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The Minnesota Rural Real Estate Market in 1987



With an Analysis of Three Decades of Land Price Changes

by

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**University of Minnesota
St. Paul, Minnesota 55108
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September, 1988**

Including Special Studies of:

- Economic Development Regions**
- Southwestern Minnesota**
- The Greater Twin Cities Metropolitan Area**
- The Red River Valley Area**
- Distribution of Idled Cropland**
- Deflated Estimated Values and Land Prices**
- Contour Maps of Land Price Changes Over Three Decades**

Cover photo by Dave Hanson

ERRATA

The Minnesota Rural Real Estate Market in 1987

- Page 19 Change subheading in center of page to read: "Improved versus Unimproved Land"
- Page 28 In Figure 3, the ratio for Economic Development Region 1 showing percentage of sales and acres purchased should read "86" and not 68.
80 80
- Page 53 The table is a continuation of Table 31, not Table 32 as shown.
- Page 67 In Table 33 the annual data begins with 1946. The data shown for 1946-47 are for 1946.

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Summary

The estimated average value of Minnesota farm land and buildings as of July 1987 was \$480 per acre, a decline of 7 percent from July 1986. This was the smallest annual decline since land values began to fall in 1981-82. All reporting districts experienced declines, but the smallest declines were the Southeast and especially in the Southwest.

The average price per acre received in actual sales for the period January-June 1987 was \$559, down 14% from the same period in 1986. Adjusting to remove the effect of an increased volume of sales of lower priced land in 1987 reduced the statewide decline in sales price to 10%. All districts reported declines in unadjusted sales prices, but adjustment reduced the decline in the Southwest from 9% to 5%, and converted a drop of 18% into an increase of 12% in the Northwest, due primarily to expanded sales activity in the northern (and lower priced) counties of the district.

When deflated with the Consumer Price Index (1967=100), the average estimated value was \$143 per acre in 1987, slightly below the deflated estimated value of \$146 per acre in 1910-11. The deflated average sales price per acre in 1987 was \$166, the lowest since 1953.

Expansion buyers bought 74% of all tracts sold, investor buyers 14%, and sole-tract operating (non-expansion) buyers accounted for 12%. As in all recent years, expansion buyers dominated the market in 1987 in the Southwest and Northwest districts (86 and 89 percent, respectively) and acquired 72% of all tracts sold in the West Central district. Sole-tract operating buyers were an important part of the market only in the East Central and Northeast districts.

Cash financing was used in 40% of all sales, mortgages in 22%, and contracts for deed in 38%. In the Northwest district, 52% of all transactions in 1987 were cash sales, the first time in the history of this survey that over half of all sales in any district were cash sales.

In spite of the general downward trend in 1987 there were areas of stability in the market for farmland, primarily in some part of the Southeast, Southwest, and Northwest districts. These were areas in which government price and income support programs were especially significant, or in which entries in the Conservation Reserve program were concentrated. Anecdotal reports have been received of some price increases since mid-1987, but the farm land market remains subject to much uncertainty and is generally lacking in buoyancy.

Introduction and Procedures

For 77 years the University of Minnesota has been reporting information on the state's rural real estate market by the six land market districts shown in Figure 1. Since 1953, the information has been collected through questionnaires mailed each July to brokers, bankers, farm managers, appraisers and others familiar with the land market.

Respondents to the survey provide two types of information: estimates of value, and prices per acre received in actual sales. In addition, they report characteristics of buyers and sellers, financing methods used, estimated quality of land and any buildings transferred, trends in frequency of sales, and other items.

The estimates of value reflect respondents' estimates as of July of each year of the average value per acre of average size farms in their communities, for three grades of land, high, medium, and low. The estimates are aggregated by counties, then by districts, and finally for the state as a whole. The district and state estimated values are derived by weighing the county estimates by the acres of land in farms in each county, using acreage data from the 1982 U.S. Census of Agriculture.

The percentage change in estimated values from year to year is computed by using only the estimates from respondents in each of the six districts for whom an estimate was also received in the previous year. This percentage change is then applied to the estimated value of the preceding year for that district to derive the estimate for the current year. This procedure reduces distortions that might arise due to shifts in the geographic distribution of respondents from year to year.

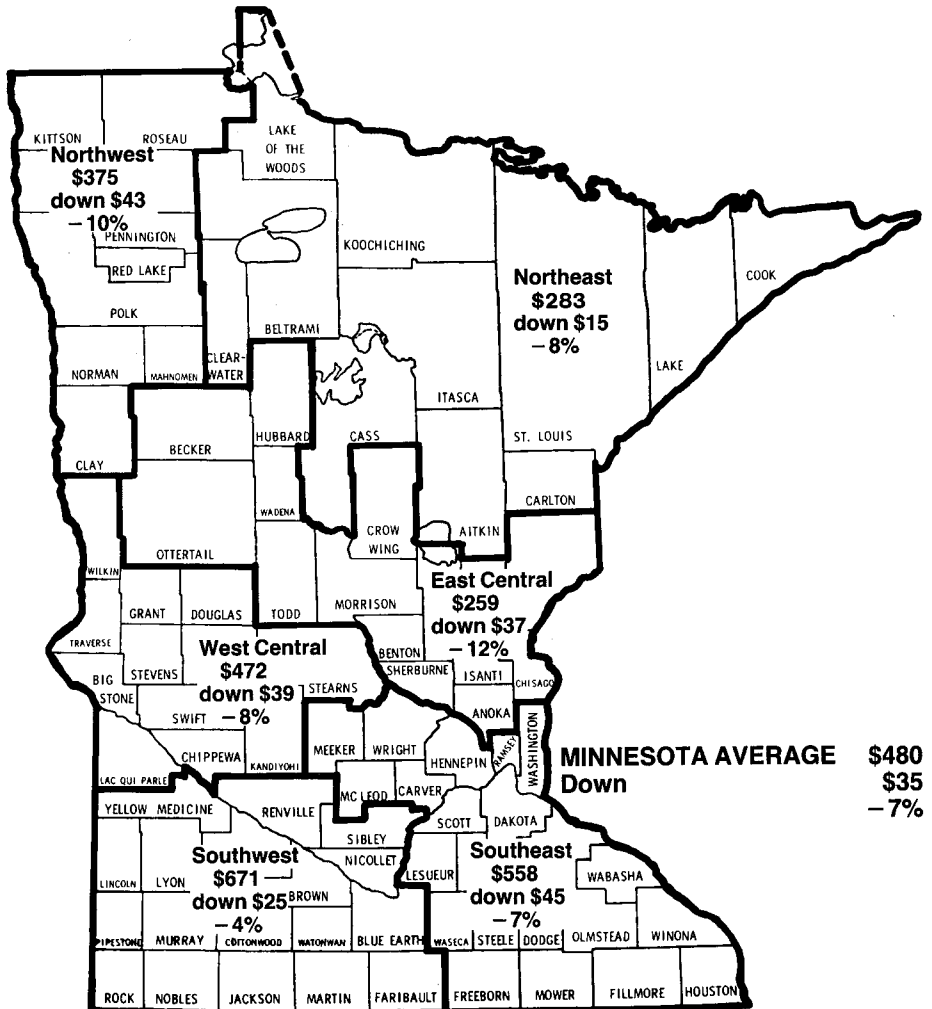
Computed in this way, the average estimated value of Minnesota farm land in July 1987 was \$480 per acre, down \$35 or 7 percent from \$515 in July 1986. The raw average of all estimates of value in 1987 was \$600 per acre, down 6 percent from the simple average of all estimates of value of \$636 in 1986.

The data on actual sales include acreage, location, method of financing, buyer and seller characteristics, quality of land and buildings, and distance of buyer from the tract purchased. In analyzing the data, duplicate reports of sales are eliminated, data for Hennepin and Ramsey counties (Minneapolis and St. Paul) are omitted, and respondents are asked not to report sales between close relatives (father-son, etc.)

The authors are indebted to Cynthia Jahr for her aid in the conduct of the study and preparation of this report.

Figure 1.

Estimated Land Values per Acre in 1987 (Excluding Hennepin and Ramsey Counties)



Based on reported estimates of average value per acre of farm land for the first six months of 1986.

Part I

The Minnesota Rural Real Estate Market in 1987

A. Land Market Trends

The 1987 Estimated Value of Rural Real Estate in Minnesota

For the state as a whole, the average estimated value per acre in 1987 was \$480, a 7% drop from the 1986 value of \$515 (Table 1). This was the smallest annual decline since the peak estimated value of \$1310 per acre in 1981.

Each district experienced declines in value in 1987, although the pattern of declines was not uniform. The smallest declines were experienced in the southern third of the state, in the Southeast district (7 percent) and in the Southwest district (4 percent).

This was a reversal from the regional pattern of declines that prevailed from 1982 through 1986, in which the sharpest drops had been in the higher priced lands in the areas of the state most dependent on cash crops. The stabilizing effects of the government support measures in the 1985 Agricultural Act seem clearly apparent. This was reenforced in areas where livestock feeding is prominent by the generally favorable relation between livestock prices and feed costs in 1986-1987.

Among the six districts the largest declines in estimated values in 1987 were the 12 percent drop in the East Central district, north and west of the Twin Cities, and the 10 percent drop in the Northwest. There was also a pattern in these declines in that they tended to be greatest in the countries bordering the Mississippi river in the East Central district and east of the Red River Valley in the Northwest district.

From the peak in estimated values in 1981 (1982 in the Northeast district) the greatest declines by districts occurred in the Southeast (-67%) and Southwest (-68%), containing the state's highest valued lands. Slightly smaller district declines from 1981 to 1987 were recorded in the East Central (-62%) and West Central (-58%). The smallest declines among districts were in the Northwest (-54%) and the Northeast (-41%). Excluding the largely non-agricultural Northeast district, land value declines from 1981-82 to 1987 wiped out just under two-thirds of the peak values of Minnesota's farm lands.

Table 1 : Estimated Average Value Per Acre of Minnesota Farmland, by District, 1972-1987

Year	South-east	South-west	West Central	East Central	North-west	North-east	State Average
1972	370	379	208	163	117	76	248
1973	433	459	247	194	146	115	298
1974	576	675	378	279	199	144	423
1975	674	844	503	296	295	163	525
1976	856	1106	624	349	378	210	667
1977	1027	1316	730	415	427	279	794
1978	1191	1421	803	498	483	304	889
1979	1453	1620	883	573	599	368	1040
1980	1526	1750	962	596	683	390	1120
1981	1709	2083	1135	679	813	460	1310
1982	1504	1875	1044	584	748	483	1179
1983	1354	1669	981	561	658	411	1065
1984	1164	1401	873	505	586	436	927
1985	861	967	690	374	510	362	686
1986	603	696	511	296	418	308	515
1987	558	671	472	259	375	283	480
% Change							
1986-87	- 7	- 4	- 8	-12	-10	- 8 ^a	- 7
1981-87	-67	-68	-58	-62	-54	-41 ^a	-63

^a 1982-87

Reported Sales in 1987

The 1987 survey assembled data on 1241 sales of farm land and buildings, occurring between January 1 and July 1. The average reported sales price per acre was \$559 (Table 2), down 14% from the 1986 value of \$650. This was the smallest percentage decline since 1984.

The regional pattern of decline in sales prices was similar to that shown for estimated values. All the districts showed a decline in average

Table 2 : Average Reported Sales Price per Acre of Farmland by District, Minnesota, 1972-1987 (Unadjusted)

Year	South-east	South-west	West Central	East Central	North-west	North-east	State Average
1972	389	366	222	145	107	76	293
1973	444	410	223	178	120	122	298
1974	598	630	340	243	204	144	450
1975	792	844	493	299	353	159	607
1976	937	1116	644	321	377	210	735
1977	1216	1340	709	446	432	198	859
1978	1352	1321	908	554	504	256	980
1979	1675	1680	949	618	612	411	1140
1980	1837	1868	1095	603	759	394	1318
1981	1965	2005	1171	680	919	483	1367
1982	1749	2022	1168	746	887	406	1360
1983	1470	1872	1068	679	711	328	1291
1984	1386	1665	1062	644	700	223	1263
1985	1013	1181	872	510	575	222	864
1986	673	830	602	556	411	220	650
1987	621	755	493	429	337	168	559
<hr/>							
% Change							
1986-87	- 8	- 9	-18	-23	-18	-24	-14
1981-87	-68	-63 ^a	-58	-43 ^a	-63	-65	-59

^a 1982-87

sales price per acre, with the smallest decline in the Southeast district, at 8 percent. This pattern was a reversal of the pattern in 1986, when the rate of decline in sales prices was greatest in the south and west. The rates of decline in sales prices by district in 1987 in descending order were as follows: Northeast (-24%), East Central (-23%), Northwest (-18%), West Central (-18%), Southwest (-9%) and Southeast (-8%).

The highest sales prices for farmland were reported in the Southwest at \$755 per acre. This district has consistently reported the highest sales prices since 1974, with the single exception of 1978. The ranking of sales prices in descending order was essentially the same as for estimated

values. The exception was the East Central district, which was ranked lowest in estimated values in 1987, but was fourth in the standings with reference to actual sales. A possible explanation for sales prices well above estimated land values is that a majority (62%) of the sales in the East Central district involved land with buildings. This illustrates the support that non-agricultural demand for rural home sites or part-time farms exerts in the East Central district, and the significance of building values in areas where dairying is prominent.

The effect of non-agricultural demand is given additional emphasis if we compare estimated values and sales prices since 1981-82 in Table 1 and 2. In general terms, the declines are parallel in the Southeast, Southwest, and West Central districts. The divergence is greater in the Northwest and greatest in the East Central and Northeast districts. The effect of non-farm demand for rural land led to much smaller declines from 1981-82 to 1987 in sales prices relative to the estimated values of the land for farming in the East Central district, and to sales price declines much greater than those for estimated values, in the Northeast. It seems reasonable to ascribe this to the generally buoyant housing market (and hence demand for rural home sites) in the Twin Cities-St. Cloud area, and to the economic stress and resultant depressed housing market in the Iron Range and Northeast.

Table3 : Adjusted Sales Prices for 1987, by District

District	1986 Price	1987 Adjusted Price	Percent Change 1986 to 1987
Southeast	673	601	-11%
Southwest	830	792	- 5%
West Central	602	488	-19%
East Central	556	393	-29%
Northwest	411	461	12%
Northeast	220	139	-37%
Minnesota	650	584	-10%

Adjusted Sales Prices

A change in average sales price may be a result of shifts in two variables: a change in price, and a change in the composition or mix of properties sold. In 1987, a smaller proportion of reported sales occurred in the southern districts than in 1986, and a higher proportion in the Northwest district. This exaggerated the price decline in 1987, since the data base contained a smaller proportion of sales from the higher priced southern districts and a larger proportion from the northern districts where prices were lower. To account for this shift, adjusted average sales prices were calculated by districts and for the state.

The adjusted prices were computed by multiplying the average reported sales prices per acre for 1987 for each county by the number of acres sold in that county in 1986. These values were then summed for the counties within a district and the product divided by the total acres sold in the district in 1986. In effect this process answers the question: What would have been the district average sales price per acre in 1987 if each county's proportion of acres sold had remained unchanged from 1986? A

Table 4 : Percentage Change in Adjusted Sales Price Per Acre and Two Nationally Recognized Price Indices¹

Years	South-	South-	West	East	North-	North-	State	Index	Index
	east	west	Central	Central	west	east	Average	1	2
								CPI	GNP
1975-76	23	33	32	6	10	21	26	6.2	5.5
1976-77	23	20	8	32	10	8	18	6.4	5.7
1977-78	13	2	18	37	12	-24	10	6.8	6.3
1978-79	13	22	4	16	44	47	17	10.3	8.7
1979-80	6	12	9	0	18	-27	9	14.3	10.1
1980-81	6	15	13	19	18	-4	11	10.5	9.2
1981-82	-8	-8	-9	4	-14	-18	-8	7.2	6.6
1982-83	-14	-11	-9	-7	-20	-17	-12	3.5	4.0
1983-84	-7	-13	-3	6	4	-44	-8	4.4	3.2
1984-85	-25	-35	-20	-12	-16	-8	-25	3.7	3.2
1985-86	-27	-30	-21	11	-13	-39	-24	2.4	2.4
1986-87	-11	-5	-19	-29	12	-37	-10	3.0	2.9

¹Index 1 is the Consumer Price Index. Index 2 is the Gross National Product (GNP) implicit price deflator for Personal Consumption Expenditures. The percentage changes in the indexes are calculated by comparing the average for the first six months of the year with the average for the first six months of the previous year.

similar calculation was made at the state level by aggregating district average prices in 1987 weighted by acres sold in each district in 1986. This process removes the effect of the shift in the geographic distribution of sales activity (Table 3).

The adjusted reported sales price per acre for the state as a whole in 1987 showed a decline of 10%. This is substantially smaller than the 14 percent decline in unadjusted sales prices. Within the state, all districts experienced a drop except the Northwest district. The greatest decline in adjusted sales prices occurred in the Northeast district at 37 percent. In descending order the rates of decline in the remaining districts were: East Central (-29%), West Central (-19%), Southeast (-11%), and Southwest (-5%). Adjusted sales prices in the Northwest district showed an increase of 12 percent over 1986.

Percentage change in the two major price indices (the Consumer Price Index and the Gross National Product (GNP) Price Deflator for Personal Consumption Expenditures) are included in Table 4 so that the adjusted price changes can be compared with economy-wide price changes. The Consumer Price Index is used also in the section on deflated land values.

Farmland Turnover

The survey gathers data on two measures of the frequency of farmland sales. One question asks the respondents to estimate the percentage change in the number of farmland sales in their area, comparing the first six months of 1986 to 1987 (Table 5). While 54 percent indicated no change in the number of reported sales, 34 percent indicated an increase and only 9 percent a decrease. The most active market was reported in the Southwest district, with over half of all respondents reporting an increase. For the state as a whole, 91 percent of the respondents said that the frequency of sales was unchanged, or had increased in 1987. Regionally the ranking is as follows: Southwest (96%), West Central (92%), Southeast (89%), East Central (89%), Northwest (86%). In contrast, the comparable statewide figure in 1986 was 67 percent.

The second source of data is the number of actual sales reported by the respondents. A total of 1241 sales were reported for the first six months of 1987, a 27% increase over the 980 sales reported in 1986 (table 6). This is the highest number of farmland sales since 1981, when 1278 sales were reported. A total of 206,995 acres changed hands, with an average of 167 acres per sale. This is the largest area and average size since 1981.

Table 5 : Estimated Change from 1986 to 1987 in number of farms sold by district

Region	% Estimating increase in sales	% Estimating decrease in sales	% Estimating no change in sales
PERCENT			
Southeast	40	12	49
Southwest	52	4	44
West Central	43	8	49
East Central	16	11	73
Northwest	29	12	60
Northeast	0	14	86
Minnesota	37	9	54

Participation of Brokers

Respondents were asked to estimate the proportion of sales in which brokers were involved. Statewide, they estimated that 55 percent of the sales were conducted through brokers. This is unchanged from 1986 and is remarkably consistent with the estimates for the years since 1972 (Table 7).

The districts with the highest and lowest percentage of brokerage participation have usually been the Southeast and Northwest with 60 and 35 percent respectively, in 1987. In the West Central, Southwest, and Northeast districts an estimated 55 percent of the sales in 1987 used brokers, with the East Central district slightly higher at 57%. It is noteworthy that there have been no sharp changes in these estimates in spite of the dramatic changes in volume and prices in the land market since 1972. It is important to keep in mind that these are subjective estimates by the respondents.

Table 6 : Number of Reported Sales, Acreage of Land Sold and Average Acres Per Sale, by District, Minnesota, January 1-July 1, 1984-1987

District	1984	1985	1986	1987
<u>No. of Sales*</u>				
Southeast	365	237	322	324
Southwest	468	221	312	462
West Central	208	142	152	194
East Central	112	86	91	109
Northwest	69	91	81	133
Northeast	8	18	22	20
Minnesota	1230	795	980	1241
<u>Acres Sold</u>				
Southeast	45,520	29,601	49,133	48,815
Southwest	52,855	27,336	39,281	62,013
West Central	34,771	22,377	28,912	33,836
East Central	15,599	10,475	12,175	16,953
Northwest	15,023	16,652	17,996	41,098
Northeast	1,346	7,273	3,199	4,280
Minnesota	165,114	113,714	150,696	206,995
<u>Acres/Sale</u>				
Southeast	125	125	153	151
Southwest	123	124	126	134
West Central	167	158	190	174
East Central	139	122	134	156
Northwest	218	183	222	309
Northeast	168	404	145	214
Minnesota	134	143	154	167

* These sales should not be interpreted as a record of total farm land transactions for the years indicated. The majority of farm land sales are completed in the first half of the calendar year, which explains the choice of the January 1-July 1 reporting period. Some sales do occur in the latter half of the year, but they are not included in the data reported.

Table 7 : Estimated Proportion of Farm Land Sales in which Brokers or Dealers Participate, Minnesota, by District, 1972-1987

Year	Sales with Brokers' Services						Minnesota
	South-east	South-west	West Central	East Central	North-west	North-east	
1972	59	52	56	54	40	50	52
1973	58	51	54	58	40	46	51
1974	61	54	53	55	40	58	54
1975	58	47	52	60	34	54	51
1976	58	48	50	56	37	57	51
1977	57	48	50	59	42	57	52
1978	60	48	51	60	43	61	54
1979	55	44	52	59	40	55	51
1980	57	48	50	60	41	56	52
1981	60	51	56	63	44	58	55
1982	61	55	59	65	45	64	58
1983	64	58	63	60	43	67	59
1984	61	54	58	57	37	52	53
1985	61	57	60	54	48	64	58
1986	64	54	61	57	45	49	55
1987	66	55	55	57	35	55	55

B. Analysis of Reported Sales

Reason for Sale

The single most frequent reason given for the sale of farmland in 1987 was financial difficulties, accounting for 60 percent of all sales (Table 8). An additional 5 percent were triggered by a decision to leave farming, and 5 percent were sales to reduce size of operation. Assuming that decisions to quit or to reduce size were strongly influenced by financial considerations, a total of 70 percent of the sales in 1987 can be attributed to deteriorating financial positions.

Retirement accounted for 14 percent of the decisions to sell in 1987, and death for 12 percent. From 1972 through 1981 the proportion of sales triggered by death or retirement fluctuated in a narrow range, from 53 to 61 percent. A remarkable feature of the land market since prices began their sharp decline in 1982 has been the steadily declining proportion of sales occasioned by death or retirement (Table 9). The 26 percent of sales reported for these reasons in 1987 is less than half of the percentages given for the 10 years, 1972-1981, and is the lowest ever reported since data were first collected on reasons for sale in 1954.

Table 8 : Percentage of Sales by Reason for Selling Land, Minnesota, by Districts, 1987^{a/}

Reason for Sale	South-east	South-west	West Central	East Central	North-west	North-east	Minnesota
PERCENT							
Financial	58	63	52	46	81	50	60
Reduce Size	6	4	4	9	5	0	5
Death	10	15	12	7	7	10	12
Retirement	16	12	18	26	4	0	14
Left Farming	6	3	9	7	2	20	5
Moved, Still Farming	1	0	0	2	0	0	0
Other	3	3	5	4	1	20	3

^{a/} Columns may not add to 100 due to rounding.

Table 9 : Percentage of Sales by Reason for Selling Land, Minnesota, 1972-1987

Year	Death	Retire- ment	Reason for Sale							
			Total Death & Retire- ment	Left Farming	Moved Still Farming	Divorce	Reduce Size of a/ Operation	a/ Financial	b/ Other	
1972	20	39	59	20	8					14
1973	15	42	57	18	6					20
1974	15	46	61	12	10					18
1975	17	40	57	15	7					21
1976	16	41	57	14	9					19
1977	15	38	53	15	9					23
1978	14	39	53	16	10					21
1979	18	41	59	15	10					17
1980	16	39	55	12	10					23
1981	17	36	53	16	9					22
1982	17	32	49	11	3	2	23			11
1983	14	29	43	12	2	1	23			20
1984	16	22	38	13	2	2	25			20
1985	17	25	42	12	2	1	18			25
1986	12	18	30	11	1	1	17			40
1987	12	14	26	5	0		5		60	3

a/ These reasons were added to the survey in 1982.

b/ This was added to the survey in 1987.

By districts, sales precipitated by financial concerns were most frequent in the Northwest and the Southwest, with 81 and 63 percent of the sales respectively (Table 8). This understates the significance of sales by banks and other credit institutions, since many respondents noted that sales classified as "for financial reasons" were in fact often precipitated by creditors.

Type of Buyer

The survey provided information on type of buyer, in three categories: Sole-tract buyers are operating farmers who are planning to manage the farms they buy and are not using the purchases to expand existing land holdings. Expansion buyers are adding the land purchased to existing holdings. Investor buyers are non-expansion buyer who do not plan to operate the land themselves but presumably expect to rent it out, or have it operated by a manager.

Expansion buyers were the purchasers in 74% of all sales in 1987 (Table 10 and Figure 2). This was slightly above the 1986 figure of 72% but below the all-time high of 79% in 1984. Sole-tract buyers purchased 12% of all sales in 1987, up from 11% in 1986. Investors accounted for 14% of the sales, down from 17% in 1986, which had been the highest level of sales to investors since 1973.

Figure 2.

Percent of Minnesota Farm Land Sales by Type of Buyer, 1954-1987

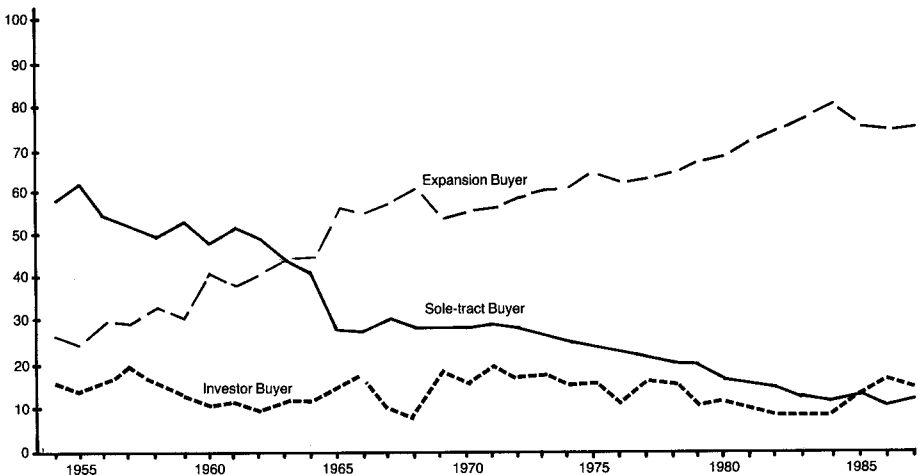


Table 10 : Proportion of Farmland Sales and Average Sales Price per Acre by Type of Buyer, Minnesota, by District, 1985-1987^{a/}

<u>District</u>	<u>Sole-Tract Operator Buyer</u>			
	1986 %	1986 \$/acre	1987 %	1987 \$/acre
Southeast	11	749	17	687
Southwest	5	842	5	620
West Central	11	585	14	564
East Central	38	709	28	536
Northwest	4	409	6	387
Northeast	32	231	32	161
Minnesota	11	681	12	572
	<u>Expansion Buyer</u>			
	1986 %	1986 \$/acre	1987 %	1987 \$/acre
Southeast	68	656	63	598
Southwest	79	624	86	780
West Central	77	612	72	504
East Central	42	523	53	376
Northwest	91	421	89	350
Northeast	45	168	32	173
Minnesota	72	645	74	581
	<u>Investor Buyer</u>			
	1986 %	1986 \$/acre	1987 %	1987 \$/acre
Southeast	21	692	21	636
Southwest	16	841	9	631
West Central	13	594	14	419
East Central	19	520	19	498
Northwest	5	305	6	184
Northeast	23	295	37	168
Minnesota	17	717	14	515

^{a/} Percentages may not add to 100 due to rounding.

Table 11 : Percent of Sales of Farm Land Made to Three Types of Buyers,
Minnesota, 1954-1987

Year	Investor Buyer	Expansion Buyer	Operating Buyer
1954	16	25	59
1955	14	24	62
56	16	30	54
57	19	30	51
58	17	33	50
59	15	32	53
1960	12	41	47
61	13	37	50
62	10	41	49
63	13	44	43
64	13	45	42
1965	16	55	29
66	17	54	29
67	11	57	32
68	9	61	30
69	18	52	30
1970	15	55	30
71	19	50	31
72	17	53	30
73	17	54	29
74	15	59	26
1975	15	60	25
76	12	65	23
77	15	63	22
78	15	64	21
79	12	67	21
1980	13	69	18
81	11	72	17
82	9	75	16
83	9	78	13
84	9	80	12
1985	13	74	13
86	17	72	11
87	14	74	12

By districts, expansion buyers dominated the market in the Southwest (86%) and Northwest (89%), and took just under three-fourths of all sales in the West Central. Sole-tract buyers were a significant part of the market only in the Southeast, East Central, and Northeast, and these were the same districts with the highest proportion of sales to investor buyers.

The dominance of expansion buyers is long standing. They have accounted for half or more of all sales since 1965, and for 70 to 80 percent of all sales since 1981 (Table 11). This dominance has mirrored the decline in the frequency of sales to sole-tract buyers. This is especially true in the Southwest and Northwest districts, where only one in twenty sales in recent years has been to a sole-tract buyer. In contrast, the trend in sales to investor buyers has been relatively stable at 9 to 19 percent of sales for the 34 years since 1954, when data on type of buyers were first included in this survey. The one clear exception was in the initial years of price declines after 1981, when investor buyers consistently accounted for under 10 percent of the sales.

Improved versus Unimproved Land

Reflecting long-established usage in the rural real estate market, the term "improved" land refers to land with buildings; unimproved land refers to land without buildings. In 1987, sales of unimproved land were 59 percent of all transactions (Table 12). This continues the predominance of unimproved land that has characterized the farm land market in the 1980's. This trend coincides with the increasing importance of expansion buyers, who are typically interested in purchasing land without buildings.

The price of unimproved relative to improved land has steadily increased over the years (Table 13). In 1987, this price ratio was 105 as compared to 98 in 1986. From 1954 through 1973 the relative price of unimproved land never exceeded 90 percent of the price of improved land. Since 1974, this ratio was below 90 percent only in 1977 and 1978 and was well above 100 percent in four of the eight years from 1980 through 1987.

By districts, the Northwest has consistently reported the highest proportion of sales of unimproved land. The 70 percent in 1987 is a reduction from 75 percent in 1986 and 85 percent in 1985, but still sharply above the remaining districts. This again reflects the fact that 88 percent of the sales in the northwest district in 1987 were to expansion buyers, who tend not to be interested in acquiring buildings with their purchased tracts. Only in the East Central and the Northeast districts did the majority of sales involve land with buildings, reflecting the lower frequency of expansion buyers in these districts (53 percent in the East Central and 32 percent in the Northeast) as shown in Table 10.

Table 12 : Proportion of Sales and Average Sales Price per Acre of Improved and Unimproved Farmland, by District, Minnesota, 1986 and 1987

District	Improved				Unimproved				Price of Unimproved Land as a percent of Price of Improved	
	1986		1987		1986		1987		1986	1987
	%	\$	%	\$	%	\$	%	\$	%	%
Southeast	52	694	40	682	48	643	60	572	93	84
Southwest	34	825	37	743	66	832	63	764	101	103
W. Central	49	608	46	520	51	595	54	465	98	89
E. Central	62	617	62	444	38	439	38	398	71	90
Northwest	25	338	30	269	75	443	70	403	131	150
Northeast	64	242	60	166	36	162	40	174	67	104
Minnesota	44	656	41	544	56	644	59	573	98	105

Method of Finance

The methods used in financing farm purchases have changed sharply in the period of falling prices since 1981, with an increase in cash financing and a steady decline in the use of contracts for deed (Table 14). In 1987, cash and contracts for deed were used for 40% and 38% of the sales respectively. This was the lowest level of use of contracts for deed ever reported in this survey. Mortgage financing was used in 22% of the sales, approximately the same level of use prevailing since 1981. Relative to 1986, the use of cash decreased by 1 percentage point, mortgage usage increased by 3 points and contracts for deed declined by 2 points.

Table 13 : Proportion of Sales and Ratio of Prices of Improved and Unimproved Land, Minnesota, 1970-1987

	Percent of Sales		Price Per Acre
	Improved	Unimproved	Unimproved/Improved
			Percent
1970	77	23	79
1971	77	23	82
1972	73	27	78
1973	73	27	74
1974	69	31	96
1975	66	34	101
1976	65	35	103
1977	60	40	87
1978	61	39	87
1979	59	41	93
1980	56	44	98
1981	53	47	106
1982	48	52	109
1983	48	52	99
1984	37	63	109
1985	43	57	95
1986	44	56	98
1987	41	59	105

There were wide regional variations, with the Northwest district reporting by far the highest proportion of cash sales. In descending order the proportion of cash-financed sales was Northwest (52%), West Central (43%), Southwest (43%), Southeast (35%), East Central (23%), and Northeast (22%). The East Central was the only district with the majority of its 1987 sales financed with contracts for deed (60%). In the Northwest district, 57% of all sales had been financed with contracts for deed in 1981, the year of peak prices, while this method was used in only 20% of the sales in that district in 1987. In general, the frequency of cash sales was greatest in the Western districts and lowest in the area north and east of the Twin Cities, with the increase in cash sales accompanying the decline in use of contracts for deed.

Table 14 : Proportion of Farm Sales by Method of Financing, By District, Minnesota, 1965, 1970, 1975, 1980-1987

Method of Financing	South-east	South-west	West Central	East Central	North-west	North-east	Minnesota
----- percent -----							
<u>Cash</u>							
1965	17	15	22	21	29	29	19
1970	15	13	14	19	20	31	16
1975	12	16	13	15	18	30	15
1980	14	22	11	16	31	33	18
1981	17	20	17	9	16	10	16
1982	20	24	20	15	28	9	21
1983	25	27	22	10	25	22	23
1984	23	31	23	19	25	13	26
1985	26	41	20	26	42	17	32
1986	32	56	36	24	49	19	41
1987	35	43	43	23	52	22	40
<u>Mortgage</u>							
1965	33	39	41	30	27	3	35
1970	19	23	28	28	40	26	25
1975	28	27	24	36	30	25	28
1980	21	24	25	12	19	12	20
1981	20	22	19	28	27	32	23
1982	17	22	17	13	22	23	19
1983	25	26	25	19	38	17	26
1984	19	25	28	22	39	13	24
1985	24	21	18	21	33	6	22
1986	17	19	19	18	19	24	19
1987	26	21	16	16	28	44	22
<u>Contract For Deed</u>							
1965	50	45	37	49	44	68	46
1970	66	64	58	53	40	43	59
1975	60	58	63	49	52	45	57
1980	65	54	63	72	50	55	61
1981	63	58	63	63	57	58	61
1982	63	54	62	72	50	69	60
1983	50	47	53	71	37	61	51
1984	59	43	49	59	36	75	50
1985	51	38	53	52	26	78	46
1986	51	25	44	58	32	57	40
1987	39	36	41	60	20	33	38

Table 15 : Average Sales Price Per Acre of Farmland by Method of Financing, by District, Minnesota 1980-87

Method of Financing	South-east	South-west	West Central	East Central	North-west	North-east	Minnesota
----- Dollars per Acre -----							
<u>Cash</u>							
1980	1774	1945	1109	694	877	319	1346
1981	2091	2058	1251	758	1084	397	1613
1982	1490	1992	1014	792	772	407	1326
1983	1367	1723	1058	476	825	328	1315
1984	1314	1520	1047	700	686	100	1254
1985	986	1063	733	454	539	237	820
1986	637	785	566	341	491	199	646
1987	614	766	450	424	447	199	585
<u>Mortgage</u>							
1980	1798	2066	914	610	720	443	1470
1981	1900	2021	1115	494	1039	514	1295
1982	1553	1909	1119	772	1240	379	1416
1983	1464	1932	1108	650	808	205	1332
1984	1375	1629	1041	761	797	185	1268
1985	969	1113	835	435	646	890	866
1986	664	895	666	736	338	212	674
1987	627	725	465	414	290	156	484
<u>Contract for Deed</u>							
1980	1883	1746	1144	594	717	415	1290
1981	1947	1910	1174	843	851	478	1318
1982	1879	2008	1223	790	834	413	1358
1983	1536	1907	1077	724	632	400	1263
1984	1417	1747	1119	605	648	229	1268
1985	1069	1194	946	552	552	179	856
1986	680	853	592	556	384	227	635
1987	624	750	541	428	246	198	578

The growing proportion of cash financing can be ascribed to the reluctance of buyers to take on new debt, the discouraging experience with reposessions under contracts for deed since 1981, and confusion regarding the merits of fixed-rate versus variable rate mortgages. In almost all areas of the state there were also small but significant numbers of conservative farmers or investors who had accumulated cash reserves, waiting for the land price bubble to break. As a result, the proportion of cash sales in 1986 and 1987 has been the highest ever reported in the predominantly agricultural districts of the state, the southwest, west central, and northwest.

Table 15 presents the average sales price per acre by method of financing and by district. Sales financed by cash or by contract for deed exhibited essentially the same price per acre, of \$585 and \$578 respectively. Mortgage financed sales were at a much lower price of \$484 per acre. Combining these results with their respective average tract sizes, the total transaction value is nearly the same for all three methods of financing: cash, \$93,600 with an average tract size of 160 acres; mortgage, \$94,380 with an average of 195 acres per sale; and contract for deed, \$96,636 with an average of 162 acres.

Distance of Buyer from Tract Purchased

The Minnesota rural real estate market remained highly localized in 1987, with a median distance of 4 miles separating buyers from the land they bought, (Table 16). This means that one-half of the buyers lived 4 miles or less from their purchases. This continues a long-standing trend, although it is up slightly from the 3 miles reported in 1984 and 1985, which was the smallest median distance ever reported.

This distribution is relatively uniform across the state. In the Southwest and Northwest districts the median distance in 1987 was 3 miles, while it was 4 miles in the Southeast and West Central districts. The market was relatively less local in the East Central district, with a median distance of 10 miles, and in the Northeast district at 8 miles. This pattern of median distance uniformity within districts has shown little change since 1980.

The median distance alone does not provide information on the spatial distribution of sales. To permit more detailed analysis the sales have been classified by distance intervals. The predominance of local buyers is shown by the fact that 57 percent of the sales were to buyers living within 5 miles of their purchases, 77 percent were to buyers living within 10 miles, and 93 percent to those living within 50 miles.

Table 16 : Percentage of Farm Land Sales by Distance of Buyer's Residence from Tract, by District, Minnesota, 1981-1987

Distance of Buyer's Residence from Tract Purchased	South-east	South-west	West Central	East Central	North-west	North-east	MN
-----percent-----							
<u>Less than 2 miles</u>							
1981	24	27	17	13	15	13	21
1982	23	17	25	17	24	14	21
1983	22	17	18	28	15	29	20
1984	20	18	21	23	24	13	20
1985	25	25	21	29	19	19	24
1986	21	18	12	16	14	20	17
1987	23	29	15	21	26	29	24
<u>2-4 Miles</u>							
1981	31	37	29	18	27	13	30
1982	40	42	36	11	41	6	35
1983	34	44	30	14	46	19	35
1984	39	46	40	21	32	0	40
1985	34	41	35	33	43	25	37
1986	31	38	41	24	43	15	36
1987	30	37	42	13	33	0	33
<u>5-9 Miles</u>							
1981	20	18	24	8	26	10	19
1982	16	27	19	17	13	3	19
1983	23	23	27	16	14	5	22
1984	19	22	20	18	32	25	21
1985	21	21	21	12	22	6	20
1986	21	24	24	15	29	15	22
1987	20	20	22	15	24	24	20
<u>10-49 Miles</u>							
1981	18	12	16	25	17	10	17
1982	15	9	13	25	13	19	14
1983	16	13	19	28	15	19	17
1984	18	11	15	23	8	50	15
1985	16	10	21	14	8	6	14
1986	17	10	16	31	9	15	7
1987	20	10	15	37	15	18	16
<u>50-299 Miles</u>							
1981	6	4	14	26	8	32	10
1982	5	5	6	21	5	33	8
1983	3	2	6	12	5	19	5
1984	4	3	3	12	5	13	4
1985	1	2	1	10	3	0	3
1986	8	7	7	11	1	15	7
1987	5	2	4	13	0	24	4

Table 16 : Percentage of Farm Land Sales by Distance of Buyer's Residence
(con't) from Tract, by District, Minnesota, 1981-1987

Distance of Buyer's Residence from Tract Purchased	South- east	South- west	West Central	East Central	North- west	North- east	MN
<u>300 Miles and Over</u>							
1981	1	3	1	9	8	23	4
1982	1	0	1	8	6	25	3
1983	0	1	0	2	3	10	1
1984	1	0	1	2	0	0	1
1985	1	1	0	1	5	44	2
1986	2	3	1	4	4	15	2
1987	1	2	2	1	2	6	2
<u>Median Distance in Miles</u>							
1981	4	3	5	15	5	55	4
1982	3	4	4	10	3	70	4
1983	4	3	5	6	3	5	4
1984	3	3	3	5	4	11	3
1985	3	3	3	3	3	27	3
1986	4	4	4	5	4	8.5	4
1987	4	3	4	10	3	8	4

A more useful interpretation is provided by aggregating the percentage of buyers in each district that lived under 10 miles from the tracts purchased. By this test, the Southwest district had the most local market, with 86 percent. In descending order the comparable figures were Northwest, 83 percent, West Central, 79 percent, Southeast, 73 percent, Northeast, 53 percent, and East Central, 49 percent.

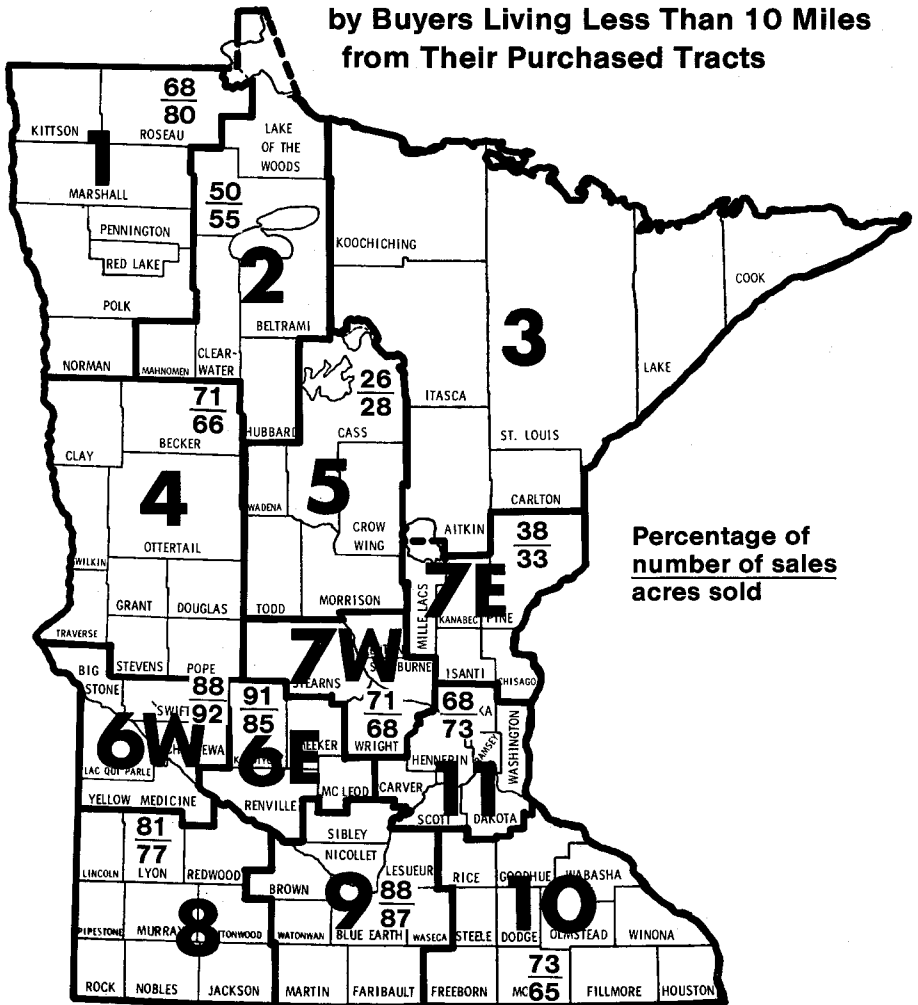
The pattern is quite similar when measured by acres sold instead of number of sales (Table 17). In descending order, the percentage of acres sold to buyers living less than 10 miles away was Southwest, 83 percent, Northwest, 78 percent, West Central, 73 percent, Southeast, 67 percent, Northeast, 59 percent, and East Central, 51 percent. Unsurprisingly, this is similar in rank to the districts when classified by the percentage of buyers who were expansion buyers (Table 10).

Table 17 : Percentage of Acres Sold by Distance of Buyer's Residence from Tract Purchased, Minnesota, 1987

Distance of Buyer's Residence from Tract Purchased	South-east	South-west	West Central	East Central	North-west	North-east	MN
Less than 2 miles	19	24	12	15	20	32	20
2-4 miles	29	38	40	17	26	0	31
5-9 miles	<u>19</u>	<u>21</u>	<u>21</u>	<u>19</u>	<u>32</u>	<u>27</u>	<u>23</u>
under 10 miles	67	83	73	51	78	59	74
10-49 miles	22	12	16	31	18	24	18
50-299 miles	6	3	8	17	0	12	5
300 miles and over	4	2	3	2	4	5	3

Figure 3.

Minnesota Economic Development Regions Showing Percentage of Acres Purchased in 1987



C. Trends in Sales Prices by Economic Development Regions

In 1967 the state of Minnesota attempted to standardize data reporting and analysis by identifying 13 Economic Development Regions. Since 1970, this system has been used in land market analysis as a supplement to the six land market districts to permit a more detailed study of the farmland market. The data on average sales prices by economic development regions are presented in Figure 3 and Table 18. The unadjusted data for 1987 emphasize the sharp declines from 1986 levels in Regions 4, 5, 7W, 7E and 11. All regions showed declines in 1987 except Region 8, which had essentially no change. When the 1987 sales prices are adjusted, as explained in the discussion of Table 3 above, the data show a 20% increase in sales prices over 1986 in Region 1, and a 3% increase in Region 8. The magnitudes of the declines in both Regions 5 and 7E are increased to 34% while the declines are significantly reduced in Regions 2, 4 and 7W.

Grouping farmland sales by economic development regions shows clearly that the magnitude of the declines in adjusted sales prices is inversely related to the proportion of expansion buyers. Region 1 had the greatest increase in adjusted sales prices in 1987 (20 percent) and also had the highest proportion of expansion buyers (89 percent). The second greatest decline in price occurred in Region 5, with a 34 percent decline, and this region also had the lowest level of expansion buyers, at 35 percent. In Region 1 and Region 5, the importance of operating farmers was 6 percent and 53 percent respectively. Investor buyers were not a major component of the market in most regions, although they accounted for 33 percent of the sales in Region 2 and 28 percent in Region 11.

The methods used to finance transfers exhibit distinct regional patterns. Cash sales are concentrated in regions 6W, 1, 8 and 11, where they accounted for 51 percent, 50 percent, 47 percent and 41 percent of the sales, respectively. The most frequent use of contracts for deed is in the central and southeastern parts of the state where they were used in 58 percent of the sales in Region 5, and 39 percent in Region 10. Mortgages were used most frequently in the north and east, financing 40 percent of the sales in Region 2 and 31 percent in Regions 7W and 7E.

Use of the Economic Development Regions instead of the six land market districts also permits a more explicit identification of the areas in which non-local buyers play the most prominent role. In Region 5, including Cass, Crow Wing, Morrison, Todd, and Wadena counties, only 26 percent of the buyers lived within 10 miles of their purchased tracts, the lowest percentage of all the regions. The second lowest was 38 percent in Region 7E, north and east of the Twin Cities (Figure 2).

Table 18 : Average Reported Sales Price Per Acre of Farmland by Economic Development Regions, Minnesota, 1974-1987 (Unadjusted) and 1987 Adjusted Sales Price Data

Year	Economic Development Regions													MN
	1	2	3	4	5	6W	6E	7W	7E	8	9	10	11	
Unadjusted	DOLLARS PER ACRE													
1974	199	141	148	317	197	341	569	430	254	534	829	565	882	450
1975	344	206	157	446	259	537	691	472	316	710	1115	753	1035	607
1976	300	250	162	542	235	696	923	596	455	906	1464	915	1150	735
1977	367	277	179	558	297	746	1027	778	473	1058	1835	1197	1437	859
1978	433	321	280	853	478	906	1171	927	575	1199	1682	1373	1396	980
1979	560	520	310	828	483	960	1528	1112	768	1574	2111	1645	1799	1140
1980	132	452	271	868	506	1051	1735	1056	741	1674	2320	1864	1778	1318
1981	888	645	386	973	695	1303	1949	1300	790	1646	2865	1941	1830	1367
1982	806	459	325	987	556	1259	1876	1240	873	1701	2484	1713	1711	1360
1983	671	515	141	874	605	1090	1569	1187	780	1743	2139	1395	1878	1291
1984	636	460	256	955	502	1098	1391	1123	828	1405	1964	1337	1642	1263
1985	533	390	192	691	467	872	1163	869	604	986	1392	929	1423	864
1986	342	231	268	622	499	552	746	738	889	701	953	629	1127	650
1987	325	198	--	458	360	506	635	592	687	703	878	577	827	559
Percent Change of Unadjusted Prices 1986-87	PERCENT													
	-5	-14	--	-26	-28	-8	-15	-20	-23	0	-8	-8	-27	-14
Adjusted 1987 Prices	DOLLARS PER ACRE													
	410	227	--	491	330	484	621	640	587	719	876	570	807	584
Percent Change from 1986 Using Adjusted 1987 Prices	PERCENT													
	20	-2	--	-21	-34	-12	-17	-13	-34	3	-8	-9	-28	10

Table 19 : Percentage of Farm Land Sales by Distance of Buyer's Residence from Tract, by Economic Development Regions, Minnesota, 1987

Economic Development Regions	DISTANCE IN MILES							Median
	<2	2-4	5-9	<10	10-49	50-299	300+	
	PERCENT							
1	23	37	26	86	13	0	2	3
2	31	0	19	50	19	25	6	8
3	0	0	0	0	0	0	0	n/a
4	20	31	20	71	18	8	3	4
5	17	0	9	26	61	9	4	10
6W	19	46	23	88	11	2	0	3
6E	24	38	29	91	6	3	1	3
7W	21	35	15	71	27	2	0	4
7E	19	6	13	38	38	25	0	15
8	31	32	18	81	12	4	3	3
9	24	42	22	88	13	0	0	3
10	23	29	21	73	18	6	2	4
11	19	39	10	68	32	0	0	3
Minnesota	24	33	20	77	16	4	2	4

In contrast, in Region 6E, west of the Twin Cities, 91 percent of the sales were to buyers living less than 10 miles from their purchased tracts, and the comparable figures were over 80 percent in Regions 1, 6W, 8 and 9. The significance of non-local buyers is clearly greatest in the counties along the axis of the Mississippi river north of St. Cloud, and along the axis of Interstate highway I-35 north and east of the Twin Cities. In the rest of the state the market is predominantly to overwhelmingly local. These relationships hold for both number of sales, and acres sold (Tables 19 and 20).

Table 20 : Percentage of Acres Sold by Distance of Buyer's Residence from Tract, by Economic Development Regions, Minnesota, 1987

Economic Development Regions	DISTANCE IN MILES							Median
	<2	2-4	5-9	<10	10-49	50-299	300	
	PERCENT							
1	19	27	34	80	16	0	4	3
2	32	0	23	55	22	18	4	8
3	0	0	0	0	0	0	0	n/a
4	16	30	20	66	20	12	4	4
5	9	0	19	28	54	13	6	10
6W	19	45	28	92	8	1	0	3
6E	18	40	27	85	4	10	0	3
7W	12	43	13	68	31	1	0	4
7E	17	3	13	33	44	24	0	15
8	26	33	18	77	15	5	3	3
9	22	42	23	87	14	0	0	3
10	17	28	20	65	22	8	5	4
11	30	33	10	73	27	0	0	3
Minnesota	20	31	23	74	8	5	3	4

Part II

The Effect of Climate, Location, Soil Quality, and Government Programs on the Rural Real Estate Market

The Rural Real Estate Market in Southwestern Minnesota

The widespread distribution of cash grain field crops and the general absence of urban influences in the southwestern quadrant of the state makes it possible to compare land market trends in areas with similar land use patterns but with significantly different exposure to climatic risk. For this purpose the counties of southwestern Minnesota are clustered into three groups: a lower risk area of nine south-central counties with high crop yields and relatively stable weather patterns; a higher risk area of nine west-central counties with a history of greater variability in crop yields and extremes in climate; and a group of ten counties comprising a transitional area, in between, as shown in Figure 4.

The trends in average sales prices in these three groups of counties are shown in Table 21, for the period of sustained land price declines from 1981 to 1987. The ordering of land prices in these three areas has been unchanged for many years, with the highest prices in the area of lower risk, intermediate prices in the transitional area, and lower prices in the area of higher risk. Although this ranking has been stable, major changes have occurred in relative price levels.

It is noteworthy, for example, that the decline from the peak prices of 1981 to 1987 was 69 percent in the lower risk area, 61 percent in the transitional area, and 59 percent in the area of higher risk. Among these counties the variability in land prices has been greatest in the counties with higher prices and relatively lower climatic risk. A second noteworthy trend is the narrowing of the spread in land prices between the areas of lower and higher climatic risk. Land prices at the peak in 1981 in the higher risk area averaged only 42 percent of per acre prices in the low risk group. As prices declined, this gap steadily narrowed to 1986, when relative prices in the higher risk group had risen to 61 percent of prices in the low risk counties. They fell back to 56 percent in 1987, but for the three years, 1985-87, they averaged 58 percent, a level of relative prices that was almost 40 percent higher than prevailed in 1981. The land price declines since 1981, in short, significantly reduced the spread in prices that could be attributed to climatic differences.

Figure 4.

High-Risk, Low-Risk, and Transitional Areas of Minnesota, 1987

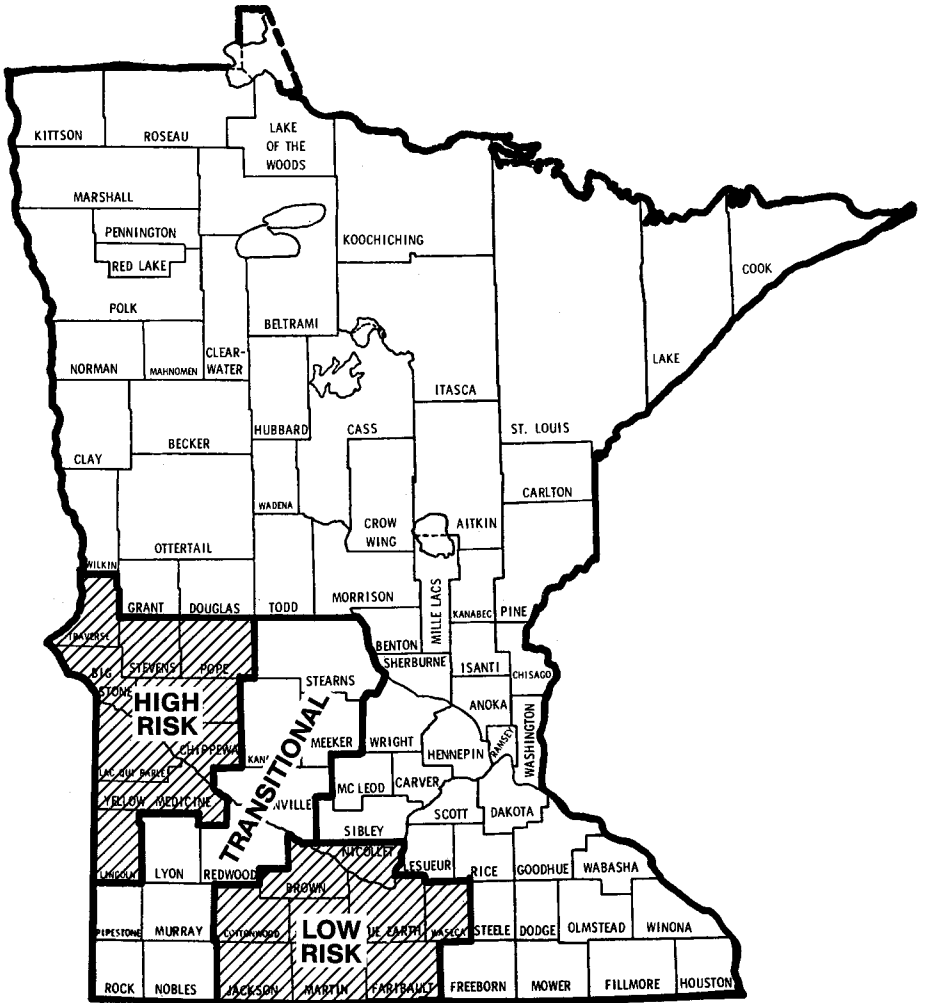


Table 21 : Farmland Sales by Risk Category in Southwestern Minnesota, 1981-1987

ITEM		1981	1982	1983	1984	1985	1986	1987	Percent Decline from 1981
DOLLARS									
Average Sale Price Per Acre (\$)	hi	1159	1140	1016	1001	783	561	479	59
	tr	1680	1698	1590	1356	1011	680	651	61
	lo	2760	2529	2145	1954	1354	919	853	69
PERCENT									
Change in Sale Price From Previous Year (%)	hi	22	-2	-11	-1	-22	-28	-15	
	tr	8	1	-6	-15	-25	-33	-4	
	lo	19	-8	-15	-9	-31	-32	-7	
Average Sale Price as Percent of Average Price in Low Risk Area	hi	42	45	47	51	58	61	56	
	tr	61	67	74	69	75	74	76	
ACRES									
Average Acres Per Sale	hi	191	158	162	167	151	206	169	
	tr	156	136	150	127	140	148	144	
	lo	111	110	110	101	115	117	125	

NOTE: "hi", "lo", and "tr" refer (respectively) to higher-risk area, lower-risk area, and transitional area.

Table 22 : Variations in Total Sale Price of Parcel, Lower Risk, Transitional and Higher Risk Areas, Minnesota, 1981-1987^{a/}

Risk Area	1981	1982	1983	1984	1985	1986	1987
DOLLARS							
Hi	221,369	180,120	164,592	167,167	118,233	115,566	80,957
Trans.	262,080	230,928	238,500	172,212	141,540	100,640	93,744
Low	306,360	278,190	235,950	197,354	155,710	107,523	106,625
PERCENT							
Hi/Lo	67.8	64.7	69.8	84.7	75.9	107.5	75.9

^{a/} Transaction Amount is price per acre times acres per sale.

Table 23 : Percentage of Sales and Price Paid Per Acre, By Type of Buyer and Risk Area, Southwestern Minnesota, 1981-1987^{a/}

	1981	1982	1983	1984	1985	1986	1987
HIGHER-RISK AREA							
sole-tract buyer	05% \$1165	06% \$1264	07% \$994	06% \$1207	08% \$499	05% \$479	08% \$410
expansion buyer	88% \$1171	83% \$1135	85% \$1026	83% \$996	83% \$836	80% \$564	81% \$482
investor buyer	06% \$1172	11% \$1127	07% \$1052	11% \$895	08% \$748	14% \$594	11% \$519
TRANSITIONAL AREA							
sole-tract buyer	13% \$1557	11% \$1733	14% \$1249	10% \$1190	14% \$900	10% \$624	10% \$631
expansion buyer	76% \$1752	81% \$1742	79% \$1678	85% \$1373	72% \$1061	76% \$68	77% \$689
investor buyer	10% \$1405	08% \$1302	08% \$1368	05% \$1330	14% \$900	14% \$677	13% \$487
LOWER-RISK AREA							
sole-tract buyer	03% \$2763	02% \$2447	04% \$1875	02% \$1699	04% \$1338	04% \$931	05% \$762
expansion buyer	93% \$2790	94% \$2569	92% \$2183	95% \$1979	83% \$1331	81% \$905	89% \$859
investor buyer	04% \$2765	04% \$1617	04% \$2368	03% \$2098	13% \$1142	15% \$968	06% \$846

^{a/} Columns may not add to 100 due to rounding.

Table 24 : Percentage of Sales and Average Sales Price Per Acre, By Method of Financing and Risk Area, Southwestern Minnesota, 1981-1987^{a/}

	1981	1982	1983	1984	1985	1986	1987
HIGHER RISK AREA							
cash	14% \$1335	23% \$1085	30% \$984	30% \$1002	33% \$730	39% \$506	45% \$473
mortgage	24% \$1042	16% \$1160	24% \$1106	26% \$1010	15% \$840	15% \$607	19% \$611
contract for deed	62% \$1165	61% \$1149	46% \$1002	44% \$1051	52% \$769	46% \$555	36% \$505
TRANSITIONAL AREA							
cash	19% \$1646	25% \$1675	23% \$1497	24% \$1985	34% \$855	50% \$676	41% \$636
mortgage	19% \$1842	21% \$1576	19% \$1604	25% \$1286	19% \$1031	20% \$722	19% \$611
contract for deed	63% \$1626	54% \$1758	58% \$1598	51% \$1476	48% \$1075	31% \$649	40% \$666
LOWER RISK AREA							
cash	28% \$2893	19% \$2502	26% \$2078	35% \$1901	38% \$1272	52% \$885	45% \$862
mortgage	24% \$2583	26% \$2546	34% \$2226	25% \$1941	20% \$1202	22% \$956	21% \$864
contract for deed	47% \$2680	55% \$2495	40% \$2175	40% \$2029	42% \$1333	27% \$920	34% \$819

^{a/} Percentages may not add to 100 due to rounding.

The Rural Real Estate Market in the Greater Twin Cities Metropolitan Area

The Greater Twin Cities Metropolitan Area is defined for this study as the 14 counties surrounding the Twin Cities core. These 14 counties are divided into three sub-areas, to facilitate more detailed study based upon population levels, recent rates of population growth, productivity of the land, and historical trends in land values. The North Metro Fringe includes four counties: Chisago, Isanti, Sherburne, and Wright. The South Metro Fringe contains five counties: Goodhue, McLeod, LeSueur, Rice and Sibley. The center comprises the "Seven" County Metro area which is region 11 among the Economic Development Regions. In this analysis it includes five counties excluding Hennepin and Ramsey (Minneapolis and St. Paul): Anoka, Carver, Dakota, Scott, and Washington (see Figure 5).

Table 25 : Average Reported Sales Price per Acre, Greater Twin Cities Metropolitan Area and Sub-areas, 1973-87

Year	"Seven" County Metro ¹	South Metro Fringe ²	North Metro Fringe ³	Greater T.C. Metro (14 counties) ⁴	Minnesota
1973	698	475	353	516	298
1974	882	647	556	689	450
1975	1035	808	599	839	607
1976	1150	1086	718	1045	735
1977	1437	1285	752	1198	859
1978	1396	1313	892	1185	980
1979	1799	1799	1309	1694	1140
1980	1778	2097	1170	1781	1318
1981	1830	1955	1334	1791	1367
1982	1711	1867	1446	1759	1360
1983	1878	1614	1325	1581	1291
1984	1642	1464	1280	1458	1263
1985	1423	1069	1051	1152	864
1986	1127	846	721	855	650
1987	827	752	764	772	559

¹Anoka, Carver, Dakota, Scott, Washington Counties. (Hennepin and Ramsey are excluded for reporting purposes.)

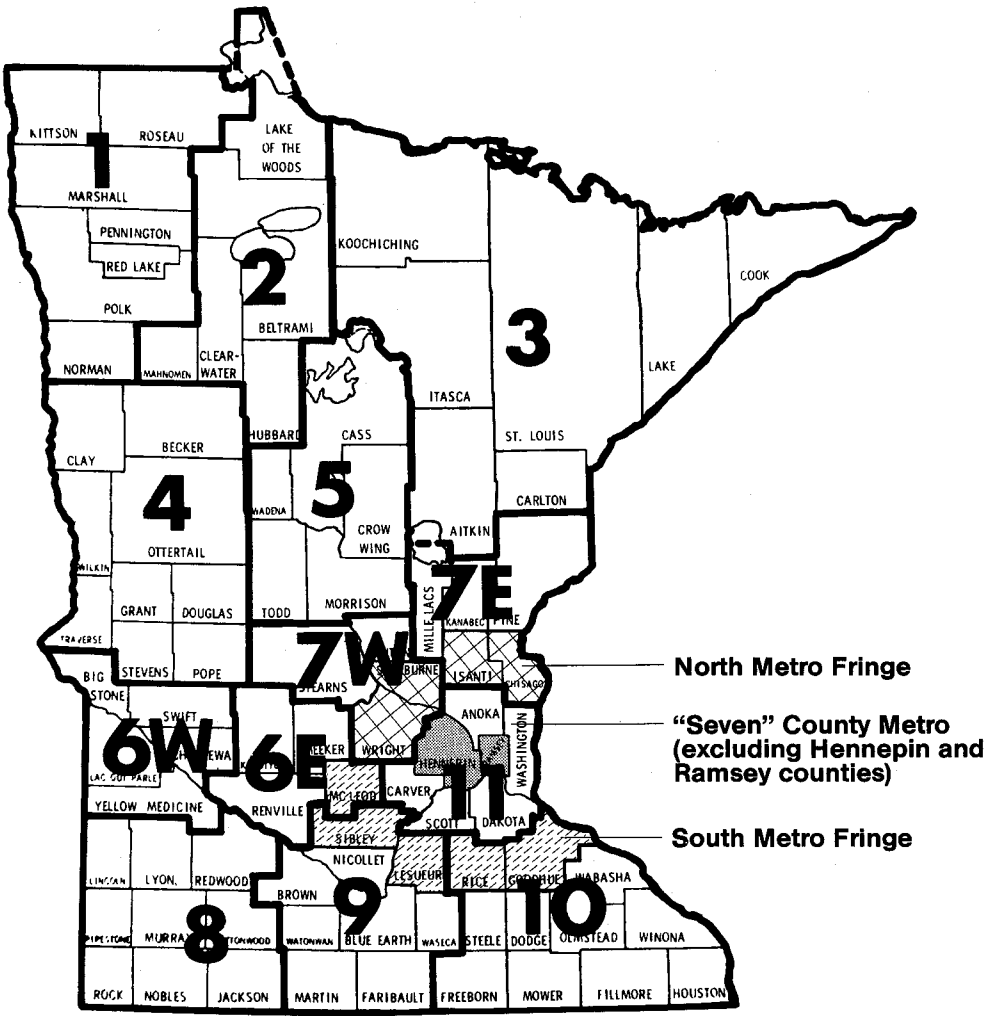
²Goodhue, McLeod, Le Sueur, Rice and Sibley Counties.

³Chisago, Isanti, Sherburne, Wright Counties.

⁴All fourteen counties named above.

Figure 5.

Minnesota Economic Development Regions and the Greater Twin Cities Metropolitan Area



For the Greater Twin Cities Metro Area, reported sales prices in 1987 average \$772 per acre, down 10% from 1986 (Table 25). Among the three sub-areas, the highest average reported price per acre was for the "Seven County Metro" region, at \$827. The South Metro Fringe counties are the most explicitly agricultural among the sub-areas and here the average price was \$752. The North Metro Fringe, with poorer soils than the South, reported an average sales price of \$764. This is a reversal from the trend in recent years, in that the South Metro Fringe has typically reported higher per acre prices than the North. The prices were essentially the same in 1987.

The decline of 10% from 1986 to 1987 in the Greater Twin Cities Metropolitan Area was the same as the 10% drop in the adjusted sales prices for the state as a whole. The South Metro Fringe declined 11% from 1986 to 1987, while sales prices in the North Metro Fringe increased 6% from the 1986 value of \$721.

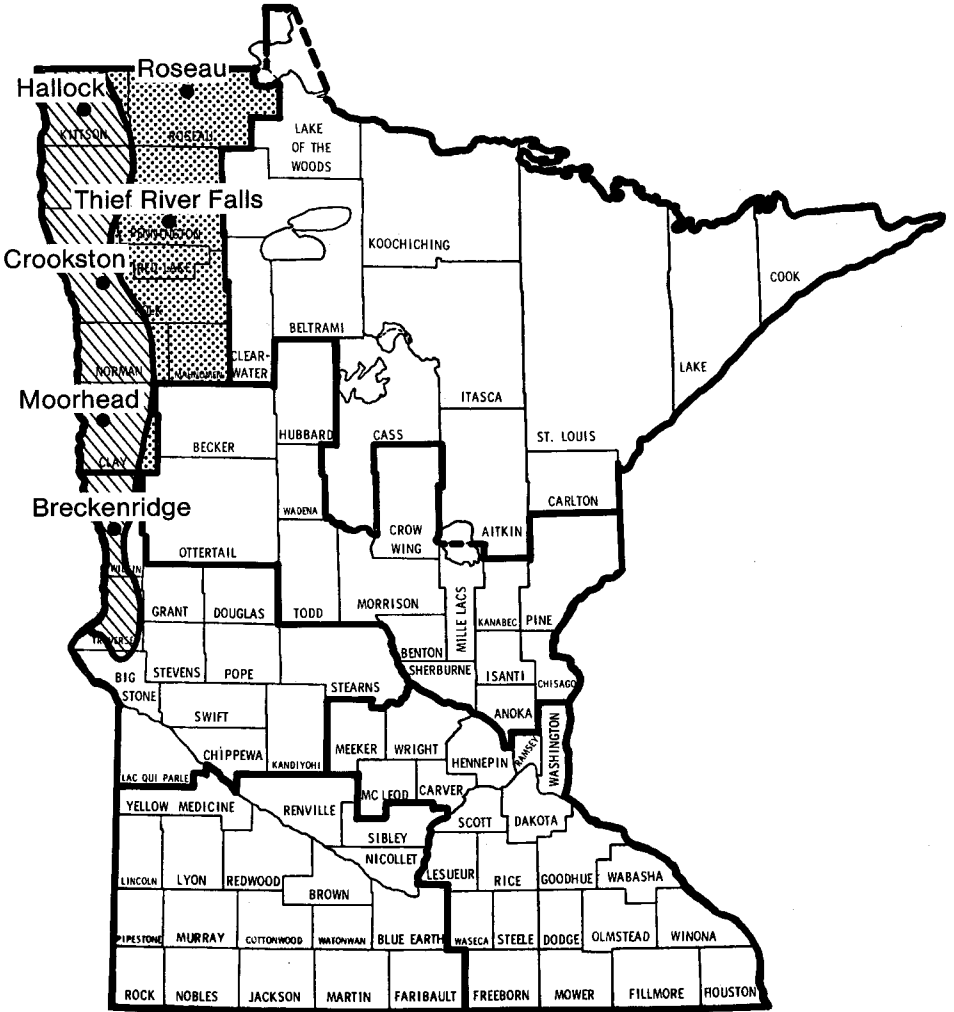
Farm Land Prices in the Red River Valley and Adjacent Areas

The differences in land quality that distinguish the former glacial lake plain known as the Red River Valley from adjacent areas create one of the sharpest dividing lines in Minnesota agriculture. Any analysis based on the county, regional or land market district data is distorted by inclusion of both Valley and non-Valley land. To reduce this distortion, a separate analysis has been made. Data by townships have been classified into a Red River Valley group and a second comparison group made up of the non-valley townships or counties falling primarily into the Northwest district as defined in this report. The outlines of the Red River Valley and the Non-Valley Comparison Area are shown in Figure 6.

In the years of greatest price declines in 1985 and 1986 the drop in sales prices was greatest in the Non-Valley Comparison Area. This pattern was sharply reversed in 1987, with a drop of 20% in the Valley and only 9% in the comparison area (Table 26). Although average prices per acre in the Valley are more than double the prices in the comparison area, the gap has narrowed. The data gathered for this report do not permit an exploration of the motives of buyers and sellers, but it may be significant that the counties and parts of counties included in the comparison area are among those in which large areas have been entered in the Conservation Reserve, authorized by the 1985 Agricultural Act. The availability of lease payments for Conservation Reserve land may have set a floor under farm land prices in this Comparison Area in a more pronounced manner than in other areas of the state. This is shown in more detail in the next section on the distribution of idled cropland.

Figure 6.

The Red River Valley and Comparison Area



 Red River Valley

 Non-Valley Comparison Area

Table 26 : Farm land sales prices and average tract size for Red River Valley and Comparison Area, 1972-1987

Year	Price Per Acre (\$)		Percent Change From Previous Year (%)		Average Size of Tracts Sold (acre)	
	Valley	Comparison Area	Valley	Comparison Area	Valley	Comparison Area
1972	151	78	-9	18	316	260
1973	201	90	33	15	252	358
1974	359	152	79	69	231	337
1975	535	227	49	49	219	270
1976	733	279	37	23	216	325
1977	780	306	6	10	284	287
1978	849	385	9	26	270	290
1979	993	461	17	20	257	321
1980	1112	638	12	38	204	317
1981	1195	788	7	24	281	284
1982	1239	629	4	-20	164	287
1983	998	561	-19	-11	190	249
1984	939	524	-6	-7	186	248
1985	755	387	-20	-26	180	203
1986	625	266	-17	-31	187	265
1987	499	243	-20	-9	231	381

In the Red River Valley all of the sales reported in 1987 were to expansion buyers, 80% of them were of land without buildings (unimproved), and 60% of the sales were reported as cash sales (Tables 27, 28, 29). In contrast, expansion buyers acquired 77% of the tracts in the Non-Valley Comparison Area, operating farmers 13% and investors 10%. Tract size was much larger in the Non-Valley Comparison Area, and the use of mortgages and contracts for deed was more frequent.

Land market activity in the Red River Valley and in the Non-Valley Comparison Area in 1987 provides a good example of the need to adjust sales prices to take account of year-to-year shifts in the geographic location of sales activity.

In 1986, for example, 33% of all acres sold in the state was in the Southeast District, containing some of the state's highest priced land. Only 12% was in the Northwest district, which includes almost all of the Red River Valley. In 1987, sales in the Southeast district involved only

Table 27 : Proportion of Sales and Average Sales Price Per Acre of Improved and Unimproved Land in the Red River Valley and Non-Valley Comparison Area, 1981-1987

Area and Year	Percentage of Sales		Price Per Acre		Price of Unimproved Land as a % of Price of Improved Land
	Improved %	Unimproved %	Improved \$	Unimproved \$	%
Red River Valley					
1981	25	75	1,083	1,293	119
1982	29	71	1,358	1,187	87
1983	25	75	959	1,027	107
1984	15	85	1,051	918	87
1985	8	92	755	755	106
1986	30	70	581	648	112
1987	20	80	423	527	125
Non-Valley Area					
1981	39	61	886	677	76
1982	42	57	663	596	90
1983	28	72	618	523	85
1984	40	60	485	561	116
1985	28	72	387	388	100
1986	24	76	238	276	116
1987	41	59	237	253	107

24% of the acres reported sold, while the Northwest district sales accounted for 20%. Most of this increase in acreage sold in the Northwest District occurred in areas of lower priced land, typified by the area specified here as the Non-Valley Comparison Area. The effect can be seen most emphatically in Table 18, in which the unadjusted sales price in 1987 in Economic Development Region 1 (containing much of the Red River Valley) showed a decline of 5% from 1986. When adjusted to reflect the relative proportions of land sold in 1986 compared to 1987, this is converted into a 20% increase in 1987.

Table 28 : Percentage of sales and price paid per acre, by type of buyer, Red River Valley and Comparison Area, 1982-1987

Type of Buyer	1982	1983	1984	1985	1986	1987
RED RIVER VALLEY						
Sole-Tract Buyer	% 03 \$ 579	02 1150	02 1250	0 --	02 513	0 --
Expansion Buyer	% 95 \$ 1254	98 995	98 1005	92 740	96 626	100 506
Investor Buyer	% 02 \$ 1400	0 --	0 --	08 857	02 897	0 --
COMPARISON AREA						
Sole-Tract Buyer	% 26 \$ 638	11 646	17 445	09 578	06 356	13 387
Expansion Buyer	% 69 \$ 625	81 561	80 544	68 402	88 258	77 232
Investor Buyer	% 05 \$ 613	08 399	03 350	23 289	06 393	10 184

Table 29 : Percentage of Sales and Price Paid Per Acre by Method of Finance, Red River Valley and Non-Valley Comparison Area, 1986-1987

Method of Finance	Red River Valley				Non-Valley Area			
	1986		1987		1986		1987	
	%	\$	%	\$	%	\$	%	\$
Cash	49	715	60	592	45	279	39	291
Mortgage	13	601	21	429	32	303	36	245
Contract for Deed	38	598	19	447	23	202	25	175

The Distribution of Idled Cropland

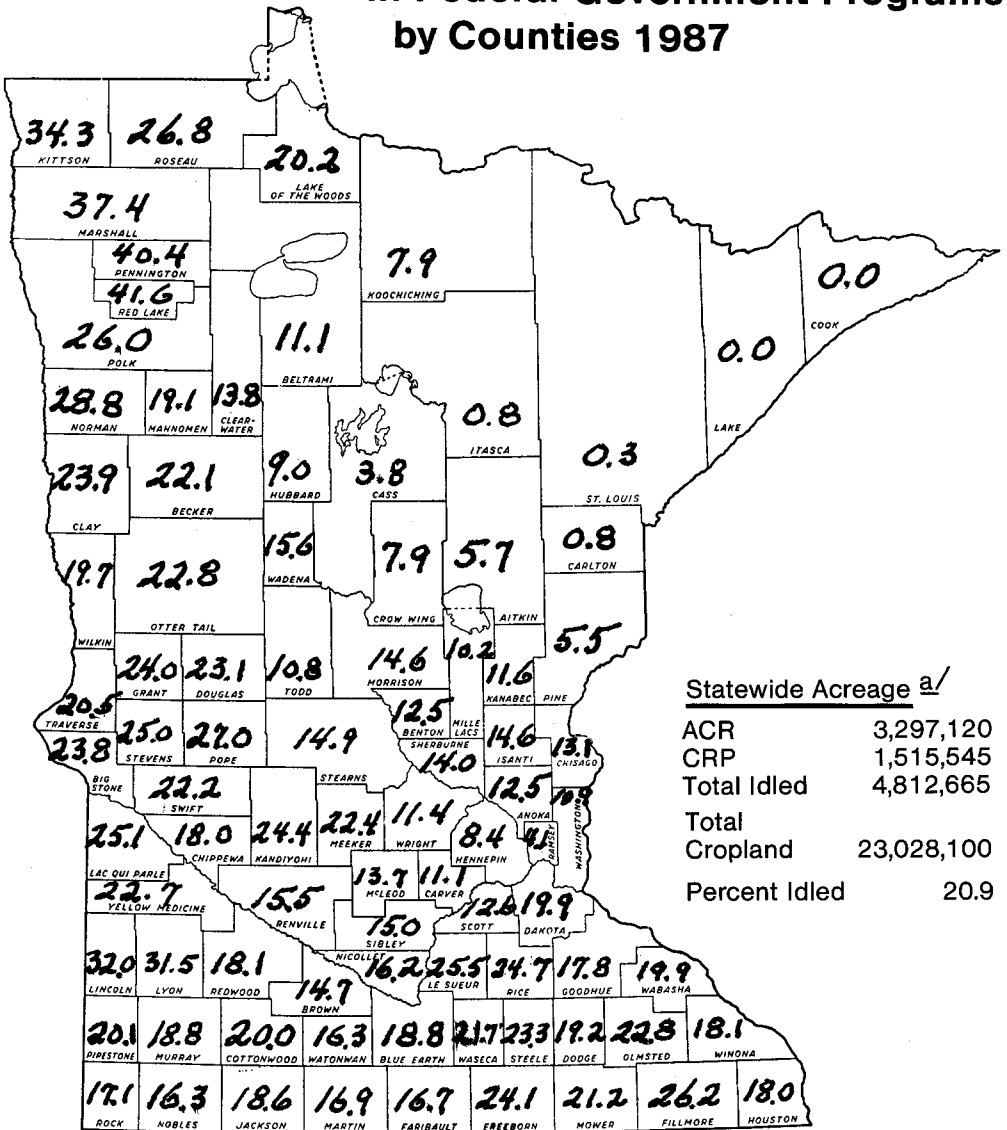
An indication of the widespread support for land values provided by price support loans, deficiency payments and conservation rental payments under government programs is indicated in Figure 7, showing, by counties, the percent of total cropland that was idled in 1987 under all programs. Statewide, participants in Acreage Conservation Reserve (ACR) programs to reduce crop surpluses (primarily corn, wheat and barley in Minnesota) had idled 3,297,120 acres in 1987, or 14.3 percent of total cropland. An additional 1,515,545 acres had been entered by October 1987 in the Conservation Reserve Program (CRP), equivalent to 6.6 percent of all cropland. Combined, the idled acres under the ACR and CRP programs equaled over one-fifth (20.9 percent) of all cropland in the state. The counties with idled cropland acres exceeding 20 percent of total cropland are shown in Figure 8.

As the data in Figures 7 and 8 show, these idled acres were not evenly distributed over the state. The concentration was heaviest in a group of counties in the southeastern quadrant of the state, in counties along the western border, and especially in counties in Economic Development Region 1, in the northwest. This concentration of idled land in the northwest, a wheat region, is due in part to the fact that in 1987 the proportion of the crop acre base required to be idled to qualify for government support programs was 27.5 percent for wheat, but only 20 percent for corn. In a contiguous area including Kittson county, eastern portions of Marshall and Polk counties and all of Pennington and Red Lake counties idled cropland in 1987 approached or exceeded 40 percent of total cropland. In this northwestern area the proportion of total cropland acres idled is the highest in the state and the proportion of idled acres accounted for by entries in the Conservation Reserve Program is also highest.

This latter point is significant in explaining the relatively strong land market in 1987 in Economic Development Region 1, as shown in Table 18, p. 30 above. Apparently the rental rates being paid for CRP lands in relation to current sales prices provide a rate of return that has not only put a floor under land prices in this area but has actually supported land price increases in areas east of the Red River Valley that showed sharp declines in 1985 and 1986.

Figure 7.

Minnesota Percentage of Total Cropland Idled in Federal Government Programs by Counties 1987

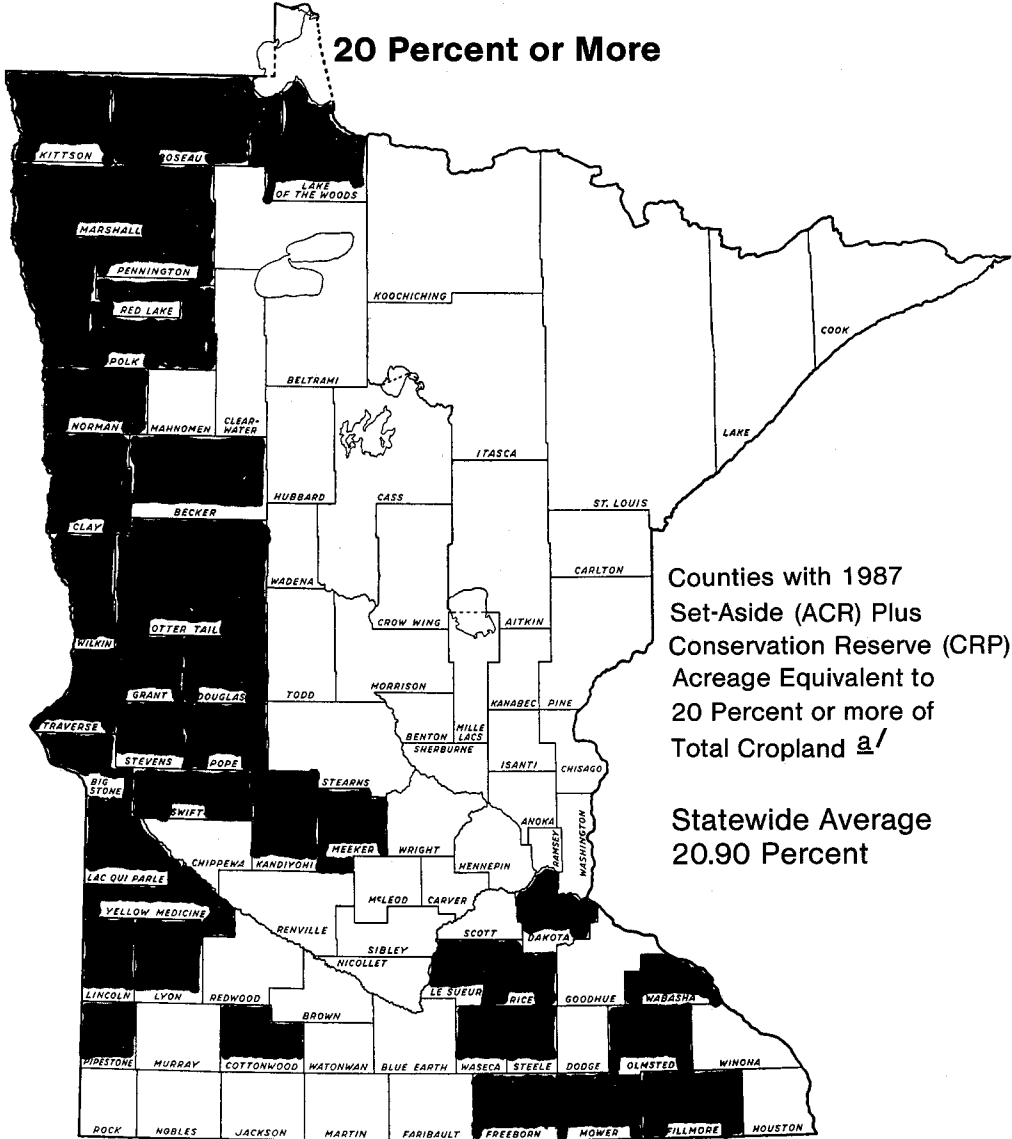


^{a/} ACR (set aside) acreage includes Paid Diversion. Total Cropland base from National Resource Inventory (NRI) of 1982.

Figure 8.

Minnesota Idled Cropland Acres by Counties 1987

20 Percent or More



^{a/}ACR Acreage includes Paid Diversion. Total Cropland Base from National Resource Inventory (NRI) of 1982.

Part III

Deflated Estimated Values and Land Prices

Trends over time in estimated values and sales prices are heavily influenced by the rate of price inflation in the general economy. One way to remove this is by deflating with the Consumer Price Index (CPI), which is a measure of shifts in the prices of specific combinations of consumer goods in 1967 dollars. With the average cost of this combination of goods in 1967 taken as 100, inflation had raised the index to an average of 336.65 in the first six months of 1987. The change due to inflation can be removed from the estimated values and land prices by dividing the data reported for 1987 by 3.3665.

In 1987, the estimated value per acre was \$480 in nominal (current) dollars. This was the lowest estimated value since 1975. The reported sales price in 1987 in nominal dollars was also the lowest price since 1975, at \$559. These nominal values and prices were still not below the 1972 "pre-boom" levels of \$248 for estimated value and \$293 for average sales price per acre.

When the figures are adjusted for inflation a different picture emerges. In 1987, the estimated average value of Minnesota farm land in 1967 dollars was \$143 per acre (Table 30). This is the lowest level of real (deflated) value since 1954, and is slightly below the deflated estimated value of \$146 per acre reported for 1910-11, when this annual survey began. The 1987 average reported sales price of \$559 per acre in current dollars is equivalent to \$166 in constant (1967) dollars. This is the lowest real price since 1953. To mid-1987, land price declines had wiped out all of the increase in the purchasing power of asset values in Minnesota farmland occurring since the end of the Korean War.

The inflation-adjusted data in Table 31 contain several surprises. One is the relatively high level of purchasing power represented by wealth in farmland during the First World War. The deflated average estimated value of \$208 per acre in 1916-17 in 1967 dollars was not exceeded until 1973, a period of 56 years. A second surprise is the complete absence of evidence of inflation in real land values during the Second World War. In fact, the average deflated estimated value of \$98 per acre in 1942-43 was slightly below the estimate of \$100 for 1934-35 and was the lowest figure for deflated values ever reported in the 88 years from 1910 through 1987.

Table 30 : Estimated Average Values and Sales Prices Per Acre of Minnesota Farmland in 1987, Deflated by the CPI, by District

	South- east	South- west	West Central	East Central	North- west	North- east	State Average
Estimated Value	166	199	140	77	111	84	143
Sales Price	185	224	146	127	100	50	166

A third point worth noting is that the collapse in real purchasing power represented by wealth in farm land after 1931 endured for 20 years. The level of \$120 per acre in constant dollars in 1930-31 was not exceeded until 1951. Past evidence suggests that the recovery from a severe collapse in real farm land values is not a question of years but of decades.

Table 31 : Average Estimated Value Per Acre, State and Districts,
Deflated by the CPI, Minnesota, 1910-1987

Year	South-east	South-west	West Central	East Central	North-west	North-east	Minnesota
----- in 1967 dollars -----							
1910-11	207	193	139	86	86	39	146
1912-13	238	238	159	100	100	45	169
1914-15	272	279	186	113	106	47	193
1916-17	281	306	205	125	113	46	208
1918-19	259	262	173	111	89	40	182
1920-21	235	253	163	113	95	40	173
1922-23	227	237	163	112	88	46	169
1924-25	203	215	145	96	86	43	152
1926-27	200	206	136	92	68	42	143
1928-29	195	199	131	86	64	41	138
1930-31	176	176	102	72	44	36	120
1932-33	156	159	103	66	49	34	110
1934-35	130	145	95	65	55	37	100
1936-37	142	154	92	70	53	58	106
1938-39	142	161	88	66	52	59	107
1940-41	140	162	86	62	53	57	102
1942-43	133	156	82	59	49	51	98
1944-45	148	171	91	66	55	53	106
1946	150	178	96	67	56	55	111
1947	143	173	93	64	55	52	108
1948	144	179	96	65	57	53	110
1949	150	190	102	69	62	55	116
1950	151	196	105	69	64	55	118
1951	161	213	114	76	69	59	127
1952	165	220	121	82	86	53	135
1953	162	218	119	77	80	50	131
1954	173	232	123	82	89	50	140
1955	187	256	128	85	91	56	151
1956	192	263	131	86	93	52	155
1957	196	273	145	91	102	58	164
1958	207	279	142	97	104	75	170
1959	219	292	153	102	118	66	180
1960	212	280	150	106	112	72	175
1961	223	292	157	112	118	76	184
1962	212	276	152	109	115	76	175
1963	212	268	155	112	124	74	176
1964	222	271	156	119	124	64	179
1965	232	276	154	119	120	54	181
1966	249	285	157	126	115	60	188
1967	262	303	163	128	108	62	194
1968	275	320	174	129	117	55	203
1969	283	321	180	134	110	50	205

Table 32 : Average Estimated Value Per Acre, State and Districts, Deflated by the CPI, Minnesota, 1910-1987
(con't)

Year	South-east	South-west	West Central	East Central	North-west	North-east	Minnesota
1970	273	299	171	139	103	53	196
1971	275	290	169	128	98	52	192
1972	296	303	166	130	94	61	198
1973	326	345	186	146	110	86	224
1974	392	459	257	190	135	98	288
1975	418	524	312	184	183	101	326
1976	502	649	366	205	222	123	391
1977	566	725	402	229	225	154	437
1978	610	727	411	255	247	156	455
1979	668	745	406	263	275	169	478
1980	618	709	390	241	277	158	454
1981	627	765	417	249	298	169	481
1982	520	649	361	202	259	167	408
1983	454	559	329	188	221	138	357
1984	374	450	281	162	188	140	298
1985	267	300	214	116	158	112	213
1986	185	213	156	91	128	94	158
1987	166	199	140	76	111	87	143

Part IV

Using Contour Maps of Farm Land Prices to Analyze Three Decades of Land Price Changes in Minnesota

The data on farmland sales collected in this annual survey have been recorded by townships within counties since 1954. This has made possible the preparation of a series of maps showing contours of land value on a township grid. Figures 9, 10, 11, 12, and 13 show these maps for 1959, 1969, 1976, 1981, and 1987. The maps are analogous to topographic maps, that show elevation above sea-level. Here the maps show contours that connect areas with approximately equal sales prices, yielding iso-price lines. When close together, the lines indicate steep price gradients in short distances. Lines further apart reveal more gradual changes in sales prices, relative to distance or spatial relationships.

These maps cover the entire period preceding, during and following the phenomenal increase in farm land values of the 1970's. The contour map for 1981, for example, captures the pattern of prices at the peak of the boom, while the map for 1987 records the effects of the post-boom collapse.

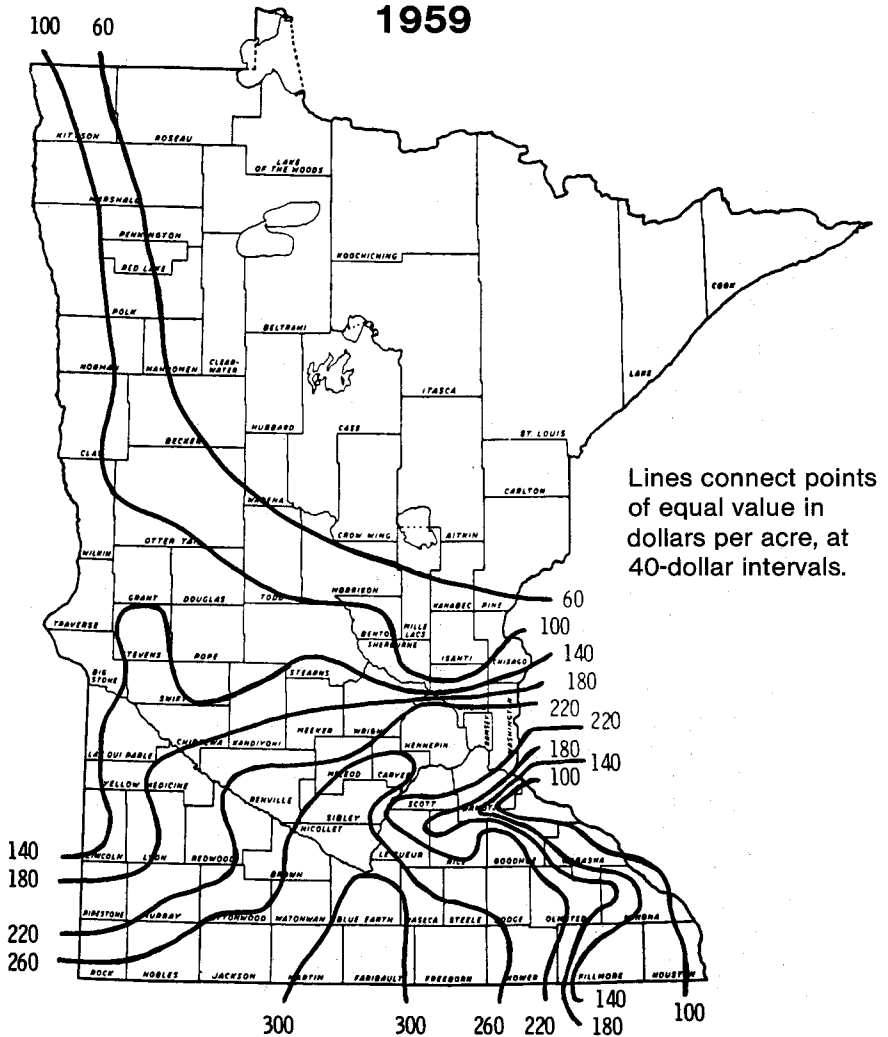
The map for 1969, depicting the pattern of land prices before the boom, shows two approximately equal peaks of elevated rural land prices at the \$420 per acre gradient, one surrounding the Twin Cities and one enveloping the highly productive south-central counties on the Iowa border.

By 1976, proximity to the Twin Cities Metropolitan Area had declined in relative importance. Farm land in the south-central counties was selling at prices 30 to 50 percent above those prevalent in counties on the fringes of the Twin cities. At the peak of the boom in 1981, this predominance of agricultural use potentials over location was especially apparent, with the highest priced south-central farm land selling at prices double those being paid for farm lands in the Twin Cities commuter belt. Forecasts of world food shortages had generated an explosion in the demand for land for farming, and petroleum price increases of 1972-73 and 1979 had dampened non-farm demand for rural homesites. The contour map of farmland prices for 1981 shows the influence of non-farm demand for farm land at its lowest level in the 34 years since township data were first included in this survey in 1954.

This was reversed in the 1980's by the dramatic decline in demand for farmland for farming. The importance of location with respect to the metropolitan area was reasserted. The contour map for 1987 shows the

Figure 9.

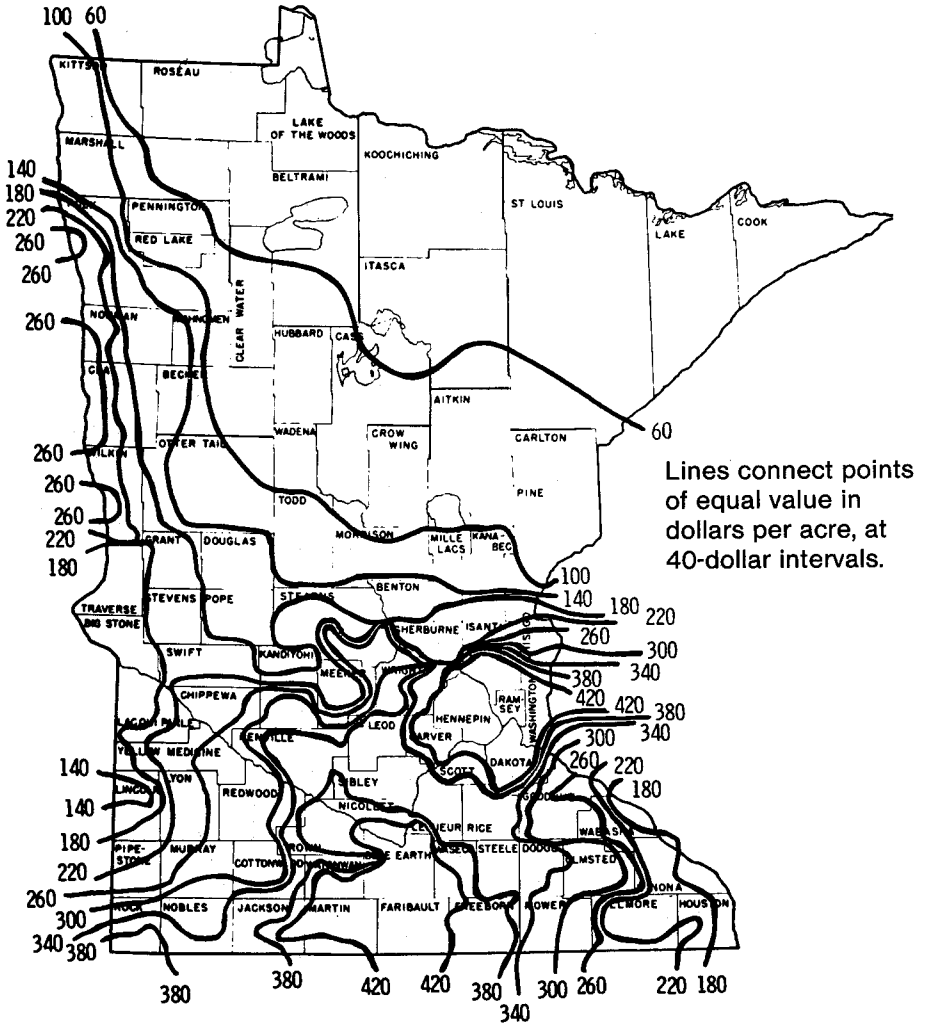
Contour Map of Minnesota Farmland Prices



(Hennepin and Ramsey counties excluded in determining contours.)

Figure 10.

Contour Map of Minnesota Farmland Prices 1969



(Hennepin & Ramsey counties excluded in determining contours)

highest priced farmland in the state again located in the rural counties surrounding the Twin Cities, as had been the case in 1969, before the boom. But there are some significant differences.

Examination of the contour maps for 1959, 1969, and 1976 shows a sharp value gradient downward on the northern boundary of the Twin Cities metro area. This gradient was less pronounced in 1981 and had separated into two gradients in 1987, one immediately north of the Twin Cities metro counties and a second one roughly north of St. Cloud. The significance of location in the counties north of the Twin Cities metro area and in the corridor linking St. Cloud with Minneapolis-St. Paul had apparently increased.

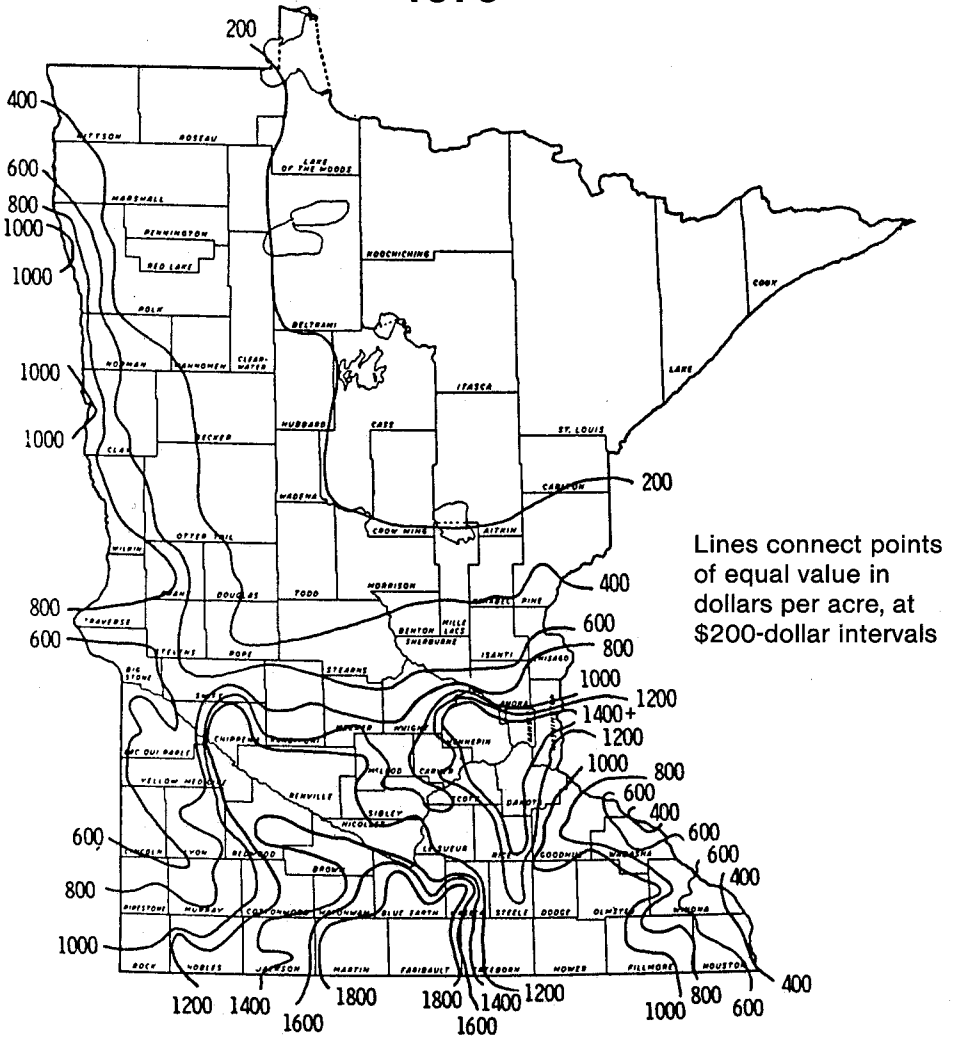
Outside the area directly influenced by the Twin Cities, one of the most pronounced shifts in land value contours occurred in the counties bordering the Minnesota river north and west of Mankato. In 1959, 1969, and 1976, farm land sales prices in Brown, Nicollet, Redwood, and Renville counties were well below the levels in Blue Earth, Faribault, Jackson, Martin, and Watonwan counties, which had for decades encompassed the highest priced farm land in the state. In 1981 and especially in 1987, farm land sales in Brown, Nicollet, Renville, and parts of Redwood and Sibley counties were at prices approximately on a par with those in the high-priced counties on the Iowa border.

One of the possible explanations of this shift can be attributed to the opening of the sugar-beet factory in Renville county in 1975. This plant, one of the most modern in the world, provided a market outlet for growers in an area in which sugar beets were previously a minor crop. The effect on land prices is clearly apparent in the contour maps for 1976, 1981 and especially 1987. While land prices in cash grain areas fell sharply after 1981, the fall was much less abrupt in the areas where sugar beets were an alternative crop. This is most visible in the location of the 1987 contours for land prices between \$800 and \$1000 per acre. In 1987 this contour linked the sugar beet area in Renville and adjacent counties in the same gradient with the highest priced corn and soybean land in the south central counties on the Iowa border. This linkage was not apparent in 1959, 1969, 1976 or 1981.

A prominent shift in land price contours is also related to changes in the transportation network. This series of five contour maps from 1959 to 1987 covers the entire construction period from beginning to completion of the Interstate highway system in Minnesota. The effects of highway expansion on rural land prices were first apparent in 1969, in the southward movement of the gradient outlining the Twin Cities metro area. In 1959 the effects of the Twin Cities on rural land prices were largely confined to Hennepin and Ramsey counties, central Washington county, southern Anoka county, and the northern portions of Dakota and Scott counties. By 1969 this "Twin Cities effect" had pushed the demarcation

Figure 11.

Contour Map of Minnesota Farmland Prices 1976



(Hennepin and Ramsey counties excluded in determining contours)

gradient outward to include virtually all of Anoka and Washington counties to the north and east and most of Carver, Dakota, and Scott counties to the south and southwest.

The sharpest effect of the Interstate highway system was apparent in the contour map for 1976, with a pronounced lobe of higher priced land outlining the route of Interstate Highway 35 running south from the Twin Cities. This effect was expanded in 1981, with a corridor of higher priced land along I-35, south to the Iowa border.

By 1987 the effects of the Interstate highway system on rural land prices had become diffused, with no clear contours that could be related to highway location. A tentative interpretation is that the initial surge in highway-related values from 1969 to 1976 had been extrapolated to rural lands in the areas traversed by the highways, leading to expectations of a more pervasive effect on land prices than did in fact occur.

With completion of the Interstate system, the geographic pattern of land prices resumed the general configuration that had prevailed before construction began. Specific sites along the Interstate, and at important junctions, did experience sharp increases but these were not generalized to all lands in the general area traversed by the highway. The area of urban influence around the Twin Cities was enlarged, but beyond about 50 miles from Minneapolis and St. Paul it was difficult in 1987 to identify any contours in rural land prices that could be related to the Interstate highway system.

Comparisons among the five contour maps is impaired by the impossibility of maintaining unchanging dollar intervals between the gradients. For 1959 and 1969 it was possible to use intervals of \$40. By 1976 the escalation in land prices required the use of \$200 intervals to avoid confusing the map with a maze of contours. By 1981 the contour interval had to be increased to \$500 for prices above \$1000 per acre, to maintain relative comparability with earlier years. In 1987 it was again possible to use the \$200 interval that had been used in 1976, making the maps for 1976 and 1987 more directly comparable than is either year with 1981.

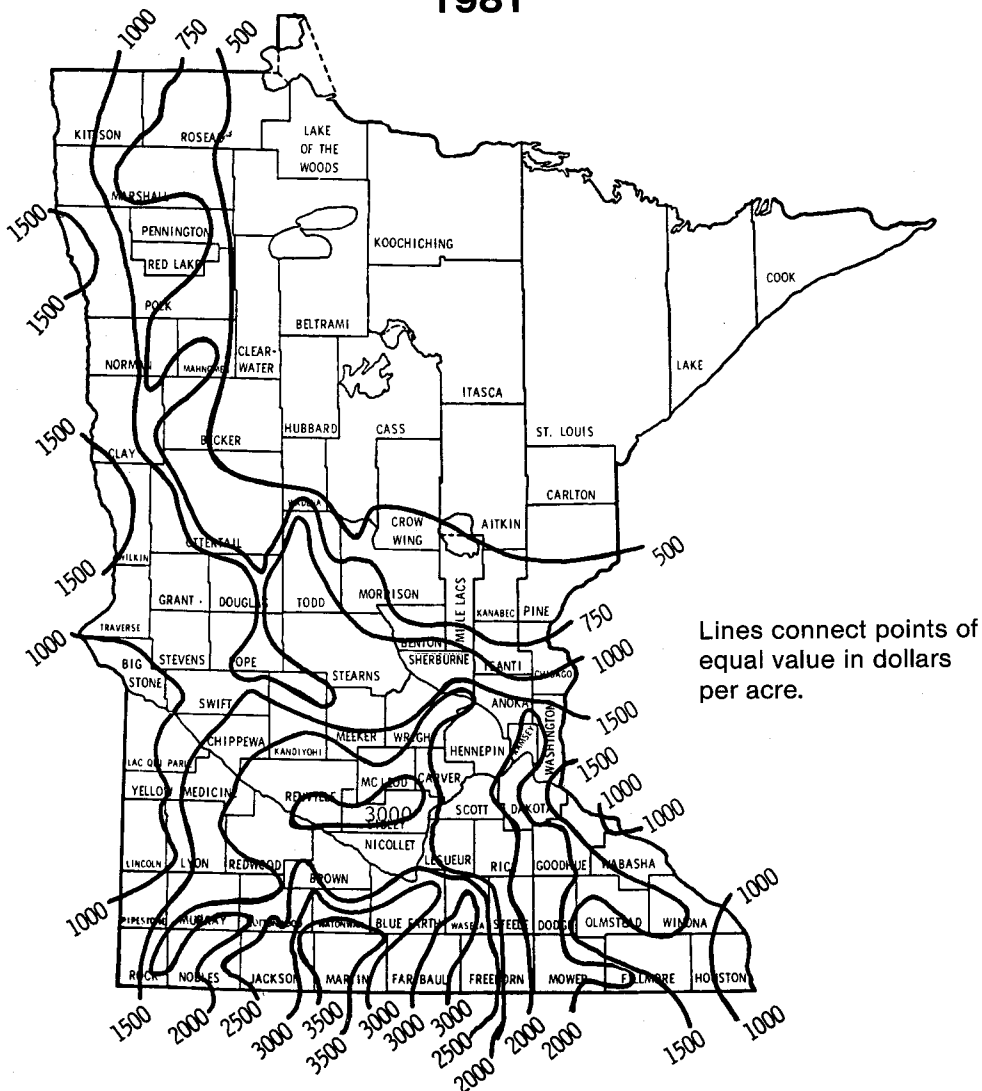
In spite of the drastic changes in land prices between 1959 and 1987, certain regularities can be identified in successive maps. One of the most prominent is the area of sharply lower priced lands in the counties bordering South Dakota, from Big Stone south to Pipestone. Together with the southeastern tip of the state in Houston and Winona counties these two areas have consistently reported the lowest priced lands in the southern half of the state. In the counties of the southeastern tip, the lower prices reflect the low percentage of tillable land per square mile due to the dissected topography and the coulee and bluff landforms.

In the South Dakota border counties a major part of the explanation for lower prices is found in weather patterns, and elevation above sea level. The

Figure 12.

Contour Map of Minnesota Farmland Prices

1981



southwestern portion of Lincoln county, for example, has a higher elevation above sea level (approximately 1700 feet) than any county in the central Corn Belt, as delineated by the U.S. Department of Agriculture. It is almost 1000 feet higher than eastern Nicollet or northern Blue Earth counties in the vicinity of Mankato, although both areas are at the same parallel of latitude and have a similar mix of crops.

Another regularity in land price contours is the downward shift in prices, running east from the North Dakota border and the Red River Valley, in the northwestern quadrant of the state. Note that the contour at \$60 per acre in 1959 is roughly the same as the contours for \$100 per acre in 1969, \$500 in 1981, and \$200 in 1987. They mark the approximate northeastern boundary of arable crop farming in Minnesota, and outline the land use transition zone from farming to forestry and recreational land uses.

Perhaps the most significant trends revealed by this series of maps are the gradual expansion of the urbanizing effect on farm land price around the Twin Cities, and the northwestward expansion of the area of highest land prices formerly centered on the south-central border with Iowa. This latter expansion northward can be interpreted as evidence of the capitalization into land prices of the effects of genetic and crop management technology that have shortened growing seasons and moderated the effects of climatic risk. This technology has not moved the northern frost-boundary of crop cultivation, as noted above. But it has pushed intensive crop cultivation closer to the frost boundary and expanded the area of higher priced farmland.

Procedural Note

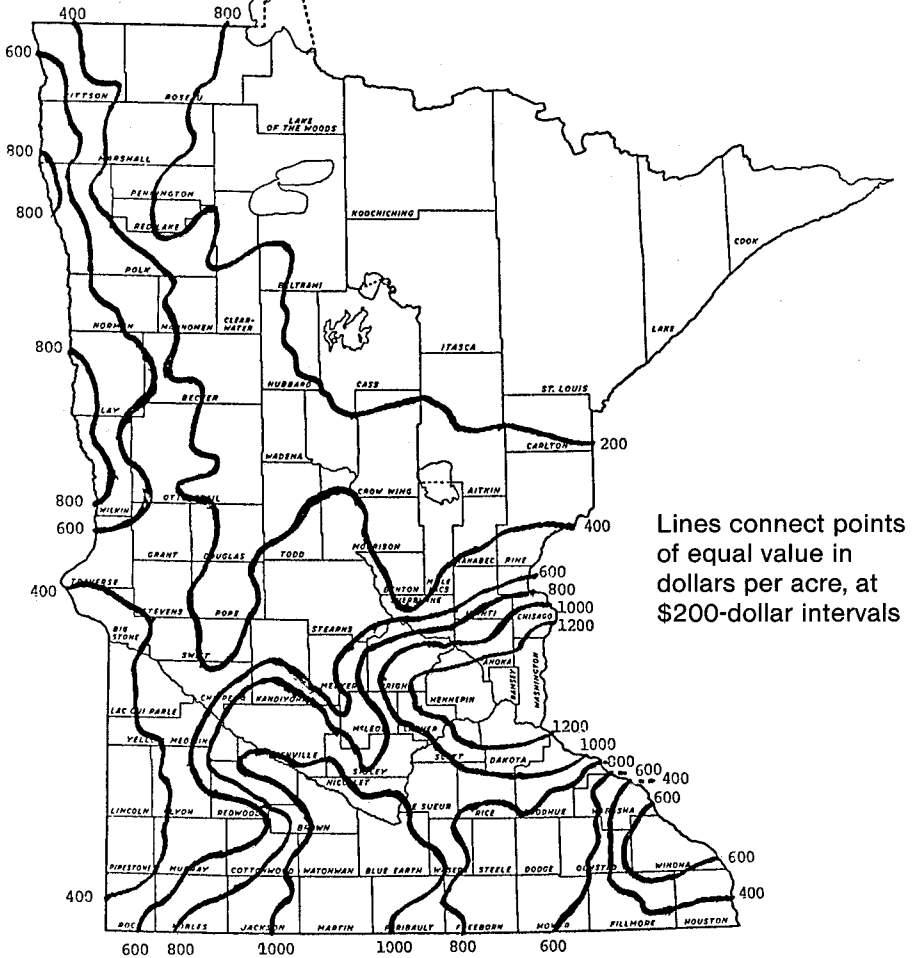
The 1987 contour map was constructed in two steps. The first step involved the computation of township average sales prices for 1986 and 1987 combined. These data by individual townships permitted greater refinement in developing land price contours for small areas. In the second step the average price for each township was combined with the average price for each adjacent township and the resultant average was ascribed to the township in the center of the cluster. In most cases, this involved an average of prices for nine townships, the one in the center, the eight adjacent. This smoothing process had the advantage of revealing the major land price contours.

The authors are indebted to Frank Martin, Dept. of Applied Statistics, University of Minnesota, for his suggestions in the development of this procedure.

Figure 13.

Contour Map of Minnesota Farmland Prices

1987



(Hennepin and Ramsey counties excluded in determining contours)

Statistical Appendix

This report has made use of averages. In using averages, the variation about the average is not apparent. A wide variation reduces the reliability of the data, and any reduction in variation increases the significance of the averages. The measures of variation given here are for the average reported sales prices.

Two measures of variability are the standard deviation and the coefficient of variation. One standard deviation gives a dollar value which, when used to make upper and lower bounds around the average, would include about two-thirds of the reported sales. For the state in 1987, two-thirds of the sales would be bound within \$271.50 ($\$558.70 - \287.20) and \$845.90 ($\$558.70 + \287.20). The coefficient of variation is a related measure. It is calculated by dividing the standard deviation by the mean. This product is multiplied by 100 to obtain a percentage figure. Again for the state as a whole in 1987, the coefficient of variation would be 51.4 percent. For each of the two measures, larger coefficients reflect larger variation about the average reported price.

Table 32 : Average Price Per Acre of Reported Farm Sales, Standard Deviation and Coefficient of Variation, Minnesota and districts, 1961-1987

Year	South-east	South-west	West Central	East Central	North-west	North-east	Minnesota
Average Price Per Acre (dollars)							
1961	189.1	255.8	130.3	89.0	92.0	37.9	165.2
1962	195.7	228.5	140.5	76.3	73.9	30.3	161.1
1963	214.1	221.9	136.2	86.2	108.8	47.6	168.1
1964	213.3	234.3	150.3	86.3	103.6	51.6	178.1
1965	202.0	232.7	133.2	95.8	106.2	39.7	178.0
1966	253.4	260.4	164.3	113.0	103.4	30.6	203.4
1967	272.4	306.1	178.6	92.9	116.6	51.2	214.8
1968	316.0	329.0	186.0	104.0	90.0	47.0	232.0
1969	340.7	334.1	193.6	129.7	120.8	50.7	238.3
1970	346.0	340.0	206.0	141.0	113.0	45.0	243.0
1971	343.6	343.0	204.5	150.2	100.1	43.7	259.0
1972	389.4	365.7	221.7	145.1	107.2	76.4	293.3
1973	443.5	410.1	223.0	178.1	119.7	121.7	298.4
1974	598.4	630.1	339.8	242.7	204.0	144.4	450.1
1975	791.8	843.9	492.9	298.5	352.8	159.3	607.0
1976	937.2	1115.7	663.7	321.3	377.0	209.7	735.2
1977	1216.0	1340.4	708.6	445.7	431.7	197.9	858.8
1978	1351.7	1320.7	907.6	554.0	504.0	256.3	979.6
1979	1674.6	1679.5	618.1	618.1	612.2	410.9	1139.9
1980	1837.1	1868.2	1095.3	603.0	758.8	394.5	1318.5
1981	1965.3	2004.6	1170.6	680.1	918.7	482.8	1367.1
1982	1748.5	2022.3	1167.9	745.7	886.8	405.7	1359.5
1983	1470.0	1872.0	1068.4	678.5	711.1	327.6	1291.0
1984	1386.1	1658.1	1062.2	644.4	700.0	223.2	1263.0
1985	1012.5	1181.0	872.3	509.6	575.0	222.0	862.4
1986	672.5	829.6	602.3	556.0	411.3	219.8	649.8
1987	620.8	754.6	493.4	428.7	337.4	168.0	558.7
Standard Deviation							
1961	83.5	71.9	40.0	47.8	54.1	20.1	86.8
1962	80.7	68.6	45.1	39.1	57.2	29.7	88.5
1963	79.4	77.1	50.8	43.7	69.4	26.1	88.6
1964	91.6	77.3	70.1	52.4	89.9	39.0	97.2
1965	96.3	87.0	82.1	63.5	91.1	31.7	98.1
1966	142.7	95.3	56.1	66.5	65.7	32.2	199.4
1967	115.3	106.2	62.8	67.6	85.4	29.8	127.6
1968	179.0	124.2	77.5	108.5	70.5	41.6	160.7
1969	228.6	123.4	64.5	104.2	83.9	45.0	174.0

Table 32 : Average Price Per Acre of Reported Farm Sales, Standard Deviation (con't) and Coefficient of Variation, Minnesota and districts, 1961-1987*

Year	South-east	South-west	West Central	East Central	North-west	North-east	Minnesota
1970	189.7	129.6	75.4	105.6	89.5	29.3	162.5
1971	154.3	128.1	66.6	100.7	66.9	28.9	157.4
1972	154.9	136.4	79.0	96.7	70.0	38.8	164.4
1973	183.3	164.1	94.0	97.2	76.8	86.6	188.9
1974	265.2	290.0	147.2	153.0	127.5	60.6	287.7
1975	291.3	373.8	225.0	142.5	220.8	72.2	360.4
1976	359.0	501.4	243.0	176.2	273.2	100.6	457.8
1977	476.9	606.8	305.2	244.1	294.3	99.4	599.0
1978	454.4	496.9	329.2	304.0	260.9	100.5	539.7
1979	850.3	833.3	361.4	357.2	354.7	228.3	791.6
1980	639.5	746.7	487.2	298.1	337.2	152.9	780.1
1981	675.8	891.3	426.9	624.5	332.2	157.0	826.6
1982	615.9	758.5	423.5	360.8	405.0	127.4	774.3
1983	501.2	593.0	355.4	369.9	293.1	160.5	665.7
1984	452.8	585.6	311.1	334.0	328.4	105.5	586.1
1985	383.8	450.9	350.8	298.6	294.9	122.8	464.9
1986	264.3	266.9	213.6	317.3	241.2	106.5	293.02
1987	251.6	268.6	171.8	248.0	208.4	65.3	287.2
Coefficient of Variation (percent)							
1961	44.2	31.8	30.7	53.7	58.7	53.1	52.6
1962	41.2	30.0	32.2	51.2	77.3	98.0	54.9
1963	37.1	34.8	37.3	40.7	63.8	54.8	52.7
1964	42.9	33.0	46.6	60.8	86.7	75.5	54.6
1965	47.6	37.4	61.6	66.2	85.8	79.8	55.1
1966	56.4	36.7	32.6	58.9	63.8	105.4	58.7
1967	42.3	34.7	35.2	72.8	73.2	58.2	59.4
1968	56.6	37.3	41.6	103.8	78.3	88.5	69.2
1969	67.1	36.9	33.3	80.4	69.5	88.9	73.0
1970	54.8	38.1	36.6	74.9	79.2	65.1	66.9
1971	44.9	37.4	32.6	67.0	66.8	66.1	60.8
1972	39.8	37.3	35.2	66.6	65.3	50.8	56.1
1973	41.3	40.0	42.2	54.6	64.2	71.2	63.3
1974	44.3	46.0	43.3	63.0	62.5	42.0	63.9
1975	36.8	44.3	45.7	47.7	62.6	45.3	59.4

Table 32 : Average Price Per Acre of Reported Farm Sales, Standard Deviation (con't) and Coefficient of Variation, by District, Minnesota 1961-1987*

Year	South-east	South-west	West Central	East Central	North-west	North-east	Minnesota
1976	38.3	44.9	36.6	54.8	72.5	48.0	62.3
1977	39.2	45.3	43.1	54.8	68.2	50.2	69.7
1978	33.6	37.6	36.3	54.9	51.7	39.2	55.1
1979	50.8	49.6	38.1	57.8	57.9	55.6	69.4
1980	34.8	40.0	44.5	49.4	44.4	38.8	59.2
1981	34.4	44.5	36.5	91.8	36.2	32.5	60.5
1982	35.2	37.5	36.3	48.4	45.7	31.4	57.0
1983	34.1	31.7	33.3	54.5	41.2	48.9	51.6
1984	32.6	35.3	29.3	51.8	46.9	47.3	46.4
1985	37.9	38.2	40.2	58.6	51.3	64.8	53.9
1986	39.3	32.2	35.5	57.1	58.6	48.5	45.1
1987	40.5	35.6	34.8	57.9	61.8	38.9	51.4

*Each acre is treated as a unit in calculating standard deviations and coefficients of variation.

Table 33 : Average Estimated Value Per acre of Farm Real Estate in Minnesota by Districts, 1910-11 through 1944-45, by Two-Year Periods, and Annually, 1946 through 1987, in current dollars

Year	South-east	South-west	West Central	East Central	North-west	North-east	Minnesota
1910-11	58	54	39	24	24	11	41
1912-13	69	69	46	29	29	13	49
1914-15	82	84	56	34	32	14	58
1916-17	92	100	67	41	37	15	68
1918-19	117	118	78	50	40	18	82
1920-21	141	152	98	68	57	24	104
1922-23	114	119	82	56	44	23	85
1924-25	104	110	74	49	44	22	78
1926-27	106	109	72	49	36	22	76
1928-29	100	102	67	44	33	21	71
1930-31	88	88	51	36	22	18	60
1932-33	64	65	42	27	20	14	45
1934-35	52	58	38	26	22	15	40
1936-37	59	64	38	29	22	24	44
1938-39	60	68	37	28	22	25	45
1940-41	59	68	36	26	22	24	43
1942-43	65	76	40	29	24	25	48
1944-45	78	90	48	35	29	28	56
1946-47	88	104	56	39	33	32	65
1947	96	116	62	43	37	35	72
1948	104	129	69	47	41	38	79
1949	107	136	73	49	44	39	83
1950	109	141	76	50	46	40	85
1951	125	166	89	59	54	46	99
1952	131	175	96	65	68	42	107
1953	130	175	95	62	64	40	105
1954	139	187	99	66	72	40	113
1955	150	205	103	68	73	45	121
1956	156	214	107	70	76	42	126
1957	165	230	122	77	86	49	138
1958	179	242	123	84	90	65	147
1959	191	255	134	89	103	58	157
1960	188	248	133	94	99	64	155
1961	189	247	133	95	100	64	156
1962	192	250	138	99	104	69	159

Table 33 : Average Estimated Value Per acre of Farm Real Estate in Minnesota (con't) by Districts, 1910-11 through 1944-45, by Two-Year Periods, and Annually, 1946 through 1987, in current dollars

Year	South-east	South-west	West Central	East Central	North-west	North-east	Minnesota
1963	194	246	142	103	114	68	161
1964	206	252	145	111	115	59	166
1965	219	261	146	112	113	51	171
1966	242	277	153	122	112	58	183
1967	262	303	163	128	108	62	194
1968	286	333	181	134	122	57	211
1969	308	350	196	146	120	54	223
1970	317	347	198	161	120	62	227
1971	333	351	204	155	119	63	232
1972	370	379	208	163	117	76	248
1973	433	459	247	194	146	115	298
1974	576	675	378	279	199	144	423
1975	674	844	503	296	295	163	525
1976	856	1106	624	349	378	210	667
1977	1027	1316	730	415	427	279	794
1978	1191	1421	803	498	483	304	889
1979	1453	1620	883	573	599	368	1040
1980	1526	1750	962	596	683	390	1120
1981	1709	2083	1135	679	813	460	1310
1982	1504	1875	1044	584	748	483	1179
1983	1354	1669	981	561	658	411	1065
1984	1164	1401	873	505	586	436	927
1985	861	967	690	374	510	362	686
1986	603	696	511	296	418	308	515
1987	558	671	472	259	375	283	480

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