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Alternative Evaluation Procedures for South Dakota Use-Value Assessment of Agricultural Lands

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ALTERNATIVE EVALUATION PROCEDURES FOR SOUTH DAKOTA'S USE-VALUE ASSESSMENT OF AGRICULTURAL LANDS

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PREFACE

Property taxes for agricultural lands continue to be a source of concern to both agricultural producers who must pay them and local units of government which depend upon this revenue. Recently attention has focused on the assessment criteria for agricultural lands. Should the assessment of agricultural lands be based on market values or productivity? If productivity is used, what estimation procedure should be used?

This research bulletin puts these public affairs questions in a decision making framework. The purpose is to educate rather than to advocate a particular solution.

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by

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ALTERNATIVE EVALUATION PROCEDURES FOR SOUTH DAKOTA'S USE-VALUE ASSESSMENT OF AGRICULTURAL LANDS

Use-value assessment has been used almost twenty years in some parts of the United States but is relatively new in South Dakota. Provisions for this type of assessment were first adopted in South Dakota in 1970. Prior to 1970, agricultural land assessments were based on the land's market value. The use-value assessment was given more strength in 1974 by the requirement that:

> "Land devoted to agricultural use shall be classified and taxed as agricultural land without regard to the zoning classification which it may be given; provided, however, that all or any portion of such land which is sold or otherwise converted to a use other than agriculture shall be classified and taxed accordingly."[1/]

The law specifies that the assessment procedure for agricultural land be based on consideration of the following factors:

(1) The capacity of the land to produce agricultural products as defined in South Dakota Compiled Laws (SDCL) 10-6-33:2;

(2) Soil, terrain, and topographical condition of property;

(3) The present market value of said property as agricultural land;

(4) The character of the area or place in which said property is located; and

(5) Such other agricultural factors as may from time to time become applicable.

The law was vague about the actual procedure to be utilized in determining what is the capacity of the land to produce agricultural products, although it does specify the source of information in detail and certain elements of a procedure.[2/]

In response to these recent laws, a number of counties are in the process of instituting use-value assessment procedures.[3/] Figure 1 shows the counties currently utilizing use-value assessment procedures.

Recently agricultural producers have proposed to change the procedure that is used to estimate the capacity of agricultural lands to produce. The 1974 South Dakota legislature passed House Bill 662 which amended the assessment procedure described in SDCL 10-6-33.1 so that subdivision 3 reads:

> "(3) The present market value of said property as agricultural land as determined by the factors contained in subdivisions 1, 2, 4, and 5 of this chapter."

This change in the law raises the question of how should the land's capacity to produce agricultural products be measured and what does the "present market value of property as agricultural land" mean?[4/]

Alternative Ways of Estimating Land's Capacity to Produce Agricultural Products

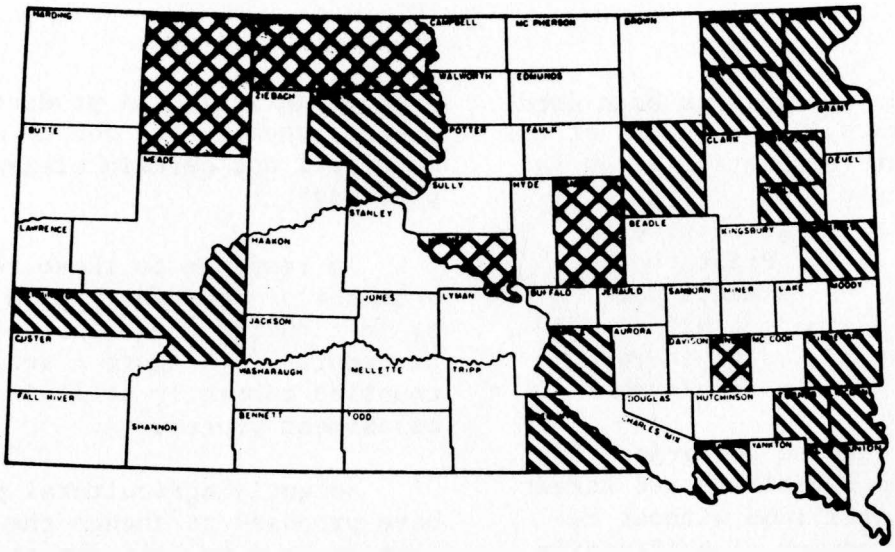
Two basic means can be used to estimate the land's capacity to produce agricultural products:

(1) Comparable sales of farmland

(2) Capitalization of earned income

Soil productivity ratings can also be utilized with both approaches.

Figure 1: South Dakota Counties Using the Comparable Sales and Soil Productivity Ratings Approach to Use-Value Assessment, March 1975.



Counties currently using this approach in at least 1 township.

Counties anticipating using soils productivity data in assessment procedures in 1976.

There are several alternative ways to estimate the annual earned income: (1) actual farm earnings, (2) rental income, (3) typical crop budgets by soil class, and (4) typical crop budgets for actual acreage planted.

These alternative assessment procedures differ in several respects. They differ in their ability to reflect the land's capacity to produce agricultural products, in terms of ease of administration, and equity with respect to income. Each of these systems are described briefly and then the difference in the results obtained are discussed.

Comparable Sales Approach to the Assessment of Farmland

The "Comparable Sales" approach relies on the current market values of sales of comparable farms. The current market value is the price that a well informed buyer is willing to pay and a well informed seller is willing to accept for a particular piece of land.

To insure that the farm sales are comparable, recent sales are carefully examined to exclude involuntary sales, sales between family members, affiliated companies, sales of mineral or timber rights and sales to public agencies. Essentially these procedures separate agricultural sales from non-agricultural sales, and then use only the agricultural sales for assessment criteria. Does the comparable sales approach accurately estimate the land's capacity to produce agricultural products?

In the Sioux Falls area farms have been sold for farming purposes only to have the farmstead sold off within a year or so for a significant part of the original price paid for the entire farm. This makes it difficult to separate agricultural sales from non-agricultural sales.

From March 1974 to March 1975 land values in South Dakota increased by 24%[5] compared to a general rate of inflation of about 9.3%.[6] Savings accounts had rates of return of 5 to 8 percent. Consequently land purchases have become a good means of hedging against inflation. This creates an investment demand for land that may drive the price of land above its income generating capacity. As a result it is impossible to accurately separate the land that is purchased solely for agricultural purposes from that which is purchased both for farming and as a hedge against inflation. Thus, the comparable sales approach may not accurately estimate the land's capacity to produce agricultural products. The difference in estimates will be greatest in counties with growing urban demands for land on the urban-rural fringe.[7] As a result assessments may not necessarily closely reflect the land's income generating capacity.

The degree to which market values are above use-values cannot be gauged on a theoretical basis. While there appear to be forces pushing the market value of land above its use-value, empirical estimates are needed on the land's use-value to determine the extent to which this is occurring.

Administratively it is somewhat difficult to determine which sales are comparable without additional criteria such as the soil's productivity. While no evaluation procedure can be free from human judgment and error, the comparable sales procedure requires more subjective judgments than the other alternatives.

Physical Productivity Ratings

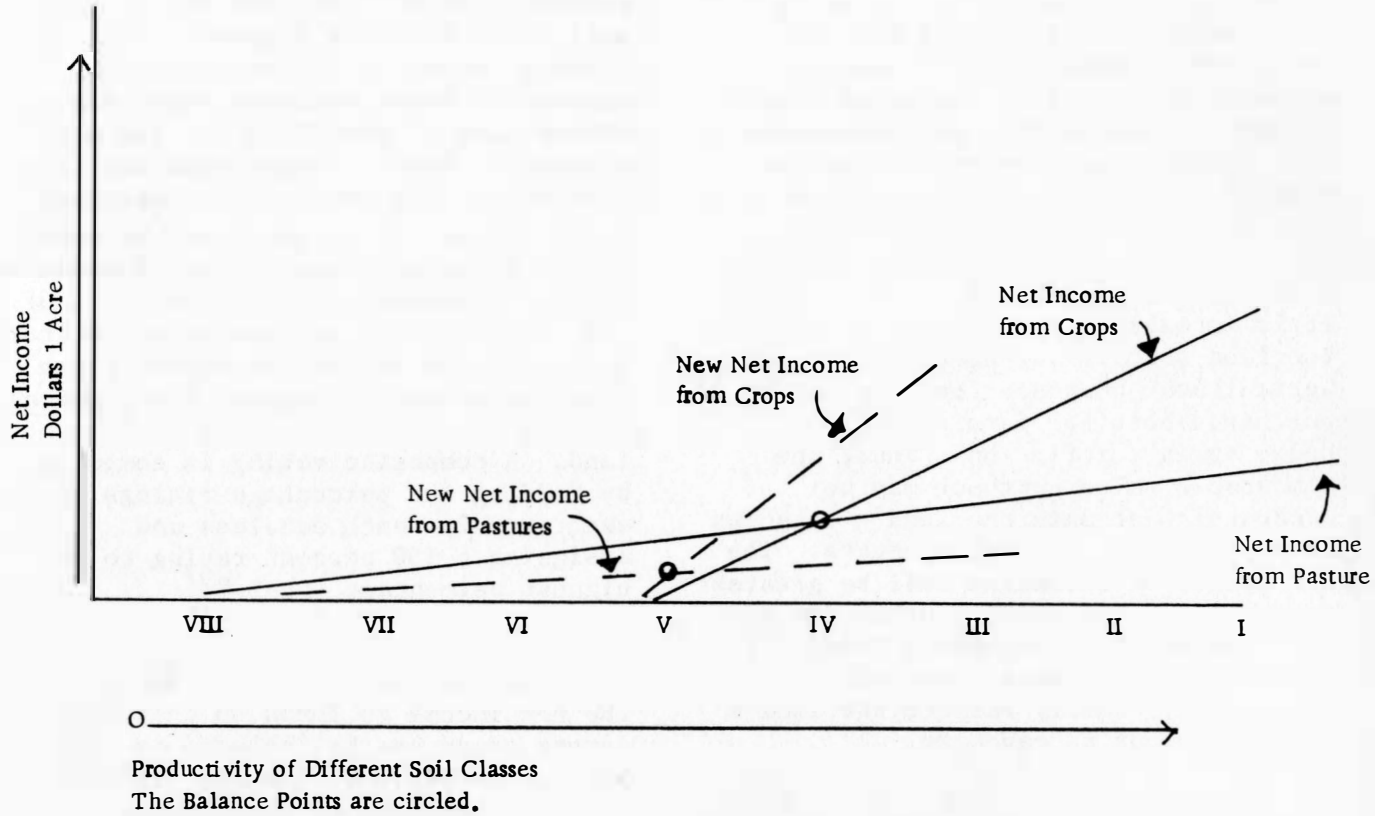
The market value of different soil classes has been estimated by using comparable sales data and physical productivity ratings for each soil class.[8]

The first step in deriving a physical productivity rating involves the estimation of physical ratings of the productivity of different soils. The soil class with the highest yields is given a rating of 100 percent. The rating for lower yielding soils are all percentages of the yield for the most productive land. These rates are calculated for the area's most important local crops. It is important to note that a physical relationship is measured by the individual crop ratings. As of yet the "capacity to produce agricultural products" has not been measured since there is no way to compare the physical ratings for different crops or grazing land. A composite rating is computed by "adding the percentage ratings of each crop for each subclass and assigning a 100 percent rating to the highest percentage total."[9]

The next step actually incorporates the net income to lands so that different crops can be included in one scale. To achieve this the Class IV soils are assumed to have "equal capacities to produce agricultural products" as measured by income. This soil class is called the "balance point" soil class. The concept of the "balance point" is shown in Figure 2. Given the assumption of equal income capacities in both crops and pastures, the rating for pastures for Class IV is set equal to the crop rating. To get the crop ratings for the remaining soil classes, their percentage of the yield for the balance point pasture land is multiplied by the balance point crop rating.

Note that the entire set of ratings are now economic ratings rather than physical ratings, because income has been used to make these two types of land comparable. The balance point soil class depends upon prices of crops and animal products. If the price of crops increases while the prices of animal products fall, the balance point class will fall to a lower soil class. In other words, we would see farmers leaving much less Class IV land in pasture than with lower grain prices and higher beef prices.

Figure 2: "Balance Point" Soil Class and Net Income from Crops and Pasture



The dashed lines in Figure 2 show the change in net income curves due to depressed livestock conditions and improvements in crop prices. The new balance point is further to the left which is a higher soil subclass. If there was considerable shifting in land use over a 10 year period, the balance point should be changed to reflect this and new productivity ratings calculated. This is probably a minor problem, however, if a 10 year average is considered.

The fourth step uses the productivity ratings and data on either the market value of unimproved agricultural land, or a similar county aggregate, to estimate the current value of each soil subclass. This calculated value is called the "conceptual dollar value" (CDVs). The CDV for the best soil in the county is found by solving the following equation:

$$Y = XA_1 + P_2XA_{2c} + P_3XA_{2w} + P_4XA_{2a} + \ldots P_jXA_72$$

where: Y = Total value of agricultural land in the county

X = Conceptual dollar value of Class I land

$A_1 \ldots A_7$ = acreage of land in each land subclass

$P_2 \ldots P_7$ = crop ratings

Once X has been determined, the CDVs for all other classes are simply the product of their crop rating and X.

The above equation can be solved using various values for Y. Currently comparable sales have been used to determine the total market value of agricultural land in the county, which is then Y. As will be discussed later, the capitalized income attributable to land could be utilized.

In order to achieve smooth value transitions between counties the CDVs

can be adjusted to take account of climate. The climate is drier and cooler as one moves from southeastern to northwestern South Dakota. The CDVs can be decreased in a linear fashion along this line.

The primary appeal of this approach is that it makes the assessment procedure more systematic. Land of identical quality and productivity is assessed at the same level regardless of its current use.

Capitalization of Earned Income from Land

The capitalization of earned income from land ties the property evaluation closely to the income earned from a parcel of land in the previous year or period of years. Under this approach, the property value reflects the amount of capital, which if invested at a given interest rate, would yield the income actually earned by the land from agricultural production.

To determine the capitalized property value, one determines the net earned income attributable to land and then divides it by a fair rate of return. All non-land expenses plus a standard return to management are deducted from gross receipts to get the net income to land. The rate of return which is considered "fair" is a state policy which must be selected through the legislative process. Several of the considerations which help in the selection of this rate are discussed later.

Several estimation procedures can be utilized to determine the annual income attributable to land: (1) actual farm earnings, (2) rental income, (3) typical crop budgets by soil class, and (4) typical crop budgets for actual acreage planted. Table 1 shows the methods used in other states which are utilizing an income capitalization approach to determine use-value.

Actual Farm Earnings

Theoretically actual earnings for land on each farm could be utilized to calculate the use-value of that farm's land. This approach will not be discussed in detail because it appears too administratively cumbersome. In addition, this approach would result in land of identical quality being valued at different rates due to differences in management. Rather than the land's capacity to produce, this approach would measure the land's actual level of productivity.

Rental Income

Rental value of land is used in some states to determine the annual income to land. The advantage of this approach is its simplicity in deriving the annual return. In the simplest form, cash rents minus depreciation, taxes, repairs and insurance equal annual returns. In crop share rentals the annual return to land equals the landlord's receipts, minus the landlord's expenses minus the landlord's management, minus interest on non-real estate capital.

There is considerable variation in crop-share rents in South Dakota (see Figure 3), including variations in the crop share rent within a given county. For example in 1961 forty percent of the respondents in Brookings County reported a 1/3 share, forty-four percent reported 2/5 share and sixteen percent reported 1/2 share arrangements.[10]

In order to use a landlord income approach to estimating the land use-value some assumption must be made about the crop sharing arrangement. Since there is considerable variation in South Dakota, the estimates may vary considerably depending on the arrangements assumed.

Economic rent from land refers to the net return to land once all non-land expenses are deducted from gross receipts. Contract rents for land may not equal economic rents. Since the latter approaches the use-value of land this makes the use of contract rents procedure difficult. One reason that contract rents may exceed economic rents is that

TABLE 1: SUMMARY OF METHODS OF DETERMINING USE-VALUE IN STATES USING INCOME CAPITALIZATION APPROACHES*

State	Method of Determining Annual Income	Capitalization Rate
California	Typical rentals or enterprise budgeting	Component Method
Colorado	N.A.	11.5%
Conneticut	N.A.	N.A.
Florida	Local assessor	N.A.
Hawaii	Rentals	N.A.
Iowa	Landlord share	6.5%
Maryland	Typical enterprise budgets	6.0%
Minnesota	Rental	N.A.
Ohio	Typical enterprise budgets	Component Method
Oregon	N.A.	7.5%
Virginia	Typical enterprise budgets	Component Method 7.03 to 7.77%
Washington	Rentals	N.A.

*Developed from Lower Taxes for Farmland and Open Space by Richard Borrows, Wisconsin Cooperative Extension Bulletin G2668, November 1974.

rented land frequently is obtained in small additional acreages in order to fully utilize labor and equipment. Consequently, the lesser can afford to pay a higher rent than would be possible in renting an entire farm.

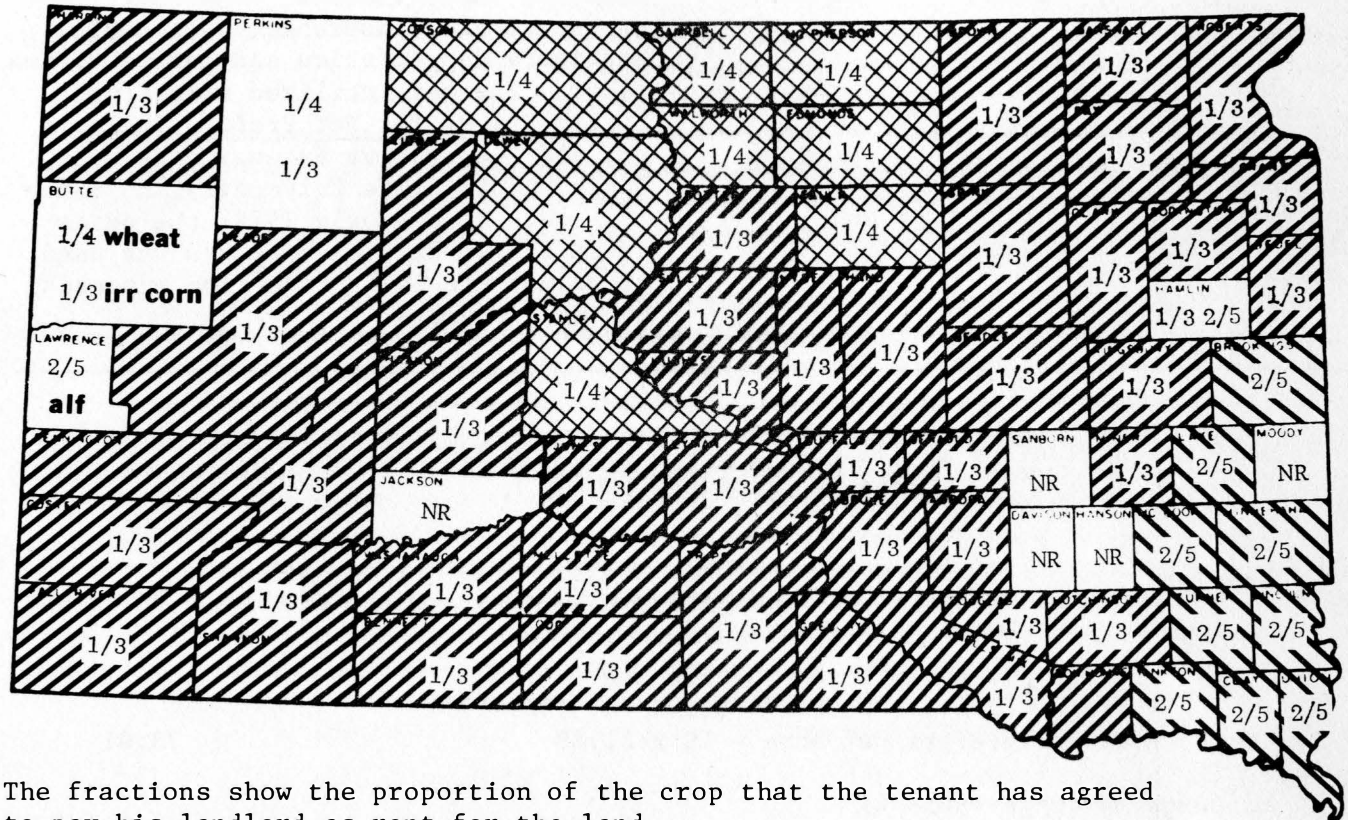
If the landlord income approach is utilized, then the net income to land is calculated per acre. Multiplying the return per acre by the number of acres in farmland gives the total return to land in the county. The productivity index can then be utilized to distribute these earnings by soil class.

Crop Budgets by Soil Class

A third method of estimating the annual income to land is to construct typical crop enterprise budgets for the major crops in the county. The average net income to land is calculated as the residual after all other production expenses and a charge for management are deducted from gross receipts. Table 2 gives an example of the procedure utilized for each crop for each year from 1965 to 1974. Note that this example deals only with corn so that the use-value is higher when all crops are considered.

To account for the diversity of crops the net income to land for major crops is calculated. To determine the productive capacity of a given class of land without regard for its use on a particular parcel, the net income for the four crops were weighted by the proportion of land in the county planted to this crop. Alternatively a typical

FIGURE 3: CROPLAND: TYPICAL CROP SHARE RENTS IN SOUTH DAKOTA, 1968*



The fractions show the proportion of the crop that the tenant has agreed to pay his landlord as rent for the land.

When fertilizer and sprays are used they are generally shared in the same way that the crop is shared.

Alfalfa and other tame hay are generally shared 50-50. Sometimes the landlord furnishes 100% seed or 50% seed and 50% fertilizer. Some also share harvesting costs. Some landlords charge a cash rent for land producing alfalfa or other hay.

NR = No Report.

SOURCE: Berry, Russell L., "Typical Farm and Ranch Rentals in South Dakota". Economics Department, South Dakota State University, Sept. 1969.

*Including corn, oats, wheat, barley, rye, sorghums, milo, and flax.

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rotation could be assumed to calculate the composite income. Using the actual portion of land utilized removes the need to assume a given rotation.

This procedure needs to be done for a ten year period to adjust for variations in yields and prices. The ten year average net income to land is the simple average of the annual results.

This procedure has been tried in Brookings County. Yields per acre were based on data for each soil class and adjusted by the average yields in the county. For example, the long term average for corn in Class 1 is 49 bushels per acre. In Brookings County the average actual yield for all soil classes from 1965 to 1974 was 38 bushels per acre planted. In 1974 the corn yield per acre planted was only 25 bushels or 68 percent of the 10 year average. On the assumption that yields on Class 1 land changed in direct proportion to the average, the 1974

yield for Class 1 land was estimated as 33 bushels (i.e. 68% of 49).

Data on the yields by soil class are from Westin et. al. (1974),[11] and data on the average yields per planted acre are from South Dakota Agricultural Statistics, South Dakota Crop and Livestock Reporting Service, 1965 to 1974. (See Table 3)

Non-land expenses include seed, fertilizer, pesticides, machinery repairs, fuel, interest on production expenses, crop insurance, overhead, machinery depreciation and interest, and labor. The data utilized were from Market Prices for Net Profit, Bulletin EMC 652 Cooperative Extension Service, South Dakota State University.[12] Since this data covers only 1974, the price index for production expenses was used to adjust the 1974 production expenses to earlier years.

TABLE 2: ESTIMATION OF AVERAGE INCOME FROM LAND, HYPOTHETICAL CASE*
Class 1, Brookings County

Receipt	
Corn Average yield per acre = 49 bushels Average price per bushel = $1.49 for 1965-1974 Average receipts per acre = 49 x $1.49	$ 73.01
Expenses (Average 1965-74)	
Direct costs (seed, fertilizer, fuel, oil, etc.)	$ 28.71
Labor	4.45
Machinery charges (depreciation, insurance, taxes, etc.)	6.93
	$ 40.08
Income to Land & Management ($73.01 - $40.08)	$ 32.93
Charge for operator's management 5% of gross receipts for management = $3.65	3.65
Income Attributable to Land	$ 29.28

Use-Value of Class 1 Land

(a) at .10 capitalization rate = $292.80

(b) at .12 capitalization rate = $244.00

*Note that this hypothetical case is based entirely on corn. If the other crops are included, the annual return and use-value fall.

Management was assumed to earn five percent of the gross receipts. The total non-land expenditures were the sum of the return to management and the explicit non-land costs.

The proportion of land utilized by the four crops considered for Brookings County varied from 84.1 to 93.9 percent. Consequently, the weighted average of the four crops had to be adjusted upward to obtain the full income. Since only 85% of the land was accounted for by the crops considered the weighted average was multiplied by 1.18 to obtain the full value. The implicit assumption in this procedure is that the remaining land is worth the same as the weighted average of these four crops.

Table 4 gives the estimated annual return to Class 1 land in Brookings County from 1965 to 1974, using the procedure described above. The use-value of Class 1 land in Brookings depends on the capitalization rate chosen. While the components of the capitalization rate will be discussed later, Table 5 shows the use-value of Class 1 land in Brookings County at various rates. Note that the use-value of Class 1 land is identical to the market value at a capitalization rate of 9.5 percent and falls below the market value at higher rates. At a rate of 13.5 percent, the use-value falls to 157.92 or only 70 percent of the current market value.

TABLE 3: ESTIMATED PRODUCTION COSTS PER ACRE FOR BROOKINGS COUNTY, 1974*

	Corn	Oats	Flax	Alfalfa
Direct Costs				
Seed	4.95	3.60	11.00	1.20
Fertilizer	13.20	7.80	7.95	4.95
Pesticides	6.50	3.05	3.60	1.00
Machinery Repairs	2.70	2.35	2.30	4.40
Fuel & Lubricants	3.05	2.10	2.15	2.50
Interest on Operating Capital	2.45	1.50	2.15	1.10
Crop Insurance	2.50	2.00	2.00	----
Overhead	1.75	1.75	1.75	1.75
Total Direct Costs	37.10	24.15	32.90	16.95
Fixed Costs				
Machinery Depreciation	5.85	4.40	4.40	2.70
Machinery Interest	3.10	2.30	2.30	1.45
Labor	5.75	4.00	4.50	10.00
Total Fixed Costs	14.70	10.70	44.10	14.15
Total Non-Land Costs/Acre	51.80	34.75	44.10	31.10

*Source: Derschied, Lyle, Wallace Aanderud, and Arthur Sogn, Market Prices for Net Profit. Cooperative Extension Service Bulletin EMC 652, South Dakota State University, Brookings, South Dakota.

TABLE 4: ESTIMATED ANNUAL INCOME TO CLASS 1 LAND IN BROOKINGS COUNTY 1965 TO 1974*

1965	10.76	1970	13.74
1966	7.85	1971	4.37
1967	6.14	1972	20.66
1968	15.32	1973	63.97
1969	17.34	1974	53.11

AVERAGE 21.32

*Estimates made by the author using the procedure described on page 6 through 9.

TABLE 5: USE-VALUE OF CLASS 1 LAND IN BROOKINGS COUNTY, AT CAPITALIZATION RATES OF .065 TO .135

Capitalization Rate	Use-Value	Percent of Current* Market Value
.065	328.00	146.4
.095	224.10	100.0
.10	213.26	95.2
.115	185.39	82.7
.12	177.66	79.3
.13	164.00	73.2
.135	157.92	70.1

*Estimated market value based on data received from the Department of Revenue, Pierre, S.D. was $224 for Class I lands.

In the case of typical crop budgets the net return to land can be calculated separately for each soil class, or the physical productivity index can be used to determine the value of the remaining soil classes. The budget enterprise approach can be modified to estimate the net return to all agricultural land in the county.[13] The value of Class 1 land can then be found by solving the equation on page 4.

Regardless of the means of estimating the annual income to land, the above approaches generally require detailed soil maps. Currently these maps are completed for only 28 of the 67 counties. (Eleven more counties are partially done. See Figure 5.)

Until the detailed maps are available are there any intermediate steps which can be taken to estimate the land's use-value? Two alternatives which could be utilized are: (1) the acreage planted method, and (2) the estimation of productivity ratings by mapping units.

The "Acreage Planted" Method

A fourth means of determining the annual return to land utilizes data on the actual acreage by crop on each farm with average yields, prices, and costs. This approach was examined in 1971 for the South Dakota Tax Information Program, by Lybrand, Ross Bros. and Montgomery.[14] In this paper this approach is called the "acreage planted" method. To calculate the value of the net income to land for each farm, the following calculations are used:

$$F = A_1xN_1 + A_2xN_2 + \ldots A_nxN_n$$

F = net income to the farm

where $A_{1\ldots n}$ = actual acreage on each farm by crop for crops 1 to n.

$N_{1\ldots n}$ = net return to land for crops 1 to n.

To estimate the value of the net return to land for each crop, average yields per acre are multiplied by the average price for each crop. Then the average cost per acre is deducted to yield the net return per acre. Table 6 illustrates this procedure for two typical farms in Minnehaha County.

An advantage of the acreage planted method is that it could be implemented in counties without detailed soil maps. The only piece of data required from individual properties is the number of acres in different agricultural uses. The remaining data is entirely from secondary sources. The net return to an acre of land could be established for each crop so that local assessors could simply multiply this times the number of acres in each crop.

A disadvantage of the acreage planted method is that identical soil classes might not be taxed at identical rates. Rather, an acre of corn within a county would result in the same net income and the same assessed valuation regardless of the type of soil. Consequently, land owners with poor lands would be taxed more heavily with respect to their actual yields than those with highly productive lands.

Despite this disadvantage, the acreage planted method does appear to lower farm land assessments. In addition, an appeal procedure could be established for yields. This would permit some variation in value by soil type.

Productivity Ratings by Mapping Units

Another alternative for counties without detailed soil maps is to estimate the percentage of land in each mapping unit which falls into each soil class. Data is available on the amount of land in each county in each of the soil classes.[15] Likewise data exists on the total amount of land in each mapping unit.[16] Soil scientists and field workers in the Soil Conservation Service could estimate the amount of distribution of class I land among mapping units.

Once this step is completed, each farm within a given map unit would be evaluated as follows:

$$F = (C_1 x V_1 + C_2 x V_2 + \ldots + C_8 x V_8)$$

where F = assessed value of a farm

A = number of acres on the farm

C_1 to C_8 = percentage of the land within the map unit which falls in soil class C_1 to C_8.

V_1 to V_8 = value per acre of land in Class 1 to 8.

All farms within a given map unit will be evaluated at the same value per acre. The only data needed by county assessors is the number of acres per farm. However, assessors would probably have to make adjustments for individual farms.

Like the acreage planted method this method will not assess identical soil classes at identical levels. An individual with a larger percentage of poor land on his farm than for the mapping unit as a whole would be assessed at a higher level relative to his land's productivity than others.

Capitalization Rate

As Table 5 indicated, the capitalization rate chosen is extremely important. The use-value of land ranges from $157.92 per acre at a 13.5 percent capitalization rate to $328 per acre at 6.5 percent.

The capitalization rate is the reciprocal of the number of years it takes to pay off the land's mortgage at the land's annual income level. A capitalization rate of 5 percent implies the purchase price will be paid back in 20 years given the land's productivity. Likewise a 10 percent rate has a 10 year pay back period.[17]

The capitalization rate is the rate of return on capital adjusted for variations in risk and uncertainity. Farm land owners face several types of risk when they invest in land. While land has been appreciating rapidly, farm real estate cannot be liquidated in small units. While there have been capital gains on land the risk of unstable net income remains. The 10 year averages reduce some of the production uncertainity and risk. However, the uncertainties on the demand side cannot be accounted for easily and deserve some recognition.

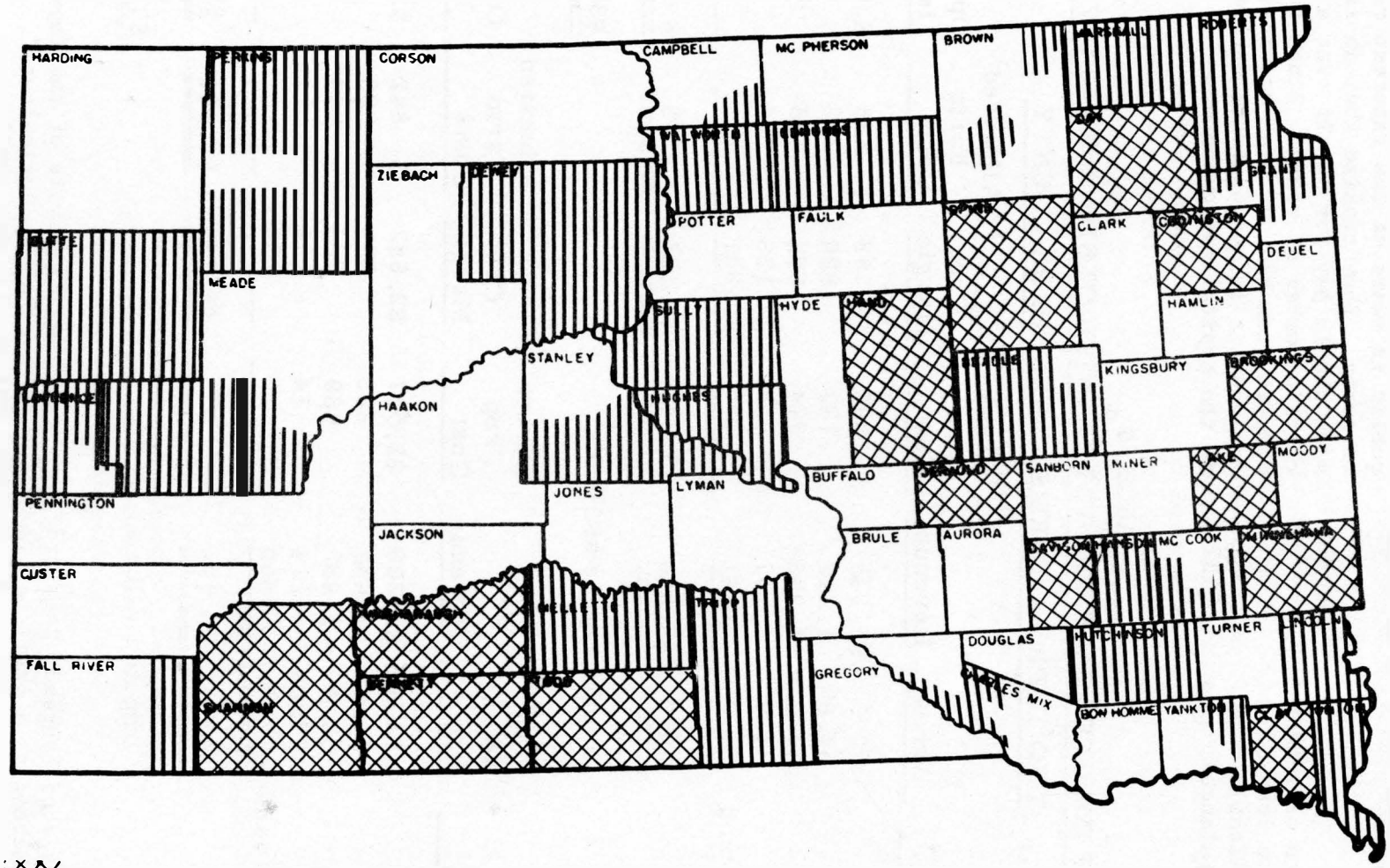
Two methods exist for selection of the capitalization rate: (1) comparable returns on alternative investments and (2) the component rate method.[18]

Table 7 shows the performance of eight investment alternatives, 1955-1968 studied by Lee and Brake.[19] Farm real estate had an average yearly return of 12.0 percent with 5.2 percent from income. While the total return was relatively stable the income return was more variable than all other investments.

The component rate method of establishing the capitalization rate makes the rate dependent not only on the rate of return on investment but also on the quality of the investment. For example the following components can be considered:

1.	Safe rate (i.e. current rate of return on investment having greatest liquidity and safety, like U.S. Government Bonds)	4.5%
2.	Risk rate (allowance for continued ability of property to earn current income.)	3.0%
3.	Penalty for non-liquidity	2.0%
4.	Burden of management	1.5%
		11.0%

FIGURE 4: COUNTIES WITH PUBLISHED SOIL SURVEYS IN SOUTH DAKOTA, JANUARY 1, 1975.



Published Detailed Soil Surveys

Unpublished Detailed Soil Surveys

SOURCE: "Progress of Soil Surveys", January 1, 1975, State of South Dakota, Soil Conservation Service, USDA.

The component rate method can also be determined from a cash flow basis. From the net annual income to land it is necessary to pay (1) the market price of interest charged by lending institutions, (2) an annual portion for debt amortization, and (3) property taxes. In this case the capitalization rate is selected in this fashion:

1. Borrowing rate of interest on real estate loans 7% (rate is applicable to ½ the initial balance)	3.5%
2. Annual rate of payback (20 year payment)	5.0%
3. Property taxes	2.0%
	10.5%

The cash flow basis of rate selection appears to be the most understandable to the general public. The public is aware of the interest charges on money. They realize that an investment should pay for itself over a certain number of years. Since the property tax had not been previously removed, it is necessary to include it in the capitalization rate.

TABLE 6

COMPARISON OF IMPUTED ASSESSED VALUE WITH OTHER ASSESSED VALUES

TWO TYPICAL FARMS - MINNEHAHA COUNTY

Farm 1

Crop No.	Crop	No. of Acres	Revenue	Direct Crop Cost	Crop Margin	Allocated Farm Costs	Operating Income
1	Corn	87.5	$5,145	$2,363	$2,783	$ 788	$ 1,995
2	Oats	54.8	1,412	792	620	299	321
4	Hay	27.0	1,236	574	662	186	475
5	Pasture	34.7	147	17	129	14	116
	Set-aside land	21.0	941		941		941
Total		225.0	$8,880	$3,745	$5,134	$1,286	$ 3,848
	Imputed value at 10.0%						$38,481

Farm 2

Crop No.	Crop	No. of Acres	Revenue	Direct Crop Cost	Crop Margin	Allocated Farm Costs	Operating Income
1	Corn	93.6	$5,209	$2,527	$2,682	$ 842	$1,839
2	Oats	55.6	1,432	803	629	303	326
4	Hay	32.4	1,483	689	794	224	571
5	Pasture	27.0	114	14	101	11	90
	Set-aside land	22.4	950		950		950
Total		231.0	$9,188	$4,033	$5,155	$1,380	$3,776
	Imputed value at 10.0%						$37,755

SOURCE: Exhibit V of Lybrand, Ross Bro. and Montgomery "Analysis of the Imputed Value Method as a Basis for Taxation of Land Used in Agriculture", South Dakota Tax Information Program, Volume III, Dec. 1971.

Table 7. Performance of Eight Investment Alternatives, 1955-1968

	Price Returns		Income Returns		Total Returns	
	Average Yearly Return	Standard Deviation	Average Yearly Return	Standard Deviation	Average Yearly Return	Standard Deviation
	Percentages					
Equity Assets						
Farm Real Estate	6.8	3.8	5.2	1.8	12.0	4.5
425 Indus. Stocks	11.8	14.2	5.6	1.1	17.4	14.4
55 Utility Stocks	8.6	16.6	6.8	1.5	15.4	16.1
5 Income Mut. Funds	6.7	12.1	5.6	.7	12.3	12.3
5 Growth Mt. Funds	15.7	26.3	2.4	.9	18.1	26.6
Fixed Income Assets						
20 Yr. Corporate Bonds	-1.3	2.9	3.0	.0	1.7	2.9
15 Yr. Gov't. Bonds	- .4	2.3	2.8	.0	2.4	2.3
4 Yr. Gov't. Bonds	- .1	1.1	3.5	.8	3.4	1.2

SOURCE: W. F. Lund & G. R. Brake, "Conversion of Farm Assets for Retirement Purposes", Research Report 129, Michigan State University, East Lansing, Michigan, Jan. 1971.

Summary of the Differences

Table 8 summarizes the principal differences between the six methods discussed in this paper: (1) comparable sales, (2) comparable sales with physical productivity ratings, (3) capitalization of earned income from actual income, (4) capitalization of income using rental income, (5) capitalization of income using enterprise budgets, and (6) capitalization of income from actual acreage planted.

Methods 2 and 6 can be administered systematically provided the required data bases are available. Either detailed soil maps or estimates of the percentage of land in each mapping unit falling in each soil class is required for methods 2, 4 or 5. To utilize these methods in the 28 counties without detailed soil maps will require that additional resources be put into the mapping process. Estimates of the cost and time required to complete these estimates or the detailed soil maps are required to judge the feasibility of utilizing methods 2, 4 or 5.

The only data required from each farm to utilize the acreage planted method are the number of acres in each crop. This procedure can be easily adopted even in counties without detailed soil maps.

A frequently voiced concern is whether a given evaluation procedure will tax land of the same quality at the same rate. The percentage of the land's net income capacity paid as property taxes will vary with both the assessment level and the mill rate. The mill rate is partially a function of the demand for locally generated tax revenues and thus beyond the control of land evaluation procedures. The assessment level for all land in a given soil class will be identical, at least within a township, if methods 2, 4 or 5 are utilized. The sixth method will yield identical assessment levels for all classes of soil planted to the same crop. Poor lands are over-valued while good lands are under-valued when the sixth method is used.

Will good management be taxed more under any of these procedures? A distinction must be made between taxes per acre and taxes per dollar of net income. If taxes per acre are considered, then methods 3 and 6 will result in higher taxes on good management. In both cases the return per acre depends on the crops actually planted. Thus managers that consistently select the most profitable crops will have higher land values. However, if taxes per dollar of net income are considered, good management is not taxed more by any of these procedures. The sixth method actually taxes good managers at lower levels than poor managers if the good managers own a higher proportion of highly productive soils.

The final column in Table 8 indicates whether each evaluation procedure appears to satisfy the requirements of South Dakota's present use-value tax laws (SDCL 10-6-31:1 and 10-6-33:2). All six approaches consider "the character of the area and such other agricultural factors as may from time to time become applicable" by allowing some discretion to local assessors. Consequently the major differences in procedures occur in subdivisions one and two which require the consideration of:

(1) The capacity of the land to produce agricultural products as defined in SDCL 10-6-33:2.

(2) Soil, terrain and topographical condition of the property.

Neither of the comparable sales approaches satisfy the first subdivision since comparable sales data may incorporate investment demand influences as well as the land's productive capacity. The capitalization of actual income reflects the land's actual productivity rather than its capacity to produce. Although there are some practical estimation problems, methods 4 and 5 appear to satisfy both the first and second subdivisions of the law.

TABLE 8: DIFFERENCES IN THE ALTERNATIVE LAND EVALUATION PROCEDURES FOR AGRICULTURAL LAND, SOUTH DAKOTA

Method of Land Evaluation	Administrative Ease & Uniformity	Land of Same Quality Taxed at same Rate	Good Management Taxed More/ Dollar Net Income	Detailed Soils Maps Needed	Market Value Considering sections 1,2,4,5,*
1. Comparable Sales	Highly Subjective	No	No	No	No
2. Comparable Sales with Physical Productivity Rating	Systematic	Yes	No	Yes	No
Capitalization of Earned Income Estimated from :					
3. Actual Income	Heavy Data Demand	No	No	No	No
4. Rental Income	Systematic	Yes	No	Yes	Yes
5. Enterprise Budgets by Soil Class	Systematic	Yes	No	Yes	Yes
6. Actual Acreage Planted	Systematic	No	No	No	Yes

*Of SDCL 10-6-31.1

Would the sixth method meet the requirements of subdivision one? Under SDCL 10-6-33:2 the law reads: "Capacity of land in agricultural use to produce agricultural products shall be based on average yields under natural conditions...." No explicit requirements is stated for the consideration of yields on different soil classes. Thus the sixth method appears to satisfy the first subdivision.

Subdivision two of SDCL 10-6-31:1 requires the consideration of "soil, terrain and topographical condition of the property." It could be argued that the type of crop planted reflects these conditions at least to some degree. For example, Class 4 or 5 is less likely to be planted to corn, wheat, oats than Class 1 and 2. A procedure for documenting the actual yields of less productive lands could be established in order to reflect the considerations of subdivision two. The cost and time required to develop data, in actual yields, or to utilize existing ASCS information, needs to be considered to determine the feasibility of this approach compared to data on soil classes.

The procedure for local assessors is identical for methods 2, 4 and 5. In counties with detailed soil maps, the assessor needs data on the acres of land in given soil classes. If detailed soil maps are not available but the distribution of each class of land has been estimated for each soil association mapping unit the assessor needs only data on the acreage in each farm. Method 6 requires the assessor to have data on the land in each crop but no data on soil classes. Currently this characteristic makes it more feasible in the 28 counties without either detailed soil maps or estimates of the distribution of soil classes by soil association mapping units.

One of the main concerns with taxation of agricultural lands has been the high percentage of annual income paid in property taxes. In addition, some lands are experiencing speculative and urbanization pressures and consequently, market values are above use-values. The utilization of an income capitalization approach for the determination of use-values guarantees that all farmlands will be assessed at the **same** ratio to net income. It cannot insure that taxes paid will be uniform across jurisdictional lines due to differences in mill rates.

Taxes per acre are the product of the assessed valuation, the assessment sales ratio and the mill rate. The use-value tax law only deals with the value. Consequently, the actual taxes paid may not fall if assessed valuations fall. Either the assessment sales ratio or the mill rate could increase sufficiently to off-set reductions in the assessed values.

Policy Questions

The state and each county face several policy questions on the use-value assessment of agricultural lands.

(1) Should the land's assessed value be determined by capitalizing the net return to land from agricultural land?

(2) Which method should be utilized to estimate the land's net income?

(3) What capitalization rate should be selected?

(4) In counties without detailed soil maps, should all farms within a given soil association be assessed at the same level or should the acreage planted to various crops be utilized to determine the net return to land?

(5) Should state law require all counties to utilize the same procedure?

(6) If all counties are required to utilize the same procedure, should any sanctions be against counties not utilizing the procedure? If so, what should these be?

NOTES

1. South Dakota Compiled Laws 10-6-31:1.

2. The law describing the method of determining the capacity of land to produce agricultural products reads:

> Determination of capacity to produce agricultural products - Source of information.--Capacity of land in agricultural use to produce agricultural products shall be based on average yields under natural conditions, in the case of land producing crops or plants, and on the average "acres per animal unit," in the case of grazing land; said average shall affect each operating unit and shall be based on the ten-year period immediately preceding the tax year in issue. In determining such capacity to produce, the county director of equalization and/or the county board of equalization must take into consideration yields, and/or carrying capacity as determined by the soil conservation service, the agricultural stabilization and conservation service, the extension service, federal land bank and private lending agencies dealing with land production capacities. (SDCL 10-6-33:2)

3. Personal correspondence with the South Dakota Department of Revenue, March 17, 1975.

4. The impact on land use and taxes are explored in a separate bulletin: George Morse, "Considerations for Rollback Provisions for South Dakota's Use-Value Assessment of Agricultural Lands," Experiment Station Bulletin B638, Economics Department, SDSU, 1975

"Farm Real Estate Market Developments," CD-80, Economic Research Service, U.S.D.A., Washington, D.C., July 1975.

6. National Economic Trends Federal Reserve Bank of St. Louis, July 28, 1975.

7. E. C. Pasour has found that a 10 percent increase in the county's population was associated with an increase of $19.70 per acre in the average value of farm real estate in the county. Farm values were also found to be positively related to population density with a $3.40 increase per acre for each additional 10 persons per square mile. Since the date was at a county level of aggregation, the impact of the urban variables is likely to have been more pronounced if township or individual farm data had been used. These estimates were made in North Carolina using multivariate regression analysis to hold constant the influence of other factors such as tax rates, three productivity variables, and farm size. American Journal of Agricultural Economics, November 1973, 55(4) pp. 549-56.

8. Westin, Frederick C., Maurice Stout, Jr., Donald L. Bannister and Charles J. Frazee, "Soil Surveys for Land Evaluation," Assessors Journal, 1974.

9. Ibid, p. 21.

10. Berry, Russell L., "Typical Farm and Ranch Rentals in South Dakota," Economics Department, South Dakota State University, Sept. 1969.

11. Westin, et. al., op. cit.

12. Derscheid, Lyle, Wallace Aanderud, and Arthur Sogn, Market Price for Net Profit, Cooperative Extension Service EMC 652, South Dakota State University, Brookings, South Dakota.

13. At the time of this publication, work on this approach was being conducted by the author, Dr. Fred Westin and Dr. Wallace Aanderud at South Dakota State University.

14. Lybrand, Ross Bros. & Montgomery, "Analysis of the Imputed Value Methods As A Basis for Taxation of Land Used in Agriculture", South Dakota Tax Information Program, Volume III, December 1971.

15. South Dakota Conservation Needs Inventory, U.S. Department of Agriculture, Soil Conservation Service, August 1970.

16. Mapping units are shown on the map of Soil Associations for South Dakota, AES Info Series No. 3, Agricultural Experiment Station, SDSU, Brookings, and Soil Conservation Service, Huron, January 1971.

17. Since usually land does not depreciate, some would feel that the capitalization rate should not include a component for the amortization of the debt. However, a component is generally included for this element.

18. This section draws heavily on a paper by E. T. Shandys and D. G. Chafin, "A Technique for Taxation Assessment of Farm Realy Estate Based on the Capitalized Income Stream of Agricultural Land," Department of Agricultural Economics and Rural Sociology, Ohio State University, Oct. 1972.

19. Lee, W. F. and G. R. Brake, "Conversion of Farm Assets for Retirement Purposes," Research Report 129, Michigan State University, East Lansing, Michigan, January 1971.

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