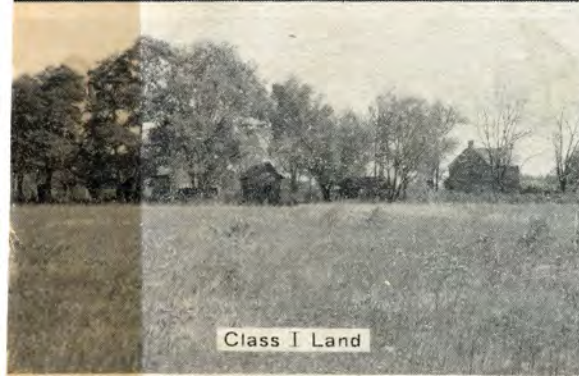


An Economic Study of
LAND UTILIZATION
IN SUSSEX COUNTY,
DELAWARE

by
R. O. Bausman



Class I Land



Class II Land



Class III Land



Class IV Land

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DIGEST

Of the 602,460 acres of land in Sussex County, 312,175 acres (51.8 per cent) were in land class I (mostly timber, brush, and marsh land); 61,849 acres (10.3 per cent) were in land class II (mostly open untillable land and land tilled only occasionally); 128,647 acres (21.3 per cent) were in land class III (less intensively used than class IV land); and 99,789 acres (16.6 per cent) were in land class IV (most intensively used crop land), at the time of the survey, 1938 and 1939. Land classes I and II, comprising about three-fifths of the land area, not being able under existing conditions to produce an adequate income from cropping the land, could possibly be utilized to a better economic and social advantage as forests, wildlife preserves, and public recreation than for agricultural use.

As compared with that of farmers residing in the better land classes a larger proportion of the farmers in the poorer land classes were older men, and a smaller proportion of the farm children had taken full advantage of the school facilities offered by the state. In these two respects, the social behavior of the rural people in the different land classes in Sussex County was similar to that in New Castle and Kent Counties, Delaware. However, in other respects, there were distinct differences. Most of the farmers of Sussex County were born and reared in rural Delaware and the number of foreign-born farmers was negligible. In fact, most of the farmers of Sussex County were born and reared in Sussex County. Probably because there were so few of the farmers born outside of the state, there was no significant difference in the proportion of the farmers in the different land classes who were born outside of rural Delaware and in foreign countries. There was no significant difference in the various land classes in Sussex County in the farm experience of farmers; in the proportion of farmers who took up non-agricultural vocations after leaving the farms; in the proportion of farmers' sons who took up farming as a vocation; and in the number of children per farm family. In general, it appears that the farmers of Sussex County, particularly the farmers in the poorer land classes, are more closely attached to the land than in New Castle and Kent Counties. Most of the farmers of Sussex County were born and reared on Sussex soil and spend their life time on the soil.

Land classes III and IV, comprising about two-fifths of the land area, are suited for agricultural use. In the event that there is pressure for an increased production of the more nutritive high-acre-value crops, as a result of the national defense program and our increasing population, and in the event that future trends in food production correspond reasonably closely with those of the past, there will be a greater increase in the production of these foods in land class IV than in land class III, and a greater increase in land class III than in land classes I and II. Probably only in the event of an extreme food shortage would an appreciable amount of land classes I and II be placed in cultivation.

AN ECONOMIC STUDY OF LAND UTILIZATION IN SUSSEX COUNTY, DELAWARE

by
R. O. Bausman

Since 1880, the acreage of land in farms in Sussex County has decreased by slightly less than one-fourth. This is the response the farmers have made to changing economic conditions. The poorer grades of land, when first put under cultivation, probably paid fair returns. However, changing conditions since that time have rendered these lands incapable of making returns commensurate with the expenditure of capital and labor. Farmers, therefore, have been forced to abandon, for cropping purposes, large tracts of these poorer lands.

Drainage is one of the important land-use problems of Sussex County. Most of the soils are of a lighter character and the well-drained soils of the county usually are suited for the production of high-acre-value crops, whereas, on the more poorly drained soils, most crops are produced with a marked degree of uncertainty. The economic use of these poorly drained lands is one of the urgent land-use problems in Sussex County.

PURPOSE OF STUDY

The purpose of this study is to classify the land of Sussex County according to the present economic uses for which it is best suited in order that there may be factual bases:

1. For locating areas best suited for intensive food production, in the event the impact of a war should create acute pressure for increased food production.
2. For locating areas submarginal for cropping purposes for purchase by federal or state agencies, should they desire to do so.
3. In the event that future study should indicate the desirability of rural zoning in Sussex County, this study would serve as a basis for determining zoning areas and thus protect people unfamiliar with the lower classes of agricultural land from purchasing land in these areas for agricultural use.

Acknowledgment—The author is indebted to Mr. F. J. Marschner, Bureau of Agricultural Economics, U. S. Department of Agriculture, who gave invaluable advice relative to the technique in making the land-classification map. The author is also indebted to Messrs. J. E. H. Lafferty and W. F. Mai for doing the field work. Mr. Lafferty's careful observation of details is responsible, to a large degree, for the accuracy of the land-classification map.

4. For directing people who desire to purchase farms, to the areas of the better agricultural land.
5. As an aid to established farmers in making adjustments in the use of their land.
6. As an aid in appraising farms for placing mortgage and operating loans.
7. As an aid in determining the location of improved farm-to-market roads.
8. As an aid in determining the location of rural electric power lines and rural telephone lines.
9. As an aid in farm-management studies. Good farm-management practices in the best grade of land may be different from those in the next best grade.
10. As an accurate appraisal of the timber, marsh, pasture, and crop resources of the state.
11. As an aid in dealing with some of the rural social problems. Data are presented indicating the effect of the different land classes on age of farmers, nationality of farmers, farm experience of farmers, number of farmers' sons who become farmers, size of farm families, and education of farm children.

DESCRIPTION OF SUSSEX COUNTY

Climate

The climate of Sussex County is marked by reasonably good rainfall, relatively high humidity, and moderate temperatures. The mean annual rainfall is approximately 43 inches. The rainfall is distributed throughout the year, the heaviest rains occurring, as a rule, during the growing season. However, crop yields are, at times, decreased by dry spells or periods of excessive moisture, but these seldom result in complete crop failures.

During the summer the days are hot, but periods of excessive heat are generally short. The humidity is high, and this has a tendency to make the heat oppressive. The hottest month is July, with an average mean temperature of about 76 degrees F. The winters are moderate but the air is damp and penetrating. February is the coldest month, with a mean temperature of about 34 degrees F.

The average growing season is about 185 days, the average date for the last killing frost in the spring being about April 20, and that of the first killing frost in the fall being about October 24.¹

¹ Soil Survey of Sussex County, Delaware, Bureau of Soils, U. S. Department of Agriculture, p. 1533, 1924.

Soils

The topography of Sussex County is exceedingly level. The soils of Sussex County have been classified into seven series.

The Sassafras series includes the high-lying and the best-drained soils of the county. This series is distinguished by the brown color and mellow structure of the surface soil, the reddish-yellow to yellowish-brown color of the subsoil, and the presence of coarser materials in the lower subsoil than in the upper subsoil.

The Norfolk series is intermediate between the Sassafras series and Keyport and Woodstown series. The Norfolk series is characterized by a gray, or grayish-yellow, color of the surface soil and the pale yellow color of the subsoil. These soils are reasonably well-drained but not quite so well-drained as the Sassafras soils.

The Woodstown series is characterized by the grayish-brown color of the surface soil and the mottled-gray color and compact structure of the subsoil. The surface soil resembles in color that of the Sassafras series, and the subsoil is similar to the Elkton series. The subsoil is less compact than that of the Keyport series. The drainage of the surface soil is good and that of the subsoil is poor. On the Kent County and New Castle County soil maps, the Woodstown series is indicated as the Leonardtown series.

The Keyport series is light-brown in the surface layer and light-gray or bluish-gray in the subsoil, which is a stiff, plastic clay or sandy clay. The Keyport soils resemble the Sassafras or Norfolk soils in the surface, and the subsoil bears a close resemblance to the subsoil of the Elkton series. The surface soil is well-drained and the subsoil is poorly drained.

The Elkton series has a light-gray surface soil, and light-gray to bluish-gray subsoil of a heavy texture. The soils of this series occupy flat level areas, where the drainage is poor in both the surface soil and subsoil.

The St. Johns series is characterized by its dark-gray to black color in the surface soil, which is underlaid with a compact layer of sand having a granular structure and brown color resembling that of coffee grounds. The drainage is poor in both the surface soil and subsoil.

The Portsmouth series varies from a dark-gray to a black surface soil and a mottled-yellow, light-gray, or bluish-gray subsoil. These soils have developed in slightly depressed areas where natural surface drainage is poor in both the surface soil and subsoil, and where water-loving vegetation has flourished.²

Markets

Sussex County is easily accessible by railroad and highway to most eastern markets. In the important fluid-milk area in the eastern

² Soil Survey of Sussex County, Delaware. Bureau of Soils, U. S. Department of Agriculture, pp. 1541 - 1563, 1924.

part of the county, the milk is shipped by tank cars to Philadelphia. Sussex County is a deficit grain area; however, during the harvest season some grain is shipped largely by railroad to Philadelphia and Baltimore. Fruits, vegetables, poultry, and eggs are transported largely by trucks and are marketed, for the most part, in the New York, Philadelphia, and other eastern markets.

TRENDS IN THE PRODUCTION OF IMPORTANT CROPS, KINDS OF LIVESTOCK, AND LIVESTOCK PRODUCTS IN SUSSEX COUNTY

The number of farms in Sussex County has decreased from 5,508 in 1910, to 4,665 in 1940, a decrease of 843 farms, or 15.3 per cent. The number of acres of land in farms has decreased from 516,697 acres in 1880, to 402,163 acres in 1940, a decrease of 114,534 acres, or 22.2 per cent during this sixty-year period. This is an average decrease in land in farms in Sussex County, during this sixty-year period, of approximately 2,000 acres annually, Table 1 and Figure 1. A small proportion of this land has been taken out of farms and used for public improvements but the large proportion of it is the poorer grades of land which have been abandoned for agricultural use. It has been stated, previously, that this is the response Sussex County farmers have made to changing economic conditions.

Table 1—Number of farms and acres of land in farms in Delaware and in Sussex County, Delaware, 1850 - 1940¹

Year	Number of farms		Acres of land in farms		Index numbers of acres of land in farms 1940 = 100	
	Delaware	Sussex County	Delaware	Sussex County	Delaware	Sussex County
	number	number	acres	acres		
1850	6,063	—	956,144	454,467	107	113
1860	6,608	2,971	1,004,295	460,042	112	114
1870	7,615	3,519	1,052,322	493,924	118	123
1880	8,749	4,215	1,090,245	516,697	122	128
1890	9,381	4,461	1,055,692	475,517	118	118
1900	9,687	4,785	1,066,228	483,200	119	120
1910	10,836	5,508	1,038,866	469,178	116	117
1920	10,140	5,404	944,511	413,513	105	103
1930	9,707	4,994	900,815	391,486	100	97
1940	8,994	4,665	895,507	402,163	100	100

¹ United States Census.

The crops, livestock, and livestock products that are produced in Sussex County are determined by physical and economic conditions. The farmers of Sussex County have produced many kinds of crops and livestock products. Through the process of trial and error and

economic profit and loss over a long period of years, farmers have found the crops and kinds of livestock that are most nearly adapted to Sussex County conditions. For those enterprises that were found to be less profitable, farmers have taken their losses and tried others, until at the present time the type of crop and livestock production in Sussex County, in general, is about the most profitable one under existing conditions.

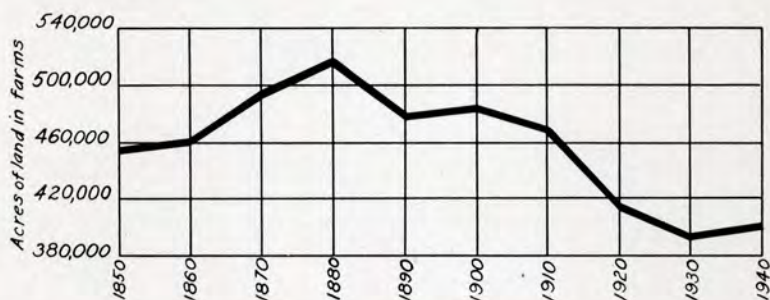


Figure 1—Acres of land in farms, Sussex County, Delaware, 1850 - 1940

The trend in the acreage of land in farms in Sussex County has been downward since 1880. This is due largely to the abandonment of the poorer land for agricultural use.

Among the more important factors which determine the type of farming within an area are climate, soil, topography, and marketing costs. For example, the climate in Sussex County precludes the economic production of cotton. Cotton can be, and has been, grown in Sussex County but the economic production of cotton requires a warm climate and a long growing season. The soil of Sussex County precludes the economic production of tobacco. Economic production of tobacco requires a peculiarly adapted soil. Topography influences directly the economic use of machinery, horse labor, man labor, and the control of erosion. When the topography becomes too rough, or lies too low to afford good drainage, the land is usually used for livestock production, or possibly the growing of timber. Marketing costs are conditioned by bulk and perishability of the products. Marketing costs are high for perishable products, such as eggs, fruits, and vegetables. Marketing costs place a handicap on the production of this type of product in areas distant from markets and give an advantage to areas near the eastern markets.

Physical conditions in an area change only slightly but economic conditions are constantly changing. This necessitates that the farmers gradually adjust their type of farming to meet these changing conditions. Sussex County, therefore, is tending towards the production of more of the perishable products, such as vegetable crops, and less of the more staple or concentrated products, such as wheat, corn, butter, dressed pork, and dressed beef. Tables 2 to 7, and Figures 2 to 14, show the trends in the production of crops, livestock, and livestock products in Sussex County from 1840 to 1940.

Table 2—Number of different kinds of livestock in Sussex County, Delaware, 1840 - 1940.¹

Kinds of animals	1840	1850	1860	1870	1880	1890	1900
	number	number	number	number	number	number	number
Cows milked ²	—	5,475	5,189	6,127	6,973	7,178	6,910
Swine, all ages.....	33,054	29,251	21,768	18,409	24,378	15,446	19,523
Sheep & lambs, all ages...	17,996	13,802	9,174	12,213	7,875	4,238	3,701
Chickens over 3 mos. old.	—	—	—	—	126,027	395,050	343,443
	1910	1920	1925	1930	1935	1940	
	number	number	number	number	number	number	
Cows milked ²	7,823	7,260	7,053	7,423	8,594	7,488	
Swine, all ages.....	20,914	16,703	9,394	13,292	11,772	9,987 ⁴	
Sheep & lambs, all ages...	1,852	646	356	943	482	595	
Chickens over 3 mos. old.	429,310 ³	546,890	815,028	1,070,867	589,413	407,179 ⁴	

¹ United States Census.

² Prior to 1925, dairy cows 2 years old and over.

³ Poultry of all kinds. Excludes most, if not all, commercial broiler production.

⁴ Over 4 mos. old.

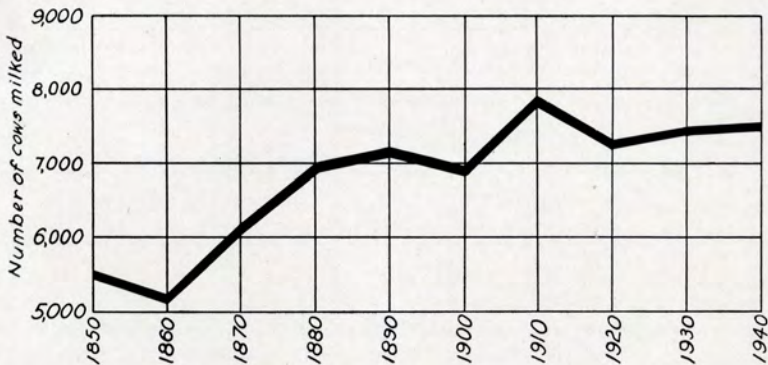


Figure 2—Number of cows milked, Sussex County, Delaware, 1850 - 1940

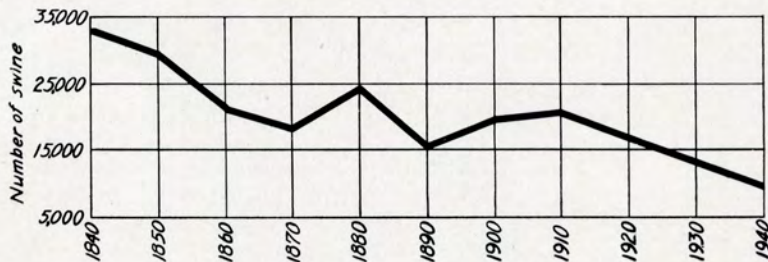


Figure 3—Number of swine, Sussex County, Delaware, 1840 - 1940

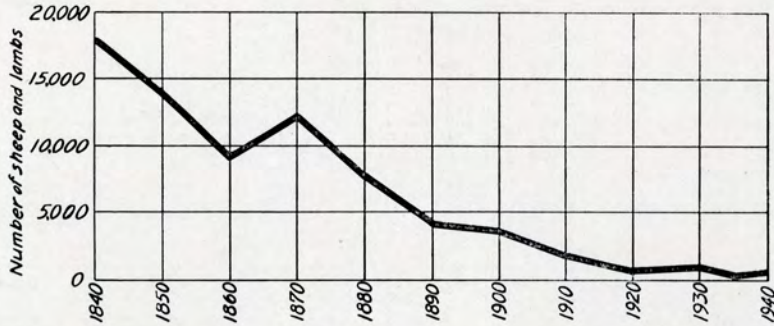


Figure 4—Number of sheep and lambs, Sussex County, Delaware, 1840 - 1940

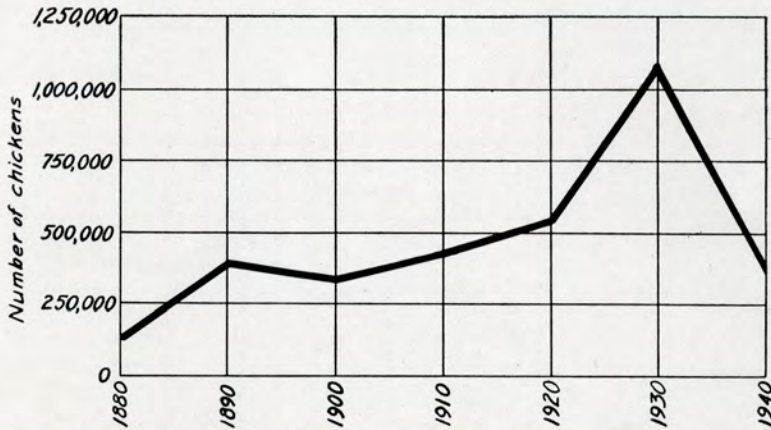


Figure 5—Number of chickens (excludes most if not all commercial broiler production) Sussex County, Delaware, 1880 - 1940

Table 3—Production and sale of dairy products in Sussex County, Delaware, 1850 - 1940.¹

Kinds of products	1850	1860	1870	1880	1890	1900
Milk produced, gals.	—	—	—	—	1,745,134	2,265,768
Milk sold, gals.	—	—	—	103,595	—	141,168
Cream sold, gals.	—	—	—	—	—	408
Butter churned, lbs.	108,489	177,562	185,005	384,613	412,176	420,741
Butter sold, lbs.	—	—	—	—	—	221,758
	1910	1920	1930	1935	1940	
Milk produced, gals.	1,933,260	1,816,381	3,072,802	3,034,221	—	3,437,657
Milk sold, gals.	98,988	148,967	1,591,903	—	—	1,794,280
Cream sold, gals.	494	10,096	1,983	—	—	—
Butter churned, lbs.	558,535	400,701	256,299	184,126	—	160,633
Butter sold, lbs.	296,612	284,706	118,066	—	—	53,084

¹ United States Census.
Data apply to year preceding census date.

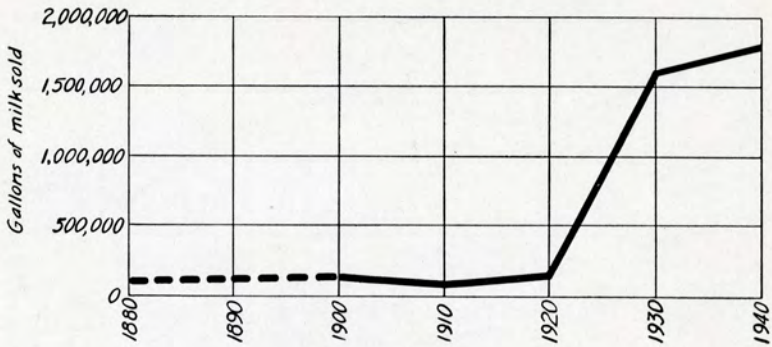


Figure 6—Number of gallons of fluid milk sold, Sussex County, Delaware, 1880 - 1940

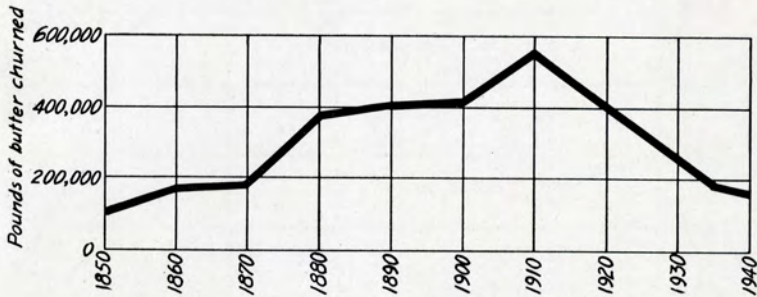


Figure 7—Number of pounds of butter churned, Sussex County, Delaware, 1850 - 1940

Table 4—Acreage of grain crops in Sussex County, Delaware, 1880 - 1940.¹

Kinds of grain	1880	1890	1900	1910	1920	1925	1930	1935	1940
	acres	acres	acres	acres	acres	acres	acres	acres	acres
Corn for grain	105,442	91,277	95,962	100,644	89,657	66,742	68,620	73,716	71,359
Wheat	16,428	14,080	22,102	22,260	27,340	17,355	22,694	14,205	9,155
Rye threshed . . .	169	773	260	156	3,877	1,908	4,375	5,923	7,439

¹ United States Census.
Data applying to year preceding census date.

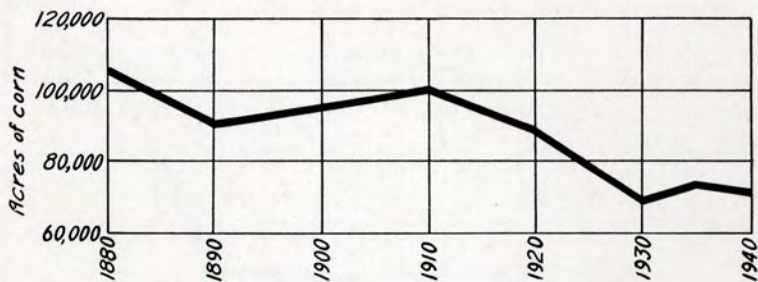


Figure 8—Number of acres of corn for grain, Sussex County, Delaware, 1880 - 1940

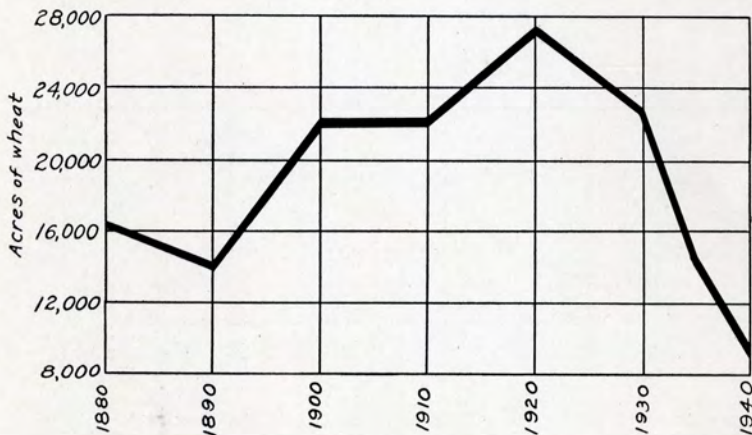


Figure 9—Number of acres of wheat, Sussex County, Delaware, 1880 - 1940

Table 5—Acreage of hay crops in Sussex County, Delaware, 1880 - 1940.¹

Kinds of hay crops	1880	1890	1900	1910	1920	1925	1930	1935	1940
	acres	acres	acres	acres	acres	acres	acres	acres	acres
All hay.....	2,111	15,904	14,464	20,839	20,842	19,397	20,252	16,942	21,451
Alfalfa hay....	—	—	51	30	363	792	931	894	286
Timothy and clover, alone or mixed....	—	—	—	2,933	3,101	5,251	5,568	9,239	7,401
Annual legumes saved for hay....	—	—	—	—	4,107	5,429	4,739	5,983	5,940

¹ United States Census.
Data apply to year preceding census date.

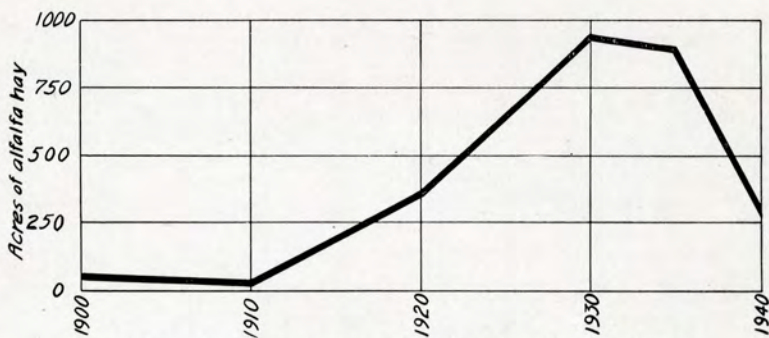


Figure 10—Number of acres of alfalfa hay, Sussex County, Delaware, 1900 - 1940

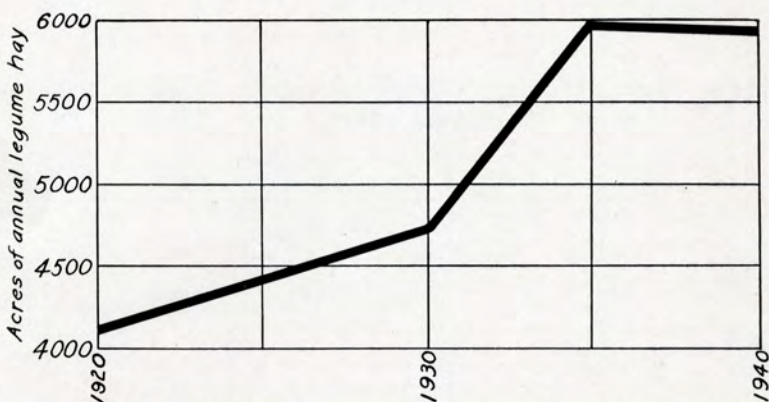


Figure 11—Number of acres of annual legumes used for hay, Sussex County, Delaware, 1920 - 1940

Table 6—Acreage of truck crops, Sussex County, Delaware, 1880 - 1940.¹

Kinds of truck crops	1880	1890	1900	1910	1920	1925	1930	1935	1940
	acres	acres	acres	acres	acres	acres	acres	acres	acres
Total vegetables harvested for sale ²	—	—	9,083	11,161	19,056	9,887 ³	19,341	24,254	26,737
White potatoes.....	—	1,388	2,569	6,049	5,230	2,284	2,010	3,201	1,779
Sweet potatoes.....	1,619	1,275	1,433	3,351	8,062	3,659	4,563	4,169	1,983
Total truck crops.....	—	—	13,085	20,561	32,348	15,830	25,914	31,624	30,499

¹ United States Census.

² Does not include acreage for sweet corn, white potatoes, and sweet potatoes except the years 1900 and 1910 which do include the acreage of sweet corn.

³ Includes acreage for cabbage, cantaloupes and muskmelons, lettuce, onions, tomatoes, and watermelons, only.

Data apply to year preceding census date.

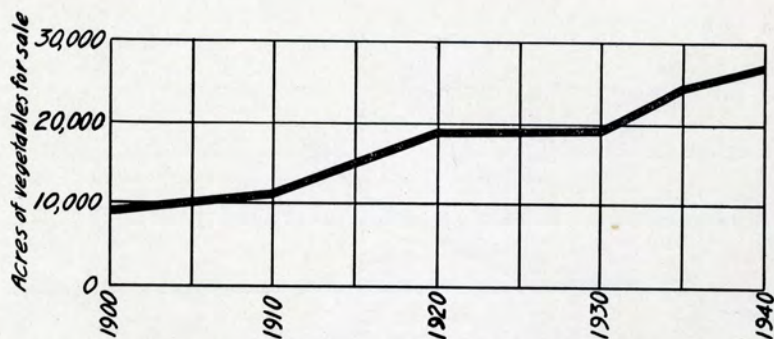


Figure 12—Number of acres of vegetables harvested for sale, Sussex County, Delaware, 1900 - 1940

Table 7—Number of fruit trees in Sussex County, Delaware, 1890 - 1940.¹

Kinds of fruit trees	1890	1900	1910	1920	1925	1930	1935	1940
	number	number	number	number	number	number	number	number
Apple trees of bearing age.....	140,998	302,092	192,938	284,477	293,379	277,688	279,391	144,860
Peach trees of bearing age.....	1,597,764	1,579,531	523,158	139,595	—	161,866	144,378	135,674

¹ United States Census.
Data apply to year preceding census date.

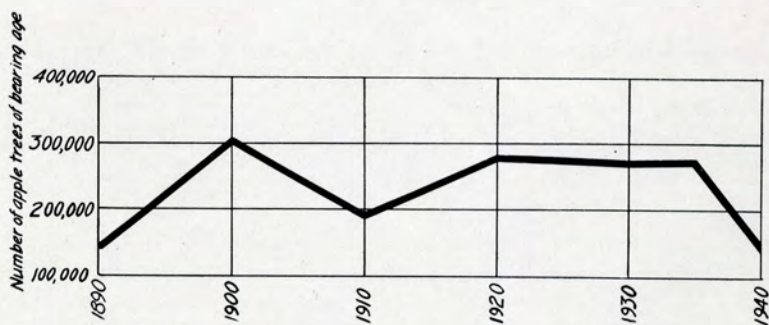


Figure 13—Number of apple trees of bearing age, Sussex County, Delaware, 1890 - 1940

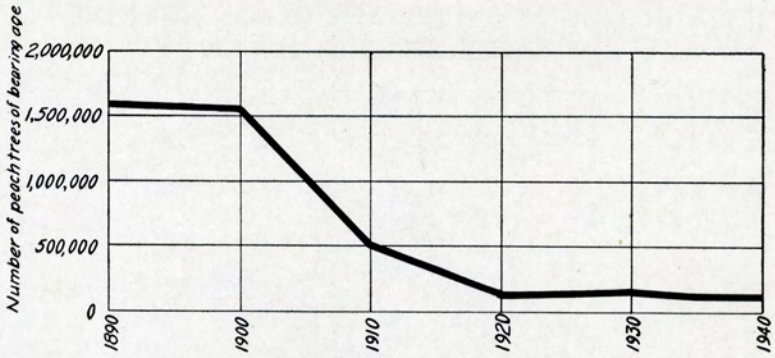


Figure 14—Number of peach trees of bearing age, Sussex County, Delaware, 1890 - 1940

DISTRIBUTION OF IMPORTANT CROPS AND KINDS OF LIVESTOCK IN SUSSEX COUNTY

Type of soil and drainage are the chief factors determining the distribution of crops and kinds of livestock within Sussex County. The distribution of crops and livestock are shown in Figures 15 to 21.

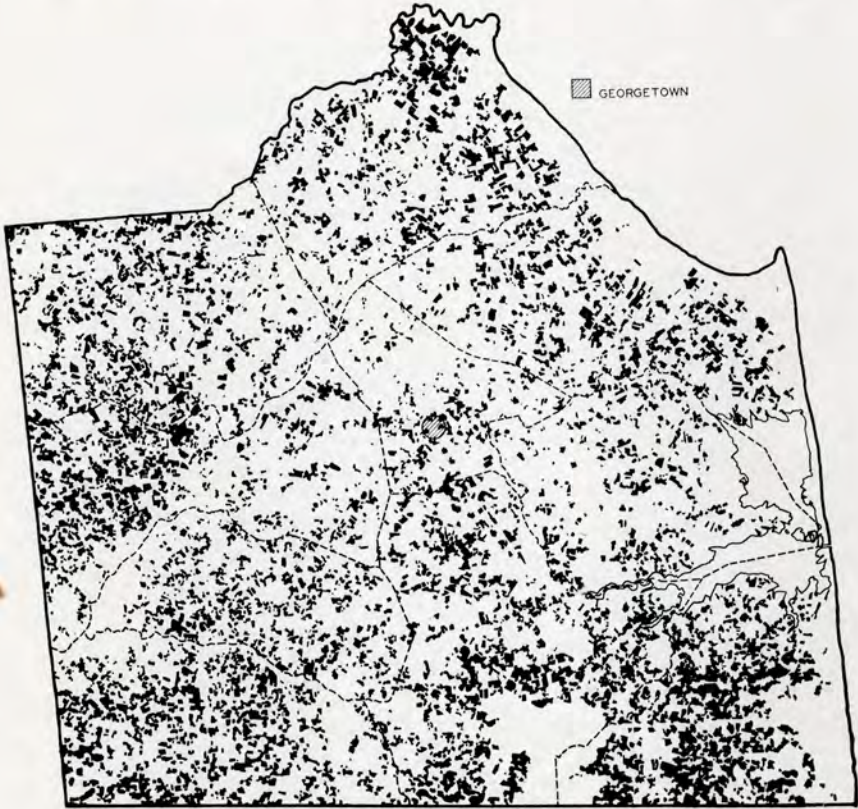


Figure 15—Distribution of the acreage of grain crops¹, Sussex County, Delaware, 1938 - 1939

Grain crops are distributed fairly evenly over the entire county. However, there is a somewhat greater concentration of corn in the south-eastern section of the county. This is the section of the Portsmouth soils and yields are relatively low. Grains are used largely for feed for the farm livestock. Includes corn, wheat, rye, oats, and barley.

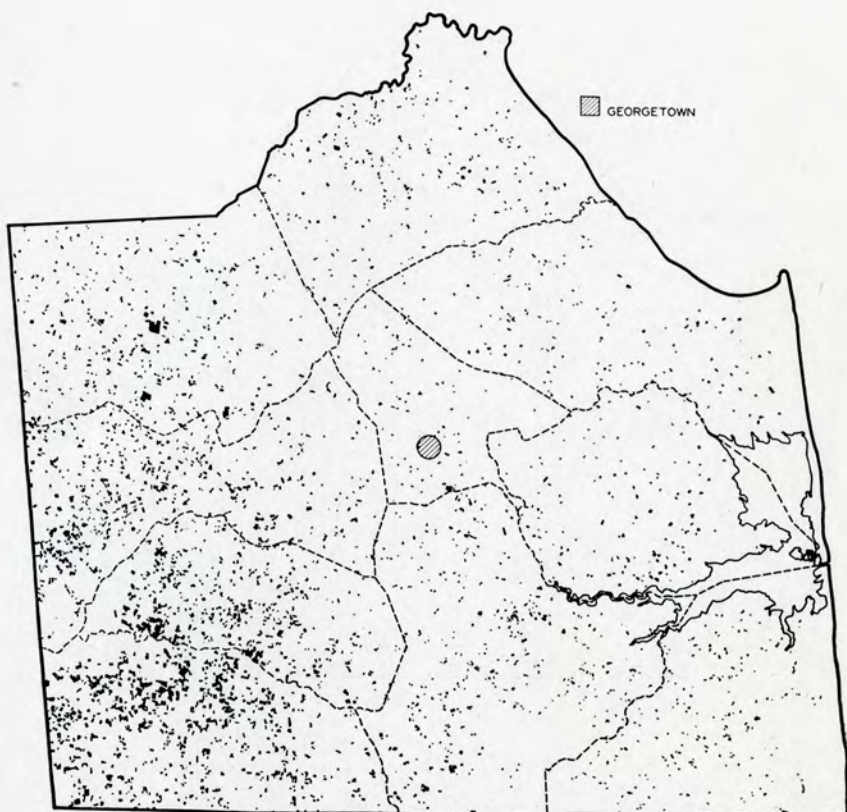


Figure 16—Distribution of the acreage of truck crops¹, Sussex County, Delaware, 1938 - 1939

Truck crops are grown over most of the county, but there is a marked concentration in the western part of the county. This is the area of the lighter soils.

¹ Includes sweet potatoes, white potatoes, asparagus, cantaloupes, watermelons, cucumbers and pickles, peppers, and other truck crops.

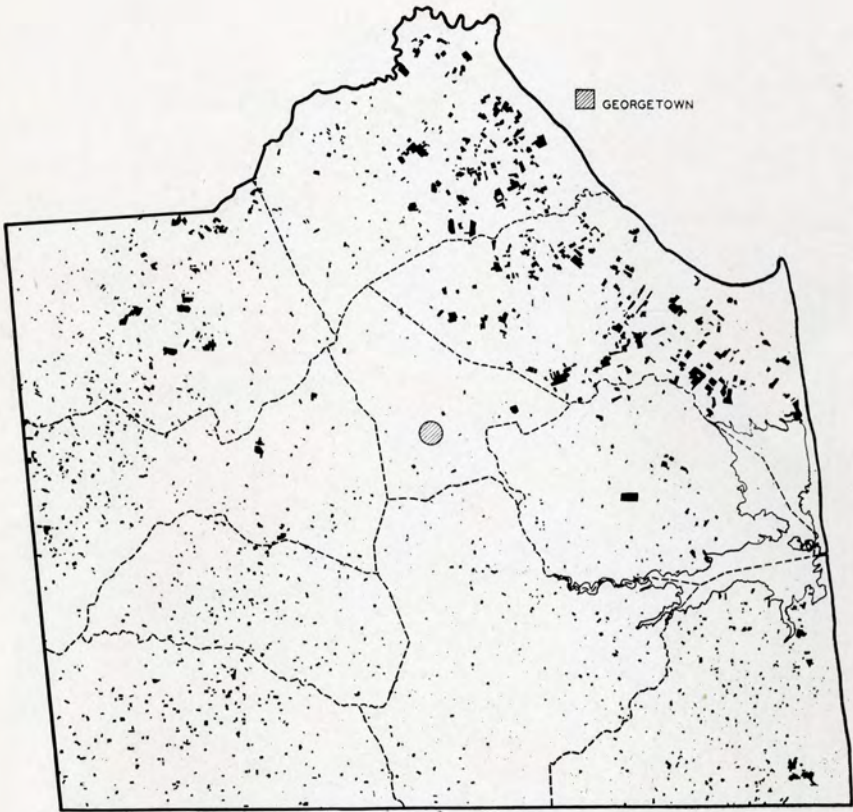


Figure 17—Distribution of the acreage of cannery crops¹, Sussex County, Delaware, 1938 - 1939

Cannery crops are concentrated largely in the eastern and in the western parts of the county. Lima beans and string beans constitute most of the cannery crops in the north-eastern section. Tomatoes constitute most of the cannery crops in the other sections of the county.

¹ Includes lima beans, string beans, and tomatoes.

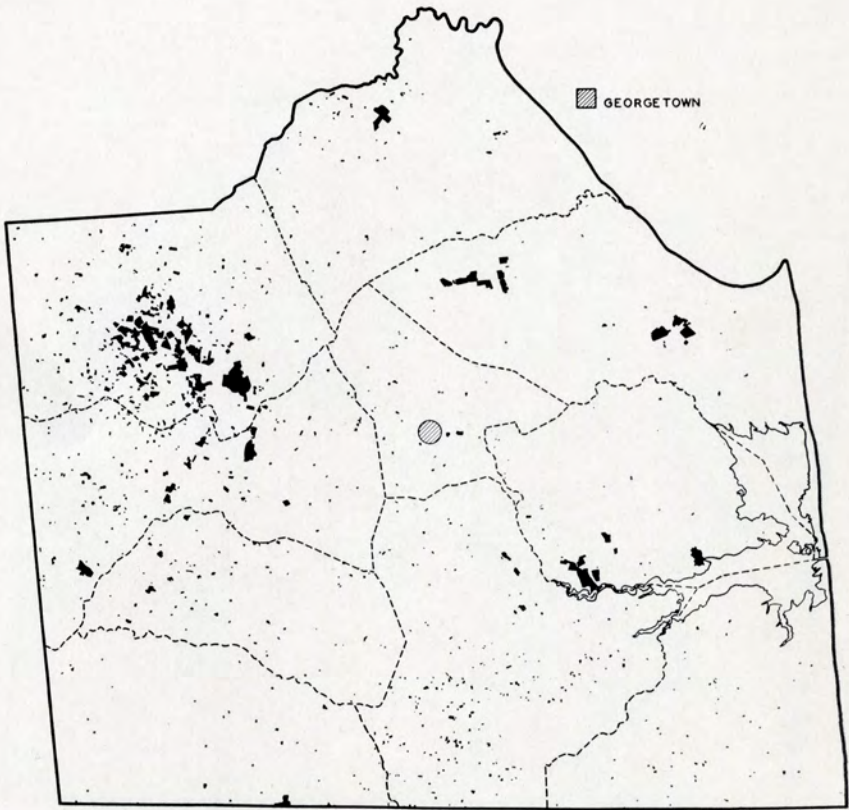


Figure 18—Distribution of the acreage of fruit crops¹, Sussex County, Delaware, 1938 - 1939

A limited acreage of strawberries and other small fruits is distributed through the southern and western portions of the county. With the exception of a few large orchards, apple and peach production is concentrated in the north-western section of the county.

¹ Includes apples, peaches, vineyards, strawberries, and other small fruits.

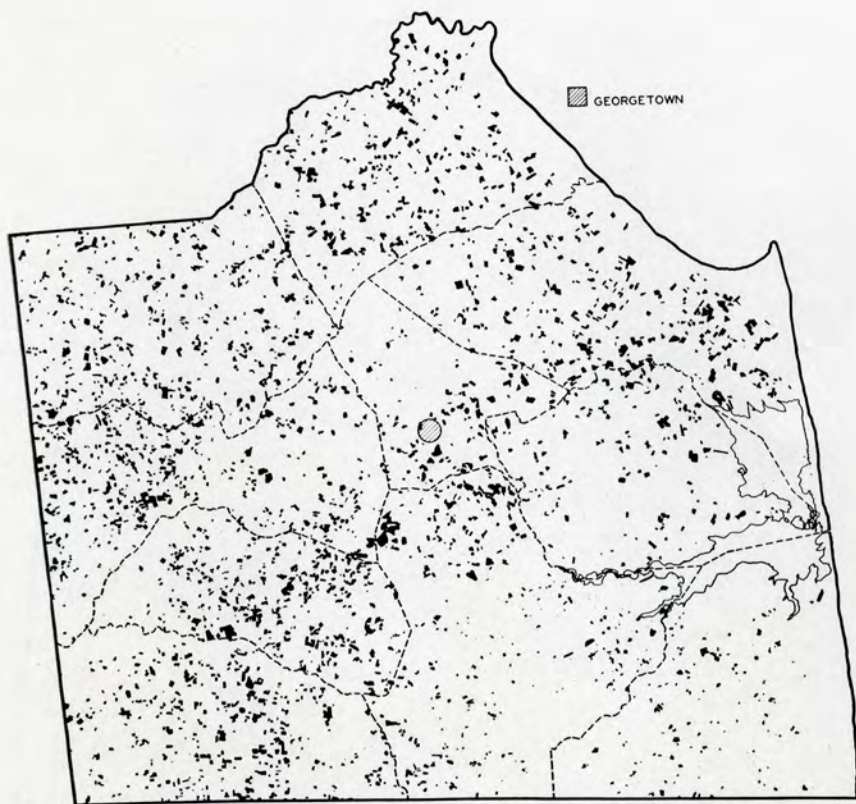


Figure 19—Distribution of the acreage of hay¹, Sussex County, Delaware, 1938 - 1939

Hay crops are distributed fairly evenly over the entire county.

¹ Includes clover and timothy, clover, alfalfa, soybean and cowpea, and other legume and non-legume hays.



Figure 20—Distribution of the acreage of timber, brush, and open untillable land, Sussex County, Delaware, 1938 - 1939

Timber, brush, and open untillable idle land are distributed over the entire county, however, there is a greater concentration in the central part of the county extending from north to south. Timber and brush land constitute 46.1 per cent of the land area of the county. When open untillable idle land and marsh land are added, it amounts to 54.2 per cent of the land area of the county.

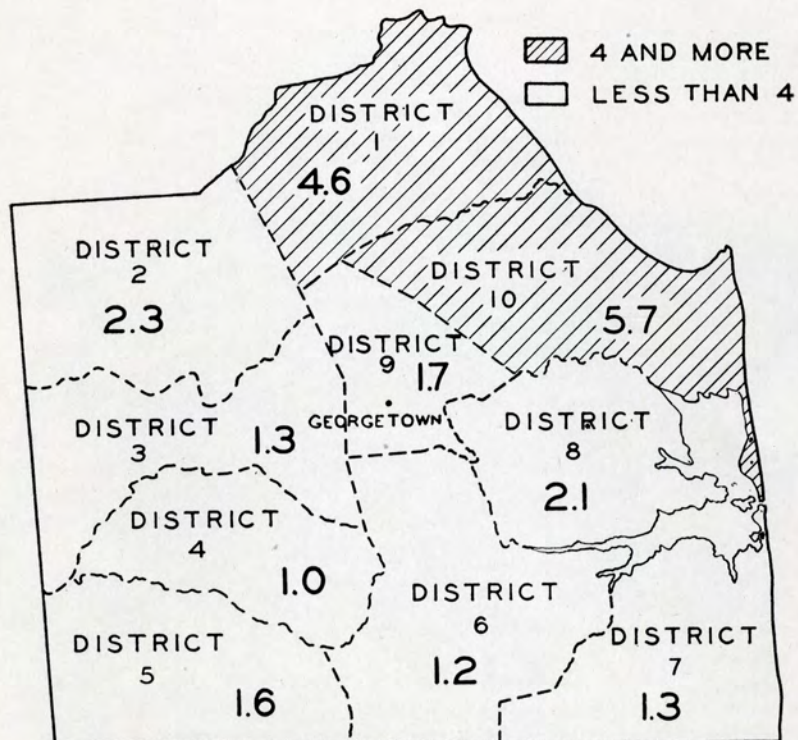


Figure 21—Number of cows per farm, by representative districts, Sussex County, Delaware, 1938 - 1939

Dairy cattle are concentrated largely in the north eastern portion of the county. This is a commercial fluid milk area.

METHODS USED

Measures of Land Classes

There is no precise measure of land classes. Four measures of land classes, therefore, have been used in this study, each of which acts as a check on the others. These measures are intensity in the use of land, type of soil, size and condition of buildings, and crop yields.

Use of Land. The use farmers are making of the land is the most important measure of land classes and has formed the chief basis for the land classification in this study. Farmers, over a long period of years, through the process of trial and error and economic gain and loss, have found, in general, the use for which the different types of land are best suited. It is true there is usually a lag in land-use adjustment. It is also true that under a different state of economic conditions some of the land classifications in this study would need readjusting. For example, if farm wages were to continue to increase over a reasonably long period of years without an accompanying rise in the farm price level, some of the land which has been classified as suitable for cropping purposes would need to be reclassified as sub-marginal for cropping purposes.

Aerial photographs of Sussex County were obtained through the courtesy of the United States Geological Survey and the Delaware Highway Department. The negatives were printed on dull, double-weight printing paper in order that they would take the land-use symbols and stand up under the weather conditions in the field. The photographs are of a scale of approximately four inches to one mile. Field men marked on the photographs the symbols which indicate the use of each parcel of land. The use of some parcels of land could be observed from the road while other parcels required considerable walking to get a view of them. In some cases fields had been divided since the photograph was taken. In these cases where no land marks were available, such as a house or a tree, considerable pacing was necessary.

Following the completion of the field work the boundaries and symbols of the different parcels of land were transcribed on topographic maps of the United States Geological Survey. The set of topographic maps of Sussex County was enlarged to the same scale as the photographs. This was done through the courtesy of the Bureau of Agricultural Economics of the United States Department of Agriculture. These enlarged maps were superimposed on the photographs and the boundaries and symbols of the parcels of land were transcribed through the use of a light table. Each parcel of land, whether it be a field crop, marsh, or timber, was measured with planimeters and the area of the parcels indicated on the map. These are known as the land-use maps.

These land-use maps were then in shape to serve as a guide in the

initial laying out of the boundaries of the different land classes. This was done by superimposing tracing sheets on the land-use maps and tentatively drawing the land-class boundaries on the tracing sheets. The intensity of use of land was the determining factor in the initial laying out of the boundaries. The most intensively used crop land composed the best class of land, while the least intensively used land, namely, timber and brush, composed the poorest class of land.

Soils. The type of soil is a reasonably good measure of land classes. The soil map of Sussex County, made by the Bureau of Soils of the United States Department of Agriculture, was made use of in this respect. The United States Bureau of Agricultural Economics made enlargements of the soil map of Sussex County to the same scale as the aerial photographs. This made it possible to superimpose the tracing sheets (which had the tentative land-class boundaries laid out) on the enlarged soil map. The tentative land classes were then checked against the soil types and topography. Where the land classes checked reasonably closely with the soil types of corresponding economic productivity, more confidence was had in the tentative land-class boundaries. Where there was some discrepancy between the land classes and the soil types of corresponding productivity, adjustments were made in the land-class boundaries. The tentative land-class boundaries up to this point, then, were a compromise between these two measures.

Size and Condition of Buildings. The size and long-time condition of buildings, disregarding the condition resulting from the economic depression, in general, is a good measure of the class of land. Normally, the better classes of land support and necessitate buildings of a reasonably large size in a reasonably good condition. There are, of course, cases where buildings in poor condition are found on good land and where good buildings are found on poor land.

Field men classified the farm buildings and rural residences in Sussex County. They traveled together by automobile and checked the judgment of each other in regard to the classification of each set of buildings. No attempt was made to inspect the interior of the buildings. If close to the road, judgment was made without driving into the farmsteads. In other cases, it was necessary to drive into the farmsteads. Because the poultry industry has no close relationship to land use, specialized poultry buildings were not included in this classification.

The following classifications for farm buildings were used: excellent, good, fair to good, fair to poor, poor, and buildings standing but unusable. For rural residences not farms, the following classifications were used: good (occupied), good (unoccupied), poor (occupied), and poor (unoccupied). For other buildings, including schools, churches, and commercial buildings, used and unused. The field men supplied themselves with a set of Sussex County topographic maps made by the United States Geological Survey. Each set of buildings was located on the map and its class was indicated by a symbol on the map. These condition-of-buildings maps also were enlarged to the same scale as the aerial photographs. The tracing sheets showing the

land classes were then superimposed on the condition-of-buildings maps. Where the land classes, in a general way, checked reasonably well with buildings of a corresponding size and condition, more evidence was had as to the correctness of the land-class boundaries. Where there was a reasonably large discrepancy between the land classes and the size and condition of buildings suitable adjustments were made in the land-class boundaries.

Crop Yields. Crop yields were taken on 527 Sussex County farms for the year 1938. These farms were selected as representative of the different land classes. Each of these farms was located and indicated on the map. A crop-yield index was calculated and the figure indicated on the map opposite each farm. The tracing sheets were then superimposed on the crop-yield map and the land classes were checked against the crop-yield data.

On these same 527 farms for which crop yields were taken, data were obtained relative to size of farms, acreages of different crops grown, kinds and number of livestock kept, and data relating to the personal history of the farmers and their families.

The final land-class boundaries, then, were a compromise between these four measures. As a final check the land-class boundaries were checked in the field. During the growing season, field men traveled over every road in the entire county and checked each parcel of land and satisfied themselves that each parcel was properly classified. The land-class boundaries having now become final, the area of each parcel of land was then tabulated according to use, and according to the land class. This tabulation shows the acreage of each crop, timber, brush, and marsh in each land class.

The printing of the map was accomplished by using as a base map the United States Geological Survey Sheets. Towns, streams, railroads, and other features appearing on the United States Geological Survey Sheets also appear on the printed land-classification map. The tracing sheets showing the final land classes were printed over the base map.

Definition of Land Classes

Class I land, as used in this study, is the poorest grade of land. It is made up, largely, of timber, brush, and marsh land. Marsh land is indicated as IM. Most of the farms in this land class have been abandoned for cropping purposes; however, many of the buildings are occupied by persons engaged in non-agricultural pursuits. Some of the land is still cultivated, but with relatively few exceptions the land is poorly drained. Most of the land in this class will probably remain permanently in its present predominate use, namely, forests, wildlife preservation, and public recreation.

Class II land comprises largely open untillable land and idle land tilled occasionally. There is some crop land in this land class but many of the farms have been abandoned for cropping purposes, al-

though many of the buildings are occupied by persons engaged in non-agricultural pursuits. Most of this land is poorly drained. The land use, the soil types, the size and condition of the buildings, and the crop-yield indices, indicate that the land in this class is poorly suited for cropping purposes.

Class III land comprises largely crop land that is less intensively used than class IV land. The majority of the land in this class probably will remain permanently in agricultural use. Most of it is level with fair drainage, and the farm buildings generally are of a fair size and in fair condition.

Class IV land is the best grade of crop land. In general, the land in this class is well-drained, is fairly level, and is more intensively used than is the land in class III. The farm buildings generally are of good size and in reasonably good condition.

It is impractical to endeavor to classify land in great detail. This becomes more evident when it is considered that the land-classification map is of a scale of approximately one inch to one mile. One square inch on the map, therefore, represents 640 acres of land. There are, therefore, some of the poorer grades of land in class IV but the areas are too small to make separate classifications practical. Likewise, class III comprises some land which is of a class IV character, but the areas are too small to deal with in practical land classification. Furthermore, the location of land influences its economic use. For example, a parcel of land which is not suited for cropping purposes but does produce fairly good pasture, if located adjacent to class II land, would be classified as class II land. However, if the same parcel of land were located adjacent to class IV land it may be classified as IV land. A parcel of land in itself may be submarginal for agricultural purposes but when managed in connection with a good farm it may become supra-marginal for agricultural purposes. Untillable pasture land may be a distinct asset to a "going" farm. The same principle is true in regard to the location of land in relation to shipping points and markets.

Land classification does not pretend to show the precise economic status of each individual parcel of land, or even each individual farm, but it does show the economic status of the area in which a parcel of land, or a farm, may be located. Furthermore, it is seldom that there is a distinct boundary between land classes. Usually, the land classes grade into one another and the transition area commonly approaches the average of the two adjacent land classes.

EXTENT OF LAND CLASSES IN SUSSEX COUNTY

Table 8 shows the extent of the different land classes by representative districts and for the county as a whole. Table 9 shows the percentage of the land classes in the different representative districts and for the county as a whole. These land classes are shown in the land-classification map in the folder in the back of this publication.

Table 8—Land area by land classes and representative districts, Sussex County, Delaware, 1938 - 1939

Representative districts	Land classes				Districts acres
	I & IM	II	III	IV	
	acres	acres	acres	acres	
1.....	32,000	3,836	7,385	25,126	68,347
2.....	33,611	6,069	22,014	10,869	72,563
3.....	32,516	2,579	13,522	15,958	64,575
4.....	24,179	3,138	13,762	3,356	44,435
5.....	29,793	4,822	16,196	8,061	58,872
6.....	45,195	19,651	13,185	3,709	81,740
7.....	25,781	8,867	21,029	—	55,677
8.....	33,184	2,228	9,402	5,140	49,954
9.....	18,585	5,631	4,930	1,470	30,616
10.....	37,331	5,028	7,222	26,100	75,681
County.....	312,175	61,849	128,647	99,789	602,460 ¹

¹ The United States Census 1940, indicates a total land area of 605,440 acres.

Table 9—Percentage of land area by land classes and by representative districts, Sussex County, Delaware, 1938 - 1939

Representative districts	Land classes				Districts per cent
	I & IM	II	III	IV	
	per cent	per cent	per cent	per cent	
1.....	46.8	5.6	10.8	36.8	100.0
2.....	46.3	8.4	30.3	15.0	100.0
3.....	50.4	4.0	20.9	24.7	100.0
4.....	54.4	7.0	31.0	7.6	100.0
5.....	50.6	8.2	27.5	13.7	100.0
6.....	55.4	24.0	16.1	4.5	100.0
7.....	46.3	16.0	37.7	—	100.0
8.....	66.4	4.5	18.8	10.3	100.0
9.....	60.7	18.4	16.1	4.8	100.0
10.....	49.4	6.6	9.5	34.5	100.0
County.....	51.8	10.3	21.3	16.6	100.0

Land classes I and IM comprised 51.8 per cent of the land area of the county; class II, 10.3 per cent; class III, 21.3 per cent; and class IV, 16.6 per cent. Slightly more than three-fifths of the land of Sussex County (land classes I and II) appear to be unsuited for cropping purposes but apparently are adapted for the production of timber, wildlife preserves, and public recreation. Slightly less than one-fifth of the land (land class IV) is suited for the intensive production of crops and approximately one-fifth (land class III) is adapted for the production of crops, but on a less intensive scale than in class IV land.

This discussion does not indicate that portions of the poorer land classes may not be used profitably for enterprises which have only

slight relationship to land use. For example, the poultry industry, and particularly the important commercial broiler enterprise in Sussex County, to a marked degree, is located in class II land and some of it even in class I land. There are few areas of poorly drained land in Sussex County that do not afford an occasional piece of land that lies high enough to offer satisfactory drainage for the establishment of a broiler enterprise.

USE OF LAND^{2A}

It has been indicated previously that the degree of intensity in the use of land is an important measure of land classes.

Use of Land in the Different Land Classes

The acreage of grain crops grown, ranged from a negligible amount in land classes I and IM to 41.0 per cent in class III land. The acreage of truck crops grown in land classes I and IM ranged from a negligible amount to 6.5 per cent in class IV land; the acreage of cannery crops in land classes I and IM varied from a negligible amount to 10.2 per cent in class IV land; and the acreage of fruit crops ranged from practically none in land classes I and IM to 6.5 per cent in land class IV. However, the acreage of timber, marsh, and wasteland ranged from 97.9 per cent in land classes I and IM to 1.4 per cent in land class IV, Tables 10 and 11.

Even though land classes I, IM, and II are devoted largely to timber, marsh, wasteland, and land that is tilled only occasionally, many valuable uses may be made of this land. Portions of these poorer lands are now, through private enterprise, being utilized reasonably well in the production of timber, and as wildlife preserves. To utilize fully other portions of these lands, the purchase of them by state or federal agencies may be desirable. The areas that are now publicly owned are shown on the land-classification map in the folder of this publication. It appears evident that the full utilization of these areas would involve many problems in reforestation, forest management, wildlife management, and probably in providing public recreational facilities. It will be pointed out later that many complex social problems become evident when formulating a program for the proper utilization of these poorer grades of land.

Apparently of more economic importance than the utilization of the poorer grades of land, is the problem of the full utilization of the two-fifths of the land area of the county which is suited for crop production. The better classes of land apparently are adapted to a more intensive system of land use than are the poorer classes of land. Of the land in classes III and IV, 13.2 per cent and 23.2 per cent, respectively, were devoted to the production of the high-acre-value

^{2A}. Although use of land, soils, crop yields, and size and condition of buildings have been used as measures of land classes, data will appear in the following pages showing the relationship between land classes and each of these four factors used as measures. This is done with the thought of indicating the reliability of these factors as measures of land classes.

Table 10—Acres of land used for the different purposes by land classes, Sussex County, Delaware, 1938 - 1939

Use of land	Land classes				County acres
	I & IM	II	III	IV	
	acres	acres	acres	acres	acres
Corn—grain, sweet corn and silage.....	650	17,473	44,310	22,560	84,993
Wheat.....	46	670	5,200	9,357	15,273
Rye.....	34	290	2,965	2,945	6,234
Other grains.....	—	64	219	281	564
Total grain crops.....	730	18,497	52,694	35,143	107,064
Clover and timothy hay.....	3	20	150	282	455
Clover hay.....	24	154	1,049	2,030	3,257
Alfalfa hay.....	—	—	34	246	280
Soybean or cowpea hay ¹	190	3,556	14,585	10,690	29,021
Other legume hay.....	4	127	879	617	1,627
Other non-legume hay.....	—	17	33	8	58
Total hay crops.....	221	3,874	16,730	13,873	34,698
Sweet potatoes.....	7	74	843	739	1,663
White potatoes.....	10	159	346	134	649
Asparagus ¹	1	13	206	646	866
Cantaloupes.....	17	233	1,547	1,530	3,327
Watermelons.....	52	392	2,148	928	3,520
Cucumbers and pickles.....	11	174	498	443	1,126
Other truck crops.....	179	1,483	3,546	2,099	7,307
Total truck crops.....	277	2,528	9,134	6,519	18,458
Tomatoes.....	62	835	3,084	2,055	6,036
Lima beans.....	15	179	2,000	7,750	9,944
String beans.....	—	22	95	396	513
Total cannery crops.....	77	1,036	5,179	10,201	16,493
Orchard ²	7	108	1,354	5,941	7,410
Vineyard.....	—	6	19	76	101
Strawberries.....	23	703	1,173	363	2,262
Other small fruit.....	16	30	117	37	200
Total fruit crops.....	46	847	2,663	6,417	9,973
Tillable land lying out.....	820	11,865	21,860	8,807	43,352
Tillable pasture.....	30	1,082	4,513	6,599	12,224
Open untillable pasture.....	122	748	508	286	1,664
Brush pasture.....	517	53	65	31	666
Total pasture.....	669	1,883	5,086	6,916	14,554
Timber.....	267,723	2,121	1,589	880	272,313
Brush not pastured.....	4,526	384	287	104	5,301
Marsh land.....	30,947	5	—	5	30,957
Open untillable idle land.....	2,491	13,913	1,169	352	17,925
Total timber, marsh, and wasteland.....	305,687	16,423	3,045	1,341	326,496
Farmsteads.....	198	1,758	5,012	2,790	9,758
Other houses.....	350	512	875	716	2,453
Roads.....	2,246	1,411	3,534	2,444	9,635
Railroads.....	166	101	167	332	766
Villages and towns ³	433	690	1,856	2,348	5,327
Miscellaneous ⁴	255	424	812	1,942	3,433
Total development.....	3,648	4,896	12,256	10,572	31,372
Total land area.....	312,175	61,849	128,647	99,789	602,460
Internal water area ⁵	24,245	1	2	13	24,261
Total land and water area.....	336,420	61,850	128,649	99,802	626,721
Per cent land area in each land class.....	51.8	10.3	21.3	16.6	100.0

¹ An undetermined amount was harvested for seed.

² Includes land used for recreation, cemeteries, schools, and churches.

³ Internal water areas, villages, and towns classified according to the land class they border.

⁴ An undetermined amount was canned.

⁵ Mostly apples and peaches.

Table 11—Percentage of land used for the different purposes by land classes, Sussex County, Delaware, 1938 - 1939

Use of land	Land classes				County
	I & IM	II	III	IV	
	per cent	per cent	per cent	per cent	per cent
Corn—grain, sweet corn and silage . . . . .	.2	28.2	34.4	22.6	14.1
Wheat	*	1.1	4.1	9.4	2.5
Rye	*	.5	2.3	3.0	1.1
Other grains	—	.1	.2	.2	.1
Total grain crops . . . . .	.2	29.9	41.0	35.2	17.8
Clover and timothy hay	*	*	.1	.3	.1
Clover hay	*	.3	.8	2.0	.5
Alfalfa hay	—	—	*	.3	.1
Soybean or cowpea hay ¹ . . . . .	.1	5.8	11.4	10.7	4.8
Other legume hay	*	.2	.7	.6	.3
Other non-legume hay	—	*	*	*	*
Total hay crops . . . . .	.1	6.3	13.0	13.9	5.8
Sweet potatoes	*	.1	.6	.8	.3
White potatoes	*	.3	.3	.1	.1
Asparagus ¹	*	*	.2	.6	.1
Cantaloupes	*	.4	1.2	1.5	.6
Watermelons	*	.6	1.7	.9	.6
Cucumbers and pickles	*	.3	.4	.5	.2
Other truck crops . . . . .	.1	2.4	2.7	2.1	1.2
Total truck crops . . . . .	.1	4.1	7.1	6.5	3.1
Tomatoes	*	1.4	2.4	2.0	1.0
Lima beans	*	.3	1.5	7.8	1.6
String beans	—	*	.1	.4	.1
Total cannery crops	*	1.7	4.0	10.2	2.7
Orchard ⁵	*	.2	1.1	6.0	1.2
Vineyard	—	*	*	.1	*
Strawberries	*	1.1	.9	.4	.4
Other small fruit	*	.1	.1	*	*
Total fruit crops	*	1.4	2.1	6.5	1.6
Tillable land lying out . . . . .	.3	19.1	16.9	8.8	7.2
Tillable pasture	*	1.7	3.5	6.6	2.0
Open untilable pasture	*	1.2	.4	.3	.3
Brush pasture . . . . .	.2	.1	.1	*	.1
Total pasture . . . . .	.2	3.0	4.0	6.9	2.4
Timber	85.8	3.5	1.3	.9	45.2
Brush not pastured	1.4	.6	.2	.1	.9
Marsh land	9.9	*	—	*	5.1
Open untilable idle land . . . . .	.8	22.5	.9	.4	3.0
Total timber, marsh, and wasteland	97.9	26.6	2.4	1.4	54.2
Farmsteads . . . . .	.1	2.8	3.9	2.8	1.6
Other houses . . . . .	.1	.8	.7	.7	.4
Roads . . . . .	.7	2.3	2.8	2.5	1.6
Railroads . . . . .	.1	.2	.1	.3	.1
Villages and towns ² . . . . .	.1	1.1	1.4	2.4	.9
Miscellaneous ² . . . . .	.1	.7	.6	1.9	.6
Total development	1.2	7.9	9.5	10.6	5.2
Total land area	100.0	100.0	100.0	100.0	100.0

* Less than .05 per cent.

¹ - ⁵ See footnotes 1 to 5 to Table 10.

crops. However, of the land in classes I and II, .1 per cent and 7.2 per cent, respectively, were devoted to the production of the high-acre-value crops.

In the event that there is pressure for an increased production of the more nutritive high-acre-value crops, as a result of the national defense program and our increasing population, and in the event that future trends in food production correspond reasonably closely with those of the past, there will be a greater increase in the production of these foods in land class IV than in land class III, and a greater increase in land class III than in land classes I and II. Probably only in the event of an extreme food shortage would an appreciable amount of land classes I and II be placed in cultivation.

Farm Tenancy and the Use of Land

There appears to be no significant difference in the percentage of the farms that were occupied by tenants and by owner-operators in the different land classes in Sussex County, Table 12. In both New

Table 12—Percentage of owner-operators and tenants by land classes, Sussex County, Delaware, 1938*

	Land classes				County
	I	II	III	IV	
Number of farms	60	82	253	132	527
	per cent	per cent	per cent	per cent	per cent
Owner-operators	56.7	73.2	70.0	64.4	67.6
Tenants	43.3	26.8	30.0	35.6	32.4
Total	100.0	100.0	100.0	100.0	100.0

* According to the United States Census, 1940, Sussex County had 61.9 per cent owner-operators, 8.9 per cent owners-additional, 1.2 per cent managers, and 28.0 per cent tenant farmers. Owners-additional are farmers who operate rented land in addition to the land they own.

Castle and Kent Counties, Delaware, there was a smaller proportion of the farms in the better land classes occupied by owner-operators than in the poorer land classes³. This difference probably is explained by the difference in the amounts of capital required to acquire farm ownership in the different counties. In New Castle County, the average value of a farm in land class IV was \$12,534, in Kent County \$6,528⁴, and in Sussex County it will be shown that the average value of a farm in class IV land was \$4,317. Apparently, the capital outlay required to buy a farm in the better land classes in Sussex County was

³ Bausman, R. O., An Economic Study of Land Utilization in New Castle County, Delaware, Station Bulletin 228, p. 37, 1941; and Bausman, R. O., An Economic Study of Land Utilization in Kent County, Delaware, Station Bulletin 224, p. 42, 1940.

⁴ Bausman, R. O., An Economic Study of Land Utilization in New Castle County, Delaware, Station Bulletin 228, p. 47, 1941; and Bausman, R. O., An Economic Study of Land Utilization in Kent County, Delaware, Station Bulletin 224, p. 58, 1940.

sufficiently low that it was not the deterrent to ownership by operators as it was in Kent and New Castle Counties.

SOILS

As one square inch on the land-classification map represents 640 acres of land, it is apparent that land classification deals with the larger areas and no attempt was made to classify separate small, isolated parcels of land. It has also been indicated that the location of a parcel of land in relation to other classes of land and in relation to markets, influences its economic value and, therefore, the land class in which it may be placed. Some land of the poorer soil types, therefore, may be placed in the better land classes and some land of the better soil types may be placed in the poorer land classes.

Distribution of Soil Types in the Different Land Classes

The Sassafras soil series constituted over two-fifths of the land of Sussex County. The Sassafras soils constituted 28.4 per cent of the land in class I land and it ranged up to 80.8 per cent in class IV land. The Norfolk series were found largely in class III land. However, the Elkton, Portsmouth, and Woodstown series were found largely in land classes I and II, with a decreasing amount in land class III and a very small amount in land class IV, Table 13. Table 14 shows the percentage of the land in the different representative districts made up of the various general soil types.

Table 13—Percentage distribution of the general soil types by land classes, Sussex County, Delaware, 1938

General soil types	Land classes				County per cent
	I & IM	II	III	IV	
	per cent	per cent	per cent	per cent	
Sassafras series ¹	28.4	21.0	49.1	80.8	41.2
Elkton series ²	18.6	26.2	17.4	4.6	16.8
Norfolk series ³	10.4	10.5	16.0	8.8	11.4
Portsmouth series ⁴	14.7	21.5	6.7	1.1	11.3
Woodstown.....	6.3	10.6	9.6	3.6	7.1
Coastal beach.....	.1	5.9	—	—	.7
Keyport series ⁵.....	.4	1.4	.2	—	.4
St. Johns.....	.1	.1	.1	—	.1
Marsh.....	21.0	2.8	.9	1.1	11.0
Total.....	100.0	100.0	100.0	100.0	100.0
Acres of land in each land class.....	294,360	67,450	137,560	103,030	602,400
Per cent error.....	-5.7 ⁶	+9.0 ⁶	+6.9 ⁶	+3.2 ⁶	-.01 ⁷

¹ Includes Sassafras Sand, Sassafras Loamy Sand, Sassafras Sandy Loam, Sassafras Sandy Loam (Deep Phase), and Sassafras Loam.

² Includes Elkton Sand, Elkton Sandy Loam, and Elkton Loam.

³ Includes Norfolk Sand, Norfolk Loamy Sand, Norfolk Sandy Loam, and Norfolk Sandy Loam (Deep Phase).

⁴ Includes Portsmouth Sandy Loam, Portsmouth Loam, and Portsmouth Loam (Mucky Phase).

⁵ Includes Keyport Fine Sandy Loam and Keyport Silt Loam.

⁶ Calculated by using as the base, planimeter measurements made of the land classes by the Department of Agricultural Economics, Delaware Agricultural Experiment Station.

⁷ Calculated by using as the base, planimeter measurements made of the county by the Division of Land Economics of the United States Bureau of Agricultural Economics.

Table 14—Percentage distribution of the general soil types by representative districts, Sussex County, Delaware, 1938

General soil types	Representative districts										County
	1	2	3	4	5	6	7	8	9	10	
	per cent	per cent	per cent	per cent	per cent	per cent	per cent	per cent	per cent	per cent	
Sassafras series ¹	65.5	49.1	46.2	39.0	37.1	18.1	15.8	39.0	23.4	64.6	41.2
Elkton series ²	5.3	31.4	13.5	16.7	23.2	20.9	31.9	5.5	20.2	1.8	16.8
Norfolk series ³	2.4	2.4	11.0	17.6	15.0	18.5	13.3	35.9	1.3	1.1	11.4
Portsmouth series ⁴	4.3	2.7	8.7	6.6	7.8	34.6	19.1	1.5	28.5	2.0	11.3
Woodstown.....	3.0	8.1	10.6	12.5	10.0	4.4	4.3	4.9	24.4	.9	7.1
Coastal beach	.8	—	—	—	—	—	2.3	—	—	3.3	.7
Keyport series ⁵	—	—	—	1.6	2.4	.1	.1	.3	—	—	.4
St. Johns.....	—	—	—	—	.1	.1	.7	—	—	—	.1
Marsh.....	18.7	6.3	10.0	6.0	4.4	3.3	12.5	12.9	2.2	26.3	11.0
Total.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Acres of land in each district.....	70,520	72,450	62,740	43,840	58,650	81,440	56,360	50,530	31,090	74,780	602,400
Per cent error ⁶	+3.2	-.2	-2.8	-1.3	-.4	-.4	+1.2	+1.2	+1.5	-1.2	-.01

¹⁻⁵ See footnotes 1 to 5 to Table 13.

⁶ Calculated by using as the base, planimeter measurements made of the districts by the Division of Land Economics of the United States Bureau of Agricultural Economics.

Soil Types and Crop Yields

Table 15 indicates the crop-yield indices of the different general soil types. These crop-yield indices ranged from an index of 104 for the Sassafras series to an index of 77 for the Portsmouth series, or an increase of 35 per cent in the average crop yields on Sassafras soils over that of the Portsmouth soils. These index numbers are weighted and represent the nineteen important crops grown in Sussex County.

Table 15—Crop-yield indices¹ on 527 farms by general soil types, Sussex County, Delaware, 1938

General soil types	Number of fields	Crop-yield index
Sassafras series.....	1,557	104
Norfolk series.....	296	96
Woodstown series.....	214	92
Keyport series.....	8	88
Elkton series.....	422	87
Portsmouth series.....	154	77
Total or average.....	2,651	100

¹ Weighted. Includes corn, wheat, rye, clover and timothy hay, clover hay, alfalfa hay, soybean or cowpea hay, soybean seed, sweet potatoes, white potatoes, asparagus, cantaloupes, watermelons, cucumbers and pickles, tomatoes, lima beans, string beans, strawberries, and peppers.

SIZE AND CONDITION OF BUILDINGS

Size and condition of buildings, in general, is a valuable measure of productivity of soil and of land classes. Productive soils usually require large buildings for storing crops and sheltering livestock. Likewise, productive soils usually necessitate and support an improved condition of buildings. Obviously, other factors, such as the human factor, the investment of capital derived from sources off the farms, and enterprises which bear no close relationship to land use, may have an influence on the size and condition of buildings. These factors at times may make exceptions to the rule but, in general, size and condition of buildings is a reasonably good measure of land classes. However, in Sussex County the broiler enterprise did constitute an exception. The broiler enterprise bears no close relationship to land use and specialized poultry plants, therefore, were not included in the classification of buildings in Sussex County.

Size of Business on Farms with the Different Classes of Buildings

Table 16 indicates that the farms with the better classes of buildings were larger in size, had a larger amount of invested capital, had more productive man-work units, and had more animal units than did the farms with the poorer classes of buildings.

Table 16—Size of business per farm on farms with the different classes of buildings, Sussex County, Delaware, 1938

Classes of buildings	Number of farms	Total acres per farm	Capital per farm ¹	P. M. W. U. per farm ²	Animal units per farm ³
	number	acres	dollars	number	number
Excellent	4	121.0	4,250	469.0	15.2
Good	108	119.6	4,004	439.9	15.4
Fair to good	208	100.6	3,348	374.9	11.8
Fair to poor	122	98.7	2,550	308.4	7.5
Poor	85	94.5	2,121	252.6	5.5

¹ Real estate, only.

² A productive man-work unit is the average amount of productive work accomplished by a man in one day. For example, producing and harvesting one acre of corn for grain comprises 6 productive man-work units, an acre of white potatoes 8, and one acre of tomatoes for the cannery 12. Caring for one cow for a year comprises 15 productive man-work units and caring for 100 hens for a year, involves 20 productive man-work units.

³ An animal unit represents an average mature horse, or cow, or the equivalent in other livestock based on the amount of feed eaten and manure produced.

Classification of Farm Buildings and Rural Residences in the Different Land Classes

Of the total number of buildings in the different land classes, the percentage of occupied farmsteads was greater in the better land classes than in the poorer land classes, Tables 17 and 18. The number of vacant farmsteads was small in all land classes, and there was no

significant difference in the percentage of vacant farmsteads in the different land classes. However, many of the farmsteads in the lower land classes had been abandoned for agricultural purposes, but most of them were occupied by persons engaged in non-agricultural pursuits. The percentage of good occupied rural residences increased from land class I to land class IV. In land class I, more than one-half of the buildings were standing but unusable, while in land class IV, only 12.0 per cent of the buildings were standing but unusable.

Of greater significance than the data just discussed, is the classification of occupied farmsteads according to land classes, Table 19. In land class I, only 3.4 per cent of the farmsteads were classified as "good" and none was classified as "excellent," whereas in class IV land, 30.0 per cent of the farmsteads were classified as "good" and 4.5 per cent as "excellent." Likewise, 60.0 per cent of the farmsteads in class I land were classified as "poor" and only 9.8 per cent of the farmsteads in land class IV were classified as "poor."

Table 17—Number of farmsteads, rural residences, and other buildings, occupied or vacant, by land classes, Sussex County, Delaware, 1938¹

Classes of buildings	Land classes				County number
	I	II	III	IV	
	number	number	number	number	
Farmsteads					
Occupied.....	145	792	1,922	1,017	3,876
Vacant.....	2	16	31	7	56
Rural residences					
Occupied					
Good.....	163	225	697	525	1,610
Poor.....	242	281	337	186	1,046
Unoccupied					
Good.....	2	4	3	2	11
Poor.....	14	22	22	10	68
Other buildings ²					
Occupied.....	81	93	205	136	515
Vacant.....	10	5	11	7	33
Buildings standing but unusable.....	786	349	535	257	1,927
Total.....	1,445	1,787	3,763	2,147	9,142

¹ In addition there were 522 unclassified buildings, such as tenant houses, which were located apart from the farmsteads but were used in conjunction with the farmsteads. There were also 393 specialized poultry plants that were not included.

² Includes school houses, churches, and commercial establishments.
No count was made of hamlets and towns having 20 or more houses.

Table 18—Percentage of farmsteads, rural residences and other buildings, occupied or vacant, by land classes, Sussex County, Delaware, 1938¹

Classes of buildings	Land classes				County
	I	II	III	IV	
	per cent	per cent	per cent	per cent	per cent
Farmsteads					
Occupied	10.0	44.3	51.1	47.4	42.4
Vacant . . . . .	.1	.9	.8	.3	.6
Rural residences					
Occupied					
Good	11.3	12.6	18.5	24.4	17.6
Poor	16.8	15.7	9.0	8.7	11.5
Unoccupied					
Good . . . . .	.1	.2	.1	.1	.1
Poor	1.0	1.3	.6	.5	.7
Other buildings ²					
Occupied	5.6	5.2	5.4	6.3	5.6
Vacant . . . . .	.7	.3	.3	.3	.4
Buildings standing but unusable	54.4	19.5	14.2	12.0	21.1
Total	100.0	100.0	100.0	100.0	100.0
Number of farmsteads and other buildings	1,445	1,787	3,763	2,147	9,142

¹ See footnote 1 to Table 17.

² See footnote 2 to Table 17.

No count was made of hamlets and towns having 20 or more houses.

Table 19—Percentage classification of occupied farmsteads by land classes, Sussex County, Delaware, 1938

Classes of buildings	Land classes				County
	I	II	III	IV	
	per cent	per cent	per cent	per cent	per cent
Excellent	0	.5	1.2	4.5	1.9
Good	3.4	4.0	14.9	30.0	16.2
Fair to good	13.1	19.7	39.0	39.6	34.3
Fair to poor	23.5	32.5	23.6	16.1	23.4
Poor	60.0	43.3	21.3	9.8	24.2
Total	100.0	100.0	100.0	100.0	100.0
Number of farmsteads ¹	145	792	1,922	1,017	3,876

¹ 393 specialized poultry plants not included.

CROP YIELDS

Crop yields are of value as a measure of land classes; however, as is true with most measures of land classes, it is subject to limitations. On most farms in the poorer land classes, only the better fields are cultivated. The poorer fields usually are in pasture or may be idle. The crop yields in these cases represent the yields only on the better parcels of land, and no index of the productivity of the poorer parcels of land is obtained. Under these circumstances, the crop yields are larger than if the usual proportion of the farms had been in cultivated crops. The crops grown and the proportion of the land in cultivated crops (intensity of land use) apparently is a more reliable measure of the economic productivity of land than is crop yields.

Crop Yields in the Different Land Classes

Table 20 indicates the crop yields of the important extensive crops and the crop-yield indices of all crops by land classes. These data show a close relationship between crop yields and the different land classes. The crop-yield indices ranged from an index of 64 in land class I to an index of 109 in land class IV, or an increase of 70 per cent in the average crop yield in class IV land over that of class I land. The fact that these crop-yield indices are weighted according to the acreage grown of each crop and that they include the nineteen important crops grown in Sussex County, gives them added significance.

Table 20—Yields per acre of major extensive crops and crop-yield indices by land classes, Sussex County, Delaware, 1938

	Land classes				County
	I	II	III	IV	
Number of farms	60	82	253	132	527
Kinds of Crops					
Corn, bu.	15.6	15.6	24.7	30.3	23.8
Wheat, bu.	—	14.6 ²	14.8	16.6	15.8
Rye, bu.	6.8	12.3	13.8	14.4	13.9
Soybean seed, bu.	11.6	10.9	14.5	17.1	15.3
Clover and timothy hay, ton.	—	.9	1.5	1.8	1.5
Clover hay, ton.	1.1	1.5	1.6	1.6	1.6
Soybean or cowpea hay, ton.	1.2	1.7	1.8	1.9	1.8
Crop-yield index ¹	64	78	98	109	100

¹ Weighted. Includes corn, wheat, rye, clover and timothy hay, clover hay, alfalfa hay, soybean or cowpea hay, soybean seed, sweet potatoes, white potatoes, asparagus, cantaloupes, watermelons, cucumbers and pickles, tomatoes, lima beans, string beans, strawberries, and peppers.

² Land classes I and II combined.

SIZE OF BUSINESS

Size of Farms and Use of Land Per Farm in the Different land Classes

The average size of farms in land classes III and IV was greater than in land class II but not appreciably greater than the average

size of farms in land class I. However, the average acreages of tillable land per farm and of crops grown per farm, were much greater in the better land classes than in the poorer land classes. In land class I, 24.1 per cent of the land per farm was in crops, while in land class IV, 62.5 per cent of the land was in crops, Tables 21 and 22.

Table 21—Size of farms and use of land per farm by land classes, Sussex County, Delaware, 1938

	Land classes				County
	I	II	III	IV	
Number of farms.....	60	82	253	132	527
Total land operated per farm, acres.....	112.2	88.1	96.7	121.3	103.3
Tillable land per farm, acres.....	40.8	54.5	59.1	82.7	62.2
Use of land	acres	acres	acres	acres	acres
Corn for grain.....	14.4	23.4	20.9	20.5	20.4
Other corn.....	—	—	.4	.1	.2
Wheat.....	.3	.9	3.3	9.2	4.1
Rye.....	.3	.7	1.5	4.2	1.9
Soybeans for grain.....	2.2	4.0	6.4	12.5	7.1
Other grain.....	—	*	.3	.5	.3
Clover and timothy hay.....	—	.1	.2	.5	.2
Red clover.....	.2	.1	.7	.9	.6
Crimson clover.....	1.2	1.6	2.4	3.6	2.5
Alfalfa.....	—	—	—	.2	.1
Soybean or cowpea hay.....	1.0	2.1	2.0	1.5	1.7
Other legume hay.....	.5	1.3	2.6	3.5	2.4
Other non-legume hay.....	.2	.2	.1	.3	.2
Total extensive crops.....	20.3	34.4	40.8	57.5	41.7
White Potatoes.....	.2	.6	.3	.3	.3
Tomatoes.....	1.3	1.6	2.5	3.3	2.5
Asparagus.....	.1	*	.2	.3	.2
Peas.....	.1	.1	.2	1.3	.5
Lima beans.....	.2	.1	.4	5.2	1.5
String beans.....	—	.1	.2	.4	.2
Cantaloupes.....	.6	.6	1.4	1.5	1.2
Watermelons.....	1.3	.5	1.3	1.3	1.2
Cucumbers.....	.3	.6	.7	.6	.6
Sweet potatoes.....	.2	.1	.7	.8	.6
Pumpkins.....	—	—	.2	.6	.2
Peppers.....	*	.1	.3	.1	.2
Other truck crops.....	*	—	.1	*	*
Apples.....	.1	*	.3	.6	.3
Peaches.....	.1	—	.1	.5	.2
Other small fruit.....	.9	2.4	1.1	.4	1.1
Garden.....	1.3	1.1	1.1	1.1	1.1
Total intensive crops.....	6.7	7.9	11.1	18.3	11.9
Total crops.....	27.0	42.3	51.9	75.8	53.6
Acres double cropped.....	1.5	2.5	4.3	8.1	4.7
Difference = acres in crops.....	25.5	39.8	47.6	67.7	48.9
Tillable land lying out.....	12.9	11.8	8.0	7.1	8.9
Tillable pasture.....	2.4	2.9	3.5	7.9	4.4
Total tillable land.....	40.8	54.5	59.1	82.7	62.2
Woods not pastured.....	67.3	30.9	33.8	30.0	36.2
Woods pastured.....	1.9	.4	.2	1.1	.7
Non-tillable pasture.....	.1	*	.2	.4	.2
Farmsteads, roads, and fence rows.....	1.3	1.6	1.6	2.0	1.7
Marsh.....	—	—	1.4	5.1	1.9
Other wasteland.....	.8	.7	.4	—	.4
Total untillable land.....	71.4	33.6	37.6	38.6	41.1
Total land per farm.....	112.2	88.1	96.7	121.3	103.3

*Less than .05 acres.

Table 22—The percentage of land devoted to the various uses per farm by land classes, Sussex County, Delaware, 1938**

	Land classes				County
	I	II	III	IV	
Number of farms.....	60	82	253	132	527
Total land operated per farm, acres.....	112.2	88.1	96.7	121.3	103.3
Tillable land per farm, acres.....	40.8	54.5	59.1	82.7	62.2
Use of land	per cent	per cent	per cent	per cent	per cent
Corn for grain.....	12.8	26.6	21.6	16.9	19.7
Other corn.....	—	—	.4	.1	.2
Wheat.....	.3	1.0	3.4	7.6	4.0
Rye.....	.3	.8	1.6	3.5	1.8
Soybeans for grain.....	2.0	4.5	6.6	10.3	6.9
Other grain.....	—	*	.3	.4	.3
Clover and timothy hay.....	—	.1	.2	.4	.2
Red clover.....	.2	.1	.7	.7	.6
Crimson clover.....	1.0	1.8	2.5	3.0	2.4
Alfalfa.....	—	—	*	.2	.1
Soybean or cowpea hay.....	.9	2.4	2.1	1.2	1.7
Other legume hay.....	.4	1.5	2.7	2.9	2.3
Other non-legume hay.....	.2	.2	.1	.2	.2
Total extensive crops.....	18.1	39.0	42.2	47.4	40.4
White potatoes.....	.2	.7	.3	.2	.3
Tomatoes.....	1.1	1.8	2.6	2.8	2.4
Asparagus.....	.1	*	.2	.2	.2
Peas.....	.1	.1	.2	1.1	.5
Lima beans.....	.2	.1	.4	4.3	1.4
String beans.....	—	.1	.2	.3	.2
Cantaloupes.....	.6	.7	1.5	1.2	1.2
Watermelons.....	1.1	.6	1.3	1.1	1.2
Cucumbers.....	.3	.7	.7	.5	.6
Sweet potatoes.....	.2	.1	.7	.7	.6
Pumpkins.....	—	—	.2	.5	.2
Peppers.....	*	.1	.3	.1	.2
Other truck crops.....	*	—	.1	*	*
Apples.....	.1	*	.3	.5	.3
Peaches.....	.1	—	.1	.4	.2
Other small fruit.....	.8	2.7	1.2	.3	1.0
Garden.....	1.1	1.3	1.2	.9	1.0
Total intensive crops.....	6.0	9.0	11.5	15.1	11.5
Total crops.....	24.1	48.0	53.7	62.5	51.9
Acres double cropped.....	1.3	2.8	4.5	6.7	4.6
Difference = acres in crops.....	22.8	45.2	49.2	55.8	47.3
Tillable land lying out.....	11.5	13.4	8.3	5.9	8.6
Tillable pasture.....	2.1	3.3	3.6	6.5	4.3
Total tillable land.....	36.4	61.9	61.1	68.2	60.2
Woods not pastured.....	60.0	35.1	35.0	24.7	35.0
Woods pastured.....	1.7	.4	.2	.9	.7
Non-tillable pasture.....	.1	*	.2	.3	.2
Farmsteads, roads, and fence rows.....	1.1	1.8	1.6	1.7	1.7
Marsh.....	—	—	1.5	4.2	1.8
Other wasteland.....	.7	.8	.4	—	.4
Total untillable land.....	63.6	38.1	38.9	31.8	39.8
Total land per farm.....	100.0	100.0	100.0	100.0	100.0

* Less than .05 per cent.

** These data are based on the average amount of land per farm, whereas the data of Table 11 are based on the total land area of the county. An appreciable proportion of the land of Sussex County is not in farms. The data of the two tables, therefore, are not comparable.

Capital Per Farm in the Different Land Classes

Capital per farm in real estate varied from \$2,046 in land class I to \$4,317 in land class IV, Table 23. Capital per acre in real estate varied from \$18 in land class I to \$36 in land class IV, Table 24.

Table 23—Capital¹ per farm in real estate of occupied farms by land classes, Sussex County, Delaware, 1938

	Land classes				County
	I	II	III	IV	
Number of farms	60	81	251	129	521
Total acres per farm	112.2	88.9	96.8	118.7	102.8
Real estate	dollars	dollars	dollars	dollars	dollars
Land	1,174	1,218	1,749	2,532	1,794
Buildings	872	939	1,293	1,785	1,311
Total buildings and land	2,046	2,157	3,042	4,317	3,105

Farmers' estimates.

Table 24—Capital¹ per acre in real estate of occupied farms by land classes, Sussex County, Delaware, 1938

	Land classes				County
	I	II	III	IV	
Number of farms	60	81	251	129	521
Total acres per farm	112.2	88.9	96.8	118.7	102.8
Real estate	dollars	dollars	dollars	dollars	dollars
Land	10	14	18	21	17
Buildings	8	10	13	15	13
Total buildings and land	18	24	31	36	30

¹ Farmers' estimates.

These data do not indicate the value of farm real estate in the different land classes, but rather indicate the value of farm real estate of the occupied farms in the different land classes. Many of the farms in land class II and most of the farms in land class I have been abandoned. The value of buildings prorated on an acre basis in land classes I and II was almost as great as the value of the land. During the next several years, large numbers of the farms in land classes I and II probably will be abandoned. The buildings will have little or no value, the available soil fertility will be depleted, drainage ditches will be allowed to fill, and the land will be grown up in weeds, brush, and other vegetation. If present conditions continue, these farms,

by that time, probably may be bought by public agencies to be utilized for public purposes at prices less than the present price of the land alone.

Productive Man-Work Units Per Farm in the Different Land Classes

Table 25 indicates a reasonably close relationship between size of business and land classes. The number of productive man-work units per farm in class IV land was more than twice as great as in class I land. However, the broiler enterprise has a greater concentration in class II land than any other land class and materially increased the number of productive man-work units per farm beyond what it would otherwise have been in land class II. It previously has been indicated that the broiler enterprise has little relationship to land use. The relatively large number of productive man-work units in class II land was also influenced by the fact that a considerable acreage of field corn was grown on the more poorly drained grades of the Portsmouth soils in class II land, despite the fact that the average yield of field corn in class II land, in 1938, was 15.6 bushels per acre as compared with an average yield of 30.3 bushels in class IV land. An acre of poor corn involves the same number of productive man-work units as does an acre of good corn.

Table 25—Productive man-work units¹ per farm by land classes, Sussex County, Delaware, 1938

	Land classes				County
	I	II	III	IV	
Number of farms	60	82	253	132	527
	P.M.W.U.	P.M.W.U.	P.M.W.U.	P.M.W.U.	P.M.W.U.
Livestock	42	105	104	115	100
Crops	153	246	258	297	254
Total	195	351	362	412	354

¹ See footnote 2 to Table 16.

Livestock Per Farm in the Different Land Classes

The livestock industry, as a whole, is of less importance in Sussex County than in New Castle and Kent Counties; however, excluding the broiler enterprise, there was a fairly definite relationship between the amount of livestock per farm and the different land classes, Table 26.

Table 26—Number of livestock and total number of animal units per farm by land classes, Sussex County, Delaware, 1938²

	Land classes				County
	I	II	III	IV	
Number of farms	60	82	253	132	527
Kinds of livestock	number	number	number	number	number
Cows . . . . .	.8	1.4	2.0	4.0	2.3
Heifers (1 yr. or over) . . .	*	.2	.4	.9	.5
Heifers (under 1 yr.) . . .	.2	.1	.3	.8	.4
Herd bulls	—	*	.1	.3	.1
Total dairy cattle	1.0	1.7	2.8	6.0	3.3
Other cattle	—	—	.1	—	*
Horses . . . . .	.7	.8	1.0	1.1	1.0
Mules	1.1	1.5	1.6	1.9	1.6
Stallions	—	—	*	—	*
Colts	*	*	*	.1	*
Ewes . . . . .	.1	.2	.2	.2	.2
Lambs, weaned	*	—	*	—	*
Brood sows . . . . .	.4	.7	.5	.6	.5
Other hogs	2.5	3.3	3.7	5.0	3.8
Pigs, weaned . . . . .	.6	2.4	1.2	.9	1.3
Chickens	92.8	129.4	146.2	152.4	139.1
Broilers	311.7	2,567.1	2,028.1	647.3	1,570.7
Turkeys & other poultry . . .	10.4	4.5	6.3	12.6	8.1
Total poultry	414.9	2,701.0	2,180.6	812.3	1,717.9
Total animal units ¹ per farm	4.7	10.9	11.1	11.9	10.5

* Less than .05 of an animal.
¹ See footnote 3 to Table 16.
² On hand December 31.

Summary of Size of Business Factors

The capital investment per farm, the number of cows per farm, the acres of crops grown per farm, Table 27, and the rates of crop yields to which previous reference has been made, indicate that the income per farm from the use of the land could not more than support a meager standard of living for the farm families in land classes I and II. It is true, as will be shown later, that some of the farmers in these poorer land classes supplemented their incomes by doing work off the farm. It previously has been indicated that other farmers established broiler enterprises and thus probably improved their incomes.

Table 27—Summary of size of business per farm by land classes, Sussex County, Delaware, 1938

Land classes	Acres per farm	Capital in real estate per farm	Dairy cows per farm	Acres of extensive crops per farm	Acres of intensive crops per farm	Total P.M.W.U. per farm ¹
	acres	dollars	number	acres	acres	number
I.	112.2	2,046	.8	20.3	6.7	195
II.	88.1	2,157	1.4	34.4	7.9	351
III.	96.7	3,042	2.0	40.8	11.1	362
IV.	121.3	4,317	4.0	57.5	18.3	412
County average . . .	103.3	3,105	2.3	41.7	11.9	354

¹ See footnote 2 to Table 16.

SOME SOCIAL ASPECTS OF LAND USE

It has been indicated that a sound program in land utilization would necessitate a knowledge of the social aspects of land use as well as a knowledge of the economic aspects. Many of the most perplexing land-use problems that arise are of a social nature. What procedure would most nearly assure the welfare of the people who reside in the poorer land classes? What procedure would best serve the tax payers of the county and state? The effect of land utilization on the standard of living of farmers as indicated by size of business and crop yields in the different land classes, has already been referred to. What is the effect of land use on the age of farmers residing within an area and on the age at which they retire? From where did the farmers come who reside in the different land classes? That is, were they local people, or did they come to Sussex County from other states and from foreign countries? Are the farmers residing in the different land classes experienced in farming, or is their experience largely confined to city occupations? What is the influence of land utilization on the size of farm families and the education of farm children? And last, does land utilization have an influence on the number of farmers' sons who become farmers?

Age of Farmers in the Different Land Classes

In land classes I and II, approximately one-third of the farmers were 60 years of age and over, and this proportion ranged down to class IV land, where slightly more than one-fifth of the farmers were 60 years of age and over, Table 28. Apparently, more of the farmers in the better land classes were able to accumulate enough financial reserves to enable them to retire at an earlier age, whereas more of the farmers in the poorer land classes were forced to reside on the farms during their declining years, endeavoring to make a living.

Table 28—Percentage of farmers by age groups who reside in the different classes of land, Sussex County, Delaware, 1938

Age - years	Land classes				County per cent
	I per cent	II per cent	III per cent	IV per cent	
Less than 30.....	13.3	8.5	4.0	3.0	5.5
30 - 39.9.....	11.7	13.4	17.8	21.2	17.3
40 - 49.9.....	15.0	22.0	24.6	24.3	23.0
50 - 59.9.....	26.7	25.6	28.2	29.5	28.0
60 - 69.9.....	23.3	19.5	16.7	14.4	17.3
70 and over.....	10.0	11.0	8.7	7.6	8.9
Total.....	100.0	100.0	100.0	100.0	100.0

Amount of Time Devoted by Farmers to Work Off the Farm in the Different Land Classes

Approximately one-third of the farmers in land class I devoted a portion of their time to work off the farm, but this proportion ranged down to class IV land, where practically none did work off the farm, Table 29. Apparently, many of the farmers in the poorer land classes found that the income from the farms was inadequate and they were forced to supplement their incomes by doing work off the farms.

Table 29—Percentage of farmers devoting different amounts of their time to work off the farm by land classes, Sussex County, Delaware, 1938

Number of farms.....	Land classes				County per cent of farmers
	I per cent of farmers	II per cent of farmers	III per cent of farmers	IV per cent of farmers	
60	81	253	132	526	
None.....	66.6	79.0	90.9	99.2	88.4
1 - 25 per cent.....	21.7	14.8	4.7	.8	7.2
26 - 50 per cent.....	6.7	4.9	2.4	0	2.7
51 per cent and more...	5.0	1.3	2.0	0	1.7
Total farmers devoting a portion of their time to work off the farm.....	33.4	21.0	9.1	.8	11.6
Total.....	100.0	100.0	100.0	100.0	100.0

Birthplace of Farmers Residing in the Different Land Classes

In New Castle and Kent Counties, Delaware, about one-third of the farmers were born outside of rural Delaware, including a fair

percentage of foreign born, and the proportion of the farmers who were born out of the state was materially greater in the poorer land classes than in the better land classes⁵. In Sussex County, only about one-sixth of the farmers were born outside of rural Delaware and the number of foreign-born farmers was practically negligible. In fact, about four-fifths of the farmers of Sussex County were born in Sussex County. Furthermore, although there was a slight tendency for a somewhat greater concentration in the poorer land classes of farmers born outside of rural Delaware, including the foreign born, the tendency was so slight as apparently to be of small significance, Table 30.

Table 30—Birthplace of farmers now residing in the different land classes, Sussex County, Delaware, 1938

	Land classes				County
	I	II	III	IV	
Number of farms	60	82	253	132	527
Birthplace	per cent	per cent	per cent	per cent	per cent
Kent County	5.0	2.4	1.5	6.8	3.4
Sussex County	68.3	78.0	79.4	78.7	77.8
Rural New Castle County	—	—	—	.8	.2
Total rural Delaware	73.3	80.4	80.9	86.3	81.4
Wilmington, Delaware	1.6	—	—	—	.2
Other states of the United States	18.3	18.2	17.7	12.9	16.7
Foreign countries	6.8	1.4	1.4	.8	1.7
Total outside rural Delaware	26.7	19.6	19.1	13.7	18.6
Total	100.0	100.0	100.0	100.0	100.0

Table 31—Birthplace of fathers of farmers now residing in the different land classes, Sussex County, Delaware, 1938

	Land classes				County
	I	II	III	IV	
Number of farms	59	82	250	131	522
Birthplace	per cent	per cent	per cent	per cent	per cent
Delaware	71.1	76.8	78.8	82.5	78.5
Other states of the United States	22.0	20.7	18.4	16.0	18.6
Foreign countries	6.9	2.5	2.8	1.5	2.9
Total outside Delaware	28.9	23.2	21.2	17.5	21.5
Total	100.0	100.0	100.0	100.0	100.0

⁵ Bausman, R. O., An Economic Study of Land Utilization in New Castle County, Delaware, Station Bulletin 228, p. 52, 1941; and Bausman, R. O., An Economic Study of Land Utilization in Kent County, Delaware, Station Bulletin 224, p. 72, 1940.

According to Table 31, there was a somewhat more pronounced tendency for a larger proportion of the farmers whose fathers were born outside of Delaware, to be concentrated in the poorer land classes, than of the farmers who themselves were born outside of Delaware, but this tendency apparently was also not great enough to be of appreciable significance.

Former Place of Residence of Farmers in the Different Land Classes

In Kent County, Delaware, about one-third of the farmers resided outside of rural Delaware immediately before going on the farms occupied at the time of the survey, and the percentage of farmers that came from outside rural Delaware, was appreciably greater in the poorer land classes than in the good land classes⁶. In Sussex County,

Table 32—Place of residence of farmers immediately before going on farms occupied in 1938 (at time of survey) by land classes, Sussex County, Delaware

	Land classes				County
	I	II	III	IV	
Number of farms	50	65	195	99	409
Place of residence	per cent	per cent	per cent	per cent	per cent
Kent County	2.0	1.6	.5	3.0	1.5
Rural New Castle County	—	—	—	—	—
Sussex County	78.0	76.9	81.0	84.9	81.0
Total in rural Delaware	80.0	78.5	81.5	87.9	82.5
Wilmington, Delaware	2.0	—	2.6	1.0	1.7
Pennsylvania	4.0	7.6	6.2	6.1	6.2
New York	6.0	1.6	1.0	1.0	1.7
West Virginia	4.0	—	—	—	.5
Indiana	2.0	—	—	—	.2
New Jersey	2.0	—	2.6	—	1.5
Maryland	—	10.7	4.1	2.0	4.2
South Dakota	—	1.6	—	—	.2
Florida	—	—	.5	—	.2
Colorado	—	—	.5	—	.2
Virginia	—	—	.5	1.0	.5
Iowa	—	—	.5	—	.2
Connecticut	—	—	—	1.0	.2
Total outside rural Delaware	20.0	21.5	18.5	12.1	17.5
Total	100.0	100.0	100.0	100.0	100.0

⁶ Bausman, R. O., An Economic Study of Land Utilization in Kent County, Delaware, Delaware Station Bulletin 224, p. 73, 1940.

only about one-sixth of the farmers resided outside of rural Delaware before going on the farm occupied at the time of the survey, and although there was a tendency in Sussex County for a somewhat greater proportion of the out-of-state farmers to locate in the poorer land classes than in the better land classes, the difference was relatively unimportant. More than four-fifths of the farmers of Sussex County resided in Sussex County before going on the farms occupied at the time of the survey, Table 32.

Experience of Farmers in the Different Land Classes

In New Castle and Kent Counties, an appreciably smaller proportion of the farmers in the poorer land classes than in the better land classes were engaged in farming immediately before going on the farm occupied at the time of the survey⁷. In Sussex County, a slightly smaller proportion of the farmers in the poorer land classes than in the better land classes were engaged in farming before going on the farms occupied at the time of the survey, but the difference was so small as to appear relatively unimportant, Table 33. It is apparent, therefore, in New Castle and Kent Counties, that the farmers in the poorer land classes were less experienced in farming than the farmers in the good land classes; but in Sussex County the farm experience of the farmers in the poorer land classes compared favorably with that of the farmers in the better land classes.

Table 33—Occupation of farmers immediately before going on farm occupied in 1938 (at time of survey) by land classes, Sussex County, Delaware

	Land classes				County
	I	II	III	IV	
Number of farms	50	65	195	100	410
Occupation	per cent	per cent	per cent	per cent	per cent
Farming	74.0	76.9	80.0	80.0	78.8
Other than farming	26.0	23.1	20.0	20.0	21.2
Total	100.0	100.0	100.0	100.0	100.0

In New Castle and Kent Counties, a larger proportion of the farmers in the poorer land classes than in the better land classes, went into non-agricultural vocations after leaving the farms. With a considerable proportion of the farmers in the poorer land classes, farming appears only to be an interlude in their lives. They came to the farms from non-agricultural vocations and left the farms and returned to

⁷ Bausman, R. O., An Economic Study of Land Utilization in New Castle County, Delaware, Station Bulletin 228, p. 54, 1941; and Bausman, R. O., An Economic Study of Land Utilization in Kent County, Delaware, Station Bulletin 224, p. 73, 1940.

non-agricultural vocations⁸. However, in Sussex County, of the living farmers who occupied the farms immediately preceding the incumbent at the time of the survey, the proportion of the farmers in the poorer land classes that took up non-agricultural pursuits after leaving the farms, was practically no greater than in the better land classes, Table 34. Apparently, in Sussex County, the farmers in the poorer land classes are as much attached to the land as in the better land classes. In both the poor and good land classes in Sussex County, most of the farmers spend their lifetime on the soil.

Table 34—Occupation immediately after leaving the farms, of living farmers who preceded the incumbent of 1938 (at the time of survey) by land classes, Sussex County, Delaware

	Land classes				County
	I	II	III	IV	
Number of farms.....	42	67	156	78	343
Occupation	per cent	per cent	per cent	per cent	per cent
Farming.....	78.6	86.5	80.1	76.9	80.5
Non-agricultural occupations.....	21.4	13.5	19.9	23.1	19.5
Total.....	100.0	100.0	100.0	100.0	100.0

Size of Farm Families in the Different Land Classes

It is commonly thought that the average size of farm families in the poorer land classes is larger than in the better land classes. In New Castle County the farm families were larger in the poorer land classes but in Kent County there was no significant difference in the size of the farm families in the different land classes⁹. In Sussex County, no significant difference in the size of the farm families was indicated in the different land classes, Table 35. However, a rural social problem is indicated in Sussex County in that the farm families are as large in the poorer land classes as in the better land classes, despite an apparent lower farm income from land use in the poorer land classes.

⁸ Bausman, R. O., An Economic Study of Land Utilization in New Castle County, Delaware, Station Bulletin 228, p. 54, 1941; and Bausman, R. O., An Economic Study of Land Utilization in Kent County, Delaware, Station Bulletin 224, p. 74, 1940.

⁹ Bausman, R. O., An Economic Study of Land Utilization in New Castle County, Delaware, Station Bulletin 228, p. 55, 1941; and Bausman, R. O., An Economic Study of Land Utilization in Kent County, Delaware, Station Bulletin 224, pp. 75 - 76, 1940.

Table 35—Number of children now living, born per farm family by land classes, Sussex County, Delaware, 1938

	Land classes				County
	I	II	III	IV	
Number of farms	60	82	253	132	527
	average number	average number	average number	average number	average number
Females	1.6	1.4	1.3	1.4	1.4
Males	1.3	1.6	1.4	1.4	1.4
Total	2.9	3.0	2.7	2.8	2.8

Education of Farm Children in the Different Land Classes

Tables 36 and 37 indicate that the farm children in the better land classes took advantage of the school facilities of the state to a greater degree than did the children in the poorer land classes. This situation appears to prevail, despite the fact that, in general, the children in the different land classes attended the same schools and there was, therefore, no apparent difference in the school facilities available to the children in the different land classes.

At the age of 17 years, from 74.7 to 83.3 per cent of the farm children in land classes I and II had left school, while in land classes III and IV, from only 64.7 to 66.3 per cent of the children had left school. At the age of 20 years, practically all of the children in the poorer land classes had left school but in the better land classes, from 6.0 to 8.4 per cent were still in school, Table 36.

Table 36—Percentage of farm children who left school¹ at the different ages by land classes, Sussex County, Delaware, 1938

	Land classes				County
	I	II	III	IV	
Number of farms	60	82	253	132	527
Ages children left school	per cent	per cent	per cent	per cent	per cent
Less than 12 years	—	.6	—	—	.1
12 years	1.0	1.2	.9	—	.8
13 years	1.0	1.8	.9	—	.9
14 years	9.1	10.8	10.0	9.8	10.0
15 years	22.2	21.1	23.7	22.5	22.8
16 years	55.5	63.4	53.8	50.0	54.8
17 years	74.7	83.3	66.3	64.7	69.8
18 years	91.9	96.2	83.4	87.2	87.4
19 years	97.0	98.1	87.3	91.1	91.1
20 years	99.0	98.7	91.6	94.0	94.2
21 years	100.0	100.0	95.2	96.5	96.9
22 years	100.0	100.0	100.0	99.0	99.8
Over 22 years	100.0	100.0	100.0	100.0	100.0

¹ Grade school, high school, college, or other institutions of learning.

In the poorer land classes, approximately 63 per cent of the farm children left school at the end of the eighth grade, whereas in the better land classes, approximately 47 per cent of the children had left school at the end of the eighth grade. At the end of the twelfth grade, approximately 95 per cent of the children in the poorer land classes had left school, but in the better land classes, from 12.8 to 16.4 per cent continued school beyond the twelfth grade and from 5.0 to 8.6 per cent attended a four-year college, Table 37.

Apparently, the parents of the children in the better land classes were better able to relieve their children from the farm work and to give them a greater degree of financial and moral support in taking advantage of the more advanced school facilities. It should be kept in mind that the present school laws were not effective when many of the children in question were of school age. It is recognized that, as the parents of children in the poorer land classes were of a somewhat older age, possibly somewhat more of the children in the poorer land classes may have been of school age when the school attendance laws were less binding and when the school facilities were less adequate.

Table 37—Percentage of farm children who left the grade schools or high schools at the end of the different grades and who attended other institutions of learning, by land classes, Sussex County, Delaware, 1938

	Land classes				County
	I	II	III	IV	
Number of farms.....	60	82	253	132	527
Number of children attending school.....	106	161	440	220	927
Grade children left school	per cent	per cent	per cent	per cent	per cent
Less than 3rd grade....	—	—	—	—	—
3rd grade.....	—	.6	—	.9	.3
4th grade.....	—	1.2	.4	1.8	.8
5th grade.....	.9	1.8	3.4	2.7	2.6
6th grade.....	6.6	4.9	7.9	5.4	6.6
7th grade.....	14.2	9.2	13.6	7.2	11.4
8th grade.....	63.3	63.9	47.0	47.6	52.0
9th grade.....	65.2	72.6	53.1	54.9	58.4
10th grade.....	74.6	80.7	61.3	59.9	66.0
11th grade.....	78.4	83.8	65.6	64.9	70.2
12th grade.....	95.4	96.9	83.6	87.2	88.2
Nurses training ¹	—	1.9	2.3	1.8	1.8
Business college ¹	1.9	.6	3.9	5.0	3.4
Teachers training ¹.....	.9	—	.7	.5	.5
Four-year college course ¹	.9	—	8.6	5.0	5.4
Other schools beyond high school ¹.....	.9	.6	.9	.5	.7
Total.....	100.0	100.0	100.0	100.0	100.0

¹ Children attending indicated institutions are not counted under grade schools or high schools.

Occupation of Mature Farm Children in the Different Land Classes

In Southern New Castle County and in Kent County, Delaware, an appreciably larger proportion of farmers' sons reared in the better land classes took up farming as a vocation than in the poorer land classes¹⁰. In Sussex County, there appeared to be no significant difference in the proportion of farmers' sons in the different land classes who took up farming as a vocation, Table 38.

Table 38—Occupation of mature farm children* by land classes, Sussex County, Delaware, 1938

	Land classes			County
	I & II	III	IV	
Number of farms.....	142	253	132	527
Occupation	per cent	per cent	per cent	per cent
Farmers.....	14.0	12.2	10.8	12.4
Farm laborers.....	1.4	1.5	.6	1.3
Housewives.....	48.0	38.6	41.4	42.1
Non-agricultural vocations.....	36.6	47.7	47.2	44.2
Total.....	100.0	100.0	100.0	100.0

* Mature children who have entered a vocation.

Summarizing the social aspects of land use, as compared with that of farmers residing in the better land classes, a larger proportion of the farmers in the poorer land classes were older men, and a smaller proportion of the farm children had taken full advantage of the school facilities offered by the state. In these two respects the social behavior of the rural people in the different land classes in Sussex County was similar to that in New Castle and Kent Counties, Delaware. However, in other respects there were distinct differences. Most of the farmers of Sussex County were born and reared in rural Delaware and the number of foreign-born farmers was negligible. In fact, most of the farmers of Sussex County were born and reared in Sussex County. Probably because there were so few of the farmers born outside of the state, there was no significant difference in the proportion of the farmers in the different land classes who were born outside of rural Delaware and in foreign countries. There was no significant difference in the various land classes in Sussex County in the farm experience of farmers; in the proportion of farmers who took up non-agricultural vocations after leaving the farms; in the proportion of farmers' sons who took up farming as a vocation; and in the number of children per farm family. In general, it appears that the farmers of Sussex

¹⁰ Bausman, R. O., An Economic Study of Land Utilization in New Castle County, Delaware, Station Bulletin 228, p. 57, 1941; and Bausman, R. O., An Economic Study of Land Utilization in Kent County, Delaware, Station Bulletin 224, p. 79, 1940.

County, particularly the farmers in the poorer land classes, are more closely attached to the land than in New Castle and Kent Counties. Most of the farmers of Sussex County were born and reared on Sussex soil and spend their lifetime on the soil. This information becomes of significance when dealing with farmers in the different land classes in educational work, in making operating and mortgage loans, and in the event that federal or state agencies should purchase, for public use, certain of the areas submarginal for cropping purposes.

ROADS

A system of improved farm-to-market roads appears to be an important service in the full utilization of the land resources of a county. The attached land-classification map shows a system of improved farm-to-market roads for Sussex County. The map shows the hard-surface roads which were complete at the time of the survey, 1939. It indicates the dirt roads that it would appear desirable eventually to hard-surface. That is, as hard-surface roads are constructed, the dirt roads are indicated which, when improved as hard roads, apparently would render the greatest service to the agriculture of the county. It also indicates the dirt roads that it would appear desirable to allow to remain as dirt roads. Obviously, the hard-surfacing of dirt roads would be contingent on available funds.

The bases used for the laying out of this system of roads are the classes of land, the classes of farms, and the concentration of farms. Group A roads are, at present, dirt roads and serve the largest number of the better farms and rural residences per mile of road, largely in class IV land. Group B roads are dirt roads that serve largely farms in land class III. These roads serve fewer of the better farms and rural residences per mile of road than Group A roads. Group C includes dirt roads that are used somewhat for agricultural purposes and serve as connecting roads. These roads oftentimes extend through the poorer land classes. Group D roads are largely in land classes III and IV, but because they serve so few farms they will probably remain as dirt roads. Group E are dirt roads in, or tributary to, land classes I and II. If land class II were reforested some of these roads might be closed. Most of them probably would be needed for forest-trail purposes. Group G roads appear on the United States Geological Survey maps, and although some are not closed, they receive little or no use.

Classification of Roads in the Different Land Classes

According to the United States Geological Survey Maps, Sussex County had 1925.5 miles of roads in 1939. Of this mileage, 577.3 miles, or 30.0 per cent, were hard-surfaced, Tables 39 and 40. Of land classes I, II, III, and IV, 13.9 per cent, 33.8 per cent, 33.2 per cent, and 41.3 per cent of the roads, respectively, were hard-surfaced.

Table 39—Miles of road in the different road groups by land classes, Sussex County, Delaware, 1939

Road groups	Land classes				County ²
	I	II	III	IV	
	miles	miles	miles	miles	miles
Hard-surface roads					
Concrete.....	39.2	44.1	113.1	112.3	308.7
Macadam.....	32.9	47.5	116.7	71.5	268.6
Total.....	72.1	91.6	229.8	183.8	577.3
Dirt roads desirable eventually to improve as hard-surface					
Group A ¹	10.2	1.2	27.1	139.7	178.2
Group B ¹	24.1	11.7	201.5	31.3	268.6
Group C ¹	18.7	15.9	9.3	.8	44.7
Total.....	53.0	28.8	237.9	171.8	491.5
Permanent dirt roads					
Group D ¹	82.9	40.1	183.0	78.2	384.2
Roads that might be closed or used for forest purposes, if land were reforested					
Group E ¹	222.8	101.1	16.4	.9	341.2
Unused or abandoned roads					
Group G ¹	87.5	9.2	24.5	10.1	131.3
Grand total.....	518.3	270.8	691.6	444.8	1,925.5
Present hard-surface roads plus					
Group A.....	82.3	92.8	256.9	323.5	755.5
Groups A & B.....	106.4	104.5	458.4	354.8	1,024.1
Groups A, B, & C.....	125.1	120.4	467.7	355.6	1,068.8

¹ Group A roads are dirt roads which serve the largest number of the better farms and rural residences per mile of road, largely in land class IV. Group B roads are dirt roads which serve largely farms in land class III. These roads serve fewer of the better farms and rural residences per mile of road than Group A roads. Group C includes dirt roads used somewhat for agricultural purposes and for connecting roads. These roads oftentimes extend through the poorer land classes. Group D roads are largely in land classes III and IV but because they serve so few farms they will probably remain as dirt roads. Group E are dirt roads in, or tributary to, land classes I and II. If land class II were reforested some of these roads may be closed. Most of them probably would be needed for forest trail purposes. Group G roads appear on the United States Geological Survey maps, and although some are not closed, they receive little or no use.

² This mileage includes the roads to the boundaries of towns. The Delaware Highway Department reported 1,857.68 miles of roads in Sussex County in 1938. Part of the difference between this mileage and that obtained by measuring the roads on the United States Geological Survey Maps, is due to the fact that the Delaware Highway Department included some town streets which are under its supervision and the abandoned roads (Group G) were not included in the Highway Department's measurements.

Table 40—Percentage of road mileage in the different road groups by land classes, Sussex County, Delaware, 1939

Road groups	Land classes				County ²
	I	II	III	IV	
	per cent	per cent	per cent	per cent	per cent
Hard-surface roads					
Concrete.....	7.6	16.3	16.4	25.2	16.0
Macadam.....	6.3	17.5	16.8	16.1	14.0
Total.....	13.9	33.8	33.2	41.3	30.0
Dirt roads desirable eventually to improve as hard-surface					
Group A ¹	2.0	.4	3.9	31.4	9.3
Group B ¹	4.6	4.3	29.1	7.0	13.9
Group C ¹	3.6	5.9	1.4	.2	2.3
Total.....	10.2	10.6	34.4	38.6	25.5
Permanent dirt roads					
Group D ¹	16.0	14.8	26.5	17.6	20.0
Roads that might be closed or used for forest purposes, if land were reforested					
Group E ¹	43.0	37.4	2.4	.2	17.7
Unused or abandoned roads					
Group G ¹	16.9	3.4	3.5	2.3	6.8
Grand total.....	100.0	100.0	100.0	100.0	100.0
Present hard-surface roads plus					
Group A.....	15.9	34.2	37.1	72.7	39.3
Groups A & B.....	20.5	38.5	66.2	79.7	53.2
Groups A, B, & C.....	24.1	44.4	67.6	79.9	55.5

¹ See footnote 1 to Table 39.

² See footnote 2 to Table 39.

Group A roads constituted 178.2 miles, or 9.3 per cent, of the roads of the county. Group A made up 31.4 per cent of the roads of class IV land. Group B roads constituted 268.6 miles, or 13.9 per cent, of the roads of the county. Group B made up 29.1 per cent of the roads in class III land.

The present hard-surface roads plus road Groups A, B, and C comprised 1,068.8 miles of roads, or 55.5 per cent, of the roads of the county. This is the mileage that would appear desirable to improve as hard-surface. The present hard-surface roads plus road Groups A, B, and C comprised 24.1 per cent, 44.4 per cent, 67.6 per cent, and 79.9 per cent of the roads in land classes I, II, III, and IV, respectively.

Classification of Farms and Rural Residences in the Different Road Groups

Of all farms in the county, 37.4 per cent were served by the

present hard-surface roads and 36.6 per cent were located on road Groups A, B, and C. If road Groups A, B, and C were eventually hard-surfaced, 74.0 per cent of the farms would be located on hard roads, Table 41.

Of all rural residences in the county, 51.6 per cent were located on hard-surface roads and 26.1 per cent were located on road Groups A, B, and C. If road Groups A, B, and C were eventually hard-surfaced, 77.7 per cent of the rural residences would be on hard roads.

Concentration of Farms and Rural Residences per Mile of Road in the Different Road Groups

The present hard-surface roads served 2.54 farms per mile of road and road Groups A, B, and C served an average of 2.93 farms per mile of road, Table 42. The present hard-surface roads had 2.44 rural residences per mile of road, and road Groups A, B, and C had an average of 1.45 rural residences per mile of road.

Table 41—Percentage of farms and rural residences of the different classes in the various road groups, Sussex County, Delaware, 1939

Road groups	Farms							Rural residences				Commercial establishments, churches, schools	Buildings standing but unusable	County total of all buildings	
	Excellent	Good	Fair to good	Fair to poor	Poor	Vacant	County total	Good occupied	Poor occupied	Vacant	County total				
	per cent	per cent	per cent	per cent	per cent	per cent	per cent	per cent	per cent	per cent	per cent				
Hard-surface roads															
Concrete.....	43.3	30.9	26.1	15.5	9.4	10.7	20.6	41.9	16.2	13.9	31.3	45.1	8.1	22.6	
Macadam.....	21.6	19.4	21.1	13.5	12.5	7.1	16.8	23.1	17.0	8.9	20.3	21.9	10.6	16.9	
Total.....	64.9	50.3	47.2	29.0	21.9	17.8	37.4	65.0	33.2	22.8	51.6	67.0	18.7	39.5	
Dirt roads desirable eventually to improve as hard-surface															
Group A ¹	20.3	23.1	15.2	11.2	6.9	8.9	13.6	12.7	11.2	11.4	12.1	9.5	6.7	11.5	
Group B ¹	12.1	17.2	21.7	23.8	19.9	16.1	20.8	9.6	15.1	16.5	11.9	11.0	15.0	16.3	
Group C ¹	—	1.3	2.0	3.1	2.6	5.4	2.2	1.2	3.0	6.3	2.1	.9	3.2	2.3	
Total.....	32.4	41.6	38.9	38.1	29.4	30.4	36.6	23.5	29.3	34.2	26.1	21.4	24.9	30.1	
Permanent dirt roads															
Group D ¹	2.7	7.9	10.6	17.1	24.5	30.4	15.1	8.3	22.2	16.4	13.8	8.0	22.9	15.9	
Roads that might be closed or used for forest purposes if land were reforested															
Group E ¹	—	.2	3.3	15.8	24.2	21.4	10.9	3.2	15.3	26.6	8.5	3.6	26.3	13.0	
Unused or abandoned roads															
Group G ¹	—	—	—	—	—	—	—	—	—	—	—	—	7.2	1.5	
Grand total....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	
Present hard - surface roads plus															
Group A.....	85.2	73.4	62.4	40.2	28.8	26.7	51.0	77.7	44.4	34.2	63.7	76.5	25.4	51.0	
Groups A & B.....	97.3	90.6	84.1	64.0	48.7	42.8	71.8	87.3	59.5	50.7	75.6	87.5	40.4	67.3	
Groups A, B, & C.....	97.3	91.9	86.1	67.1	51.3	48.2	74.0	88.5	62.5	57.0	77.7	88.4	43.6	69.6	
Total number of farmsteads ² , rural residences, and commercial establishments..	74	628	1,328	908	938	56	3,932	1,610	1,046	79	2,735	548	1,927	9,142	

¹ See footnote 1 to Table 39.

² Does not include 393 specialized poultry plants.

Table 42—Number of farms² and rural residences of the different classes per mile of road in the various road groups, Sussex County, Delaware, 1939

Road groups	Farms per mile of road							Rural residences per mile of road				Commercial establishments, churches, schools, per mile of road	Buildings standing but unusable per mile of road	County total of all buildings per mile of road
	Excel- lent	Good	Fair to good	Fair to poor	Poor	Vacant	County total	Good occu- pied	Poor occu- pied	Vacant	County total			
	number	number	number	number	number	number	number	number	number	number	number			
Hard-surface roads														
Concrete.....	.10	.63	1.12	.46	.29	.02	2.62	2.19	.55	.03	2.77	.80	.51	6.70
Macadam.....	.06	.45	1.04	.45	.44	.02	2.46	1.38	.66	.03	2.07	.45	.76	5.74
Average.....	.08	.55	1.08	.45	.36	.02	2.54	1.81	.60	.03	2.44	.64	.63	6.25
Dirt roads desirable eventually to improve as hard-surface														
Group A ¹.....	.08	.81	1.14	.57	.37	.03	3.00	1.14	.66	.05	1.85	.29	.72	5.86
Group B ¹.....	.03	.40	1.07	.81	.70	.03	3.04	.58	.58	.05	1.21	.22	1.08	5.55
Group C ¹	—	.18	.60	.63	.54	.06	2.01	.45	.72	.11	1.28	.11	1.36	4.76
Average.....	.05	.53	1.05	.70	.56	.04	2.93	.77	.62	.06	1.45	.24	.98	5.60
Permanent dirt roads														
Group D ¹.....	.01	.13	.36	.40	.60	.05	1.55	.35	.60	.03	.98	.11	1.15	3.79
Roads that might be closed or used for forest purposes, if land were reforested														
Group E ¹	—	*	.13	.42	.66	.04	1.25	.15	.47	.06	.68	.06	1.49	3.48
Unused or abandoned roads														
Group G ¹	—	—	—	—	—	—	—	—	—	—	—	—	1.06	1.06
Average.....	.04	.33	.68	.47	.49	.03	2.04	.84	.54	.04	1.42	.29	1.00	4.75
Present hard - surface roads plus														
Group A.....	.08	.61	1.10	.48	.36	.02	2.65	1.66	.61	.04	2.31	.55	.65	6.16
Groups A & B.....	.07	.56	1.09	.57	.44	.02	2.75	1.37	.61	.04	2.02	.47	.76	6.00
Groups A, B, & C.....	.07	.54	1.07	.57	.45	.02	2.72	1.34	.61	.04	1.99	.45	.79	5.95

* Less than .005.

¹ See footnote 1 to Table 39.

² See footnote 2 to Table 41.

Farm Capital per Mile of Road in the Different Road Groups

Farm capital per mile of road was greater for the average of road Groups A, B, and C than it was for the present hard-surface roads. However, farm capital per mile of road was much less for Group D and Group E roads than the average of the A, B, and C groups of roads, Table 43.

Table 43—Calculated farm capital² per mile of road in the different road groups, Sussex County, Delaware, 1939

Road groups	Farm capital per mile of road
	dollars
Hard-surface roads	
Concrete.....	8,485
Macadam.....	7,620
Average.....	8,070
Dirt roads desirable eventually to improve as hard-surface	
Group A ¹	9,639
Group B ¹	8,863
Group C ¹	5,481
Average.....	8,822
Permanent dirt roads	
Group D ¹	4,060
Roads that might be closed or used for forest purposes, if land were reforested	
Group E ¹	2,906
Average.....	6,005
Present hard-surface roads plus	
Group A.....	8,453
Groups A & B.....	8,576
Groups A, B, & C.....	8,450

¹ See footnote 1 to Table 39.

² Real estate, only.

ELECTRIC POWER AND TELEPHONE SERVICES

Electric power and telephones are important services in making the fullest use of land. Where the class of land and the concentration of farms warrants, electric power and telephone services should be available for farm use.

Farms Having Electric Power and Telephone Services in the Different Land Classes

Of the 3,876 occupied farms in Sussex County, 21.6 per cent had electric power service and 14.6 per cent had telephone service. The

Rural Electrification Administration is working on this problem and has made some progress in Sussex County since this survey was made. However, a markedly greater proportion of the farms in the better land classes had electric power and telephone services than in the poorer land classes, Table 44.

Table 44—Percentage of occupied farms² having electric power connections and telephone connections by land classes, Sussex County, Delaware, 1939

	Land classes				County
	I	II	III	IV	
	per cent	per cent	per cent	per cent	per cent
Electric power connections ¹	3.4	7.8	19.6	38.8	21.6
Telephone connections ¹	2.1	4.8	14.4	24.6	14.6
Total number of occupied farms . . .	145	792	1,922	1,017	3,876

¹ Some farmsteads probably had electric power and telephone connections but did not have electric power and telephones.

² Does not include 393 specialized poultry plants.

Of the 3,171 rural residences, schools, churches, and commercial establishments, 35.2 per cent had electric power service and 14.8 per cent had telephones, and the concentration of these services was much greater in the better land classes than in the poorer land classes, Table 45.

Table 45—Percentage of occupied buildings other than farmsteads¹ having electric power connections and telephone connections by land classes, Sussex County, Delaware, 1939

	Land classes				County
	I	II	III	IV	
	per cent	per cent	per cent	per cent	per cent
Electric power connections ²	15.8	21.5	40.4	48.4	35.2
Telephone connections ²	7.6	9.3	16.7	20.1	14.8
Total number of buildings other than farmsteads	486	599	1,239	847	3,171

¹ Buildings other than farmsteads include rural residences, school houses, churches, and commercial establishments.

² See footnote 1 to Table 44.

SUMMARY AND CONCLUSIONS

Trends in the Production of the Different Crops and Kinds of Livestock

During the sixty-year period from 1880 to 1940, the amount of land in farms in Sussex County decreased from 516,697 acres to 402,163 acres, a decrease of 114,534 acres, or 22.2 per cent. This is an average abandonment of almost 2,000 acres annually. Apparently, many farmers have learned that it pays to farm only the better classes of land.

Since 1840, the trend of agriculture in Sussex County, in general, has been towards an increase in the production of the more perishable products and a decrease in the production of the more staple and concentrated products. This has involved a marked increase in the production of vegetable crops and a decrease in the production of hogs, sheep, field corn, and wheat.

Extent of Land Classes

As used in this study, land class I is the poorest class of land. It is made up largely of timber, brush, and wasteland. This land class comprised 51.8 per cent of the land of Sussex County. Land class II comprised largely open-untillable land and land tilled only occasionally, and constituted 10.3 per cent of the land area of the county. Land class III is made up largely of the crop land that is less intensively used than class IV land, and comprised 21.3 per cent of the land. Land class IV is the best grade of crop land and amounted to 16.6 per cent of the land. Approximately three-fifths of the land of Sussex County was submarginal for agricultural purposes, and about two-fifths was reasonably well suited for agricultural purposes under prevailing conditions.

As this submarginal land apparently is not able to produce, under existing conditions, an adequate farm income through the use of the land, it would appear that it could possibly be used to a better economic and social advantage for forests, wildlife preserves, and for public recreation than for agricultural purposes.

One square inch on the land-classification map represents approximately 640 acres of land. It is evident, therefore, that land classification does not indicate the precise economic status of each parcel of land or even of each farm. It does indicate the economic status of the area in which the parcel of land or the farm may be located.

Relation of Farm Practices to Land Classes

In general, there is a close relationship between land classes and the intensity of agricultural practices.

In land classes I, II, III, and IV, .1 per cent, 7.2 per cent, 13.2 per cent, and 23.2 per cent, respectively, of the land were devoted to

truck, cannery, and fruit crops. However, in the same land classes, 97.9 per cent, 26.6 per cent, 2.4 per cent, and 1.4 per cent, respectively, of the land were devoted to timber, marsh, and wasteland.

In the four land classes, ranging from the poorest class to the best, 28.4 per cent, 21.0 per cent, 49.1 per cent, and 80.8 per cent, respectively, of the land were of the Sassafras soil series. Conversely, the percentage of the land in the different land classes made up of the Elkton and Portsmouth soil series, decreased from the poorer land classes to the better classes.

The crop-yield indices ranged from an index of 77 for the Portsmouth series to an index of 104 for the Sassafras series, or an increase of 35 per cent in average crop yields on Sassafras soils over that on Portsmouth soils.

In the four land classes, ranging from the poorest to the best, 3.4 per cent, 4.5 per cent, 16.1 per cent, and 34.5 per cent, respectively, of the farm buildings were classified as "good" and "excellent."

The crop-yield indices ranged from an index of 64 in land class I to an index of 109 in land class IV, or an increase of 70 per cent in the average crop yields in class IV land over that of class I land.

Capital in real estate per farm, ranging from land class I to land class IV, were \$2,046, \$2,157, \$3,042, and \$4,317, respectively, and capital per acre ranging in the same order were \$18, \$24, \$31, and \$36, respectively.

In the event there is pressure for an increased production of the more nutritive high-acre-value crops, as a result of the national defense program and our increasing population, and in the event future trends in food production correspond reasonably closely with those of the past, there will be a greater increase in the production of these foods in land class IV than in land class III, and a greater increase in land class III than in land classes I and II. Probably only in the event of an extreme food shortage would an appreciable amount of land classes I and II be placed in cultivation.

Social Aspects of Land Use

As compared with farmers residing in the better land classes, a larger proportion of the farmers in the poorer land classes were older men, and a smaller proportion of the farm children had taken full advantage of the school facilities offered by the state. In these two respects, the social behavior of the rural people in the different land classes in Sussex County was similar to that in New Castle and Kent Counties, Delaware. However, in other respects, there were distinct differences. Most of the farmers of Sussex County were born and reared in rural Delaware and the number of foreign-born farmers was negligible. In fact, most of the farmers of Sussex County were born and reared in Sussex County. Probably because there were so few of the farmers born outside of the state, there was no significant

difference in the proportion of the farmers in the different land classes who were born outside of rural Delaware and in foreign countries. There was no significant difference in the various land classes in Sussex County in the farm experience of farmers; in the proportion of farmers who took up non-agricultural vocations after leaving the farms; in the proportion of farmers' sons who took up farming as a vocation; and in the number of children per farm family. In general, it appears that the farmers of Sussex County, particularly the farmers in the poorer land classes, are more closely attached to the land than in New Castle and Kent Counties. Most of the farmers of Sussex County were born and reared on Sussex soil and spend their lifetime on the soil.

Some farmers in the poorer land classes, apparently, have improved their incomes by establishing enterprises which have little relationship to land use. The poultry enterprise, particularly broiler production, is the outstanding example of this type of enterprise in Sussex County.

Farm-to Market Roads in the Different Land Classes

In 1939, 30.0 per cent of the roads of Sussex County were hard-surface. In land classes I, II, III, and IV, 13.9 per cent, 33.8 per cent, 33.2 per cent, and 41.3 per cent, respectively, of the roads were hard-surface.

If the roads in Groups A, B, and C were improved as hard-surface, 55.5 per cent of the roads of the county would be hard roads. For the roads in land classes I, II, III, and IV, 24.1 per cent, 44.4 per cent, 67.6 per cent, and 79.9 per cent, respectively, would be improved as hard-surface.

In 1939, 37.4 per cent of the farms were served by hard-surface roads. If the roads in Groups A, B, and C were improved as hard-surface, 74.0 per cent of the farms would be served by hard roads.

APPENDIX

Table A—Acres of land used for the different purposes by representative districts, Sussex County, Delaware, 1938 - 1939

Use of land	Representative districts										County
	1	2	3	4	5	6	7	8	9	10	
	acres	acres	acres	acres	acres	acres	acres	acres	acres	acres	
Corn - grain, sweet corn, and silage.....	6,155	8,324	7,641	6,406	10,377	15,051	14,295	5,419	3,142	8,183	84,993
Wheat.....	3,689	3,898	2,921	410	1,044	75	3	564	252	2,417	15,273
Rye.....	2,013	1,073	1,436	405	231	131	33	135	157	620	6,234
Other grains.....	71	20	135	24	49	27	—	60	59	119	564
Total grain crops.....	11,928	13,315	12,133	7,245	11,701	15,284	14,331	6,178	3,610	11,339	107,064
Clover and timothy hay.....	203	20	58	3	17	23	17	28	56	30	455
Clover hay.....	1,190	319	307	54	117	85	33	219	115	818	3,257
Alfalfa hay.....	109	31	45	14	4	4	—	1	—	72	280
Soybean or cowpea hay ¹	2,615	4,608	4,111	3,643	3,412	2,816	1,013	1,467	1,314	4,022	29,021
Other legume hay.....	170	564	481	147	40	40	17	41	2	125	1,627
Other non-legume hay.....	3	5	27	—	4	2	10	7	—	—	58
Total hay crops.....	4,290	5,547	5,029	3,861	3,594	2,970	1,090	1,763	1,487	5,067	34,698
Sweet potatoes.....	—	49	167	307	813	145	9	165	6	2	1,663
White potatoes.....	6	43	3	9	10	324	131	43	4	76	649
Asparagus ¹	15	534	186	12	—	3	1	—	3	112	866
Cantaloupes.....	—	284	953	708	1,322	45	—	15	—	—	3,327
Watermelons.....	10	185	828	839	1,351	278	—	12	7	10	3,520
Cucumbers and pickles.....	11	77	370	253	313	78	—	11	—	13	1,126
Other truck crops.....	781	1,361	872	654	1,096	744	561	396	256	586	7,307
Total truck crops.....	823	2,533	3,379	2,782	4,905	1,617	702	642	276	799	18,458
Tomatoes.....	357	1,206	1,121	651	961	407	661	232	92	348	6,036
Lima beans.....	3,027	1,041	227	19	38	—	633	466	83	4,410	9,944
String beans.....	—	137	192	18	37	—	5	2	—	122	513
Total cannery crops.....	3,384	2,384	1,540	688	1,036	407	1,299	700	175	4,880	16,493

Table A—Acres of land used for the different purposes by representative districts, Sussex County, Delaware, 1938 - 1939 (continued)

Use of land	Representative districts										County acres
	1 acres	2 acres	3 acres	4 acres	5 acres	6 acres	7 acres	8 acres	9 acres	10 acres	
Orchard ¹	308	3,917	1,028	102	113	78	13	842	45	964	7,410
Vineyard.....	1	21	38	9	2	11	—	19	—	—	101
Strawberries.....	69	749	319	208	115	561	115	49	69	8	2,262
Other small fruit.....	7	17	61	91	10	2	10	2	—	—	200
Total fruit crops.....	385	4,704	1,446	410	240	652	138	912	114	972	9,973
Tillable land lying out.....	5,718	4,643	3,941	2,458	3,668	7,435	4,964	3,701	2,267	4,557	43,352
Tillable pasture.....	3,251	1,565	1,007	515	519	747	679	832	345	2,764	12,224
Open untillable pasture.....	220	303	164	78	121	231	110	61	159	217	1,664
Brush pasture.....	224	69	58	13	29	19	33	122	36	63	666
Total pasture.....	3,695	1,937	1,229	606	669	997	822	1,015	540	3,044	14,554
Timber.....	22,318	32,438	30,909	23,328	28,539	43,432	20,094	28,709	17,993	24,553	272,313
Brush not pastured.....	566	686	938	701	816	667	360	188	214	165	5,301
Marsh land.....	8,797	77	192	79	124	801	5,670	3,572	33	11,612	30,957
Open untillable idle land.....	2,130	917	475	375	685	3,525	2,393	872	2,560	3,993	17,925
Total timber, marsh, and wasteland.....	33,811	34,118	32,514	24,483	30,164	48,425	28,517	33,341	20,800	40,323	326,496
Farmsteads.....	1,024	1,219	1,104	591	870	1,344	1,556	633	382	1,035	9,758
Other houses.....	380	361	263	158	308	252	278	119	134	200	2,453
Roads.....	974	1,174	1,068	675	981	1,469	1,030	758	215	1,291	9,635
Railroads.....	71	79	63	47	60	110	36	—	111	189	766
Villages and towns ³	574	359	476	320	512	479	542	65	355	1,645	5,327
Miscellaneous ²	1,290	190	390	111	164	299	372	127	150	340	3,433
Total development.....	4,313	3,382	3,364	1,902	2,895	3,953	3,814	1,702	1,347	4,700	31,372
Total land area.....	68,347	72,563	64,575	44,435	58,872	81,740	55,677	49,954	30,616	75,681	602,460
Internal water area.....	671	65	421	376	305	1,250	7,305	8,244	0	5,624	24,261
Total land and water area.....	69,018	72,628	64,996	44,811	59,177	82,990	62,982	58,198	30,616	81,305	626,721

¹ - ⁵ See footnotes 1 to 5 to Table 10.

Table B—Percentage of land used for the different purposes by representative districts, Sussex County, Delaware, 1938 - 1939

Use of land	Representative districts										County
	1	2	3	4	5	6	7	8	9	10	
	per cent	per cent	per cent	per cent	per cent	per cent	per cent	per cent	per cent	per cent	
Corn - grain, sweet corn, and silage.....	9.0	11.4	11.9	14.4	17.6	18.4	25.6	11.0	10.3	10.8	14.1
Wheat.....	5.4	5.4	4.5	.9	1.8	.1	*	1.1	.8	3.2	2.5
Rye.....	2.9	1.5	2.2	.9	.4	.2	.1	.2	.5	.8	1.1
Other grains.....	.1	*	.2	.1	.1	*	—	.1	.2	.2	.1
Total grain crops.....	17.4	18.3	18.8	16.3	19.9	18.7	25.7	12.4	11.8	15.0	17.8
Clover and timothy hay.....	.3	*	.1	*	*	*	*	.1	.2	*	.1
Clover hay.....	1.8	.4	.5	.1	.2	.1	.1	.3	.4	1.1	.5
Alfalfa hay.....	.2	*	.1	*	*	*	—	*	—	.1	.1
Soybean or cowpea hay ¹	3.8	6.4	6.4	8.2	5.8	3.4	* 1.9	3.0	4.2	5.3	4.8
Other legume hay.....	.2	* .8	* .7	— .4	* .1	* .1	*	* .1	—	—	* .3
Other non-legume hay.....	—	—	—	—	—	—	—	—	—	—	—
Total hay crops.....	6.3	7.6	7.8	8.7	6.1	3.6	2.0	3.5	4.8	6.7	5.8
Sweet potatoes.....	—	.1	.2	.7	1.4	.2	*	.4	*	*	.3
White potatoes.....	*	.1	*	*	*	.4	*	.1	*	.1	.1
Asparagus ⁴.....	.7	.3	*	*	—	*	.3	—	*	.2	.1
Cantaloupes.....	—	.4	1.5	1.6	2.2	.1	—	*	—	—	.6
Watermelons.....	*	.2	1.3	1.9	2.3	.3	—	*	*	*	.6
Cucumbers and pickles.....	*	.1	.6	.6	.5	.1	—	*	—	*	.2
Other truck crops.....	1.2	1.9	1.3	1.5	1.9	.9	1.0	.8	.9	.8	1.2
Total truck crops.....	1.2	3.5	5.2	6.3	8.3	2.0	1.3	1.3	.9	1.1	3.1
Tomatoes.....	.5	1.7	1.7	1.5	1.6	.5	1.2	.5	.3	.4	1.0
Lima beans.....	4.5	1.4	.4	*	.1	—	1.1	.9	.3	5.8	1.6
String beans.....	—	.2	.3	*	.1	—	*	*	—	.2	.1
Total cannery crops.....	5.0	3.3	2.4	1.5	1.8	.5	2.3	1.4	.6	6.4	2.7

Table B—Percentage of land used for the different purposes by representative districts, Sussex County, Delaware, 1938 - 1939, (continued)

Use of land	Representative districts										County
	1	2	3	4	5	6	7	8	9	10	
	per cent	per cent	per cent	per cent	per cent	per cent	per cent	per cent	per cent	per cent	
Orchard ¹.....	.5	5.4	1.6	.2	.2	.1	*	1.7	.1	1.3	1.2
Vineyard.....	*	*	*	*	*	*	*	*	*	*	*
Strawberries.....	.1	1.1	.5	.5	.2	.7	.3	.1	.3	*	.4
Other small fruit.....	*	*	.1	.2	*	*	*	*	*	*	*
Total fruit crops.....	.6	6.5	2.2	.9	.4	.8	.3	1.8	.4	1.3	1.6
Tillable land lying out.....	8.3	6.4	6.1	5.5	6.3	9.1	8.9	7.4	7.4	6.0	7.2
Tillable pasture.....	4.8	2.2	1.6	1.2	.9	.9	1.2	1.7	1.2	3.6	2.0
Open untillable pasture.....	.3	.4	.2	.2	.2	.3	.2	.1	.5	.3	.3
Brush pasture.....	.3	.1	.1	*	*	*	.1	.2	.1	.1	.1
Total pasture.....	5.4	2.7	1.9	1.4	1.1	1.2	1.5	2.0	1.8	4.0	2.4
Timber.....	32.7	44.7	47.9	52.5	48.4	53.2	36.1	57.5	58.8	32.4	45.2
Brush not pastured.....	.8	.9	1.5	1.6	1.4	.8	.6	.4	.7	.2	.9
Marsh land.....	12.9	.1	.3	.2	.2	1.0	10.2	7.2	.1	15.4	5.1
Open untillable idle land.....	3.1	1.3	.7	.8	1.2	4.3	4.3	1.7	8.3	5.3	3.0
Total timber, marsh, and wasteland.....	49.5	47.0	50.4	55.1	51.2	59.3	51.2	66.8	67.9	53.3	54.2
Farmsteads.....	1.5	1.7	1.7	1.3	1.5	1.6	2.8	1.3	1.2	1.4	1.6
Other houses.....	.6	.5	.4	.4	.5	.3	.5	.2	.4	.3	.4
Roads.....	1.4	1.6	1.7	1.5	1.6	1.8	1.8	1.5	.7	1.7	1.6
Railroads.....	.1	.1	.1	.1	.1	.1	*	*	.4	.2	.1
Villages and towns ².....	.8	.5	.7	.7	.9	.6	.9	.1	1.2	2.2	.9
Miscellaneous ²	1.9	.3	.6	.3	.3	.4	.8	.3	.5	.4	.6
Total development.....	6.3	4.7	5.2	4.3	4.9	4.8	6.8	3.4	4.4	6.2	5.2
Total land area.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

* Less than .05 per cent.

¹ - ² See footnotes 1 to 5 to Table 10.

LAND CLASSIFICATION MAP OF SUSSEX COUNTY DELAWARE

BASE MAP FROM UNITED STATES GEOLOGICAL SURVEY SHEETS
This map was prepared as a part of the National Study of Land Utilization in Sussex County, Delaware, by the Agricultural Experiment Station, University of Delaware.
Survey made in 1938-39.
SEPTEMBER, 1941

LAND CLASSIFICATION

- I** Class I—Highly fertile and rich land
- II** Class II—Moderate
- III** Class III—Lightly fertile and moderate
- IV** Class IV—Poorly fertile and light

ROAD CLASSIFICATION

- ROADS** (indicated by solid lines)
- ROADS UNDER CONSTRUCTION** (indicated by dashed lines)
- ROADS TO BE CONSTRUCTED** (indicated by dotted lines)
- ROADS TO BE ABANDONED** (indicated by long-dashed lines)
- ROADS TO BE RECONSTRUCTED** (indicated by short-dashed lines)
- ROADS TO BE IMPROVED** (indicated by dash-dot lines)
- ROADS TO BE MAINTAINED** (indicated by solid lines with a different pattern)

ABANDONED ROADS

- Class A—1/2 Mile
- Class B—1/4 Mile
- Class C—1/8 Mile
- Class D—1/16 Mile
- Class E—1/32 Mile
- Class F—1/64 Mile

PERMANENT DIRT OR GRAVEL ROADS

- Class A—1/2 Mile
- Class B—1/4 Mile
- Class C—1/8 Mile
- Class D—1/16 Mile
- Class E—1/32 Mile
- Class F—1/64 Mile

RECREATIONAL TRAILS IN LAND

- Class A—1/2 Mile
- Class B—1/4 Mile
- Class C—1/8 Mile
- Class D—1/16 Mile
- Class E—1/32 Mile
- Class F—1/64 Mile

TRAILS AND RIDGES

- Class A—1/2 Mile
- Class B—1/4 Mile
- Class C—1/8 Mile
- Class D—1/16 Mile
- Class E—1/32 Mile
- Class F—1/64 Mile

DEPRESSIONS AND BOUNDARIES

- Class A—1/2 Mile
- Class B—1/4 Mile
- Class C—1/8 Mile
- Class D—1/16 Mile
- Class E—1/32 Mile
- Class F—1/64 Mile

BOUNDARIES

- Class A—1/2 Mile
- Class B—1/4 Mile
- Class C—1/8 Mile
- Class D—1/16 Mile
- Class E—1/32 Mile
- Class F—1/64 Mile

