr. Ohling's brother.

The sheep moving equipment on the ranch consists of one 1976 four-wheel drive three-quarter ton truck and a large sheep trailer. Mr. Ohling estimates their value at $10,000.

Portable fencing used for fat lamb grazing is valued at $5,000. Irrigation equipment, which is hand set, is estimated to be worth $7,000.

In total, Mr. Ohling values his farm equipment at $31,000. When compared to the larger operations previously discussed, this figure represents a small investment in equipment. Nevertheless, Mr. Ohling's equipment represents a significant percentage of his total farm investment.

Buildings and Land Values

Exclusive of the house, there is only one building on the ranch. This barn is used for feed storage, equipment storage, and sheep shelter. It is valued at $12,000.

The size of the Ohling ranch makes it ideal as a part-time farm, rural residence, or retirement farm. Therefore, the value of the land on a per acre basis is higher than that of larger full-time farm units. Mr. Ohling did not wish to estimate the value of his land,

however, based upon discussions with people in the Tangent area, the author estimates the land to be worth about $1,500 per acre without buildings. At $1,500 per acre, the total land value is approximately $60,000.

Farm Calendar

The busiest period on the Ohling ranch is the lambing season which begins in September and ends in February. During this time, Mr. Ohling and his wife often must assist the ewes in giving birth and sometimes must work late into the night.

The sheep are sheared by professionals in April. Mr. Ohling prefers to use hired help because it is a time-consuming and difficult job and because he feels he can put his efforts to better use. After the sheep are sheared they are sprayed to rid them of pests.

Mr. Ohling purchases his hay from other farmers and stores it in his barn in late June. This process requires considerable hand labor as the Ohling ranch is not equipped with the latest haying machinery. Improvements in pasture are made during June and July. These improvements consist of reseeding, spraying, and the application of fertilizers.

Irrigation of the pastures begins around the end of June and continues until the first of September. The irrigation equipment must be moved by hand, but because the acreage is small this task can be

completed in a short time each morning and evening.

Mr. Ohling markets his sheep in a number of sales throughout the nation. In April he hauls sheep to a sale in Oklahoma; in May to Dixon, California; in June to Sadalia, Mississippi; and he sells at local sales throughout the year. He also markets the fat lambs in the spring.

Maintenance on the Ohling ranch is accomplished on a year round bais as it is needed. Mr. Ohling does not have a particular maintenance schedule which he follows, but repairs buildings and equipment when he finds the time.

Management

Mr. Ohling has adopted a strategy of specialization in high value animals as the primary orientation of his operation. This organizational strategy is appropriate for a small farm that could not be profitably planted to grain or grass and that does not have suitable soils for intensive row crop production. Mr. Ohling makes optimal use of his land resource and his time by specializing in high value purebred sheep. He increases the total net returns of his operation by winter grazing fat lambs on the grass fields of his neighbors. The grazing of these lambs requires a small percentage of Mr. Ohling's time and does not require large investments in equipment, fences, or buildings.

Sheep ranching does not generally require large and expensive

equipment. Buildings, fences, and irrigation equipment represent the greatest expenditures. Mr. Ohling is conservative concerning equipment purchases and believes that some farmers buy more machinery than they need. He believes in purchasing equipment only when it is absolutely necessary.

The high value of Mr. Ohling's sheep are the result of years of hard work, quality control, and honest and effective marketing. Mr. Ohling personally hauls his sheep to sales throughout the United States. He is well known among sheep breeders all over the nation for raising some of the finest purebred Dorset and Suffolk sheep available.

Mr. Ohling is generally able to accomplish all the required farm work in the evenings and on weekends. His wife also assists him by helping feed and care for the sheep and lambs. In this way, Mr. Ohling is able to farm commercially while working full time for a seed company.

The recent rental of scattered parcels of land by Mr. Ohling's son who may soon take over the entire operation may change the simplicity of the Ohling farm strategy. At present, however, Mr. Ohling has, through hard work, solid management, and careful planning, established a simple but profitable part-time commercial farm unit. His strategy of specialization in a small number of high value animals carries with it, however, an element of risk. If a disease should

strike his small flock, or if the market for purebred sheep should fall, his ranch could begin to operate at a loss. For Mr. Ohling, however, the risk is minimized by the fact that his farm provides only a supplemental income and is as important as a rural residence as it is as a production unit. Because he does not rely heavily on the farm for his support, his farm organizational strategy of specialization well suits his needs and lifestyle (Ohling, Feb., 1977).

Conclusions

Mr. Ohling's unit is relatively productive for a part-time operation. In general, Mr. Ohling's operational strategy is well suited to the use of a small land base and fits in well with his full-time job.

The fixed costs associated with operating a commercial farm unit generally make it impractical for full-time farming to take place on a small land base such as that of Mr. Ohling. Many owners of small parcels use the land for rural residences but often do not establish viable commercial operations. Mr. Ohling has developed a pure bred sheep operation that provides a substantial supplement to his income and makes efficient use of his land base.

The Fishback Retirement Farm

Physical Characteristics

The 52 acre farm of Mr. Elton Fishback is located

approximately three and one-half miles ~~east~~ West of Monmouth, Oregon, on a rise of about 800 feet elevation in Section 33, Township 8 South, Range 5 West in Polk County (Figure 13). The soils of the farm consist of the Steiwer-Willakenzie association and are well suited to orchard and pasture production.

Development of the Operation

The farm, originally consisting of 120 acres, was purchased by Mr. Fishback's grandfather in 1891. Mr. Fishback's grandfather and later his father operated the farm on a full-time basis and were able to secure a comfortable living. In 1941, the United States Government purchased most of the farm from the Fishback family. Elton Fishback, a school administrator, was able to purchase 52 acres of the original place in 1947. Until recently Mr. Fishback operated the farm on a part-time basis. Now, in his retirement, he devotes more time to farm activities.

Commodity Mix

The primary source of income has been from orchard production since Mr. Fishback's grandfather planted the first trees in the 1890's. The present orchard is small enough to be operated by a man in retirement. Mr. Fishback also maintains approximately 30 sheep to keep the weeds down and to make use of the pasture land.

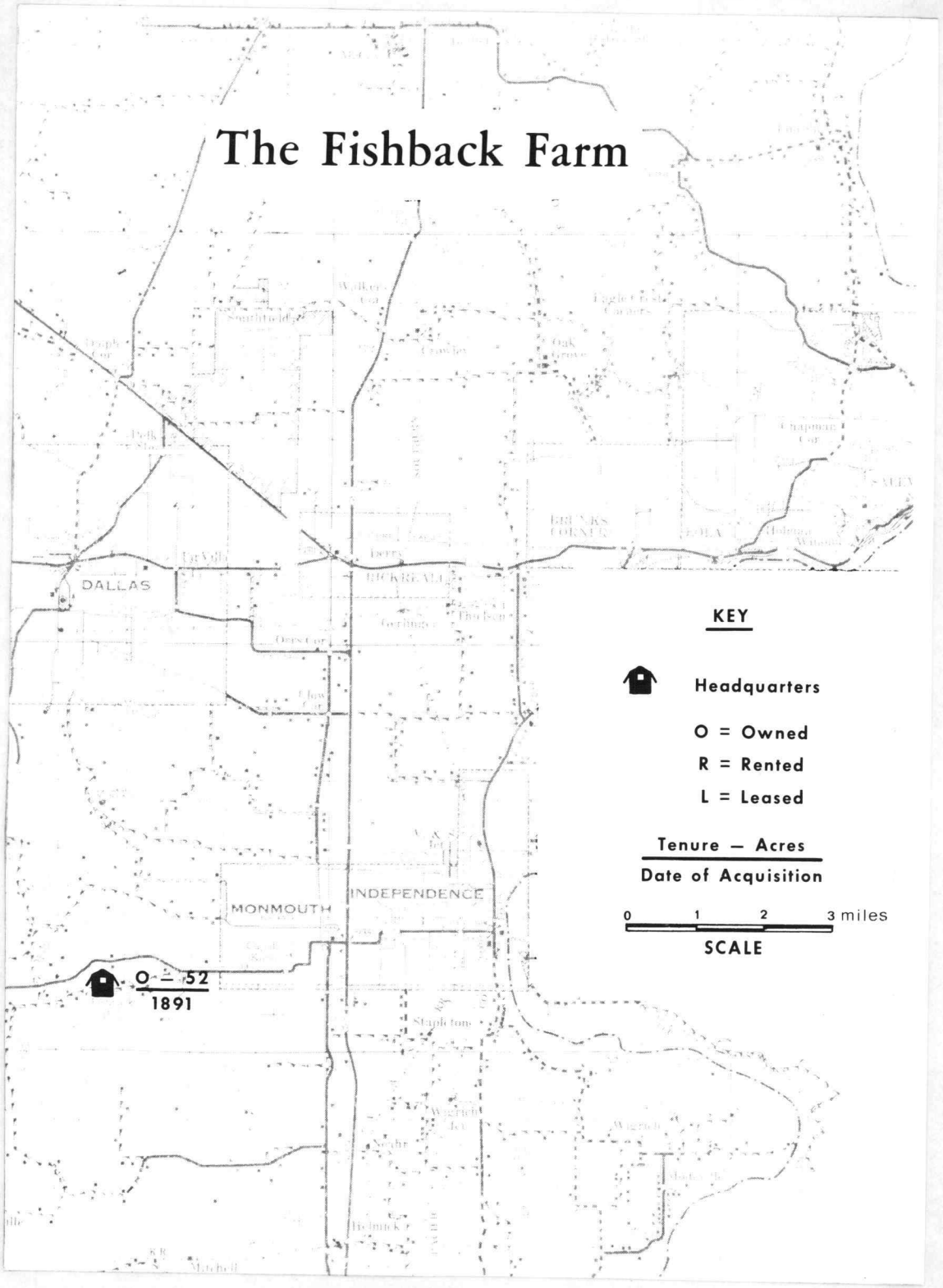

Figure 13
Source: Oregon, Dept. of Trans.

Approximately 30 acres of the farm is in brush and timber, about 15 acres is committed to pasture, and seven acres are planted to orchard. Of that, six acres are planted with cherry trees and one acre is committed to prunes.

Farm Equipment

Mr. Fishback owns three small gasoline tractors valued at a total of $15,000. His field preparation equipment is estimated to be worth $1,500 and includes a disk and spring tooth. He owns a spraying machine used on the orchard that he estimates to be worth $2,500. Mr. Fishback's light truck, used for farm and non-farm activities, is a 1974 one-half ton Chevrolet. He estimates this truck is worth $4,500. In total Mr. Fishback has approximately $23,500 invested in farm equipment. The replacement cost for this machinery would be around $30,000. It should be noted, however, that the operation does not require three tractors; two would be sufficient.

Buildings and Land Values

The buildings on the Fishback farm consist of one sheep barn worth approximately $10,000, one machine shed worth about $2,000, and fences valued at $4,000. In total, Mr. Fishback estimates that he has about $16,000 invested in buildings exclusive of his house.

The orchard land, including the trees, is estimated by the

author to be worth about $2,500 per acre, whereas the timber and pasture land would presently sell for about $1,200 per acre. If the land were subdivided, it would, of course, bring a higher price. In total, the land base presently is estimated to be worth $71,500 exclusive of buildings.

Farm Calendar

Mr. Fishback's farm calendar is relatively simple. Lambing begins around the first part of January and continues until the first of February. The cherry and prune trees are pruned and sprayed during February and fertilizer is applied.

From the end of February to the first of April, there is little work that must be accomplished, however, Mr. Fishback repairs his buildings and equipment during this time. Cultivation of the orchard is accomplished in the first two weeks of April. The process takes only a few days because of the small number of acres involved. Usually about 50 lambs are sold in April or May.

At the end of May or the first of June, the orchard is sprayed to eliminate disease and insect pests. This process is spread over approximately one week. The sheep are sheared around the first part of June by professionals and are sprayed to rid them of parasites.

In mid July, the cherries are picked by hand. If enough pickers can be found, this activity usually takes about one week. After the

crop has been picked, the orchard is cultivated.

Prunes are picked in September and hauled to the dryer. This process takes about one week. In October all the trees are sprayed with copper sulfate to control disease, and weed killer is applied to the orchard in November.

December is a slack month on the farm, and Mr. Fishback accomplishes building maintenance and machine repairs as they are needed. He also spends some time relaxing during this time of the year (Fishback, Feb., 1977).

Management

Mr. Fishback makes effective use of his orchard land but is not interested in utilizing other suitable parts of the farm for orchard production. Because he is retired and in his sixties, he sees little advantage in taking on more work. The farm represents his hobby more than a commercial establishment. He enjoys working with the animals and the trees, and appreciates the added income the farm provides. Primarily he farms the land because he likes country living and would continue to farm it even if farm proceeds only covered his costs.

The Fishback farm organizational strategy is not designed to provide a family with an adequate means of support and is not intended to maximize profits. Nevertheless, Mr. Fishback's orchard is highly

productive and the trees are meticulously maintained.

In the future, the land base may be broken into smaller parcels for a number of rural residences.

Conclusions

The organizational strategy of the Fishback farm could not be adapted successfully by a commercial farmer who hoped to support his family from the farm returns. To Mr. Fishback, the farm represents a retirement hobby and a way of life that he enjoys. Moreover, the land is steadily increasing in value so that Mr. Fishback is improving his financial condition without developing income that interferes with his social security payments. Beyond the economic considerations, this land has been in the Fishback family for three generations and therefore has sentimental value to Mr. Fishback.

The Griffin Rural Residence

Physical Characteristics

The 14 acre rural residence of Professor Paul Griffin is located on the south margin of Monmouth, Oregon. Professor Griffin's home and about an acre of his land are inside the city limits; the remainder of the property extends outside the city.

The nearly flat topography and the Willamette-Woodburn soils

of the property could be utilized for the production of a variety of crops. The parcel, however, is not large enough to be efficiently used for the production of most agricultural commodities.

The property is situated in an area of relatively rapid urbanization. To the north, south, and west of Professor Griffin's land, housing developments have occurred. Moreover, additional developments are expected in the near future (Figure 14).

Development

Professor Griffin came to the Willamette Valley in 1960 from Stanford, California, when he accepted an offer at Oregon College of Education to head the Department of Social Science. He desired to establish his residence in a rural environment. He purchased his 14-acre parcel of land in 1963 so that he could live close to his work and could also maintain horses and dogs for his wife and children. In order to gain the tax advantages of owning a farm, Professor Griffin purchased about 20 sheep to produce enough sales each year to qualify his holding as a farm. In this way part of his property taxes are deferred and he is able to write off depreciation on some of the buildings and fences against his income tax.

In 1975, Professor Griffin allowed his daughter to build a home on one-half acre of the land that is within the Monmouth city limits. The remainder of his land, exclusive of houses, remains in pasture

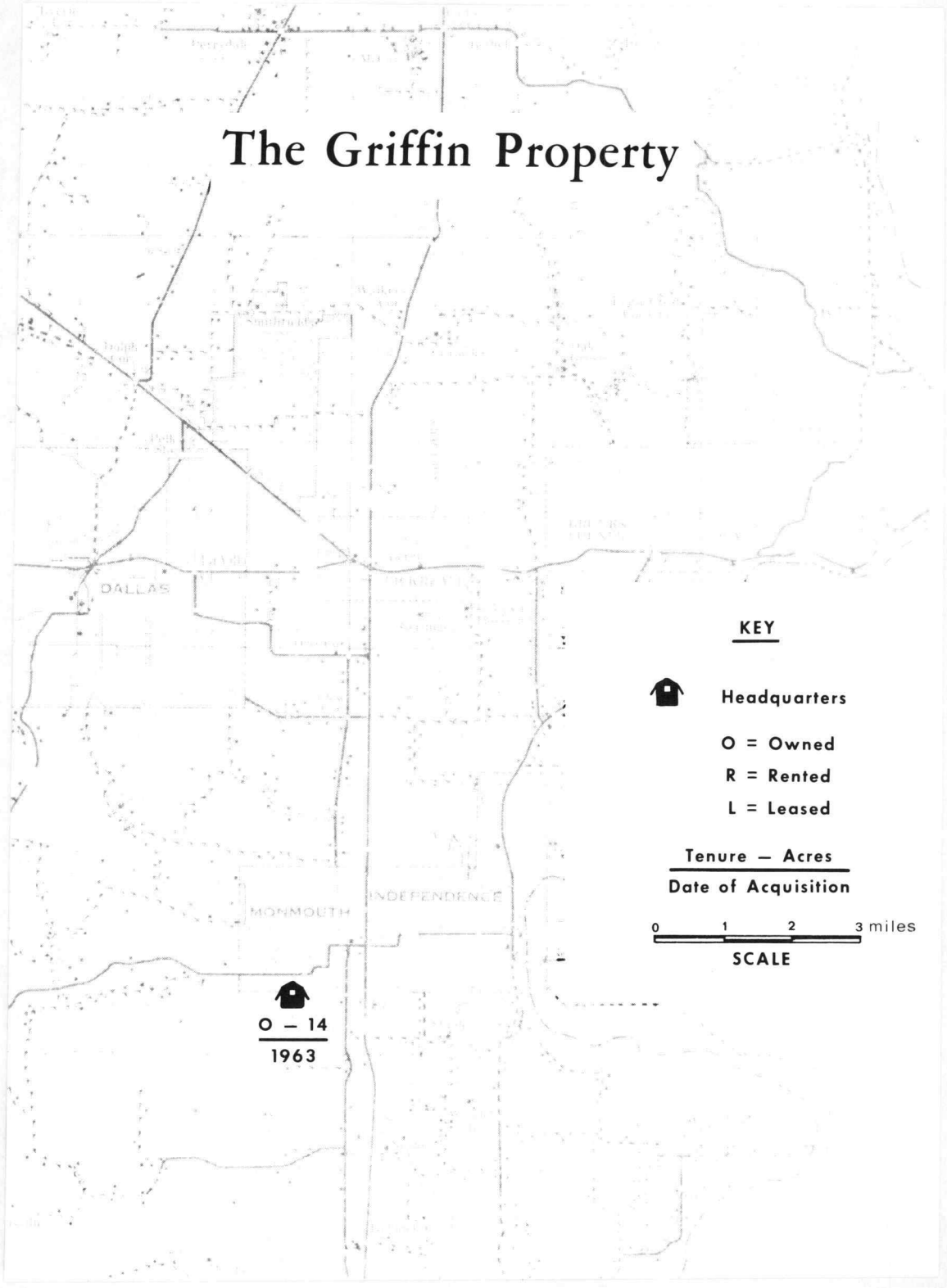

Figure 14
Source: Oregon, Dept. of Trans.

and is still considered as agricultural land for tax purposes.

Commodity Mix

Professor Griffin maintains a flock of 20 ewes and one ram from which he derives a small return in most years. The sheep keep the grass down on the 13 acres of pasture and produce 15 to 20 lambs for sale.

The Griffins (primarily Professor Griffin's daughter and wife) raise registered Golden Retriever dogs from which they derive relatively small income but which also serve to qualify the place as a business. The maintenance of facilities for the dogs are also tax deductible and can be depreciated. In all, the Griffins maintain 15 Golden Retrievers and sell the pups.

Professor Griffin's granddaughter has three ponies, one horse, and a goat which are also kept on the property as pets.

Equipment

With the exception of a small garden tiller, Professor Griffin has no farm equipment. When he needs any major cultivation accomplished, he hires someone to do the work.

Buildings and Land Values

There is one barn on the property utilized for storage valued at

$2,400, one shed for the sheep valued at $1,000, and a dog kennel valued at $11,000. The fences on the land are in poor repair and are worth no more than $1,000. In all, Professor Griffin has about $15,400 invested in buildings and fences, exclusive of houses.

The land base, which is probably worth less than $1,000 per acre as an agricultural resource, will be worth many times that amount when subdivided for housing. The sensitive nature of Professor Griffin's property tax status and the uncertainty of his future plans for the land make it difficult for him to discuss the value of his land base.

Farm Calendar

Very little farm work takes place on the Griffin property. The only period of active farm work is in January and February when the ewes are lambing. At this time, Mrs. Griffin watches the ewes for complications and provides assistance when needed.

Throughout the year, Professor Griffin works on building maintenance and fence repair when he has the time. He also occasionally pulls Tansy Ragwort from his pastures to retard spread to neighboring fields where cattle graze.

The dogs require daily attention and are handled by Professor Griffin's daughter and wife. Throughout the year Professor Griffin's daughter, Barbara, travels widely to dog shows and sales. Her

Golden Retrievers have won many prizes and bring premium prices when sold.

Management

Professor Griffin and his family do very little active management of their property. For them the land represents a private and attractive place in which to live. The associated tax advantages are helpful, but, according to the Griffins, are not large enough to make this their principal reason for owning the land.

Professor Griffin notes that if he were not actively involved in research, publishing, and the administration of the Department of Social Science at Oregon College of Education, he would optimize the use of his land by starting a nursery. He states, however, that he does not have the time, and operating a nursery does not appeal to his wife or children (Griffin, Feb., 1977).

Conclusions

Professor Griffin utilizes his 14-acre land base to enhance the comfort of his way of life and as an investment. He does not make optimal use of his land because he uses his time in more financially rewarding activities and because the land was not purchased for its yearly income potential.

When Professor Griffin purchased the land, he considered its

potential as an investment and was aware of the tax advantages he could derive. However, the most important reason for the purchasing of the land was that it made it possible for his family to have the pets they wanted, and it afforded him with the privacy and rural atmosphere he desired.

Case Study Conclusions

The case study farms serve to substantiate, with actual operational examples, the high level of variances in farm characteristics identified in Chapter Four. Whereas commercial farmers must work within the limits and possibilities associated with their land bases and present socio-economic conditions, each farm organization is reflective of the attitudes and personal preferences of the operator.

The range of possibilities for differences in spatial organizations is documented by the case studies. For example, some farms, such as the DeJong and Kampfer units, are contiguous while others such as the Nofziger, Wheeler, and Scharf units consist of several scattered parcels. With the exception of the DeJong farm, the full-time operators have adopted a strategy of enlargement; but they vary in their means of implementation. The Wheeler operation consists of large scattered parcels that have been purchased, whereas a major portion of the Nofziger farm consists of scattered parcels which are rented from a number of owners.

These studies bring out the dependency of modern, successful, commercial operators upon mechanization. They suggest that once the basic requirements are met noteworthy differences exist. For example, all operators who farm scattered parcels have noted an increased need for mobile equipment as a result. They differ markedly, however, in the ways in which they satisfy this requirement. For example, the Nofziger operation, which consists of about 1,500 acres of cultivated land, has an equipment inventory valued at approximately $535,000; this includes six new combines, five new tractors, one of which is a large four-wheel drive, one large Diesel truck, two smaller trucks, and six swathers. The Wheeler farm, which consists of 2,900 acres of which approximately 1,700 acres are under cultivation, has an equipment inventory valued at approximately $170, 000; this includes three combines, three tractors, one which is the smallest four-wheel drive model, three small farm trucks, and three swathers.

The case studies confirm the results stated in Chapter Four that the farming of scattered parcels introduces additional management complexities and increased production costs. Nevertheless, farmers approach these problems in different ways. Even a given farmer will vary his strategy from year to year depending upon his commodity mix. For example, Mr. Scharf plans to concentrate his commodity types to achieve efficiency in equipment use, however, his reaction to anticipated commodity prices may restrict this possibility.

CHAPTER VI

CONCLUSIONS

Organizational Strategy Changes

Significant changes have occurred in farm size and farm organizational strategies in the mid-Willamette Valley in the post World War II period. In the 1930's and 1940's the commercial production units were typified by small, diversified family farms which averaged about 140 acres. Today commercial farming in the area is characterized by relatively large, commercial units, averaging 545 acres, specializing in one or two commodities. A common second production component consists of small, part-time farms that average 173 acres and that are also specialized. In addition, there has been the development of an increasing number of rural residences that have a few acres of land; some have sufficient sales to rate farm status for tax purposes.

Farm Size Changes

Census data indicates that the average farm size in the study area increased steadily from the 1950's through 1969, but after 1969 decreased from 211 acres to 187 acres (United States Bureau of the Census, 1976). The results of the sample farm interviews, however,

indicate that full-time commercial operators have steadily expanded the areal extent of their farms since World War II. For example, the average sample grain farm in 1946 consisted of 298 acres, whereas, by 1976, the average sample grain farm consisted of 498 acres. Only orchard units, according to this study, have shown a substantial decrease in size in the past 30 years. There has been, however, a dramatic increase in the number of small livestock operations since 1946. Of the 280 farms in the sample, 117 were in operation in 1946; only three livestock units of less than 180 acres in size and one under 50 acres were in operation at that time. Presently, 90 of the sample farms are livestock operations of under 180 acres and 59 of these are under 50 acres. These farms are not generally competitive, efficient units; commonly they reflect the desires of their owner's for country living, land speculation, and the tax benefits often associated with small farms. Most of the owners of these small units work full time at non-farm occupations and spend only a small amount of their time farming. The large increase in these combination rural residence/part-time farm units explains the decrease in average farm size indicated by recent census data.

Means of Farm Size Changes

Renting and leasing of farm land are a common means of enlargement in the mid-Willamette Valley. The price of available farm

land often exceeds $1,000 per acre thereby making it difficult or impractical for most farmers to purchase the land they need to expand the areal extent of their operations. Approximately 43 percent of the land base controlled by sample farmers is rented or leased.

The competition among farmers for rental or lease land is keen. In some cases this process results in a price that places the winning farmer in a marginal profit-making position. Nevertheless, the economic pressures that are part of modern commercial agriculture force farmers to take risks and to pay premium prices for the use of land.

Farmers who rent large portions of their land bases incur an element of uncertainty as to the availability of the land in the future. Most modern landlords prefer to enter short term leases and to negotiate the price on a yearly basis. In consequence, some farmers are uncertain from year to year as to the size of their land base. One of the case study farmers, Mr. Leo Nofziger, noted that he spends considerable time each year locating suitable land to rent or lease, and that it is a source of constant anxiety to him and his sons (Nofziger, 1977).

The purchase of land as a means to farm expansion is generally undertaken by farmers who wish to speculate in farm land; they, for the most part, realize that the returns from farming the land will not usually justify the purchase price. These people expect land prices

to increase dramatically in the next few years. Well established farmers who have substantial capital available for investment are in the best position to purchase land. Part-time operators with substantial incomes from sources other than their farms are also in a good position to invest in land. Farmers operating closer to the margin, however, generally prefer to rent or lease the land they require.

Reasons for Farm Size Changes

Economies of scale represent the most pervasive reason given for farm size changes by sample farm operators. As the costs of farm equipment have increased and the capabilities of farm machinery have improved, it has become both necessary and possible for farmers to spread their costs over larger production units. While farm prices have not increased proportionally with operational costs over the past ten years, farmers have been able to increase their total returns by farming more acres and by achieving greater economies of scale. Failure to enlarge has placed many farmers in a position in which they are unable to operate at a profit.

Other important reasons for farm size changes noted by the sample farmers include the desire to raise a particular crop, inheritance, desire to speculate, need for water rights, and the closeness of available land to the headquarters farm. In general, however, most farmers increase the spatial component of their operations because

they believe that it will provide them with larger economic returns, and because they believe they could not maintain an efficient and competitive operation if they did otherwise.

Effects of Farm Size Changes

Farmers are somewhat reluctant to discuss the profits they make from their farms. Nevertheless, an analysis of answers to questions asked the sample farmers indicates that the primary effect of farm size changes is a more efficient and more prosperous operation. Certainly farming more land results in more labor, time, and capital requirements; but if these were the most pervasive results of increases in farm size, few would want to increase their land bases.

In general, it must be concluded that the spatial enlargement of most operations has resulted in increased efficiencies in the use of time, labor, management, and equipment. Moreover, most of those farm operators who have expanded to the greatest extent are presently in the strongest economic position to contend with the pressures of urbanization, low farm produce prices, and high operational costs.

Spatial Characteristics of Farm Size Changes

The pressures on farmers to enlarge their operations are strong. They often have no alternative but to purchase, rent, or lease land that

is considerable distance from their headquarters. Nearly 33 percent of the farmers in the sample reported that they farm land that is not contiguous to their headquarters. Of the large full-time operations examined in the case studies, only the DeJong and the Kampfer units have contiguous land bases.

Movement of farm equipment for considerable distances has become common in the mid-Willamette Valley, and farm machinery designs are changing to satisfy farmers' increasing demands for mobility. Large four-wheel drive tractors are replacing slower standard models and most field preparation equipment is not fitted with rubber tires.

Farmers are well aware of the costs in time, fuel, labor, and management associated with farming scattered plots. They feel, however, that the improved returns associated with larger land bases are worth the extra difficulties and expenses. All the case study farmers who operate scattered parcels noted that if they were to farm only their headquarter units, they could not continue to operate at a profit.

Some farmers move machinery as much as 25 miles; but when the distances are greatest, the parcels of land are also large. In general, the friction of distance is lessened with the larger size of the parcel, as the costs of the move can be spread over a greater production unit. Nevertheless, if given a choice, the sample and case study farmers would prefer to farm land close to their headquarters.

Farm Organization Strategies and Land Uses

Diversified Farms of the 1920's through the 1940's

In general, the small diversified farm operation of the period from the 1920's through the 1940's represented an efficient use of the land, given the economic conditions and technologies of the times (Blok, 1973, p. 83-101). Small dairies with grain, orchard, and poultry components not only provided their owners with year round employment and acceptable incomes, but also put the land base to a relatively intensive use. Most farmers of the diversification period attempted to obtain the highest yields from their fields and to utilize their land base to its fullest potential.

Modern Part-Time Farms

Although the size of many small part-time farm operations of the present is similar to the diversified farm units of the 1920's through the 1940's, the use of the land on these modern part-time farms appears to be less effective. Many of these small units are purchased as investments, rural residences, and hobbies rather than as commercial farms; and many of the small farm owners are invovled in full-time professions other than farming. Considerable land in the study area is not managed to produce at optimal capacity, and some prime farm land produces no agricultural commodities. A

significant amount of this land could be put to more productive uses, but the economic incentive is not present.

It is not known how many potentially productive acres in the Willamette Valley are left unused each year under the control of rural residents, speculators, developers, and estates. The loss in food and fiber to the state of Oregon is probably significant, and an investigation of this problem should be taken up in the future.

Large Commercial Farms

There is, in general, almost total use of the land base on large commercial farms. Seldom is there evidence of land that is left to non-productive uses. In some cases, this desire to maximize the use of the land has resulted in the removal of fence rows and hedge rows to make larger fields to accommodate large equipment. In general, sample and case study farmers are informed and concerned about maintaining the condition of their soil and give careful consideration to the problems of soil erosion, soil depletion, and workability. When wheat prices are high, however, most grain farmers feel they must plant wheat on the same fields for several years to maximize profits. They argue that prices always fall after a few years, and therefore, they must maximize profits when they can. They reason that when prices are down, they can take the time to rebuild their soil by planting legumes, such as crimson clover.

Whereas most farmers are concerned with maintaining the productivity of their land base, they are less motivated to maintain the aesthetic qualities of their farms. Although some operators, such as the Kampfers, are particularly interested in protecting the beauty of the rural scene, the majority of the sample and case study farmers, while not taking the destruction of natural beauty lightly, clear land and modify landscapes as needed to enhance their profits. In this regard, part-time farmers generally appear to be as concerned with the aesthetic qualities as they are with the productive capabilities of their farms.

For the most part, modern commercial farmers in the study area make effective use of their land bases and are oriented toward optimization of output. Because these farmers are astute businessmen, they realize their wealth and hopes for a prosperous future is in the land. This provides a motivation which enhances their efforts in their role as custodians.

Concluding Remarks

In the post World War II period the mid-Willamette Valley has been in a stage of transition. It has been steadily and relentlessly changing from a rural area dominated by small family farm units to a relatively heavily urbanized area with attending suburban sprawl, rural residences, small acreages, hobby or part-time farms, and

relatively few very large commercial farm units. If the present trend continues, the commercial farm units of 200 or 300 acres will have nearly vanished by the turn of the century; and the only viable farms will consist of large specialized units of 2,000 to 3,000 acres.

Renting and leasing are increasing in importance and are likely to continue to be prevalent for the next twenty years; but as the present owners pass their lands on to their heirs, the future is uncertain. Farmers who presently rely heavily on rented or leased land may eventually find themselves in a precarious position because the next generation of landowners may not want to continue renting or leasing the land to farmers.

Some individuals are concerned that large corporate farms will take over agriculture in the study area. While a large number of closely held family corporations presently exist in the mid-Willamette Valley, only two percent of the study area farms are owned by agribusiness corporations. Therefore, it is more likely that large family owned farm units will dominate mid-Willamette Valley commercial agriculture in the near future.

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APPENDICES

APPENDIX I

QUESTIONNAIRE

"Hello, I'm _____working on a farm survey for Oregon State University and I would like to ask you a few questions, if you don't mind. You were chosen for this survey at random and you are an important part of our cross-section. Since we want our studies to be accurate and useful, your participation is very important. All the information you provide will be strictly confidential and the results are tabulated for the area as a whole, not for any one person. If you have any questions about our study other than what I can tell you, we would be happy to have you call Dr. Richard Highsmith at Oregon State University."

INTERVIEWER: BEFORE CONTINUING FURTHER, ASK IF THE RESPONDENT IS THE OPERATOR OF A COMMERCIAL FARM. ASK IF THE FARM IS ACTIVELY ENGAGED IN PRODUCING SOME FARM PRODUCE FOR THE MARKET. IF YES, CONTINUE INTERVIEW. IF NO, USE SHORT INTERVIEW FORM.

---

1. _____ How many years have you yourself lived in Oregon?
   Years
2. _____ and, how many years have you farmed in Oregon?
   Years
3. _____ How many years have you farmed this farm operation?
   Years
4. (Circle) Is your farm family owned?
   2 Yes (Skip to 5)
   1 No (Skip to 6)
   9 Don't know, NA
5. _____ How many years has this farm been in your family?
   Years (if applicable)
6. How is the farm owned then?

   Can you think of anything else that might be helpful?
7. _____ How many acres of land do you farm (operate)?
   Acres
8. _____ How many acres of land do you own?
   Acres
9. _____ How many acres do you lease? (EXPLAIN THIS IS BASED ON SPLITTING PROFITS)
   Acres To or From (Circle one)
10. _____ How many acres do you rent? (EXPLAIN THIS IS A SET FEE) To or From (Circle
    Acres one)

---

11. (Acres) How many acres of land do you have committed to growing:
    _____ grains
    _____ grasses
    _____ pasture
    _____ livestock production
    _____ orchard
    _____ vegetables
    _____ other (specify: _____)

---

12. (INTERVIEWER: FOR THIS QUESTION USE THE MAPS PROVIDED. BY USING THE FOLLOWING QUESTION YOU ARE TO DETERMINE THE LOCATION OF THE FARMER'S FIELDS INCLUDING THOSE HE OWNS, LEASES OR RENTS AND MARK IT ON THE MAP WITH THE FOLLOWING CODE. INTERVIEW NUMBER, ACRES, O = OWNED, L = LEASED, S = SOLD, AND R = RENTED. UNDER THAT PUT THE DATE HE ACQUIRED ACCESS TO THE LAND OR GAVE UP ACCESS TO IT. FOR EXAMPLE,

    $1 \frac{0 - 150}{1952}$ or $10 \frac{L - 10}{1946}$ or $1 \frac{S - 150}{1973}$

    "Here is a map of this area. Would you please point out the changes you have made since 1946 in the fields you rent, lease or own, provide the approximate year when you or your family first made these changes and state the numbers of acres in each parcel."

    (MARK THIS INFORMATION ON THE MAP WITH THE CODE EXPLAINED ABOVE. IF SOME OF THE LAND IS OUTSIDE THE STUDY AREA DON'T TRY TO RECORD IT ON THE MAPS. ALSO MARK CHANGES AND REASONS ON QUESTIONNAIRE. START WITH CHANGES IN CHRONOLOGICAL ORDER SINCE 1946).

---

13. What reason or reasons did you have for making this change? First change: _____ (Year) Reasons:

    Can you think of anything else that might be helpful?

- -

13a. and in what way or ways did this change effect your operation--just what result did this change have? Effect:

    Can you think of anything else that might be helpful?

---

14. Same question as 13 Second change _____ (Year) Reasons:

    Can you think of anything else that might be helpful?

- -

14a. Same as question 13a Effect:

    Can you think of anything else that might be helpful?

---

15. Same as question 13 Third change _____ (Year) Reasons:

    Can you think of anything else that might be helpful?

- -

15a. Same as question 13a Effect:

    Can you think of anything else that might be helpful?

---

16. Same as question 13 Fourth change ____ Year Reasons:

Can you think of anything else that might be helpful?

16a. Same as question 13a Effect:

Can you think of anything else that might be helpful?

17. Same question as 13 Fifth change ____ Year Reasons:

Can you think of anything else that might be helpful?

17a. Same as question 13a Effect:

Can you think of anything else that might be helpful?

More changes if necessary; use format as above

18. _____ Acres Of the total acres that you farm, either owned, leased or rented, about how many acres are not joined to the headquarters farm?

19. _____ Miles If you farm scatter plots, at what distance is the furthest parcel of land from your headquarters? About how many miles?

20. (ASK ONLY IF RESPONDENT FARMED LAND NOT JOINED TO THE HOME PLACE)

Thinking now about the land you farm that is not joined to your home place, what effects have farming fragmented parcels of land had on your overall operation?

Can you think of anything else that might be helpful?

Now, a few questions about you--

21. _____ Grade Would you mind telling me the last grade you completed in school?

22. (Circle) Are you presently working for pay off the farm?
2 Yes (Ask 22a and 22b)
1 No (Skip to 23)
9 Don't know

22a. _____ Type What type of work do you do?

22b. _____ Percentage About what percentage of your income comes from other than farm work?

23. _____ Age May I ask your approximate age?

I hereby certify that this interview represents a true and accurate account of the contact.

Date Interviewer's signature (required) Respondent's phone (required)

APPENDIX II

LETTERS OF AUTHORIZATION

Letter of Authorization

I hereby acknowledge that I granted George A. Van Otten an interview in February, 1977, during which the size, evolution, and organizational characteristics of my farm operation were discussed. He has my permission to use the interview information, to describe my farm operation, and to use my name in his dissertation which is being completed at Oregon State University in partial fulfillment of the requirements for the degree of Doctor of Philosophy.

Date 6/10/77

Name RICHARD DE JONG

Signature Redacted for Privacy

Letter of Authorization

I hereby acknowledge that I granted George A. Van Otten an interview in February, 1977, during which the size, evolution, and organizational characteristics of my farm operation were discussed. He has my permission to use the interview information, to describe my farm operation, and to use my name in his dissertation which is being completed at Oregon State University in partial fulfillment of the requirements for the degree of Doctor of Philosophy.

Date 6/10/77

Name Leo Noetzliger

Signature Redacted for Privacy

Letter of Authorization

I hereby acknowledge that I granted George A. Van Otten an interview in February, 1977, during which the size, evolution, and organizational characteristics of my farm operation were discussed. He has my permission to use the interview information, to describe my farm operation, and to use my name in his dissertation which is being completed at Oregon State University in partial fulfillment of the requirements for the degree of Doctor of Philosophy.

Date 6/8/77

Name John E Scharf

Signature Redacted for Privacy

Letter of Authorization

I hereby acknowledge that I granted George A. Van Otten an interview in February, 1977, during which the size, evolution, and organizational characteristics of my farm operation were discussed. He has my permission to use the interview information, to describe my farm operation, and to use my name in his dissertation which is being completed at Oregon State University in partial fulfillment of the requirements for the degree of Doctor of Philosophy.

Date 6/10/77

Name ALFRED WHEELER

Signature Redacted for Privacy

Letter of Authorization

I hereby acknowledge that I granted George A. Van Otten an interview in February, 1977, during which the size, evolution, and organizational characteristics of my farm operation were discussed. He has my permission to use the interview information, to describe my farm operation, and to use my name in his dissertation which is being completed at Oregon State University in partial fulfillment of the requirements for the degree of Doctor of Philosophy.

Date 6/10/77

Name IRWIN M. RAMPFER

Signature Redacted for Privacy

Letter of Authorization

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Date 5/8/77

Name ARTHUR E. OHLING

Redacted for Privacy

Signature _____

Letter of Authorization

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Date 6-11-77

Name Elton Fishback

Signature Redacted for Privacy

Letter of Authorization

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Date June 10, 1977

Name Paul F. Griffin

Signature Redacted for Privacy