FACTORS AFFECTING RURAL LAND VALUE

by

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APPENDIX

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FACTORS AFFECTING RURAL LAND VALUE

ABSTRACT. The value per-acre and annual amortization of rural land varies dynamically by parcel size. There are several adjustment factors or independent variables spatial, productive and development potential which affect the market value of all rural land. The evaluation of these must be accomplished by parcel size to be realistically equated. All variables or adjustment factors interact to comprise market value per-acre.. It is important to have a clear understanding of the extent variables interact to know the actual value attributed to each. With this knowledge the adjustment factor to stress for a particular size property becomes obvious. Between property size categories trends establishd by important variables further understanding. The increase of a single acre on a small rural homesite makes a large difference in the total per-acre value. A parcel's location in respect to communities and population density are important value factors. This is true for any size property, particularly the rural residence. Soil productivity potential becomes important on parcels 11 to 20 acres in size. Soil is of prime consideration in evaluation properties of 61 acres and larger. The date of sale, reflecting amortization, is a major factor when evaluating rural land. Large equitable farms are an exception where amortization plays a lessor roal in evaluation with soil and location the key factors. The rural land market establishes the importance

of each variable associated with per-acre value for all size property. Given the value and relationship of important adjustment factors, an intellegent appraisal of market value can be made on any size parcel.

INTRODUCTION

The interest in agricultural land as an investment has increased over the 1972 to 1977 period. This lucrative investment has ranged in yearly amortization from 24.3 percent on Iowa farm land to a low of 6.3% in Navada.[1] During this same period the farm land in Oregon had a compounded value growth rate of 8.9% annually. This ranked Oregon's farm land 45th as an investment in the 48 states. The average per-acre value of land in Oregon was $288 in 1977 compared to first ranked New Jersey's $2,051.[2] From observation and study of this sector in Linn and Benton County, it was concluded that the average per-acre value of farm land in Oregon appeared low. This posed the question of why per-acre values and annual amortization vary so significantly from one area to another.

There are definite geographical and demographic factors which affect the Linn/Benton County Region's rural land market. In the two counties approximately 782,069 acres (41%) are considered cultivatable land. This is identified as Soil Conservation Service, Soil Class I through IV. Roughly one half of this land is under cultivation. The remainder is classed forest, pasture, urban uses or rural residental. The majority of cultivatable land is in the fertile alluvial river valleys. Nearly 607,450 acres (78%) is located in the lowlands of Linn County. The most important crop is grass seed; 60% of that grown in the Willamette Valley is produced in this two county region. The other important crops raised are small grains, hay, fruits, vegtables, nursery products and Peppermint.[3]

Agriculture in Linn County accounted for 5.6% of all personal income in 1975. This amounted to 17.2 million dollars of a 317.7 million dollar total. In Benton County the agricultural sector accounted for 2.6% of the personal income. This represented 4.9 million dollars of a 190 million dollar total in 1975.[4] In 1976 there were 1,785 and 925 people employed directly by agriculture in Linn and Benton County respectively. It is projected that through 1990 these figures in both counties will remain the same.[5]

The data suggests that there are factors affecting the local two county region's land market other than agricultural production. Local population growth in this region denotes a 3% gain between 1975 and 1976. Projection of population growth using data from the first six months of 1978 depicts a 6% increase. It has been predicted that the region will grow 2.74% yearly through 1990 to reach 206,220 in population. Persons per household are expected to decline from 3.15 in Linn County and 2.94 in Benton County, 1970 estimates, to 2.64 and 2.46 respectivly by 1990.[6] Both population growth and reduction in the number of persons per home increase the demand for rural land. This is reflected in the popular rural residence, parcels zoned for future development and all rural/ agricultural land. (See Appendix I.)

To establish the affects scarsity, demand, size and speculation have on per-acre market value an analysis of 310 recent sales was conducted. The attempt was made to look at sales in: 1975, 1976, 1977 and 1978. To obtain a sample of larger, seldom transacted parcels, it was necessary to use data from 1974. Statistical methodology was used to determine the influence of important independent variables on the dependent variable, value per-acre. All sales data was collected and analyzed by size category. The terms rural land and agricultural land are used interchangablly. It is known that all sales employed have some agricultural or grazing potential.

OBJECTIVES

The objective of this research is to explain important variables or adjustment factors that make up value per-acre in the rural land market. The prime concerm of the research is to fully understand the size adjustment factor. This factor adjusts how the total acreage of an undivided parcel affects per-acre market value. The influence of size on per-acre value is determined by using other important variables as indicatores. The attempt was not made to evaluate all rural land market value components. Insteas, using distinct property size categories determination was made regarding four or five important variables that influence the per-acre value. The importance of size adjustment was established by the relationship and contrast of independent variables to value per-acre, the dependent variable..

The significance of size adjustment as a variable is especially important is areas influenced by nonagricultural demand for small rural land tracts. This includes hobby farms, rural residences and investment property.[7] Such land use occupies approximately 50% of all cultivatable acreage in Linn and Benton County. There are directly related agricultural economic aspects which link farm size and value per-acre. Differences in farm size affects the total net income through changes in margin per unit and volume of output. As farm size is increased the ratio of gross to net income improves. This is established for record in years both environmentally and economically favorable. While frequently a defined downward net income trend is evident in unfavorable years.[8] The interaction of all variables associated with property size adjustment makes its understanding imparitive to rural land evaluation.

Rural land investment is more capital intensive than prehaps any other real estate transaction. The rate of return acceptable to any investor is complicated by the consideration of risk, burden of management, degree of liquidity and personal preference. An adjustment for risk is an increment added to a base or safe rate. This is to compensate for the extent of risk believed to be involved in the use of a capital sum.[9] The natural environment plus supply and demand factors in all sectors of the economy comprise the risk rate associated with rural land investment. The aspect of risk in both rural building sites and equitable farm real estate makes the size adjustment factor a principal value consideration. This research will explain the significance of rural property size on per-acre value. This will be accomplished through the association and actual valuation of other important independent variables. The mixed demand for agricultural land and rural homesites in this two County regional market is typical of most of Western Oregon.

PREVIOUS STUDIES

Prior to the description of the methodology employed in this study some similar research will be explained. G.C. Hass did early work which through the use of a multiple regression equation evaluated variables that influence land prices. He conducted a survey in Minnesota using 160 farm sales which accured between 1916 to 1919. The independent variables chosen as influencing land prices were: value of buildings per-acre, type of land, crop yields, distance from market, size of adjacent city and type of road upon which the farm was located. He established a correlation coefficient of .81 to demonstrate 81% of the value associated with the sales was found in the chosen variables. In 1925 H.A. Wallace attempted to estimate the influence of a limited number of independent variables on land value per-acre for 99 Counties in Iowa. He employed four factor variables: 10-year average corn yield per-acre, percent of land in corn, percent of land in small grain, and percent of land not plowable. The multiple correlation coefficient obtained was .9166. He concluded saying, "The writer dose not care to defend this formula as the last word in scientific accuracy."[10]

More recently M.M.A. Ahmed and L.A. Parcher conducted a study using 46 sales of unimproved farm land between 1960 and 1962 in Woods County, Oklahoma. The four independent variables selected were: number of acres, productivity, population of nearest town, and distance to principal city in miles. The coefficient squared produced was 81%, to demonstrate the variation in values explained by the four variables. In conclusion these authors stated, "The real estate appraiser must utilize his own knowledge in making the necessary adjustments for attaining the ultimate value of land." In 1967 F. Abdel-Badie and L.A. Parcher published Regression and Discriminant Analyses of Agricultural Land Prices. In this team research conducted for Oklahoma State University, 293 bona fide land sales were employed in a 10 County area. They selected 15 variables as determinants of value. These were: number of acres, quality of land, type of land, productivity index, mineral rights conveyed, road type, distance to paved road, distance to nearest town, population of nearest town, distance to nearest town of at least 1,500, distance to community of at least 50,000, distance to Oklahoma City, and acres in wheat, cotton or peanut allotments. The correlation coefficient squared in regression analysis was .51. These variables only indicated half the value associated with the sales slected. Of the 15 variables seven appeared to be the most significant: size in acres, quality and type of land, productivity index, mineral rights, distance to Oklahoma city and wheat allotments.[11]

It was noted in the best sources found that one major limitation prevailed using the statistical approach to land evaluation. That was, the multiple regression model required more independent variables or factors that affected land value than could be included in the equation. The statistical approach could explain about three fourth of the variation in values. It was suggested that when an extremely large coefficient was developed that the sales employed had a high degree of similarity in both pruchase motive and use. It was further disclosed that coefficients over 75% were obtained with a limited number of sales having a homogeneous agricultural use. Such data would be difficult to obtain locally without the use of well organized parcel size categories.

There was a study conducted in Oregon which utilized comparison. The author used multiple linear regression models to analyze the influence of particular property characteristics on sale price per-acre. Three distinct areas of Oregon were chosen to establish the significance of per-acre value coefficients. The regions of contrast were Marion County, as a region of urban influence, Douglas County an area of rural residential and recreation and Northcentral Oregon's dry land grain areas of Sherman, Gilliam, and Morrow Counties. The same independent variables were used in all three areas. These were: year of sale, number of acres, miles to nearest paved road, miles to nearest town of 1,000 and landlord net real estate income. The dependent variable was real estate sales price per-acre which included associated improvement values. All data was obtained from the local County Assessor's Office. The multiple linear regression correlation coefficient values, R^2 value totals, produced were 51.82% in Marion County, 79.60% in Douglas County, and 69.04% in the grain area.[12] It was unexpected to compute such a high coefficient explaination of per-acre value by the model in Douglas County. The relatively low R^2 value in Marion County indicated that the independent variables used were not of enough detail to evaluate extensive urban influence. What the author established differs from size adjustment significance considerably. The comparative aspect is similar and he deals with coefficients produced from Oregon sales. He used a mean parcel size which differed by region and expressed a decrease in price per-acre from the mean. He employed a limited number of sales and the sample size differed by area considerably.

THE INDEPENDENT VARIABLES

To quantify variables of value established by the rural land market the per-acre value of 310 sales were obtained. From these sales important independent variables or adjustment factors were denoted. These variables were used in different linear regression models in a combination of ways to determine their affect on the dependent variable, per-acre market value. Data was collected in nine size categories from the Department of Veteran's Affairs Farm Sales Data Sheets.[13] On each a per-acre land value by S.C.S. Soil Productivity Site Class was factored. An improvement value and one acre homesite value was also determined. (See AppendixII.) For the purpose of this study both improvement and homesite value were ignored. Only the rural land value per-acre by soil class was tabulated.

Such D.V.A. sales data is used to varify approximately 25% of the farms financed in the State annually. In 1977 this represented 103 farms in Linn County which required 5.541 million dollars in loan money. In Benton County during the same period 26 farms were financed to total 1.568 million dollars.[14] There are no records kept for the State or Benton and Linn Count y on the actual number of farms sold yearly. It was learned from the Benton County statistician that approximately 2,500 properties of all types transacted here in 1978. This makes it impossible to establish the actual statistical population of farm sales yearly. The sales kept in the D.V.A. active files are "arms length" transactions.

This means, between an informed and willing buyer and seller denoting true market value. Many of these sales were used more than once to establish value estimates for loan purposes. These sales comprise the best data of this type available. A good percentage of all recent larger farm transactions in the Linn/Benton County Region are included in this sales data information.

Zoning as an Independent Variable

The zoning imposed on the rural land in the study area has an affect on per-acre value. Real Estate is purchased with the development potential zoning provides as an important consideration. The land market is primarily concerned with buildable lot size requirements, standards of application and farm use property tax relief. It is possible that a zoning change could increase the development potential. However, if considerable speculation were associated with any sale it could not be used as a comparable. An Appraiser is bound by the courts, which hold that projected highest and best use should not be "Remote, speculative or conjectural."[15]

Benton County's Zoning Ordinance was adopted in 1974. On all of the sales used in Benton County four zones reaccured: Urban Residential District, Rural Residential District, Exclusive Farm Use and Agricultural Forestry District. Urban Residential (RU) places varying densities on rural land parcels. The density is subject to availability of urban services, land capabilities, use compatibility and consistency with the adopted Comprehensive Plan. Minimum lot size requirements range from

10,000 square feet through on-half acre, one acre, two acre, three acre and five acre. Each of these densities allow only one single family dwelling per lot. The Rural Residential District (RR) has the same standards of application as (RU.) The minimum lot size requirements for a single family dwelling are RR-1 acre, RR-2, RR-3, RR-5 and RR-10 acre. A majority of property zoned Rural Residential District has a five acre minimum. This zone allows one single family dwelling, one two family dewlling or one mobile home per lot.[16]

Exclusive Farm Use District (EFU) in Benton County provides a minimum lot size of 40 acres. The zone (EFU) attempts to minimize potential erosion, pollution, conflicting land use and further depletion of agricultural land resources. It also provides automatic form use property taxation assessment for farms which qualify under ORS 308 provisions. No more than three dwelling units or mobile homes are allowed for use by the owner, his family or farm employees. Agricultural and Forestry District (AF) is intended for rural areas having natural resource value directly beneficial to agriculture or forestry. This district allows one single family dwelling per 20 acres with provisions for additional farm structures.[17]

The Linn County Zoning Ordinance was adopted in March of 1972 and amended in January 1977. There are only two zoning classifications associated with the sales obtained in Linn County: Agricultural, Residential and Timber Use District and Exclusive Farm Use District. The Agricultural, Residential and Timber Use District (ART) is intended to provide areas for rural residential and recreation with the continuation of agriculture, forestry and resource utilization. It is often applied to areas where land division activities have begun a transition from resource use to rural residential. The minimum lot size requirements are two, three, four, and five acre. Two single family dwellings or one single family dwelling and one mobile home or one duplex per four acre lot are allowed. If the lot is under four acres only one single family dwelling or one mobile home or one duplex maybe constructed. The Exclusive Farm Use District (EFU) allow's one single family dwelling or mobile home on 40 acres or more. It provides farm use property tax assessment under ORS 308. Through (EFU) preservation of land well suited for farming is guaranteed.[18] The development potential associated with all rural zoning in both Counties is limited by septic approvel. When it was known that septic approvel had been denied the sale was deleted from the data sample.

Land Capability Classification as an Independent Variable

Soil capability classes were used to show the difference per-acre in market value for productivity potential.. Each soil land class is given a dollar value per-acre. Soil management capability units and subclasses concerning slope or seasonal drainage problems are considered before a per-acre value is made. This study contains the general I through VII capability groupings, there is no class VIII evaluated. Class I lands have few limitations that restrict their use. Class II lands have some moderate limitations that reduce choice of plants or require conservation practices. Class III lands have severe limitations that reduce plant choice and require conservation practices. Class IV land requires careful management and have severe limitations to plant slection. Class V land is not likely to erode but has limitations. This land is commonly used as pasture or range, woodland or wildlife areas. Class VI lands have severe limitations. They are generally unsuited for cultivation and have simular uses as class V. Class VII lands have severe limitations with pasture, range, woodland and wildlife habitate the only uses. Class VIII land has no commercial plant use.[19] The per-acre value of these land classes differ due to scarcity, demand and regional climatic limitations. Further critera of their individual per-acre value considers parcel size and spatial location.

Spatial Location and Density

The proximity of rural land to urban density is parhaps the most obvious single variable affecting per-acre value with the exception of parcel size. In this study there are five general categories of community influence. In the fifth category communities in both Linn and Benton County were given identification numbers. This was to distinguish their population by year so a simple gravity model could be employed. No separate measurement of miles or population takes into account the influence of the size of a community as well as distance to a specific property.[20] Distance in miles was individually measured from each sale to the nearest community. When a sale was located equally between communities a judgment was made as to which influenced the property's market potential the most. If the local transportation network was adequate the distance was recorded in a straight line to the significant community. When the property was off a surfaced road or topographic location made access difficult an additional distance consideration was made. The communities in the fifth category demonstrate a wide range in population. (See Appendix I.) It was discovered that the land values near these towns were similar.

Category-1:	Corvallis/Philomath	5: Harrisburg (6)
2:	Albany	5: Brownsvill (7)
3:	Monroe	5: Halsey (8)
4:	Lebanon	5: Lyons (9)
5:	Sweet Home	5: Scio (10)
		5: Alsea (11)

The market influence affecting the value per-acre was similar near Corvallis and Philomath, so they were placed in one category. For population gravity influence only the population of Corvallis was used. Gravity potential was determined by the population of a community at the time of sale divided by miles to the property sold. Monroe is in its own category not due to population but land value. The other towns seperately categorized or grouped demonstrate significant land market influence to distinguish per-acre value trends.

The relationship of urban influence to property value was further established through application of a density factor to each sale. The five categories were: urban, suburban, semi suburban, semi rural and rural. This was accomplished by the use of recent topographic maps in conjunction with aerial photos. Each sale was placed by square mile section into one of the five density categories. In areas of transition where questions of judgement became apparent the selling price was a guidline. Most property in the study was located in rural or semi rural areas and could be visually distinguished.

METHODOLOGY

The 310 rural property sales obtained from the D.V.A. were segrigated into nine size categories that denote the local land market's relationship between size and price per-acre. These categories are subject to variability considering a specific regions's productivity potential, crop limitation and marketability. Trends which were reflected in the sales price per-acre denote the general categories. Each sale was placed in one of the nine categories according to total acres of farm land or pasturage. Ground devoted to homesite or other structural improvements was deleted from the total acres and the market value sales price. Any irrigation equipment, drain tile, timber or crops adding value to the land was seperately denoted.

The variables or adjustment factors chosen as having the most affect on per-acre land value have been generally described. The significance of each as an independent variable is established by size category and for the total sample. The comparative R^2 difference denotes which variables affect a size category the most and how much. As was demonstrated by the examples of similar research there are more variables affecting land value than can be included. Those chosen for this study were felt to have a majority of the impact on sales price locally. All interact in their affect upon the dependent variable, value per-acre. With a data sample of this size it is necessary to employ computerized multiple regression. Several linear regression models were created using the same independent variables in different perspectives to establish their relationship to value per-acre. As the statistical proceedure is explained the application of each independent variable also is outlined as used in a particular regression model.

The date of sale denotes amortization. It reflects the value increase associated with scarcity, demand and devaluation or increased purchasing power of the dollar. Date is the prime indicator of most economic trends in any region or sector. For computer input each date was given a number by month. This started with January 1974, as number one, and with discrete progression continued through number 56, July 1978. The date was rounded to the closest month, numbered and applied to each sale in the appropriate size category. The total acres of each sale were rounded to hundrediths and assigned an average soil capability class and per-acre value. The total acres of each sale had been broken into soil capability classes by an Appraiser. The value per-acre was recorded for each land class and the number of acres in a particular sale so evaluated.

The level of urban density was judged denoting land use intensity near each sale and give one of five general categories as noted earlier. In the two county region near where sales were located there are 10 incorporated communities and one unincorporated community. Each community was given a specific number and its population at the time of sale denoted. The miles to every community were measured in a straight distance from each sale. If the access to a particular sale was difficult an extra mile was added for adjustment. There were no sales beyond 13 miles from atleast one of the communities. In both counties the zoning was generalized to denote buildable lot size categories. From 10,000 square feet minimum to one acre was given the value of one, two to five minimum - five, six to 10 acre - 10, 11 to 20 acre - 20, and 21 to 40 acre - 40. An additional value code described 10,000 square feet buildable lots, two acre buildable parcels, view property, small unbuildable parcels, irrigated and drain tiled land. These anomalies were categorized and if particularly high values per-acre were reflected they were dropped from the data sample.

Generation of General Data

The mean per-acre value was factored by size category for each year of study. Also generated with the same run was the standard deviation, variance and number of sales by year for every size category. This out-put was obtained using the "Statistical Package for the Social Sciences." This was version .07 of S.P.S.S. developed by the Vogelback Computing Center of Northwestern University and dated June 27, 1977. This version of S.P.S.S. was used for all computerized investigation with the exception of a final multiple linear regression model.

A computer run was generated which developed the mean value per-acre for each of the five densities by size category. In conjunction a run produced a mean per-acre value by density which showed directly the size categories in each density. The first four community categories and the fifth group of smaller towns were used to develop a mean value per-acre by by mileage distance from each community. With this general information about the date sample the exploration of independent variable relationship to value per-acre followed. (See Appendix XI.)

First Multiple Regression Input

This model was designed to explain by size category the interaction and relationship of important independent variables to the dependent, value per-acre. The larger R^2 value produced by an independent variable the more influence it had on the dependent. The total R^2 value denotes the importance demonstrated by the independent variables in order of importance. This is a percentage relationship to the dependent variable. Each independent variable appears in relationship to the dependent and the independent variables that preceded it. When a change in R^2 is higher than the preceding change it demonstrates that until the preceding independent variable was in the equation that variable was of less importance. This model employs the stepwise linear regression equation of version .07, S.P.S.S. All the multiple regression models develope R^2 value relationships and totals as described.

This regression run was designed to establish the most important independent variable interaction by size category. The independent variables used in this phase were given the following power and interaction relationship:

Acreage	Date^2	Acreage X Zone
Date	Miles^2	Date X Miles
Miles	Zone^2	Date X Zone
Zone	Acreage X Date	Miles X Zone
Acreage^2	Acreage X Miles	

It did not produce R^2 values clear for the understanding of size category independent variable relationships. The acreage breakdown by soil land class was used to include the indicator variable of soil capibility class. The regression equation could not handle this indicator with all the above independent variables. Soil class was regressed only with date as an independent variable and value per-acre the dependent variable. Though each soil class produced a R^2 value the total, only, should be viewed as an indicator rather than as a percentage of the dependent. (See Appendix VI and VII.)

Second Multiple Regression Run and Simple Regression

This stepwise regression model employed the same statistical package version .07 of S.P.S.S. and dependent variable. The simplified independent variables reflect a more direct relationship to value per-acre by size category. They are: date of sale, acreage, zoning, and miles to community. The acreage breakdown was used which established a more specific value per-acre. The miles to community developed the relationship of land value per-acre associated with proximity to urban density. This assumed that distance to community nodes was a independent variable associated with land value, though not specific to value developed by local land markets. It shows a relationship not dependent to the actual per-acre market value. (See Appendix VIII.)

A simple regression model was constructed using the same four independent variables. There is no R^2 total. Each independent variable created its own R^2 value total. The significance of each independent variable must be viewed alone, no interaction is considered. (See Appendix IX.)

Third Multiple Linear Regression Model

This regression model utilized the "Statistical Interactive Programing System," outlined in the "Command Reference Manual, CYBER-NOS," dated September 1978. It was designed by the Department of Statistics at O.S.U. In S.I.P.S. the regression sub system was employed which is interactive using a stepwise proceedure. This made it possable to individually enter the most important independent variable in the equation. The "F" value and R^2 were used as calculated for each independent variable to guide the entry of the next into the equation.

The four independent variables used were: community gravity, total acres, month of sale, zoning, and the indicator variable soil capibility class. The independent variable community gravity utialized the population of each incorporated community in the study area and the distance in miles to individual sales. The population of each significant community during the year an associated transaction took place was divided by the distance to that sale. This figure was applied in the equation as community gravity. This regression employed the total acres and average soil class of each sale. The effect of soil capibility class was combined to produce an indicator variable. The R^2 value obtained from this indicator variable denotes what portion of value per-acre is associated with all soil classes.

CONCLUSION and PROBLEMS

The market value of rural land is vastly affected by the parcel size. This is clearly established when considering all 310 transactions over the five year study period in nine size categories. The mean value per-acre ranged from $3,590 for an one to 5.99 acre tract to $789 for 161 to 300 plus acres. Only size category seven, 81 to 120 acres and category eight 121 to 160 acres demonstrated a deviation from the declining per-acre value parcel size relationship. The value per-acre with both category seven and eight combined would have produced a mean of $861 per-acre. The combination of categories seven and eight into a single 81 to 160 acre category would have been more functional. This is the acreage size where equitable farming begins in this region. The economics of rural land investment help justify why a higher per-acre price is paid for category seven land.

Category:	Number of Sales:	Mean Value per-Acre:
1- 1 to 5.99 A's	48	$3,590
2- 6 to 10	48	2,623
3- 11 to 20	51	1,754
4- 21 to 40	51	1,324
5- 41 to 60	30	999
6- 61 to 80	31	954
7- 81 to 120	22	1,006
8-121 to 160	16	717
9-161 to 372	13	789

A more reveling relationship of value per-acre was produced when the year of sale was segregated within each size category. This showed a decline in value per-acre in 1976 on the smaller homesite tracts, logically denoting well water supply during the, "drought years." The most dynamic annual amortization appeared in the smaller two size categories after 1976. The problems associated with trending from a limited number of sales is exemplified by the amortization which occurred between 1977 and 1978 in category six. Four sales with a standard deviation of $399 per acre (highest for this category) demonstrated 56% annual amortization. A guide for using this generalized statistical information is to put the most faith in larger more evenly destributed data samples. (See Appendix III.)

The density category assigned to each sale established a definite trend with a mean annual value per-acre relationship in each size category. (See Appendix IV.) A majority of the sales were located in the semi rural and rural categories. The limited number of sales in the semi suburban category showed a similar yearly trend. The highest density demonstrated a larger value per-acre annually. The smaller parcel sizes were, in all density categories, the most valuable per-acre and inflationary. The rural density graphs show a very clear grouping of value per-acre and yearly amortization in property 21 acres and larger. Most of the downward trends in a single year for any size category were denoted by a single sale. The exception is 1976 when the land market reacted to the lack of rain fall. The situation brought to attention the unequitable aspects associated with small tract farming.

Findings

From the multiple regression models it was desired to establish by size category the influence and order of importance independent variables had on the dependent, value per-acre. This was accomplished by the multiple regression models and with the simple regression output. The R^2 value of each independent variable established its influence on the dependent. From this information it was hoped to predict which adjustment factor should be weighted for any size property. A relationship was expected between independent variables and parcel size which would demonstrate a shift of influence from one variable to another by property size. All though the weight of each independent variable can be pinpointed in any size category, a logical trend or shift of influence was not revealed. Using multiple or simple regression with this type of data one independent variable in the equation is factored with the highest R^2 value. As all independent variables interact the other individual R^2 values appear unreasonably lower. It was noticed that when one R^2 value change came in quite important another independent variable's R^2 value similary declined.

By size category it is easy to see which independent or indicator variable produced the highest percentage of value per-acre. From the final regression model the problem with trending is demonstrated with the output from all 310 sales.

		R^2 Change:
Community Gravity		.3458
Total Acres		.1211
Month of Sale		.0660
Zoning		.0179
Soil Indicator	R^2 Total: .5603	.0095

This demonstrates that over 56% of the value per-acre from all sales can be established by these five variables. It does not account for the fact that in size category three 65.25% of the value is attributed to the soil indicator, category four - 14.97%. category five - 3.32%, category six - 45.81%, category seven - 11%, category eight - 66.5% and size category nine - 74.92%. It would appear that the highest R^2 value in any size category is the most important independent variable. It should be concluded that the R^2 values are significant by size category only at the 95% confidence level.

The range demonstrated by the R^2 values within each size category varied. When a narrow range occurred, it could be hypothesized that one independent variable, due to interaction, reflected a majority of the statistical significance and R^2 value. The alternative is that in a particular size category one independent variable was that much more important. It must be acknowledged that many different Appraisers created this data sample. Due to professional judgement one independent variable or adjustment factor could have been weighted in a particular size category. In conjunction with the problems associated with independent variable interaction this would produce an intercategory range difference and definate single factor significance. (See Appendix V.)

It was established by size category that the independent variables chosen differed considerably in R^2 value. With the exception of the first multiple regression model there was an increase in total R^2 value from size category one to category nine.

Total R^2 Value:	Size Category 1	Size Category 9
First Regression	.7383	.4770
Second Regression	.3529	.3830
Simple Regression (sumed)	.3790	.7400
Final Regression	.5640	.9521

The power and interaction given the independent variables in the first regression model showed this organization more revealing concerning the smaller size categories. The trend of increasing R^2 total as parcel size became larger, in the other regression models, was interrupted in only a few cases. This can be attributed to the variance in the data sample which comprised each size category. In the final regression from category six through size category nine there was a distinct increase in total R^2 value. This concluded at 95.21% which demonstrated that the five independent variables displayed a large majority of the value per-acre. In this model the smaller size categories developed R^2 values which demonstrate personal preference and the land market's reaction to diversified investment motives. In the larger size categories such a high total R^2 value denotes a conformity of use and motive of purchase. (See Appendix X.)

From multiple and simple linear regression it is difficult to establish an obvious trend between size categories created by the independent variable's R^2 value. By size category the most important independent variables can be identified. The final multiple regression model should be considered a valuable tool in understanding the value per-acre of rural land. It is possible with the use of a non-linear multiple regression model that desired trending could be further established. Non-linear multiple regression would capture the marginal returns of the independent variables more realistically. This equation is better when variables interact, when amortization occurres over a number of years and makes no presumption of a negative selling price possable as linear regression does.[21] With this recent realization similar research could be expected to define clear trends established by independent variables that affect true market value.

In reality the judgment of market value per-acre must be made on a spatially defined individual basis. The findings of this research help foster the understanding that real property appraisal is an art as well as a science. Statistical models help perdict which adjustment factors are the most important.

These variables change with time space as the land market reflect's human needs and desires. The economic reaction to demographic, cultural and environmental demands govern rural land size priority which establishes per-acre market value.

FOOTNOTES

1. Samuel C. Hadaway, "Diversification Possibilities in Agricultural Land Investment," The Appraisal Journal (1978) pg 529-537, pg 529 to 530
2. Stephen E. Roulac, "Agricultural Land Investment: Profit Opportunity or New Speculative Bubble?" The Appraisal Journal, (1978) pg 53-66, 59 to 57
3. Oregon District 4 Council of Governments for Linn and Benton Counties, Linn-Benton Economic Data Base: Elements of an Economic Study, (May, 1978) Section II pg 2 and 3
4. Ibid., Exhibit D-3
5. Ibid., Exhibit F-2
6. Ibid., Exhibit H-2
7. Willam David Crowley, The Influence of Net Real Estate and Other Property Characteristics on Prices of Agricultural Properties within and Among Slected Areas of Oregon, 1965-69 (Corvallis, OR: PhD Thesis, O.S.U., Aug. 9, 1971) pg 52
8. Earl O. Headin, Glenn L. Johnson and Lowell S. Hardin, Resource Productivity, Returns to Scale and Farm Size, (Ames, Iowa: The Iowa State College Press, 1956) pg 54
9. Ibid. 15, pg 367 to 368
10. William G. Murray, Farm Appraisal and Valuation, 5th Edition (Ames, Iowa: The Iowa State University Press, 1969) pg 273-68
11. Ibid. 10, pg 285
12. Ibid. 7, pg 111

FOOTNOTES

13. For each farm property appraised by a D.V.A. Appraiser three recent sales must be used. These are comprables to establish an estimate of value through the market approach. All sales used must be verified through a deed search accomplished in the County Recorders Office and individually inspected.

14. Department of Veteran's Affairs State of Oregon, "Annual Report," (1978) pg 41

15. Textbook Revision Subcommittee, The Appraisal of Real Estate, 7th Edition, (Chicago, Illinois: American Institute of Real Estate Appraiser, 1978) pg 138

16. Benton County Zoning Ordinance, (1974) pg 12 to 13

17. Ibid. pg 9

18. Linn County Zoning Ordinance, (Adopted 3/1972 and Amended 1/1977) pg 20 to 23 and pg 13 to 15

19. U.S. Department of Agriculture Soil Conservation Service, Soil Survey of Benton County Area, OR, (July, 1975) pg 46

20. Ann E. Hammill, "Variables Related to Farm Real Estate Values in Minnesota Counties," Agricultural Economics Research: (Vol. 21, no. 2, April 1969) pg 46

21. Peter F. Colwell, "A Statistically Oriented Definition of Market Value," The Appraisal Journal (1979) pg 53-58, pg 54 to 55

LINN/BENTON COUNTY REGION POPULATION STATISTICS

		1974		75'		76'		77'		6/78'	*[1]	80'		85'		90'
State of OR	*2%	2.266 Million	1	2.299	2	2.342	2	2.396	6	2.472						
Linn/Benton Co. Region	3	143,400	1	144,400	3	149,000	2	152,400	6	157,100	3	163,370	2	183,150	2	206,220
Benton Co.	4	63,500	0	63,600	3	65,600	3	68,800	4	68,800	4	72,470	3	82,150	3	93,190
Corvallis	-2	39,100	-2	38,200	5	40,180	-5	38,230	12	10,500	5	43,310	3	50,120	3	58,000
Philomath	1	1,960	3	2,015	7	2,160	10	2,400	0	2,400	3	2,510	4	3,020	4	3,640
Monroe	0	480	1	485	0	485	1	490	4	500	3	520	2	560	2	600
Linn Co.	2	79,900	1	80,800	3	83,400	2	85,000	8	88,300	2	90,900	2	101,300	2	113,030
Albany	2	21,930	1	22,025	3	22,800	5	24,030	16	26,150	1	26,360	4	31,600	4	37,890
Lebanon	4	8,135	0	8,100	5	8,500	4	8,880	14	9,560	0	9,560	3	11,700	3	12,810
Sweet Home	3	4,350	2	4,430	59	7,026	1	7,100	4	7,250	3	7,580	2	8,320	2	9,140
Harrisburg	10	1,560	0	1,555	6	1,660	2	1,700	8	1,775	1	1,800	2	1,980	2	2,190
Brownsvill	3	1,160	10	1,290	-6	1,220	1	1,230	6	1,270	4	1,340	3	1,510	3	1,700
Lyons	2	805	3	830	2	850	3	875	10	920	1	930	2	1,030	2	1,150
Halsey	9	625	1	630	0	630	3	650	20	725	-6	660	1	700	1	750
Scio	4	510	-2	500	1	505	5	530	6	545	1	550	2	610	2	680

* Represents the % of population growth between the preceding year and the next.

*[1] The % shown between these years demonstrate the annual increase.

The Information to construct this Chart is from the Center for Population Research and Census, Portland State University. The future Projections of Population were made by OR. District Council of Governments for Linn/Benton County

II

REMARKS:

SCALE ONE INCH EQUALS FEET

Date of Sale	Recorded V P	IRS	Consideration Actual Indicated	Code Area	Map No.
Type of Instrument WD BS QC CONTR			Equity	Acct. No.	
Grantor			Assumed Debt	County	
Grantee				Miles of	
Property Description				Special Districts	

Appraisal Data
Timber Land Improvements Total
Assessment Data
Timber Land Improvements Total

LAND CLASS	ACRES	DESCRIPTION	PER ACRE VALUE	TOTAL VALUE
Total	Cultivated	Other	Irrigated	
Dwelling Age Class Value		Bldg. Age Class Value		
Other (Specify)				
		TOTAL ANALYSIS OF SALE		

Area Conformity Above Average Below

Type Conformity Above Average Below

Condition at Time of Sale Good Average Poor

Water Rights Source

Access

Hazards

Recorded by Date

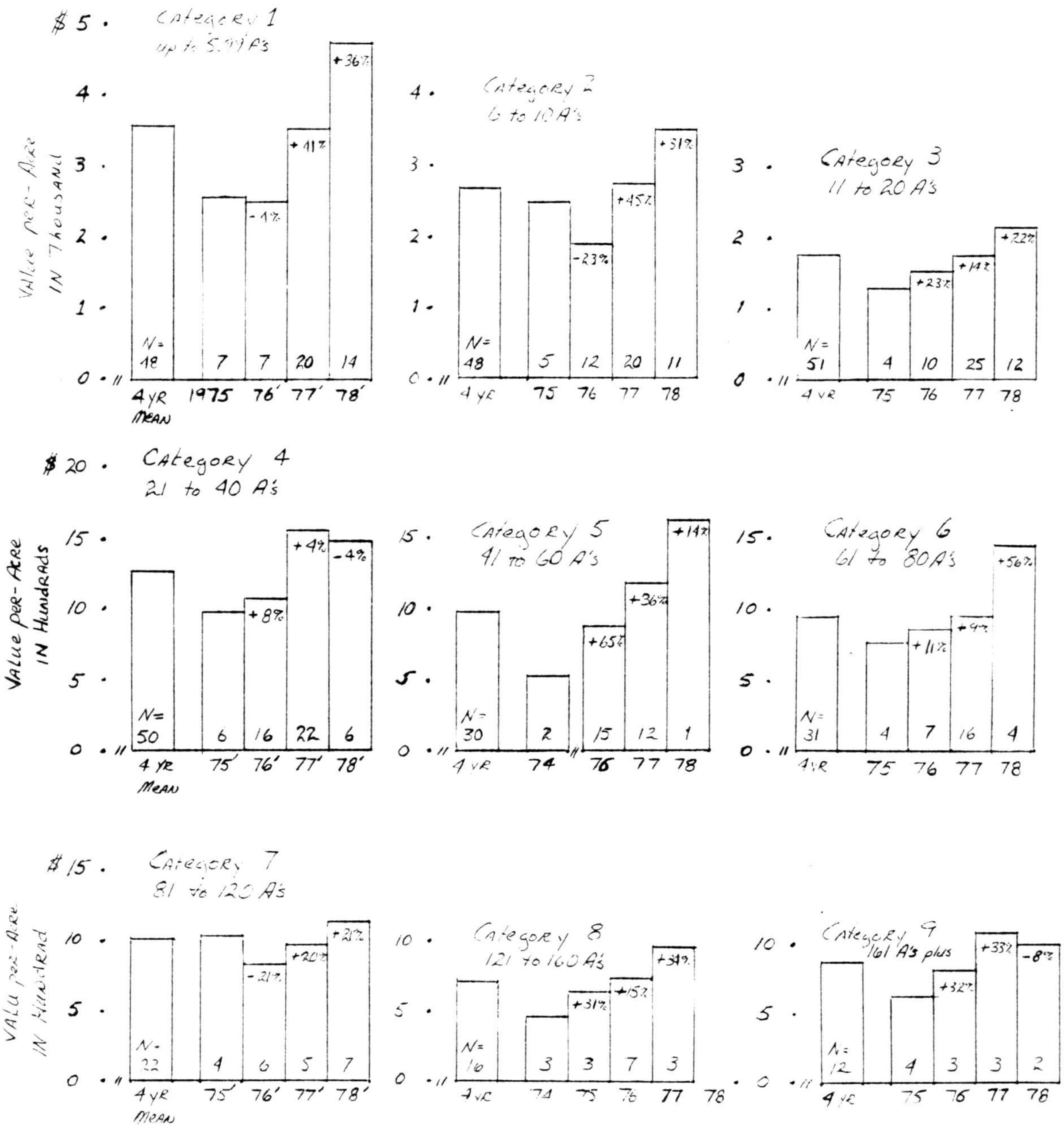
Inspected by Date

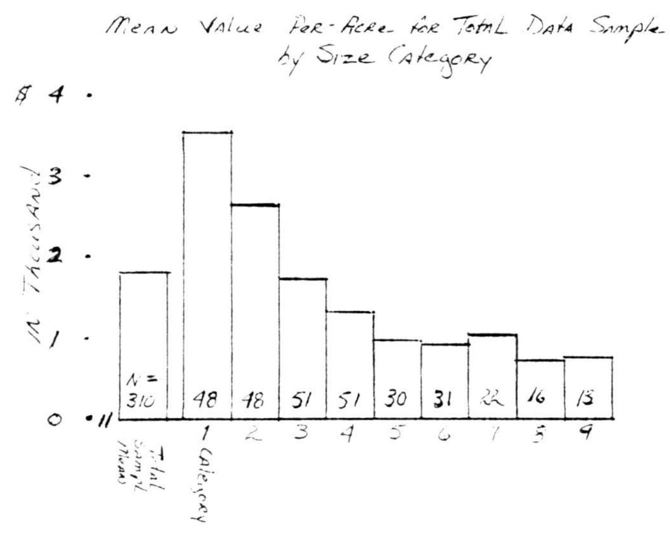
Verified by Date

Source

III

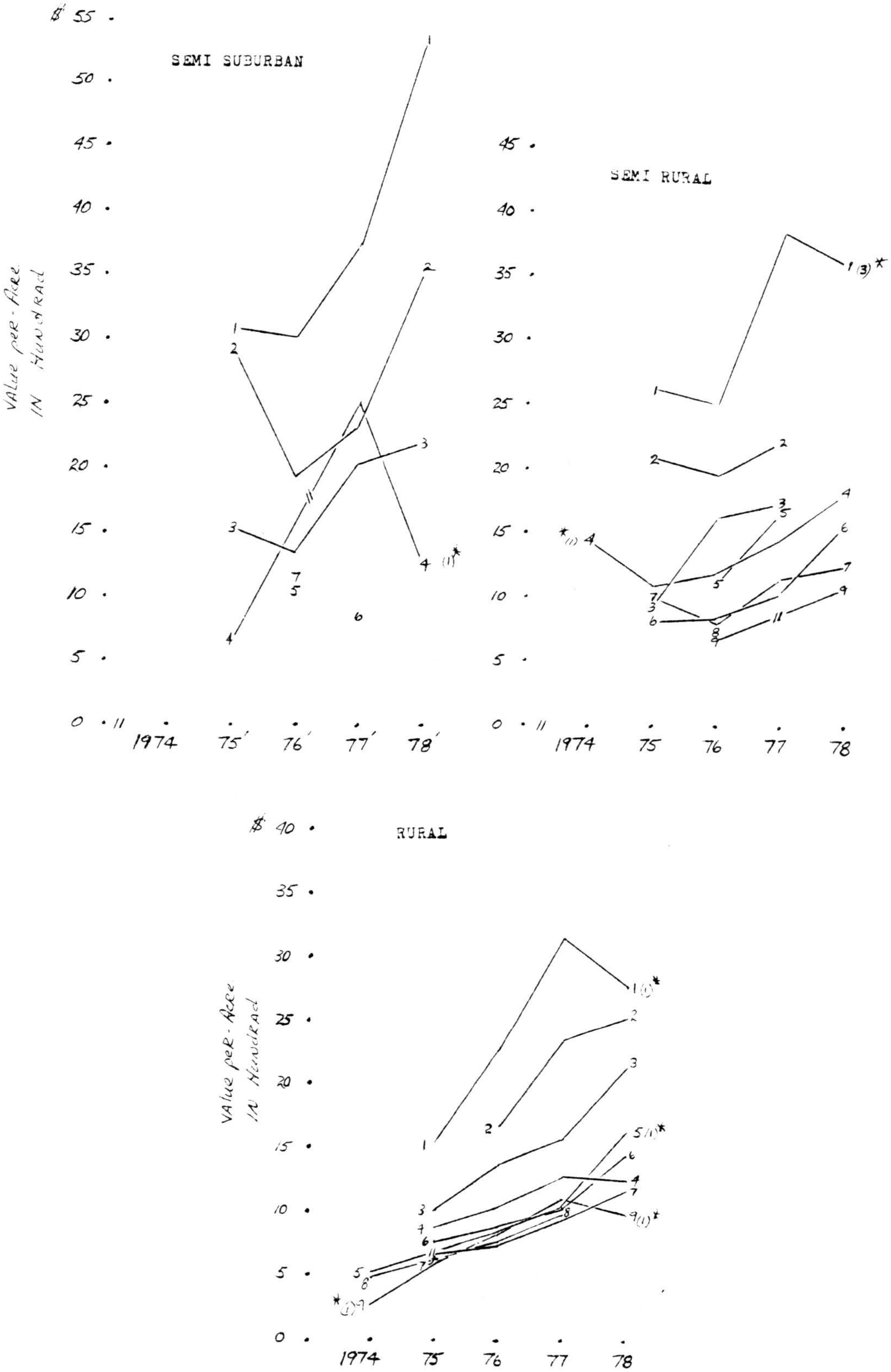
ANNUAL AMORTIZATION BY PROPERTY SIZE CATEGORY





IV

ANNUAL AMORTIZATION BY DENSITY AND SIZE CATEGORY



* Number in ( ) Indicates a Limited Sample Size in a Particular Year

REGRESSION MATRIX of IMPORTANT MODELS

FINAL Multipal Regression

	Community Gravity	Total Acres	Month or Date of Sale	Zoning	Soil Indicator
All 310 Sales	.3458	.1211	.066	.0179	.0095
Size Category 1	.1470	.1426	.2297	.006	.0387
2	.48	.0038	.1987	.0122	.0107
3	.1066	.0045	.0629	.0031	.6525
4	.3198	.0559	.0412	.0515	.1497
5	.4727	.0118	.2479	.01	.0332
6	.		.1539	.0092	.4581
7	.0096		.6613	.0009	.11
8		.0106	.1731	.0018	.6655
9	.1686	.0003	.034	.0001	.7492

Second Multipal Regression

	Miles to Community	Acreage	Date of Sale	Zoning
1	.0034	.0868	.2337	.0291
2	.0198	.0005	.2104	.0868
3	.002	.0182	.2240	.0002
4	.0029	.0682	.0661	.0755
5	.0004	.0099	.2691	.0048
6	.0018	.0556	.1646	.0129
7	.0094	.0241	.0359	.1907
8	.002	.1478		.0207
9	.0172	.0136	.3328	.0195

Simple Regression

	Miles to Community	Acreage	Date of Sale	Zoning
1	.0003	.1425	.2337	.0025
2	.0727	.0129	.2104	.1034
3	.0008	.0101	.2240	.0115
4	.0048	.0646	.0417	.0755
5	.0027	.0261	.2691	.00001
6	.0017	.0515	.1646	.0021
7	.0056	.0080	.1101	.1907
8	.0438	.0127	.1478	.005
9	.0586	.0537	.3328	.2949

First Regression Output

SIZE CATEGORY 1

Independent Variables		R Square	R Square Change
1.	$Date^2$	.2734	.2734
2.	Acreage X Date	.4305	.1570
3.	Acreage	.4739	.0434
4.	Zone	.5165	.0427
5.	Date X Miles	.5349	.0184
6.	$Miles^2$	.6456	.1107
7.	$Zone^2$	.6679	.0223
8.	Date X Miles	.7007	.0328
9.	Acreage X Miles	.7223	.0216
10.	Miles X Zone	.7345	.0122
11.	Date	.7359	.0014
12.	Miles	.7374	.0015
13.	$Acreage^2$	.7379	.0005
14.	Acreage X Zone	.7383	.0004

SIZE CATEGORY 2

1.	$Date^2$	.2455	.2455
2.	Date X Zone	.3378	.0923
3.	$Zone^2$	.4001	.0623
4.	Zone	.4158	.0157
5.	Miles X Zone	.4419	.0261
6.	Date X Miles	.4645	.0226
7.	$Miles^2$	.4999	.0354
8.	Acrage X Date	.5170	.0170
9.	Acreage	.5412	.0243
10.	Miles	.5699	.0287
11.	Acreage X Zone	.5765	.0066
12.	Acreage X Miles	.5816	.0051
13.	Date	.5879	.0063
14.	$Acreage^2$	.5915	.0037

SIZE CATEGORY 3

1.	$Date^2$	.2370	.2370
2.	Acreage	.2546	.0176
3.	$Acreage^2$	.2854	.0308
4.	Acreage X Miles	.2921	.0067
5.	Miles	.2998	.0077
6.	$Miles^2$	.3057	.0059
7.	Date	.3103	.0046
8.	Acreage X Date	.3144	.0041
9.	Acreage X Zone	.3167	.0023
10.	Date X Zone	.3601	.0434
11.	Date X Miles	.3660	.0059
12.	Zone	.3678	.0018
13.	Miles X Zone	.3692	.0015

First Regression Output

SIZE CATEGORY 4

Independent Variables	R Square	R Square Change
1. Acreage X Date	.1181	.1181
2. Acreage X Zone	.2124	.0942
3. Miles X Zone	.2247	.0124
4. Zone	.2522	.0275
5. $Zone^2$	.3161	.0639
6. $Date^2$	.3360	.0199
7. $Miles^2$	.3523	.0163
8. Acreage	.3572	.0049
9. Miles	.3605	.0033
10. Date	.3643	.0039
11. Date X Zone	.3708	.0065
12. Acreage X Miles	.3738	.0029
13. Date X Miles	.3745	.0007

SIZE CATEGORY 5

1. $Date^2$	.2953	.2953
2. Acreage X Date	.3089	.0135
3. Miles X Zone	.3114	.0026
4. Acreage X Zone	.3210	.0096
5. Date X Miles	.3542	.0332
6. $Zone^2$	.3665	.0123
7. Zone	.4099	.0433
8. Acreage	.4231	.0132
9. Date X Zone	.4287	.0057
10. Date	.4667	.0380
11. $Miles^2$	.4872	.0205
12. Miles	.4886	.0015
13. $Acreage^2$	.4891	.0005
14. Acreage X Miles	.4894	.0003

SIZE CATEGORY 6

1. $Date^2$	.2007	.2007
2. Acreage X Zone	.2715	.0708
3. Date X Zone	.3136	.0421
4. Zone	.3483	.0347
5. $Zone^2$	.4852	.1369
6. Miles X Zone	.5116	.0263
7. Acreage X Date	.5283	.0168
8. $Miles^2$	.5429	.0146
9. Date X Miles	.5603	.0174
10. Acreage X Miles	.5689	.0086
11. $Acreage^2$	.5708	.0019
12. Date	.5732	.0024
13. Miles	.5746	.0013

VI

First Regression Output

SIZE CATEGORY 7

Independent Variables	R Square	R Square Change
1. Zone	.1907	.1907
2. Date^2	.2449	.0542
3. Date	.3195	.0745
4. Zone^2	.3810	.0615
5. Acreage X Zone	.4213	.0403
6. Acreage^2	.4607	.0394
7. Date X Zone	.5402	.0785
8. Acreage X Date	.5803	.0401
9. Miles	.5844	.0041
10. Miles^2	.6643	.0799
11. Date X Miles	.6882	.0239
12. Acreage	.6892	.0010
13. Acreage X Miles	.6913	.0022
14. Miles X Zone	.6922	.0008

SIZE CATEGORY 8

Independent Variables	R Square	R Square Change
1. Date	.1478	.1478
2. Zone^2	.1685	.0208
3. Date X Zone	.1896	.0210
4. Acreage X Miles	.2029	.0133
5. Acreage^2	.2680	.0651
6. Acreage	.4319	.1640
7. Date^2	.4496	.0177
8. Acreage X Date	.4521	.0024
9. Date X Miles	.4539	.0019
10. Miles^2	.4774	.0235
11. Miles	.4781	.0007
12. Miles X Zone	.4786	.0005

SIZE CATEGORY 9

Independent Variables	R Square	R Square Change
1. Date	.2095	.2095
2. Acreage X Zone	.3018	.0923
3. Miles	.3184	.0166
4. Miles^2	.3645	.0461
5. Acreage X Date	.3832	.0187
6. Acreage X Miles	.4091	.0260
7. Date X Miles	.4362	.0271
8. Acreage	.4373	.0011
9. Acreage^2	.4444	.0071
10. Date X Zone	.4467	.0023
11. Date^2	.4517	.0049
12. Miles X Zone	.4736	.0219
13. Zone^2	.4763	.0027
14. Zone	.4770	.0007

First Regression Soil Output

Independent Variable & Indicator	R Square	R Square Change
Size Category 1		
1. Date	.2337	
2. Soil Class I	.2451	.0114
Soil Class V	.2628	.0178
Soil Class IV	.2797	.0168
Soil Class II	.4044	.1248
Size Category 2		
1. Date	.2104	
2. Soil Class VI	.3537	.1433
Soil Class I	.3546	.0009
Soil Class V	.3606	.0061
Soil Class IV	.3624	.0018
Soil Class II	.3630	.0006
Soil Class III	.3749	.0120
Size Category 3		
1. Date	.2240	
2. Soil Class VI	.3311	.1072
Soil Class II	.3728	.0417
Soil Class I	.3998	.0270
Soil Class V	.4086	.0088
Soil Class IV	.4158	.0072
Soil Class III	.5125	.0968
Size Category 4		
1. Date	.0417	
2. Soil Class III	.1583	.1166
Soil Class VI	.1756	.0173
Soil Class II	.2519	.0763
Soil Class V	.2650	.0131
Soil Class IV	.2676	.0026
Size Category 5		
1. Date	.2691	
2. Soil Class V	.2798	.0107
Soil Class VI	.3127	.0329
Soil Class III	.3195	.0068
Soil Class II	.5191	.1996
Soil Class IV	.5431	.0240

First Regression Soil Output

Size Category 6

Independent Variable & Indicator	R Square	R Square Change
1. Date	.1646	
2. Soil Class V	.2190	.0544
Soil Class IV	.2479	.0288
Soil Class II	.4145	.1667
Soil Class VI	.4599	.0453
Soil Class III	.5173	.0574

Size Category 7

Independent Variable & Indicator	R Square	R Square Change
1. Date	.1101	
2. Soil Class III	.1101	.0001
Soil Class VI	.1109	.0008
Soil Class V	.1202	.0093
Soil Class IV	.1617	.0415
Soil Class II	.4689	.3072

Size Category 8

Independent Variable & Indicator	R Square	R Square Change
1. Date	.1478	
2. Soil Class II	.4234	.2756
Soil Class V	.5290	.1056
Siol Class I	.6254	.0964
Soil Class VI	.7110	.0856
Soil Class IV	.7126	.0061
Soil Class III	.8211	.1085

Size Category 9

Independent Variable & Indicator	R Square	R Square Change
1. Date	.2095	
2. Soil Class 1	.4479	.2384
Soil Class V	.4479	-0-
Soil Class II	.6472	.1993
Soil Class VI	.6942	.0470
Soil Class IV	.7027	.0085
Soil Class III	.8276	.1249

VIII

Second Multiple Regression Model*

Size Category 1

Independent Variable	R Square	R Square Change
1. Date of Sale	.2337	
2. Acreage	.3205	.0868
3. Zoning	.3495	.0291
4. Miles to Community	.3529	.0034

Size Category 2

Independent Variable	R Square	R Square Change
1. Date of Sale	.2104	
2. Zoning	.2972	.0868
3. Miles to Community	.3170	.0198
4. Acreage	.3175	.0005

Size Category 3

Independent Variable	R Square	R Square Change
1. Date of Sale	.2240	
2. Acreage	.2422	.0182
3. Miles to Community	.2442	.0020
4. Zoning	.2444	.0002

Size Category 4

Independent Variable	R Square	R Square Change
1. Zoning	.0755	
2. Acreage	.1437	.0682
3. Date of Sale	.2098	.0661
4. Miles to Community	.2126	.0029

Size Category 5

Independent Variable	R Square	R Square Change
1. Date of Sale	.2691	
2. Acreage	.2790	.0099
3. Zoning	.2837	.0048
4. Miles to Community	.2842	.0004

Size Category 6

Independent Variable	R Square	R Square Change
1. Date of Sale	.1646	
2. Acreage	.2203	.0556
3. Zoning	.2332	.0129
4. Miles to Community	.2350	.0018

Size Category 7

Independent Variable	R Square	R Square Change
1. Zoning	.1907	
2. Date of Sale	.2267	.0359
3. Acreage	.2507	.0241
4. Miles to Community	.2601	.0094

* Using "Statistical Package for the Social Sciences," version 7.0 June 27, 1977

VIII

Second Multiple Regression Model

Size Category 8

Independent Variable	R Square	R Square Change
1. Date of Sale	.1478	
2. Zoning	.1685	.0207
3. Miles to Community	.1706	.0020

Size Category 9

Independent Variable	R Square	R Square Change
1. Date of Sale	.3328	
2. Zoning	.3522	.0195
3. Miles to Community	.3694	.0172
4. Acreage	.3830	.0136

Simple Regressions with Four
Independent Variables
per Size Category *

Independent Variable	R Square
	Size Category 1
1. Date of Sale	.2337
2. Acreage	.1425
3. Zoning	.0025
4. Miles to Community	.0003
	Size Category 2
1. Date of Sale	.2104
2. Acreage	.0129
3. Zone	.1034
4. Miles to Community	.0727
	Size Category 3
1. Date of Sale	.2240
2. Acreage	.0101
3. Zoning	.0115
4. Miles to Community	.0008
	Size Category 4
1. Date of Sale	.0417
2. Acreage	.0696
3. Zoning	.0755
4. Miles to Community	.0048
	Size Category 5
1. Date of Sale	.2691
2. Acreage	.0261
3. Zoning	.00001
4. Miles to Community	.0027
	Size Category 6
1. Date of Sale	.1646
2. Acreage	.0515
3. Zoning	.0021
4. Miles to Community	.0017
	Size Category 7
1. Date of Sale	.1101
2. Acreage	.0080
3. Zoning	.1907
4. Miles to Community	.0056

* Using S.P.S.S., version 7.0, June 27, 1977

IX

Simple Regressions

Independent Variable	R Square
	Size Category 8
1. Date of Sale	.1478
2. Acreage	.0121
3. Zoning	.0050
4. Miles to Community	.0438
	Size Category 9
1. Date of Sale	.3328
2. Acreage	.0537
3. Zoning	.2949
4. Miles to Community	.0586

FINAL MULTIPLE REGRESSION MODEL*

All 310 Sales Combined

Independent Variables	R Square	R Square Change
1. Community Gravity	.3458	
2. Total Acres	.4669	.1211
3. Month of Sale	.5335	.0660
4. Zoning	.5514	.0179
5. Soil Indicator	.5609	.0095

Size Category 1, to 5.99 A's

Independent Variables	R Square	R Square Change
1. Month of Sale	.2297	
2. Total Acres	.3723	.1426
3. Community Gravity	.5193	.1470
4. Soil Indicator	.5580	.0387
5. Zoning	.5640	.0060

Size Category 2, 6 to 10 A's

Independent Variables	R Square	R Square Change
1. Community Gravity	.4800	
2. Month of Sale	.6787	.1987
3. Soil Indicator	.6894	.0107
4. Zoning	.7016	.0122
5. Total Acres	.7054	.0038

Size Category 3, 11 to 20 A's

Independent Variables	R Square	R Square Change
1. Soil Indicator	.6525	
2. Community Gravity	.7591	.1066
3. Month of Sale	.8220	.0629
4. Total Acres	.8265	.0045
5. Zoning	.8296	.0031

Size Category 4, 21 to 40 A's

Independent Variables	R Square	R Square Change
1. Community Gravity	.3198	
2. Soil Indicator	.4696	.1497
3. Total Acres	.5254	.0559
4. Month of Sale	.5666	.0412
5. Zoning	.6181	.0515

Size Category 5, 41 to 60 A's

Independent Variables	R Square	R Square Change
1. Community Gravity	.4727	
2. Month of Sale	.7206	.2479
3. Soil Indicator	.7538	.0332
4. Total Acres	.7656	.0118
5. Zoning	.7756	.0100

* Using the Statistical Interactive Programming System (SIPS) Command Reference Manual CYBER-NOS Version, Sep. 1978

X

FINAL MODEL

Size Category 6, 61 to 80 A's

Independent Variables	R Square	R Square Change
1. Soil Indicator	.4581	
2. Month of Sale	.6120	.1539
3. Zoning	.6212	.0092

Size Category 7, 81 to 120 A's

Independent Variables	R Square	R Square Change
1. Month of Sale	.6613	
2. Soil Indicator	.7713	.1100
3. Community Gravity	.7809	.0096
4. Zoning	.7818	.0009
5. Total Acres	.7818	

Size Category 8, 121 to 160 A's

Independent Variables	R Square	R Square Change
1. Soil Indicator	.6655	
2. Month of Sale	.8386	.1731
3. Total Acres	.8492	.0106
4. Zoning	.8510	.0018

Size Category 9, 161 to 300 plus A's

Independent Variables	R Square	R Square Change
1. Soil Indicator	.7492	
2. Community Gravity	.9177	.1685
3. Month of Sale	.9517	.0340
4. Total Acres	.9520	.0003
5. Zoning	.9521	.0001

XI

Mean Value per-Acre Relitive to Distance in

Miles from the Five Community Categories

Community: Corvallis/Philomath

Miles:	Sample Size:	Mean Value per-Acre:	Standard Deviation:
total	70	$2,808	$1,844
1	2	6,045	252
2	7	3,610	1,374
3	5	4,164	1,075
4	10	3,212	1,889
5	15	3,402	2,593
6	11	1,746	835
7	11	2,048	788
8	4	1,392	412
9	3	1,318	1,099
10	1	990	-0-
13	1	1,500	-0-

Albany

Miles:	Sample Size:	Mean Value per-Acre:	Standard Deviation:
total	44	1,909	1,178
1	2	4,889	1,257
2	2	2,993	2,220
3	11	2,406	1,080
4	7	1,841	801
5	8	1,099	364
6	4	1,638	584
7	2	1,033	132
8	2	1,026	508
9	1	1,511	-0-

XI

Mean Value per-Acre Relitive to Distance in

Miles from the Five Community Categories

<u>Community</u>: (Cat. 5) Sweet Home, Harrisburg, Brownsvill, Halsey,

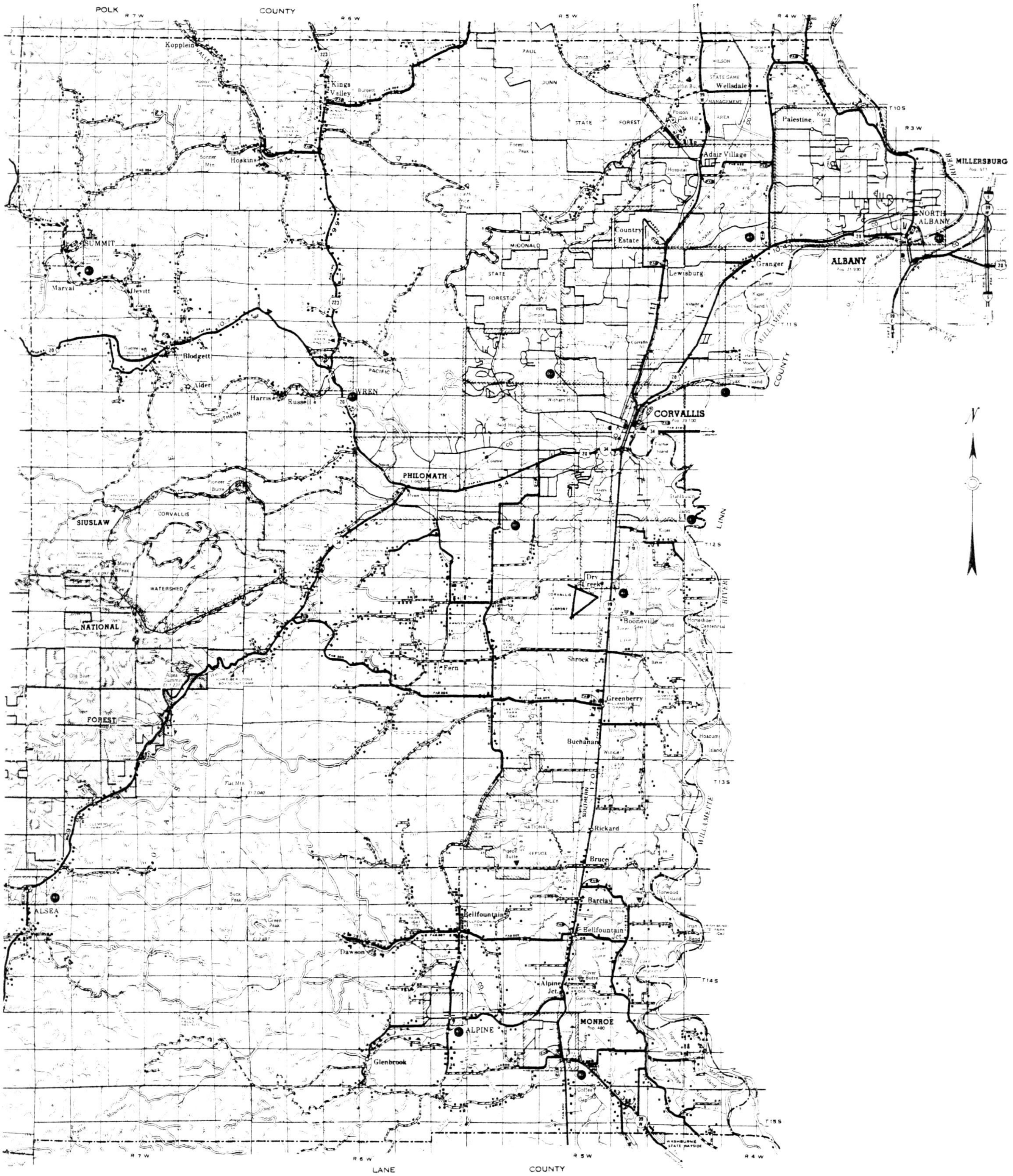
Lyons, Scio, and Alsea

Miles:	Sample Size:	Mean Value per-Acre:	Standard Deviation:
total	112	$1,202	$ 577
1	12	1,399	653
2	18	1,218	560
3	29	1,193	674
4	25	1,223	500
5	14	910	308
6	11	1,153	647
7	3	1,785	200

Mean Value per-Acre Relitive to Distance in Miles from the Five Community Categories

Community: Albany

Miles:	Sample Size:	Mean Value per-Acre	Standard Deviation:
10	2	$1,165	$ 410
11	1	3,091	-0-
12	2	1,238	435
	Monroe		
total	16	2,410	951
1	5	2,514	518
2	2	1,514	1,111
3	7	2,760	1,145
4	1	1,503	-0-
6	1	2,150	-0-
	Lebanon		
total	66	1,508	879
1	2	2,216	37
2	14	1,708	1,143
3	8	1,601	912
4	6	2,082	1,512
5	7	1,049	479
6	11	1,326	597
7	11	1,185	574
8	4	1,342	438
9	1	2,000	-0-
10	2	1,766	331


POLK
COUNTY
R 7 W
R 6 W
R 5 W
R 4 W
R 3 W
Kopplein
Kings Valley
Hoskins
Bonner Mtn
Wellsdale
Palestine
Adair Village
MILLERSBURG
NORTH ALBANY
ALBANY
Granger
Lewisburg
Country Estate
STATE FOREST
McDONALD
PAUL
DUNN
SUMMIT
Marys
Devitt
Blodgett
Alder
Harris
Russell
WREN
PACIFIC
SOUTHERN
CORVALLIS
PHILOMATH
SIUSLAW
CORVALLIS
WATERSHED
NATIONAL
FOREST
Marys Peak
Dry Creek
Booneville
Shrock
Fern
Greenberry
Buchanan
Rickard
Bruce
Barclay
Bellfountain
Bellfountain Jct.
Dawson
Alpine Jct.
MONROE
ALPINE
Glenbrook
ALSEA
Flat Mtn
Buck Peak
Green Peak
Pigeon Butte
WILLAMETTE
RIVER
LINN
COUNTY
T 10 S
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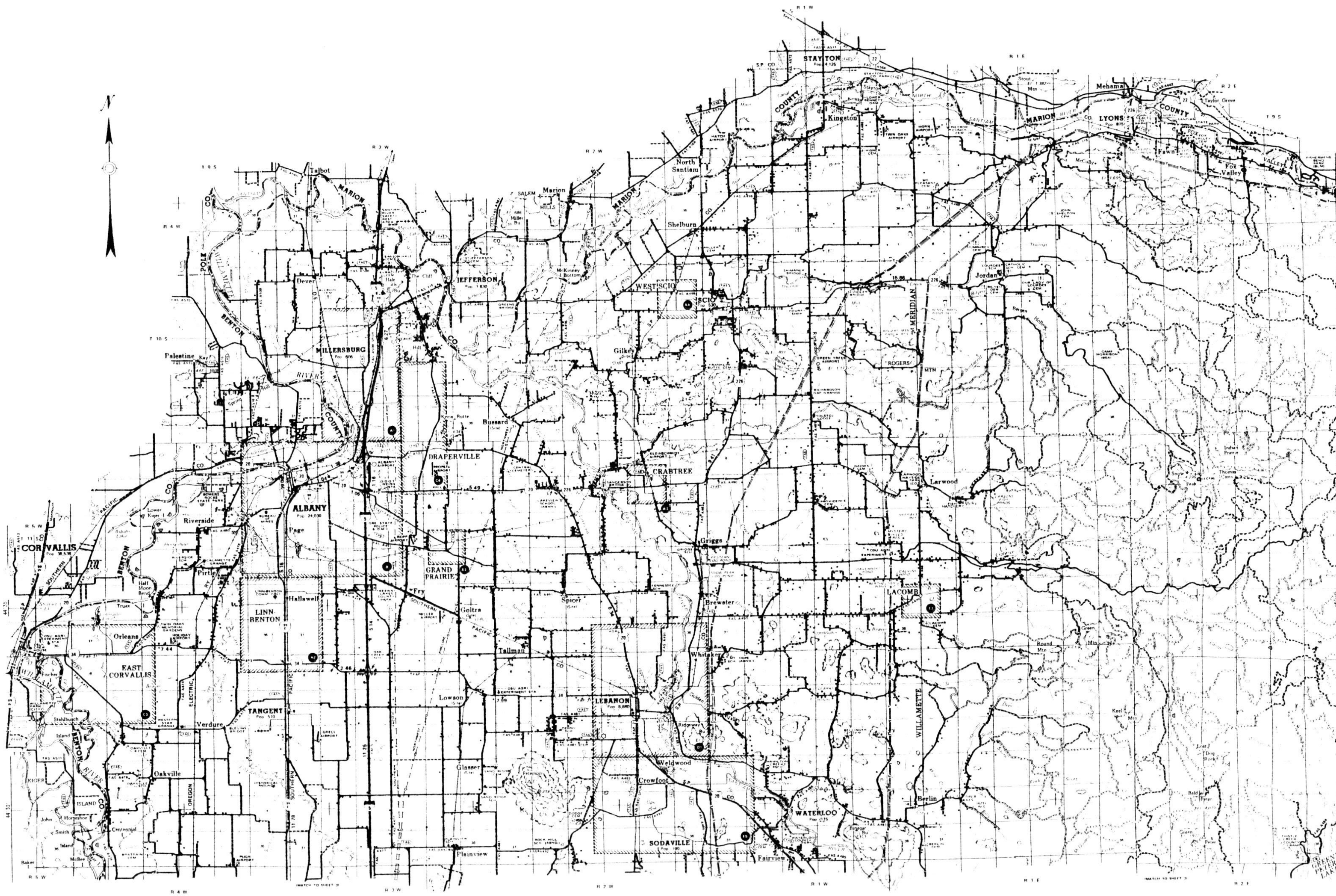
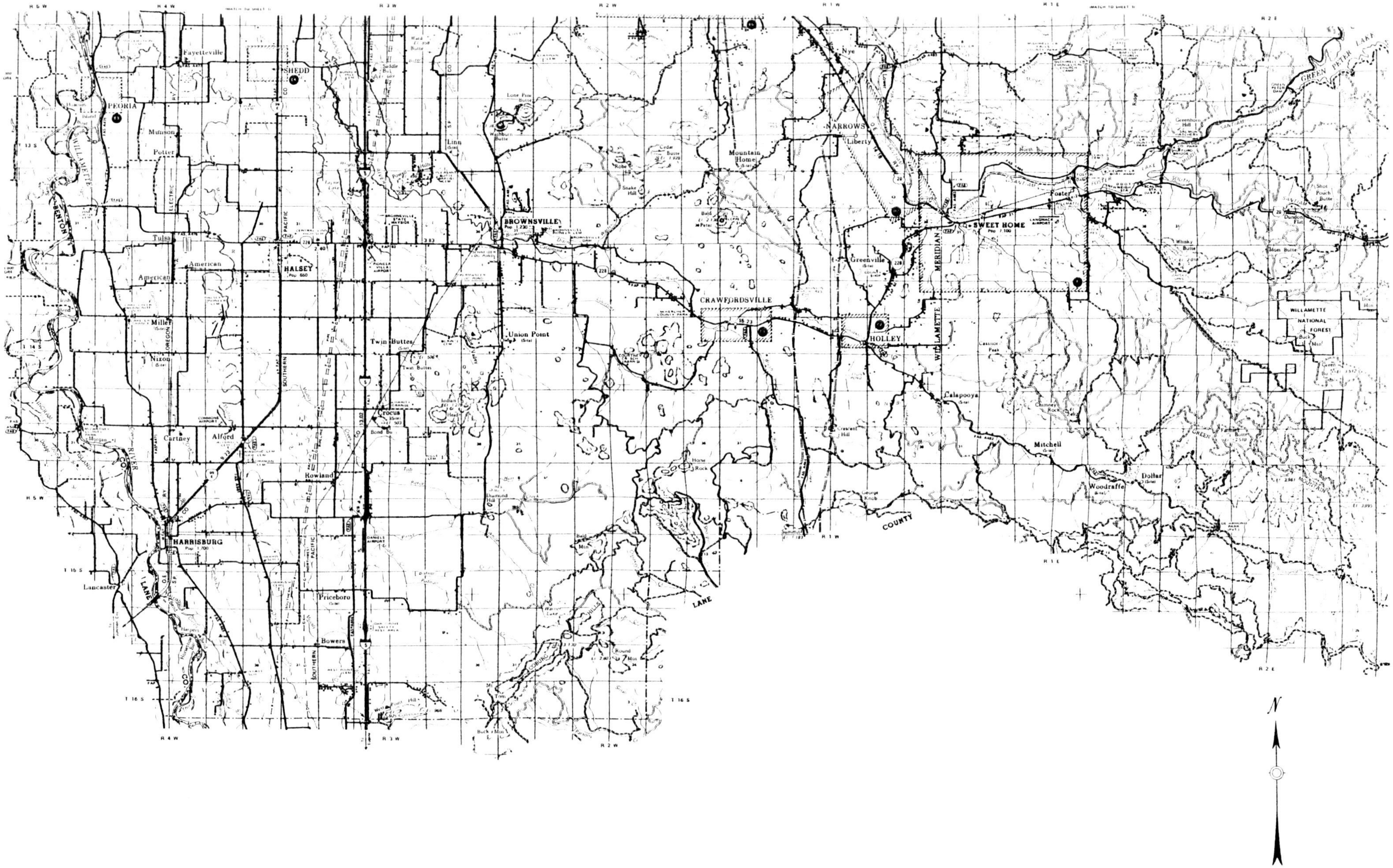
T 12 S
T 13 S
T 14 S
T 15 S
LANE
COUNTY
WASHBURNE STATE WAYSIDE
N


N
STAYTON
Mehama
LYONS
Kingston
North Santiam
Talbot
MARION
Shelburn
JEFFERSON
Dever
WEST SCIO
SCIO
MILLERSBURG
Gilkey
Palestine
Bussard
DRAPERVILLE
CRABTREE
Jordan
ROGERS
Larwood
ALBANY
Riverside
CORVALLIS
Page
Griggs
GRAND PRAIRIE
Fry
Goltra
Spicer
Brewster
LACOMB
Hallawell
LINN-BENTON
Pirtle
Truax
Orleans
EAST CORVALLIS
Tallman
Whitaker
Lowson
LEBANON
TANGENT
Verdure
Oakville
Glasser
Weldwood
Crowfoot
WATERLOO
SODAVILLE
Fairview
Berlin
Plainview
Centennial
Fox Valley
Fawn
Taylor Grove
BENTON
POLK
COUNTY
WILLAMETTE
MERIDIAN
SOUTHERN
PACIFIC
R 5 W
R 4 W
R 3 W
R 2 W
R 1 W
R 1 E
R 2 E



Fayetteville
SHEDD
PEORIA
Munson
Potter
WILLAMETTE
BENTON
Tulsa
American
HALSEY
Miller
Nixon
Cartney
Alford
Rowland
HARRISBURG
Lancaster
LANE
Priceboro
Bowers
Twin Buttes
Crocus
Linn
BROWNSVILLE
Union Point
Mountain Home
CRAWFORDSVILLE
NARROWS
Liberty
Nye
Greenville
HOLLEY
SWEET HOME
Foster
WILLAMETTE MERIDIAN
Calapooya
Mitchell
Woodraffe
Dollar
COUNTY
Green Peter Lake
WILLAMETTE NATIONAL FOREST
N