

Purdue Farm Management Report

A BIMONTHLY PUBLICATION OF THE FARM MANAGEMENT STAFF

G. A. HARRISON & J. H. ATKINSON, EDITORS

AGRICULTURAL ECONOMICS DEPARTMENT • PURDUE UNIVERSITY

August, 1976

LAND VALUES CONTINUE TO INCREASE

by J. H. Atkinson and Gary Van Hoozer, Agricultural Economics Department

For the fourth consecutive year, Indiana farm real estate values have increased sharply. This is according to estimates of 125 farm managers, lenders, appraisers and brokers who were involved last year in about 2500 loans and contracts, 200 farm sales and nearly 3,000 appraisals.

Respondents reported estimates of per acre values of top, average and poor farm land and for land moving into non-farm uses (transitional land). They also gave their estimates of average corn yields for the three classes of farm land. Replies came from six geographic areas (Figure 1).

GENERAL LEVEL OF LAND VALUES

On a statewide basis, top quality land estimated to yield 132 bushels of corn was reported to be valued at about \$1600 per acre in the spring of 1976 (April-June). Average land (102 bu./acre) carried an estimate of about \$1225 per acre, with poor land (78 bu./acre) about \$900.

Spring 1976 top land values in Central and West Central Indiana were reported to average over \$1900, followed by over \$1600 in the North and Northeast, \$1356 in the Southwest and \$1158 in the Southeast. Corn yields on top quality land in the Northwest and Central were estimated at around 140 bushels, or 6 to 12 bushels more than other areas, except the southeast where the difference was nearly 20 bushels per acre (Table 1).

Average land was estimated to yield about 30 bushels per acre less than top quality land and carried value discounts of \$400 to \$500, except in the two southern areas where the difference was about \$300.

Land moving into non-agricultural uses was valued at \$2300 to \$2400 per acre in most areas, or \$400 to \$600 more than top quality land, except in the south where the difference was \$700 to \$1000. The differential between this transitional land and good farm land has narrowed over the past year or so.

The highest bare land value was in the West Central area (\$1847) followed by the Central area (\$1822). Top quality bare land values in both Northern areas were around \$1500, the Southwest average was \$1336, and the Southeast was \$1068 (Table 2).

Estimates for building values were highest in the North, Northeast and Central areas, with average per acre values for top and average land ranging from about \$100 to \$150. These averages were roughly \$50 to \$100 in the West Central and Southeast areas and under \$25 per acre in the Southwest.

For several years, land of equal corn producing potential has had lower value estimates in the south than in other areas of the state. And this year was no exception. For example, 133-bushel-per-acre bare land in the Southwest was reported



to be worth \$160 per acre less than 128-bushel land in the Northeast. The difference was over \$400 between 121-bushel land in the Southeast and 112-bushel land in the Central area.

Part of the difference may be due to smaller fields of uniform land in the south and higher costs for fertilizer and weed control. But the value differences are great enough to suggest that there may be better land buys in the southern part of the state than in other areas.

PRICE INCREASES, FALL '75 TO SPRING '76

From last fall to the spring of 1976, the average increase in top land in Southwestern Indiana was reported to be \$144, and in the Southeast \$125 per acre. Good quality land in these areas went up by about \$100 per acre. However, in the rest of the state, top quality land increased an average of around \$200 per acre, and good land generally averaged an increase of \$140-\$150 per acre (Table 1).

In percentage terms, these average increases were generally in the range of 10 to 15 percent for

all three classes of farm land in all areas of the state (Table 3). For the state as a whole, farm land values were reported to have increased an average of 12 or 13 percent from last fall to this spring.

By comparison, the Federal Reserve Bank of Chicago reported Indiana land value increases of 5 percent and 6 percent for the October-December and January-March quarters. USDA reported a 7 percent increase in Indiana farm real estate values for the quarter ending February 1. These figures are in line with the 6-month increase of 12-13 percent reported by Indiana respondents—increases which are sharply higher than the 3-9 percent increases reported last year.

Transitional land averaged increases of 6 to 10 percent, well under the percentage increases for farm land.

These relatively large increases in land values followed a lull early last year in the upward spiral in land prices which started in late 1972. More money in the pockets of farmers probably was the

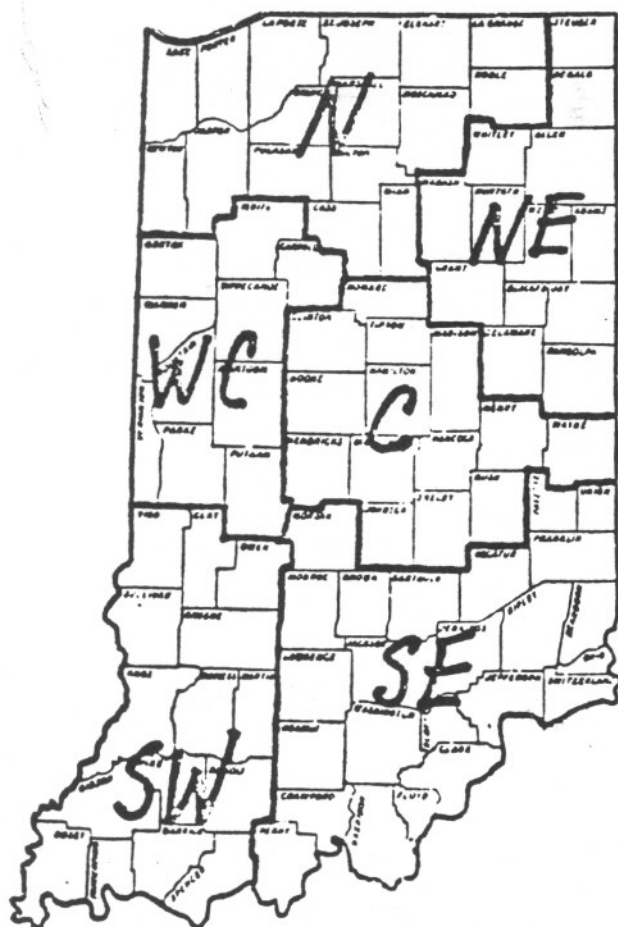


Figure 1. Geographic areas used in Purdue land values surveys, Indiana, June 1976.

Table 1. Average Estimated Land Price and Cash Rent per Acre by Land Class, Selected Time Periods, Purdue Land Value Survey, Indiana, July 1976.

Area	Land class	Bu./acre	Fall 1975	Spring 1976	Fall 1976
North	Top	132	\$1413	\$1610	\$1682
	Avg.	101	1069	1206	1254
	Poor	77	769	860	895
	Tran.	---	2110	2274	2474
Northeast	Top	128	1478	1646	1715
	Avg.	101	1155	1235	1284
	Poor	76	779	836	879
	Tran.	---	2065	2275	2382
West Central	Top	138	1666	1914	2079
	Avg.	109	1275	1425	1555
	Poor	79	869	1028	1113
	Tran.	---	2033	2330	2332
Central	Top	140	1768	1955	2002
	Avg.	112	1452	1599	1668
	Poor	85	1122	1220	1287
	Tran.	---	2237	2418	2333
Southwest	Top	133	1212	1356	1450
	Avg.	100	927	1025	1103
	Poor	75	681	767	843
	Tran.	---	2045	2317	2436
Southeast	Top	121	1035	1158	1212
	Avg.	90	759	845	887
	Poor	71	521	601	634
	Tran.	---	1659	1927	2036

1429 1696
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single most important factor in this increase. Grain prices moved up sharply last summer because of western Corn Belt drouth and good export prospects. Hog prices and profits were generally good. Cattle prices were improved from previous low levels. Thus by fall, Indiana farmers had realized good hog profits and harvested generally good crops, which sold for better prices than had been in prospect when they were planted.

Furthermore, many farmers had invested in new and bigger equipment capable of handling more acreage. In addition, there appeared to have been some increase in "big money" (non-farm) interest in investment in farms, though this is hard to verify.

The net result of more available funds for investment by farmers and others plus the push for farm enlargement was a substantial increase in land prices.

WHERE DO THINGS GO FROM HERE?

At this time last year, it appeared the land boom might be fizzling out; and this might have been the case had there been better weather conditions at home and abroad. In addition, the relatively low post-harvest prices stimulated greater use of feed grains—a reminder that low prices are, to some degree, self-corrective.

Again we face the uncertainty of the size of crop to be harvested this fall, the magnitude of export demand and the strength of domestic demand. Changes in these factors could result in prices for the 1976 corn crop approaching \$2 on the low side or being pushed toward the \$3 level on the high side. Corn prices of around \$2 likely would dampen the enthusiasm of land buyers and halt or even reverse the upward trend in land prices, whereas \$3 corn probably would result in further gains in the price of land.

Table 2. Estimated Bare Land Values per Acre, Spring 1976, by Geographic Area and Land Class, Purdue Land Value Survey, Indiana, June 1976.

Area	Land class		
	Top	Average	Poor
North	\$1488	\$1112	\$ 791
Northeast	1496	1117	768
West Central	1847	1377	986
Central	1822	1506	1165
Southwest	1336	1002	751
Southeast	1068	774	558

1510 ✓ 1148 ✓ 836 ✓
 9 ✓ 94 ✓ 95 ✓

Survey respondents were asked to project land prices to the fall of this year. Statewide, they estimated a 5 percent increase from spring '76 to fall '76. By areas, these average estimates fell mostly in the 4-6 percent range.

This would mean nearly a \$100-per-acre increase in top land in the Central and West Central areas to a value of over \$2000. These estimates are more optimistic than they were last year when the average respondent looked for stable to slightly declining prices.

Looking further into the future, nearly all respondents expected land prices to be higher 5 years from now—by an average of 27 percent. This is less than a 5 percent per year compound increase and quite modest in contrast to increases

Table 3. Average Percentage Change in Estimated Land Value per Acre by Geographic Area and Land Class, Selected Time Periods, Purdue Land Value Survey, Indiana, July 1976.

Area	Land class	Percent change		
		Fall '75- Spr. '76	Fall '75- Fall '76	Spr. '76- Fall '76
North	Top	14	20	5
	Avg.	14	19	5
	Poor	12	17	4
	Tran.	9	17	8
Northeast	Top	14	19	4
	Avg.	10	15	4
	Poor	15	21	5
	Tran.	9	16	6
W. Central	Top	14	22	6
	Avg.	12	19	5
	Poor	16	21	4
	Tran.	13	16	4
Central	Top	12	16	3
	Avg.	12	18	5
	Poor	10	15	4
	Tran.	6	9	2
Southwest	Top	15	26	6
	Avg.	14	26	7
	Poor	18	30	9
	Tran.	13	19	5
Southeast	Top	12	18	5
	Avg.	11	18	5
	Poor	13	21	6
	Tran.	10	18	4
INDIANA	Top	13	20	5
	Avg.	12	19	5
	Poor	13	20	5
	Tran.	9	15	5

since 1972. They are saying that they think it will take 5 years for land prices to increase about as much as they have in *each* of the past 3 years.

The annual average on-farm corn price expected by this group over the next 5 years was \$2.69 per bushel, up from \$2.49 last year and \$2.19 in 1974.

WHAT DOES IT ALL MEAN?

Is land "too high"? It does not appear to be *if* (a) long run corn price expectations are for around \$2.50 and (b) gradual increases in land prices are expected. Take \$2000 per acre land yielding 140 bushels of corn. Production costs under good management would be around \$190 (excluding interest on land, but including \$35 per acre for labor and management) and gross returns would be \$350, leaving \$160 per acre return to land. This would be 8 percent or somewhat less than the farm mortgage interest rate—pretty much in line with what has been the historical relationship between returns to land and mortgage interest rates.

Cash rents have run 6-8 percent of land values, and estimates obtained in this survey indicated 1976 cash rents averaged about 7.3 percent of fall 1975 top and average land values (except in the southeast where the figure was a little over 9 percent). The implication is that returns to land, either to the owner-operator or to the cash rent landowner, are pretty much in line with what has occurred in the past.

There is much agreement among people interested in land that long run prices likely will trend upward, perhaps at a rate of around 5 percent per year. But even if this occurs, both buyers and sellers need to keep in mind that there

may be year-to-year variations in the rate at which land prices increase.

One possibility is this: assume that the 1976 grain crop is in line with current expectations and that 1977 is an average or better crop year. By the end of 1977, grain prices could be well below current levels and profits from hog production much less favorable than at the present time. This likely would cause the bid price of land to fall, and volume of land sales probably would decrease. Land that had to be sold might bring less than it would have a year earlier.

The investor-buyer who plans to rent the land needs to budget carefully both average returns and cash flow. Returns likely will average less than the farm mortgage interest rate; therefore, the decision to purchase land may hinge on one's expectations of long run increases in land values. If 70-80 percent of the purchase price is borrowed, there will be years when the landlord's cash returns from the farm will not meet the payments.

Farm operators also need to budget carefully their expected returns and cash flow. As has been true for two decades or more, land for enlargement or as a base of operations often earns good returns. But for operators who have to borrow the maximum, this may be a good time to consider cash renting for a year or two to avoid the risk of cash flow problems.

Those in good financial condition or who have off-farm income are in a better position to weather a year of reduced farm income. If their longer run expectations are for gradually increasing land values, they probably should go ahead and purchase land of the type and location that fits their needs.

Clarification on the "Land Values" Article in the August PFMR

J.H. Atkinson and Gary Van Hoozer

Several readers have called our attention to the fact that percentage changes in land values calculated from Table 1 of our August Purdue Farm Management Report article on land values are not the same as the figures reported in Table 3. For example, West Central average land was reported to be worth \$1275 per acre in the fall of 1975; and \$1555 was the projected estimate for the fall of 1976, or an increase of 22 percent. But Table 3 reports a 19 percent change. Why the difference?

The figures in Table 3 were obtained by calculating the percentage change in land values as reported by each person, then averaging these changes. Not all respondents reported values for all time periods, but any estimates they made were included in the averages in Table 1. Thus, there might have been 25 persons who reported both fall '75 and '76 values, and 28 who reported spring but not fall estimates.

In addition, a lot of variation in the estimates from the Southwest area resulted in the percentage changes shown in Table A.

In order to make Tables 1 and 3 in the August Article approximately comparable, estimates of values for top and average were re-calculated and are presented in Table B here. (Due to wide variability and relatively small numbers of

responses, we suggest you use estimates for poor and transitional land only as general guides).

The re-calculations were made adjusting the spring '76 estimates back to fall '75 by using the fall-to-spring percentage change shown in Table 3 of the original article. The fall '75 estimate was then increased by the fall-to-fall percentage change (Table 3).

The results differed slightly from the figures in Table 1 of the August article—less than \$15 per acre for half of the estimates and a maximum of \$41 per acre. Some of the percentage changes from spring '76 to fall '76 also changed by 1 percentage point as shown in the last column of the accompanying table.

Table A. Percent Change in the Southwest Area.

Area	Land class	Percent change		
		Fall '75- Spr. '76	Fall '75- Fall '76	Spr. '76- Fall '76
Southwest	Top	15*	26*	9
	Avg.	12	24	10
	Poor	16	30*	12

*No change

Table B. Average estimated land price, top and average land, selected time periods, and percent change from Spring '75 to (projected) Fall '76 (revised), Purdue Land Value Survey, July, 1976.

Area	Land class	Estimated value per acre			Pct. change Spr. 1976- Fall 1976
		Fall 1975	Spring 1976	Fall 1976	
North	Top	\$1413*	\$1610*	\$1696	5*
	Average	1058	1206*	1259	4
Northeast	Top	1444	1646*	1718	4*
	Average	1123	1235*	1291	5
West Central	Top	1679	1914*	2048	7
	Average	1272	1425*	1514	6
Central	Top	1746	1955*	2025	4
	Average	1428	1599*	1685	5*
Southwest	Top	1179	1356*	1486	10
	Average	915	1025*	1135	11
Southeast	Top	1034	1158*	1220	5*
	Average	761	845*	898	6

*No change

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1015 x .79 = 802
945 x .94 = 888

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Cash Rental Rates for Farm Land

by J. H. Atkinson, Professor, Agricultural Economics
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According to a June 1976 survey of 125 farm lenders, managers, brokers and appraisers, the average per acre cash rent for Indiana farm land in 1976 was \$77. This is an increase over last year of \$13 per acre or about 20 percent. The statewide average cash rent reported by USDA as of March 1, 1976, was close to the June survey figure—\$72 per acre or a 14 percent increase over 1975 (Table 1).

The spring, 1976, statewide average value of cropland was \$1238 and estimated to produce 104 bushels of corn in an average year. The \$77-per-acre rent thus figures out to be 6.2 percent of the land value—over a full percentage point lower than last year. Therefore, while cash rents increased in 1976, land values went up even more, resulting in a decrease in the percent that rent is of land values.

This also is evident in the USDA figures shown in Table 1. For the first time in 3 years, there has been a decrease in the percent that cash rent is of land values—.9 of a percentage point (from 7.6 to 6.7 percent).

A widely used thumb rule is that cash rents tend to run from 6 to 8 percent of land values. Both USDA and Purdue estimates fall on the low side of this range. But for the past couple of years, these estimates have been over 7 percent or above the mid-point of the 6 to 8 percent range.

The rental figures in the Purdue survey were for bare land. Respondents also were asked to estimate building values, which were included in

their land values, and estimates were then made of bare land values. Statewide, the bare land value estimate was \$1146, and average rent as a percentage of this figure was 6.6 percent—slightly higher than the 6.2 percent figure with buildings included.

There is, however, a major valuation problem in making adjustments for buildings. In some cases, land can be rented with or without certain buildings for about the same amount. These, typically, are such buildings as obsolete livestock facilities, old barns and cribs and dwellings not easily rented, even though they might be considered to have some value. In other cases, rent is higher when buildings such as grain storage, modern livestock facilities and machinery storage are included. Thus, the percent that cash rent is of estimated bare land values may be slightly on the high side, assuming that land values were at least partly reduced by the value assigned to non-rentable buildings.

For example, assume that an 80-acre tract renting for \$75 per acre has an unused house and barn "worth" \$8000. The entire tract is valued at \$96,000 or \$1200 per acre. If the land value is reduced by \$8000 or \$100 per acre, the rent would be 6.8 percent of estimated value. For this to be a realistic way of viewing the situation, the landowner must have some expectation of eventually selling or renting the old buildings, otherwise he should calculate rent as a percent of the total value of \$1200 per acre or 6.25 percent.



Table 1. Cash rental rates of Indiana cropland, and percent which cash rent is of land value, March 1, 1972-76 (source: USDA).

Year	Cash rent per acre	Rent as percent of value
1972	\$35	7.2
1973	38	6.9
1974	48	7.1
1975	63	7.6
1976	72	6.7

RENTAL RATES BY GEOGRAPHIC AREAS AND LAND CLASS

The June survey also revealed that land values vary by geographic areas (Figure 1) as shown in Table 2. But rents, on the average, tended to vary *with* land values, so that the percent that rent is of land values was similar in all areas of the state except the Southeast. These percentage figures also were similar regardless of land quality.

With the exception of the Southeast and poor land in the Southwest, rent as a percent of value fell in the rather narrow range of 6.1 to 6.8 percent on the average. Of course, individual figures for a given area and class of land varied considerably, but when they were averaged, they were very close together. For example, on \$1000-per-acre land, the average rent would range from \$61 to \$68 per acre except in the Southeast, where rent for \$1000-per-acre land was indicated to be \$80 to \$82. The other exception was on poor land in the Southwest, where rent was 5.7 percent of land value.

Leaving out the Southeast, the state average bare land value was \$1237, and cash rent was \$79 or 6.4 percent of the value.

RENT PER BUSHEL OF CORN

Average rent per bushel of estimated "normal" corn yield ranged from 57 to 87 cents (Table 3). There was no clear-cut difference between top and average land, thus implying that renters of top quality land were getting the better deal, because fixed labor and machinery costs can be spread over more bushels of grain. The per-bushel rent on poor land tended to be somewhat lower than for better quality land.

In considering renting land of differing productivity, farm operators may need to make estimates of how much more rent per bushel they could afford to pay for better quality land. For example, 100-bushel land in the North rented for

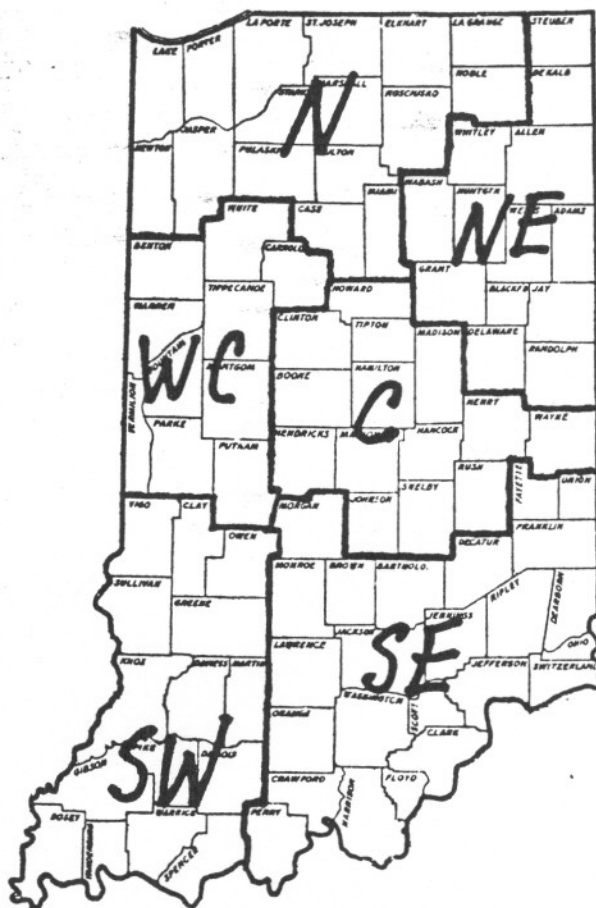


Figure 1. Indiana geographic areas.

about \$73 per acre. Assume that fixed costs, including the operator's labor, were \$60 or 60 cents per bushel. If these fixed costs could be spread over 132 bushels of corn (top quality land), cost per bushel would be 45 cents, a savings of 15 cents. Thus, the operator would be just as well off paying a rent of 88 cents per bushel (73 cents plus 15 cents) or \$116 per acre for top quality land as he would be paying the reported average rent of \$99 for this land.

This would give him a basis for bidding on the better land. Of course, he would not want to bid away his entire savings, but might rent the better land for \$110 and made an additional \$6 per acre over the lower quality land. The reported rent on top quality land could be taken as the starting point, in which case the break-even rent for average land would be lower than reported.

There were differences among geographic areas in per-bushel rents as indicated by these ranges for average and top land:

Southeast and Southwest	73¢ - 80¢
North and Northwest	61¢ - 70¢
West and West Central	82¢ - 87¢

Table 2. Estimated bare land values and cash rent per acre, and rent as a percentage of land values, Spring, 1976, by geographic area and land class, Purdue land values survey, June, 1976.

Area	Land class								
	Top			Average			Poor		
	Cash rent	Land values	Rent/values	Cash rent	Land values	Rent/values	Cash rent	Land values	Rent/values
North	\$99	\$1488	6.7%	\$74	\$1112	6.7%	\$51	\$791	6.4%
Northeast	\$102	\$1496	6.8%	\$76	\$1117	6.8%	\$50	\$768	6.5%
West Central	\$113	\$1847	6.1%	\$89	\$1377	6.5%	\$63	\$986	6.4%
Central	\$118	\$1822	6.5%	\$97	\$1506	6.4%	\$71	\$1165	6.1%
Southwest	\$84	\$1336	6.3%	\$61	\$1002	6.1%	\$43	\$751	5.7%
Southeast	\$85	\$1068	8.0%	\$63	\$774	8.1%	\$46	\$558	8.2%
State	\$100	\$1509	6.6%	\$77	\$1148	6.7%	\$54	\$836	6.5%
State, except Southeast	\$103	\$1598	6.4%	\$79	\$1223	6.5%	\$56	\$892	6.3%

Note that there is about a 10-cent-per-bushel difference between the areas as grouped above, with the highest figures being in the central part of the state. Lower rents per bushel in the North and South may reflect somewhat higher risk and production costs in these areas.

IMPLICATIONS

Cash rents for land have increased to the point that, in some situations, the return to rented land may equal or exceed the return from share renting. For example, on 110-bushel corn land, 1976 typical landlord expenses were estimated at \$57, including \$15, for taxes and other real estate expenses. With corn at \$2.40 per bushel, the landowner would net \$75 per acre.

Compare this with average land in the West Central area producing 109 bushels of corn per acre and renting for an average of \$89. Subtracting \$15 for taxes and other land expenses leaves about the same net as would be realized under a typical 50-50 share lease. With corn prices above \$2.40 per bushel, returns would be higher under the crop share lease; corn prices under \$2.40 would mean higher returns from the cash lease.

Now consider the tenant. Under a 50-50 share lease, his expenses, not including labor, were estimated at \$75. With corn at \$2.40 per bushel, he would earn \$57 for his labor. If he cash rented, his expenses would be \$117; so with cash rent at \$90 per acre, he would earn \$57 for his labor—the same as with the share lease.

However, if he paid \$90 rent and corn was only \$2.00 per bushel, his labor return would be only

Table 3. Cash rent and corn yield potential per acre and rent per bushel of estimated yield potential by area and class of land, Purdue Land Values Survey, June, 1976.

Area	Land class	Rent/acre	Yield/acre	Rent/bushel
North	Top	\$99	132 bu.	75¢
	Average	\$74	101	73¢
	Poor	\$51	77	66¢
North-east	Top	\$102	128 bu.	80¢
	Average	\$76	101	75¢
	Poor	\$50	76	66¢
West Central	Top	\$113	138 bu.	82¢
	Average	\$89	109	82¢
	Poor	\$63	79	80¢
Central	Top	\$118	140 bu.	84¢
	Average	\$97	112	87¢
	Poor	\$71	85	84¢
South-west	Top	\$84	133 bu.	63¢
	Average	\$61	90	70¢
	Poor	\$43	75	57¢
South-east	Top	\$85	121 bu.	70¢
	Average	\$63	90	70¢
	Poor	\$46	71	65¢
State, all classes		\$77	104 bu.	74¢

\$13 per acre (\$220 gross receipts minus \$117 operating expense minus \$90 rent). With a share lease and \$2.00 corn, he would still earn nearly \$35 per acre for his labor. Thus, a major consideration in cash leasing is whether the tenant has the financial strength to accept the greater risk.

Similarly, the landowner needs to be aware of the likely variation he faces in share renting and the need for somewhat greater management and capital contributions.

In summary, the most likely cash rent *operator* is one who has sufficient financial strength to provide the capital and accept the risk associated with cash renting. He also needs to be a good

manager and be able to profit from having full managerial control of the land which is cash rented. The likely *landowner* candidate for cash leasing is one who needs a secure income, is short on capital and not interested in participating in management decisions. However, in many situations, both operator and landowner will need to analyze probable returns under both cash and share lease arrangements.