

# AGRICULTURAL EXPERIMENT STATION

KANSAS STATE COLLEGE OF AGRICULTURE  
AND APPLIED SCIENCE

MANHATTAN, KANSAS

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## AREA ANALYSIS AND AGRICULTURAL ADJUSTMENTS IN NEMAHA COUNTY, KANSAS



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## CONTENTS

	PAGE
SUMMARY .....	4
INTRODUCTION .....	5
Description and Historical Development of Agriculture in Nemaha County .....	5
INVENTORY OF BASIC DATA.....	7
Physical Resources .....	9
Present Agriculture and Related Factors.....	13
Indicators of Degree of Success.....	13
AGRICULTURAL AREAS IN NEMAHA COUNTY.....	16
Delineation of Areas.....	17
Description of Agricultural Areas.....	19
SUGGESTED AGRICULTURAL ADJUSTMENTS.....	26
Determination of the Adjustments.....	26
Adjustments .....	26
Summary of Adjustments.....	32
LITERATURE CITED .....	36
APPENDIX .....	37

## SUMMARY

The primary purpose of this study was to determine desirable agricultural adjustments for Nemaha county, Kansas. Secondly, methods of analyzing an area and determining adjustments were tested. This publication emphasizes the adjustments, but a brief description of the method adopted is presented for the benefit of those who may be interested in applying the general method to other counties.

In this study it was attempted to relate a number of variables which affect the success of individual farms and an area as a whole. A number of factors were also studied which indicate the success of the agricultural economy in the area. Included among these factors were items such as condition of farmsteads and tax delinquency. An exhaustive analysis of the influence of any one factor was not attempted.

The analysis began with an inventory of (1) the physical resources, (2) present land utilization, and (3) the indicators of the degree of success of the agriculture of the county.

Based upon the data in the inventory, the county was divided into 25 agricultural areas. While all factors were considered, five were used principally in the delineation process: (1) Land type (soil), (2) physical land use (crop or pasture), (3) size of farm, (4) condition of farm finance, and (5) condition of the farmstead.

Suggested adjustments for an area were determined by (1) comparing the area with the other areas in the county with respect to resources, the uses of the resources, and the relative success of the agriculture; and (2) preparing budgets for various systems of farming and sizes of farms.

The adjustments suggested herein apply to an entire area or areas within the county. Specific adjustments on individual farms or tracts of land depend upon the farm operator and specific conditions associated with that particular farm or tract of land—a matter of detailed planning which is not considered in this study. Direction of adjustment is emphasized rather than the degree of adjustment.

Assuming that the farmers are capable of managing one type of farming as well as another, greater success could be obtained in Nemaha county by increased emphasis on livestock enterprises.

A farm of 160 acres is needed in those areas of the county with relatively highly productive land for an average farm manager to obtain a labor income of \$800, while 240 to 280 acres are required for this income in the other areas. In comparison to the average size of farm in 1939, there could be more farms in the areas with high productivity and fewer farms in the other areas.

A slight increase in the proportion of the farm land in crops in the areas with the higher productivity and a decrease in the proportion in crops in the other areas appeared desirable.

These adjustments apply to areas in other counties insofar as they are similar to Nemaha county. It is believed that they apply to portions of the northeastern five or six counties of Kansas.

# Area Analysis and Agricultural Adjustments in Nemaha County, Kansas<sup>1</sup>

By W. H. PINE

## INTRODUCTION

In recent years greater public attention has been directed toward the problems of agriculture, and various programs have been devised. To fit the programs to local areas and to individual farms, it is necessary to determine the character of adjustments which need to be made. Agricultural planning is essential in determining adjustment. The first step in planning is a careful analysis of the area involved. From this analysis the desirable adjustments will be indicated. In this bulletin the methods used in the Nemaha county study are described and the adjustments indicated by the study are given.

A complete inventory was taken of the resources, the uses of the resources, and the relative success attained by the farming population. The county was divided into areas in which there was a high degree of uniformity of resources and conditions or which had a distinct pattern of resources or conditions. Each area was described according to the items in the inventory. Adjustments were determined by relating the various factors and comparing one area with the other areas and by the use of budgets for various sizes and types of farms. A detailed analysis was not made for any one factor, such as land tenure, but rather the main purpose was to relate a number of factors.

### Description and Historical Development of Agriculture in Nemaha County

The topography of Nemaha county is typical of northeastern Kansas. The land varies from undulating to rolling and in some places is hilly. Along the streams some of the slopes are steep. Elevations range from 1,150 feet above sea level at Wetmore to 1,420 feet at Berwick.

1. Contribution No. 118 from the Department of Agricultural Economics.

Acknowledgment: This study was initiated and much of the work on it was done as a cooperative project between the Kansas Agricultural Experiment Station and the Bureau of Agricultural Economics of the United States Department of Agriculture. H. N. Watenpaugh of the Bureau of Agricultural Economics worked on the study during the gathering and analysis of data and helped to prepare the first manuscript reporting the study. Developments in connection with national defense made it necessary that the Bureau of Agricultural Economics discontinue this work before the manuscript was completed. It was agreed that, rather than delay the report indefinitely, the Kansas Agricultural Experiment Station should prepare this report on the study and assume all responsibility for it. Credit is due Merton L. Otto and W. H. Metzger of the Kansas Agricultural Experiment Station and J. R. Justice of the Bureau of Agricultural Economics for assistance in gathering and interpreting the data. Various agencies, both federal and local, generously assisted in making data available and in collecting field information. The Kansas Agricultural Experiment Station assumes full responsibility for all conclusions reached.



FIG. 1.—Location of Nemaha county, Kansas.

Nemaha county is covered in part with glacial drift and in part with wind-laid material (or loessial deposits), and in many small areas with residual soils derived from limestones and shales. These differences in soil origin are reflected in the fertility of the soil, the degree of erodability of the soil, and, to some extent, the topography.

The average annual precipitation, based upon records for 31 years (1909-1939 inclusive), at Centralia, Kansas, was 31.04 inches. Rainfall varied from a minimum of 23.37 inches in 1936 to a maximum of 44.70 inches in 1909. Approximately three-fourths of the annual rainfall comes in the six-months period from April to September, inclusive, thereby being highly effective for crop production. In some years crop yields have been low because of insufficient or unfavorable distribution of the rainfall. As a rule, such years of low crop yields have not followed each other.

The earliest recorded settlement in Nemaha county was in 1854 (1)<sup>1</sup> and the first census report of the county in 1855 recorded 99 residents. In the 1880's, much of the land in Nemaha county was in native sod. Following this date, the prairie sod was broken rapidly. Near the beginning of the present century the population of the county reached its peak. Since then, the population has decreased gradually.

In 1929, slightly less than one-half the farms were of the live-stock-specialty type, which in Nemaha county is primarily a beef cattle and hog enterprise. Thirty percent of the farms were general farms and about 13 percent were cash-grain farms. Approximately two-thirds of the farm land was crop land, corn being the chief crop in the county.

Nemaha county is 453,760 acres in area of which 450,210 acres were in farms in 1940. The 1940 Census reported 2,286 farms with

1. Numbers in parentheses refer to Literature Cited, page 36.

an average size of 192 acres (2). Fifty-one percent of the farms were tenant-operated, 35 percent were owner-operated, and 14 percent were part-owner or manager-operated. According to the 1940 Census the average value per acre of farm land and buildings was \$46. The population of Nemaha county in 1940 was 16,761, of which five-eighths lived on farms (2).

Following settlement of the county, the acreage of corn was increased rapidly and reached a peak of more than 210,000 acres in 1899 (3). During the next quarter century, the acreage declined, then increased for a few years; but after 1933 there was a sharp decline in acreage. The acreage of wheat expanded during World War I, then declined, and expanded during the years following 1934. There were no pronounced trends in the acreages of other crops excepting alfalfa. The peak acreage of alfalfa was 30,000 acres in 1919.

From 1875 to 1938 the yield of corn fluctuated widely from year to year, but the general trend was downward except for a period from 1912 to 1926. Cycles appear in the yields of wheat, but the yield has been on about the same level since 1875. The yield of oats declined until about 1900 and has been fairly stable since then. The downward trend in corn yields during the last ten years has been the result primarily of higher temperatures and lower rainfall.

There are cycles in the numbers of cattle and hogs in Nemaha county. The cycles for cattle are longer than are those for hogs. During the period 1910 to 1922 the number of hogs was at a low level, which was associated with low corn acreage during that period. With the exception of a sharp decrease in poultry numbers since 1925 and a decline in the number of horses and mules as the number of tractors increased after World War I, there have been no pronounced, long-time trends in the numbers of livestock. The development of the all-purpose tractor probably accounts for the sharp increase in the number of tractors since 1934.

After an increase from 1910 to 1920, the proportion of the farms operated by owners decreased, especially from 1930 to 1935. The percentage of the farms operated by tenants was slightly larger in 1940 than in any previous census year.

Annual data are available on land values from 1910 to 1930. The year 1921 marked the peak for the sales value of land. The assessed values of the land and buildings fluctuated less than the sales value of the land. The peak of the assessed land values was in 1920.

#### INVENTORY OF BASIC DATA

The data in the inventory of resources and conditions may be divided into three main groups: (1) Those contributing to an agronomic evaluation of physical land resources; (2) those revealing the nature and intensity of the present agriculture and related factors; and (3) those indicating relative success or failure of the agricultural economy.

TABLE 1.—Characteristics of land types. Nemaha county, Kansas.

Land type No.	Location.	Soil description.					Normal slope.	Erodability of cultivated soil.	
		Parent material.	Depth of surface soil.	Depth to lime carbonate horizon.	Dominant texture.*				Consistency of subsoil.
					Surface.	Subsoil.			
1	Upland.....	Loess.....	Inches 12-18	Inches 38+	SCL-CL	SC-C.....	Heavy.....	Less than 2.....	Slight
11	Upland.....	Loess.....	8-12	38+	SCL-CL	SC-C.....	Heavy.....	2-8.....	Moderate
2	Upland.....	Drift.....	6-10	None....	SCL-L	C (gritty)	Heavy.....	4-9.....	Moderate
21	Upland.....	Drift.....	6-10	None....	SCL-L	C (gritty)	Heavy.....	10-16.....	Severe
22	Upland.....	Drift.....	2-6	None....	SCL-L	C (gritty)	Heavy.....	More than 16..	Severe
23	Upland.....	Drift.....	10-12	18+	L-CL	L-SaCL...	Friable (locally heavy)...	4-9.....	Moderate
231	Upland.....	Drift.....	8-12	None....	L-CL	C-CL.....	Friable.....	4-9.....	Moderate
24	Upland.....	Drift.....	3-8	0-16....	L-CL	L-CL.....	Friable.....	10-16.....	Severe
25	Upland.....	Drift.....	3-8	0-16....	L-CL	L-CL.....	Friable.....	More than 16..	Severe
3	Upland.....	Limestone or shale.....	4-18	None....	SCL-CL	CL-C.....	Moderately heavy to heavy.	4-8.....	Moderate
31	Upland.....	Limestone or shale.....	4-8	None....	SCL-C	CL-C.....	Friable to mod. heavy....	10-16.....	Severe
32	Upland.....	Limestone or shale.....	4-8	None....	SCL-CL	CL (rock)	Friable to mod. heavy....	More than 16..	Severe
33	Upland.....	Sandstone.....	8-10	None....	FSaL-L	L-SaL.....	Very friable.....	8-14.....	Severe
4	Bottom.....	Alluvial.....	12-14	None....	SL-SCL	C-SCL.....	Moderately heavy.....	0-2.....	None
41	Bottom.....	Alluvial.....	12-18	None....	SL-CL	CL-SCL...	Friable to mod. heavy....	0-10.....	Slight sheet, severe gully.

\* S = silt; C = clay; L = loam; Sa = sandy; F = fine.

Physical Resources

**Identification of land types.**—The soil survey (4) used for this study is in the nature of a general land type survey (5). Although classed as a reconnaissance, it approximates a semidetained survey. Separations in this survey were made mainly on the basis of major characteristics significant to plant adaptation and farming practices. Soil characteristics were noted with respect to location (upland or bottom land), parent material, depth of surface soil, depth to lime carbonate horizon, dominant characteristics of surface soil and subsoil, and subsoil consistency. Degree of slope was noted and expressed in significant percentage intervals, and the degree of erosion which the soil had undergone was expressed in qualitative terms (Table 1).

**Agronomic evaluation of land types.**—An agronomic evaluation of the land types was made by field inspection. This inspection was made by a group of soil scientists, agronomists, and agricultural economists.<sup>2</sup> The agricultural extension agent and farmers of Nemaha county were consulted. The land type which would yield the highest under customary farming practices in the county was given a rating of 100 for the particular crop under consideration. Other land types were rated in terms of the percentage that would best express the ratio of the yielding capacity of the land under consideration to that given a rating of 100. Each land type was rated for each of the major crops grown in the area. The evaluations assigned are shown in Table 2.

TABLE 2.—*Evaluation of land types according to productive capacity. Nemaha county, Kansas.*

Land type.	Relative evaluation (100 = highest productive capacity for county).							
	Corn.	Wheat.	Oats.	Alfalfa.	Sorghum.	Red clover.	Sweet clover.	Native pasture.
1	90	100	100	85	90	100	90	100
11	80	90	90	75	80	85	85	85
2	60	65	70	50	65	60	70	60
21	20	30	35	20	25	20	40	45
22 <sup>1</sup>								40
2 31	35	35	40	25	50	20	50	40
23 <sup>1</sup>	60	50	60	50	65	50	90	60
24	50	40	50	35	60	30	60	50
25	25	25	30	15	25		50	50
3	75	70	75	80	90	90	100	100
31 <sup>1</sup>								75
32 <sup>1</sup>								80
33 <sup>1</sup>								55
4	100	80	75	100	100	90	90	100
41	90	65	65	90	90	85	85	85

1. Not evaluated for crops because of its low productive capacity.

2. W. H. Metzger, W. H. Pine, and Merton L. Otto of the Kansas Agricultural Experiment Station; H. N. Watenpaugh and J. R. Justice of the Bureau of Agricultural Economics, United States Department of Agriculture; and R. W. Eikleberry and Hermann Weber of the Soil Conservation Service.

TABLE 3.—*Relative productive capacity and farming practices for different land types.<sup>1</sup> Nemaha county, Kansas.*

Land type.	Productive capacity for all crops.	Desirable cropping systems from an agronomic standpoint.	Fertilizers and lime requirements.	Recommended erosion control practices.
4, 41	90	12 yrs.: Corn 2, oats, wheat, corn 2, oats, wheat, alfalfa 4. 6 yrs. or more: Corn 2, oats, wheat 2, sweet clover or alfalfa.	None.	No special practices except diversion ditches may be needed in some areas.
1	92	4 yrs.: Corn, oats, wheat, red clover or sweet clover. 3 yrs.: Corn, oats, sweet clover.	None—occasional exception.	None.
11	82	4 yrs.: Corn 2, oats, sweet clover. 3 yrs.: Corn (for silage), wheat, sweet clover.	Phosphorus—for wheat, oats, alfalfa, clover. Lime may be needed on some.	Contour, terracing when contour not sufficient. Sod—waterways.
2, 3	75	3 yrs.: Corn, oats, sweet clover. 3 yrs.: Wheat 2, sweet clover.	2—Phosphorus, lime on many. 3—Phosphorus, lime on some.	2—Contour, terracing. 3—Contour terracing. Sod—waterways where no terraces.
23	70	3 yrs.: Corn, oats, sweet clover. 3 yrs.: Wheat 2, sweet clover.	Phosphorus needed. No lime needed.	Contour, terracing where contour will not suffice. Sod—waterways where no terraces.
24	45	4 yrs.: Wheat 2, oats, sweet clover.	Phosphorus needed. No lime needed.	Contour, terracing; sod—waterways where no terraces.
231	35	4 yrs.: Wheat 2, oats, sweet clover. (Usually not desirable to crop).	No lime. Phosphorus for legumes.	Contour, terracing if needed.
21	30	4 yrs.: Wheat 2, oats, sweet clover.	Phosphorus; lime on some. Nitrogen for alfalfa.	Contour, terracing if needed.
25	25	3 yrs.: Oats or wheat, sweet clover with nurse crop, sweet clover.	None.	Contour, terrace, strip crop; sod—waterways.
22, 31, 32, 33.	0 <sup>2</sup>	None.	None.	Sod.

1. Prepared by W. H. Metzger, Kan. Agr. Exp. Sta.  
2. Not evaluated for crops.



FIG. 2.—Adaptation and production of crops vary for different land types. From top to bottom the pictures show corn in 1940 on poor upland, good upland, and good bottom land. Nemaha county, Kansas.

The general productivities of the land types were estimated on the basis of their productivity for individual crops, with the productivity rating for each crop (Table 2) weighted according to the frequency of occurrence in a desirable crop rotation considering soil, slope, and erosion conditions. These rotations and the estimated productive capacity for all crops for the several land types are presented in Table 3. For this purpose certain land types were grouped because of similarity in their agronomic adaptations and productivity indexes for the various crops.

**Estimates of crop yields by land types.**—For many purposes, especially for budget making, it is essential to have the yields of the various crops to be expected on the various land types rather than only relative productivity. These were obtained by first estimating the weighted average rating for the land types on which each crop was grown in 1939. A long-time average county yield as computed for each crop from data in the reports of the Kansas State Board of Agriculture was used for the average rating of the land types on which the crop was grown. The yields for each land type were determined by the use of the ratings in Table 2. The following is the formula used:

$$\frac{\text{Land type rating for the crop}}{\text{Weighted average rating for all land types used for the crop}} \times \text{Average county yield for crop} = \text{Average yield for land type}$$

For this purpose the land types were grouped. The ratings and yields for each group of land types are shown in Table 4.

TABLE 4.—Estimated productivity ratings and yields by groups of land types. Nemaha county, Kansas.

LAND TYPE.	Productivity rating, <sup>1</sup>						
	Wheat.	Corn.	Oats.	Grain sorghum.	Grain sorghum stever.	Sweet sorghum.	Alfalfa.
1, 11.....	91.6	81.9	91.7	81.8	81.8	81.8	77.0
2, 23, 3.....	62.1	60.7	68.7	66.5	66.5	66.5	51.5
21, 24.....	39.0	43.9	50.0	53.4	53.4	53.4	33.4
22, 231, 25, 31, 32, 33.....	17.8	26.1	25.5	46.0	46.0	46.0	13.3
4, 41.....	75.3	98.3	71.7	97.7	97.7	97.7	97.1
Weighted average.....	69.4	71.0	74.8	70.6	70.6	70.6	59.1

	Yield per acre <sup>2</sup>						
	Bu.	Bu.	Bu.	Bu.	Tons	Tons	Tons
1, 11.....	22.2	25.3	32.0	26.2	3.0	3.7	3.3
2, 23, 3.....	15.0	18.7	24.0	21.3	2.4	3.0	2.2
21, 24.....	9.4	13.5	17.3	17.1	2.0	2.4	1.4
22, 231, 25, 31, 32, 33.....	4.3	8.0	8.9	14.7	1.7	2.1	0.6
4, 41.....	18.2	30.3	25.0	31.1	3.6	4.4	4.1
Weighted average.....	16.8	21.9	26.1	22.6	2.6	3.2	2.5

1. Best land type for each crop was rated as 100. The average rating was obtained by estimating from a sample the proportion of the crop grown on each land type in 1939.  
 2. Computed by using a long-time average yield with the productivity ratings.

### Present Agriculture and Related Factors

**Physical land use.**—By means of field survey and records of the county Agricultural Conservation Program, data were collected and mapped showing the use of each tract of land. The crops for which data were recorded included wheat, oats, corn, alfalfa, sorghums, sweet clover, and red clover. In addition, idle and abandoned land, fallow land, permanent pasture, meadows, and woods and woodland pasture were recorded as one group. Crops such as cowpeas, flax, and millet were included in the miscellaneous group.

**Types of farming.**—The gross receipts by enterprise were computed from data on acreages of crops and numbers of livestock, and each farm was classified according to the dominance of the enterprises, based on receipts. Data on acreages of crops and numbers of livestock for 1938 were taken for each farm from the 1939 assessors' agricultural rolls. The feeds required for the livestock were deducted from the feed crops raised. The gross receipts were computed by multiplying the value per unit by the number of units for sale or family use for each crop and livestock enterprise. All of the receipts from the livestock enterprises were put together. The receipts from feed crops were combined whereas the receipts from the wheat enterprise were kept separate. On the basis of the sources of receipts, types of farming were determined. For example, if the livestock enterprises provided the largest part of the total receipts, the marketed feed crops the second largest part, and the wheat crop the smallest part, the farm was considered a livestock-feed-wheat farm. The prices used in estimating the receipts for determining type of farming were the average 1925-'34 Kansas farm prices.

**Size of operating units.**—The size of the operating unit was determined from the Agricultural Conservation Program records. The number of acres in all the tracts of land operated by one farmer was considered the unit.

**Tenancy.**—The name of the operator and tenure of each tract of land in 1939 were shown on a map prepared by the county committee of the Agricultural Conservation Program. By putting together those tracts, operated by the same person, the farm land was classified as owner-operated, part-owner operated, or tenant-operated. The part-owner operated farms are those units of which the operator owns part and rents part of the land.

**Related factors.**—Additional factors studied included tax load, market facilities, farm management practices (6), participation in programs administered by the Agricultural Adjustment Administration (7), and social communities (8).

### Indicators of Degree of Success

**Government emergency loans.**—During the last decade, emergency credit has been extended to some farm people in Nemaha county in the forms of emergency feed and seed loans by the Farm

Credit Administration and short-term loans by the Farm Security Administration. These loans were designed to aid individuals who were unable to get necessary credit through normal channels. Since these loans are evidences of distress, data of this nature are useful in the appraisal of success. The data showed the number of outstanding feed and seed loans which had been extended to each farm and the farms on which Farm Security Administration loans were current in 1939.<sup>3</sup>

**Financial condition of farm operators.**—Information showing land owned by lending agencies was obtained from county records. It was assumed that most of this land was foreclosed or the deed transferred because of the inability of the mortgagors to meet the loan obligations. The information obtained regarding loans included loans in process of foreclosure, loans delinquent, and loans in good standing, and the amount of the original loan.<sup>4</sup> For the purpose of this study, lands owned by lending agencies and lands in the process of foreclosure were combined into one class.

**Gross receipts.**—The gross receipts calculated in determining type of farming were used as the measure of income. Net income would have been a more satisfactory measure but it was not available.

**Condition of farmsteads.**—The condition of farmsteads has been considered in other studies as an indicator of the productivity of the land and the returns from farming (9). By field inspection the farmsteads in Nemaha county were classed as “good,” “fair,” “poor,” and “unoccupied” (4). The classification was based upon the size and condition of the buildings as follows:

“Good”—Adequate equipment, buildings, fences, etc., in well-kept condition.

“Fair”—Adequate buildings, equipment, etc., but not so well-kept as those of “good” classification.

“Poor”—Buildings, equipment, etc., showing lack of upkeep, and if they were to receive no more care in the future than in the past would be expected to deteriorate further.

“Unoccupied”—Not classified as to condition.

**Other indicators.**—Relief and assistance to families, tax delinquencies and local transportation facilities were studied. These indicators were not materially significant in Nemaha county. In some areas these factors, together with additional factors such as school facilities, recreational facilities, home improvement, and local government, may be of importance in area analysis. These latter factors were not considered in this study.

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3. Data were made available by local representatives of the Farm Credit Administration and Farm Security Administration.

4. Data concerning the condition of the Farm Credit Administration loans were made available by the Wichita office of the Farm Credit Administration.



FIG. 3.—Condition of the farmsteads is one indication of the capacity of an area to support people. Top to bottom: Good, poor, vacant. Nemaha county, Kansas, 1940.

**AGRICULTURAL AREAS IN NEMAHA COUNTY**

In determining desirable agricultural adjustments, the relationships existing between many agricultural factors must be considered. A convenient and effective measure in the determination of desirable adjustments is the delineation and description of agricultural areas. An agricultural area, as defined in this study, is a geographical area within which physical, economic, and social conditions are fairly homogeneous or there is a distinctive pattern of conditions.

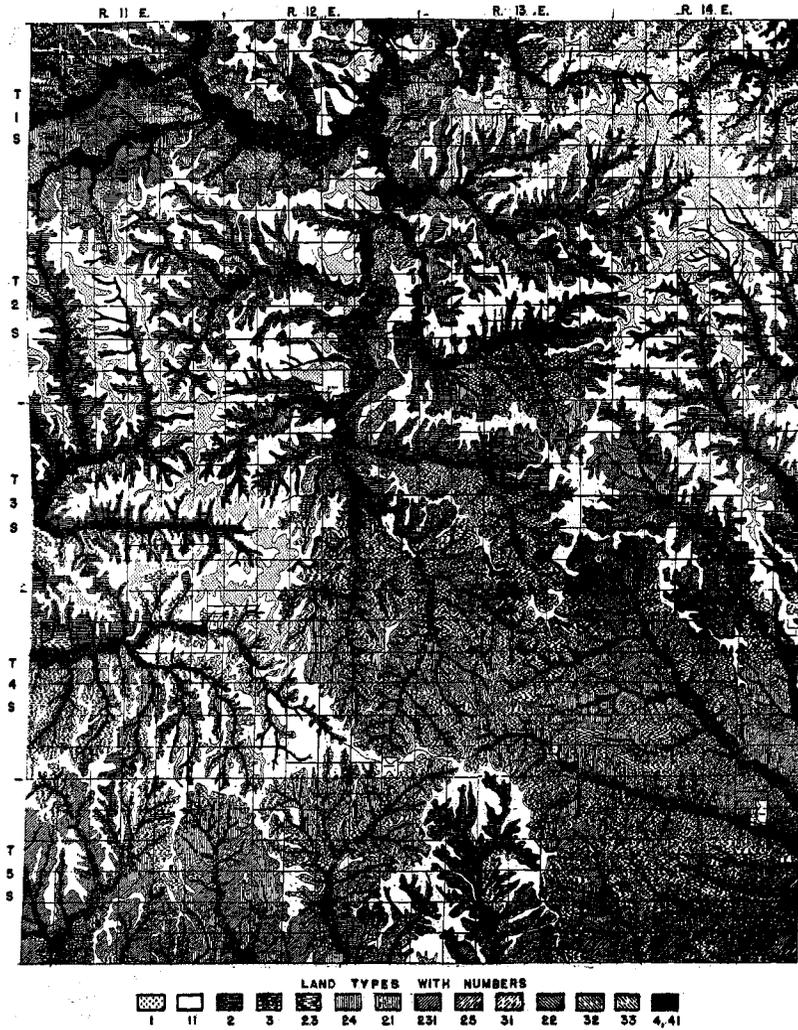


FIG. 4.—Land type map of Nemaha county, Kansas.

### Delineation of Areas

The delineation of agricultural areas in Nemaha county was accomplished by an "overlay" process, using primarily, the mapped land type, land use, size of farm, farm finance, and condition of farmstead data for the county. The remaining data investigated were used as secondary evidence in the delineation process.

The first step in delineating agricultural areas was the bounding of land-type association areas, which are groups of land types geographically associated in a given pattern or combination which

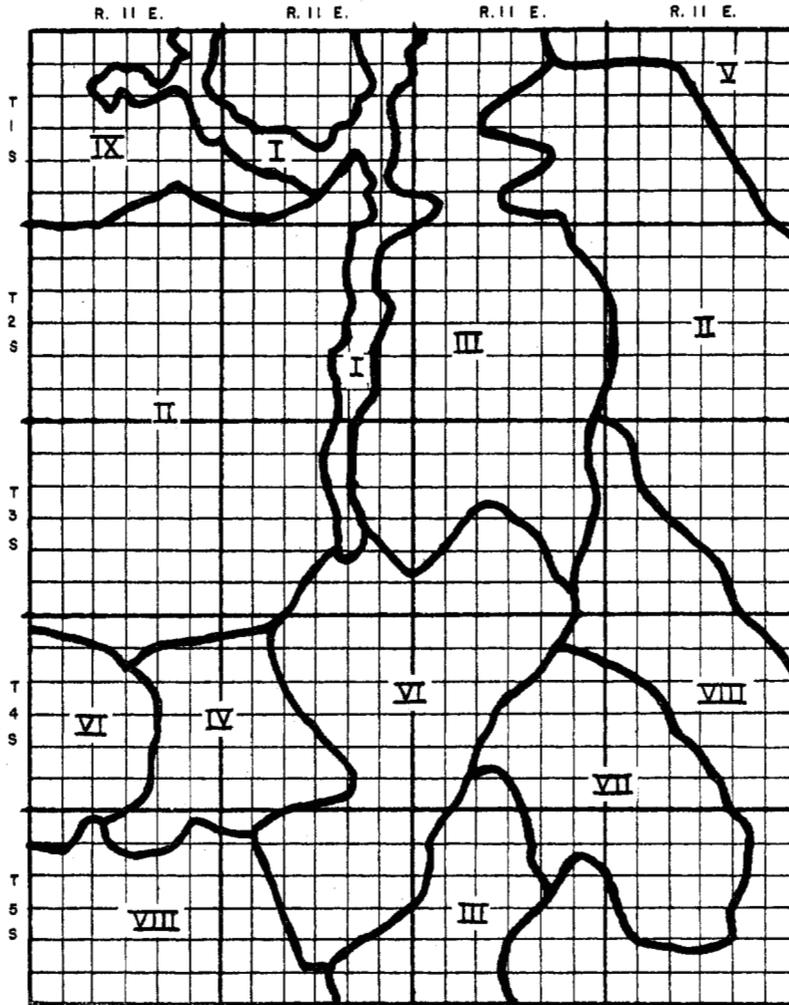


FIG. 5.—Land type association areas in Nemaha county, Kansas.

differs from other recognizable patterns or combinations. Nine recognizable land-type associations were delineated constituting 14 areas within the county. The land types and the preliminary land-type-association areas are shown in Figs. 4 and 5.

The next step was to transfer the boundary lines of the land-type-association areas to the physical land-use map and to add lines separating areas which differed in the proportion of the land used for crops. Any adjustments needed in the land-type-association areas, as revealed by the land-use data, were made. The areas delineated by a combination of the land-type and land-use maps were

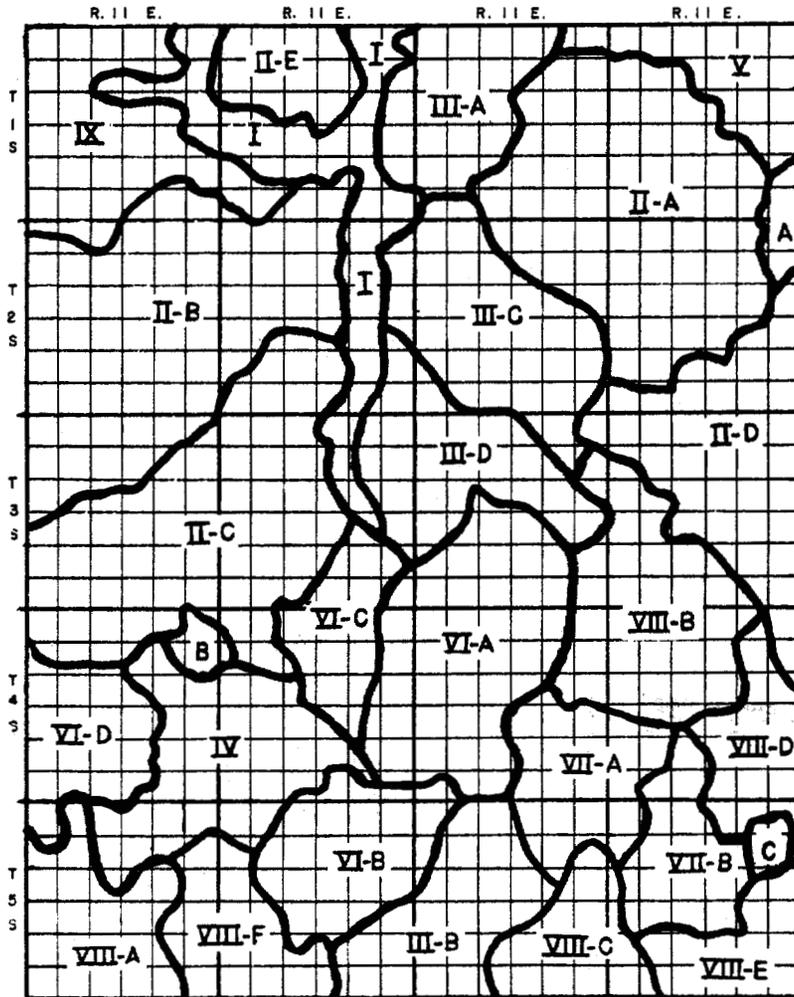


FIG. 6.—Agricultural areas in Nemaha county, Kansas.

then transferred to the size-of-farm map and, according to the process just described, additional lines were established on the basis of size of farm. In a similar manner, the delineated areas were transferred to the farm finance map and then to the map showing condition of farmsteads and the number of abandoned farmsteads, and the necessary additional boundaries were drawn. As with the preceding delineations, each line was reconsidered in relation to previous data used, especially the land-type information.

After examination of the remainder of the data, it was believed that the areas were, for the purposes of this study, satisfactorily delineated. The process may appear objective, but considerable judgment was exercised in drawing boundaries. The investigations did not provide an exact measurement of the relative importance of the various factors. Additional studies of this problem are needed. The author believes the method used is practical, particularly for planning committees.

The 25 agricultural areas as delineated in this study are shown in Fig. 6. In the final draft, consideration was given to farm-unit boundaries and natural land-type lines. Especially was this true along the bottom lands, as here the "breaks" may be associated with the bottom lands under some conditions and with the smoother uplands under other circumstances. Areas A, B, and C were delineated because of their adjacency to towns.

#### Description of Agricultural Areas

The data in the inventory were tabulated by agricultural areas for analytical purposes. Frequency distributions as well as averages were used for most factors to show the variations among and within the areas. To obtain a concise picture and to condense the data into one table for ease of analysis, the data were summarized by classes showing the differences between areas. In summarizing, the data for each area were arrayed, showing progressively the changing conditions between areas. The number of classes into which each set of data was divided depended upon the accuracy and upon a general determination of the value of the data to the analysis. This method of classifying involves considerable judgment; however, the procedure yields a reasonably sound basis for determining desirable adjustments. Where several factors were used in determining an index of adjustment, a small change in the classes for one factor did not materially affect the total index. The classes are important primarily to show relative position of the areas rather than the actual quantity for each area. It is believed to be a practical approach where a detailed analysis is not possible.

Comparisons of the areas and an index of present adjustment or degree of successful agriculture for each area are shown in Tables 5 and 6.

TABLE 5.—Comparison of agricultural areas with respect to the factors influencing economic success.<sup>1</sup> Nemaha county, Kansas.

AREA.	Pro-ductive capacity.	Inten-sity of cultiva-tion.	Farming enterprises.	Inten-sity of live-stock.	Size of farm distribu-tion.	Acres per oper-ating unit.	Ten-ancy.	Amount per acre of Federal Land Bank loans.	Land tax.
			Major Secondary Minor *						
I.....	1	3	L-F-w	2	1	2	2	3	2
II-A.....	1	1	L-F-w	2	2	3	2	1	3
II-B.....	1	1	F-L-W	5	2	3	2	2	3
II-C.....	1	1	F-L-W	5	3	5	3	2	3
II-D.....	1	1	F-L-W	5	5	5	4	2	2
II-E.....	2	3	L-W-F	3	1	3	1	5	2
III-A.....	2	1	L-F-W	2	2	4	3	3	3
III-B.....	1	2	F-L-w	5	4	4	3	4	3
III-C.....	2	2	F-L-W	5	4	3	3	3	3
III-D.....	2	1	F-L-w	5	3	2	3	3	3
IV.....	1	3	F-L-w	5	2	3	4	4	2
V.....	3	3	L-F-w	2	4	4	2	1	2
VI-A.....	3	1	F-L	4	2	1	3	4	2
VI-B.....	3	3	F-L	4	5	4	3	4	2
VI-C.....	3	2	F-L-w	5	4	4	4	4	2
VI-D.....	2	2	F-L-W	5	3	2	3	4	2
VII-A.....	4	2	L-F	1	5	4	2	5	3
VII-B.....	4	4	L-F	1	4	3	2	4	2
VIII-A.....	4	3	F-L-w	5	3	2	2	5	1
VIII-B.....	4	3	F-L-W	5	4	3	3	3	2
VIII-C.....	4	2	F-L-w	5	5	2	2	4	3
VIII-D.....	4	5	L	1	5	2	2	3	2
VIII-E.....	5	5	L	1	3	1	2	2	2
VIII-F.....	5	4	F-L	4	2	2	3	5	1
IX.....	4	3	F-W-L	6	1	2	1	4	1
Class "1" expresses	Highest	Highest		Highest	Larger size	Largest	Lowest	Highest	Lowest

1. For each factor except farming enterprises the areas were arrayed and then grouped into 3, 4, 5, or 6 classes. The highest number appearing in a column represents the number of classes for that factor.

2. L = livestock; F = feed; W = wheat; w = minor wheat enterprise.

AGRICULTURAL ADJUSTMENTS

TABLE 6.—Comparison of agricultural areas with respect to indicators of the economic success of the agriculture.<sup>1</sup> Nemaha county, Kansas.

AREA.	Erosion.	Idle land.	Gross receipts.	Government emergency loans.	Farm finance.	F. L. B. delinquencies.	Condition of farmstead.	Occupancy of farmstead.	Index.	
									Total.	Class.
I.....	1	1	1	1	2	1	2	1	10	1
II-A.....	1	1	1	1	2	1	1	1	9	1
II-B.....	1	1	1	1	1	2	1	1	9	1
II-C.....	1	1	2	1	2	1	2	2	12	2
II-D.....	2	1	2	2	2	1	4	1	15	3
II-E.....	2	1	2	2	1	1	2	1	12	2
III-A.....	2	1	1	1	2	1	2	1	11	1
III-B.....	2	2	2	3	3	1	3	1	17	3
III-C.....	2	2	2	2	2	1	4	2	17	3
III-D.....	2	1	1	2	2	2	3	1	14	2
IV.....	1	2	1	3	3	1	2	1	14	2
V.....	2	1	1	1	2	2	2	1	12	2
VI-A.....	2	1	1	1	2	1	2	2	12	2
VI-B.....	3	1	3	1	2	1	3	1	15	3
VI-C.....	3	2	2	3	4	1	4	2	21	5
VI-D.....	3	2	3	1	4	2	4	2	21	5
VII-A.....	3	2	3	2	3	1	3	1	18	4
VII-B.....	3	2	3	3	3	1	3	2	20	4
VIII-A.....	3	2	2	3	2	2	4	2	20	4
VIII-B.....	3	2	2	2	3	1	4	2	19	4
VIII-C.....	3	2	3	3	3	1	3	2	20	4
VIII-D.....	3	2	3	1	2	1	2	1	15	3
VIII-E.....	3	1	3	2	4	1	4	1	19	4
VIII-F.....	3	2	2	2	4	1	4	1	19	4
IX.....	3	1	3	3	2	2	4	1	19	4
Class "1" expresses	Least	Lowest	Highest	Lowest	Best	Least	Best	Highest		

1. For each indicator the areas were arrayed and then grouped into 2, 3, 4, or 5 classes. The highest number appearing in a column represents the number of classes for that indicator.

Two conditions are noticeable in the summarized data: First, that there is a general agreement among the individual factors measuring success and the index of success, but that no one factor was accurate enough to justify its use as a sole index; and second, that there was a lack of uniformity or relationship between factors influencing the agriculture, indicating different causes for the present degree of adjustment and land use in the separate areas. These differences among the areas furnish a basis for determining desirable adjustments for the various areas. A study of the data should, therefore, indicate the direction of adjustments and whether, under any one set of conditions, the primary adjustment should be one of physical, economic, or social nature or a combination of these.

The following descriptions give a more complete picture of the areas and differences among areas as determined by the factors shown in Tables 5 and 6. Tables 1 to 7 in the appendix show more detailed analyses and the summarized classes of some of the main factors by area.

**Land-type associations.**— In Nemaha county, a farm or an area is seldom composed of one land type. The proper use of the individual land type usually is dependent on an association of land types and the systems of farming giving significance to land-type associations. An analysis of Nemaha county agricultural areas indicated nine land-type associations of economic significance. The Roman numerals I to IX identify the land-type associations (Fig. 5).

**Land-type association I is composed primarily of bottom lands**— Land Types 4 and 41 (Table I in the appendix and Fig. 4)—which were sufficient in extent to permit most of the cropping on the farm to be concentrated on this land. While there is bottom land in other parts of the county, it is in bodies too small to warrant segregation. They have been treated in this report as integral parts of other associations or complexes in which one or more land types predominate.

Association II is made up primarily of large bodies of the more fertile land, Types I and II, of the county. Fairly large bodies of a less productive land type, No. 2, are also found, while only small bodies of some of the other land types (principally along stream channels) are included in this association.

Association III is composed chiefly of Land Types II and 2. It includes relatively little of the most fertile upland, Type I. There is a higher percentage of some of the other land types of lower productive capacity than is included in association II.

Association IV consists primarily of Land Type II with substantial bodies of Land Type 23 along the streams. Only a small portion of the association is of other land types.

Association V contains a high proportion of Land Type II. The remainder of the land consists of a fairly equal distribution of other land types (mostly Types 2, 3, 31, 32, and 4).

Association VI consists primarily of Land Type 23, which is of

medium productive capacity. Along the streams a considerable proportion of the less productive Type 24 is found.

Association VII is similar to association VI except that larger bodies of Type 24 and substantial areas of Type 25 occur along the drainage-ways.

Association VIII is composed principally of Land Type 231, which is characterized by low productive capacity for general cropping purposes. Also important in this association are Land Types 23 and 24.

Association IX has a fairly equal distribution of Land Types 2, 22, 4, and 24, with a small proportion of other land types. These groups of land types were subdivided into the agricultural areas based upon the similarity of the characteristics of the agriculture within each area.

**Productive capacity of the areas.**—The productivity of an area was determined by using the productivities of the land types (Table 3) weighted according to the acreage of these types in the area. The areas were grouped according to five degrees or classes of productivity. Class I indicates areas with the highest productive capacity (Table 1, Appendix). The productive capacity of two or more agricultural areas may be about the same even though the land-type associations are different. This is due to the differences in the proportion of the land types in the areas.

**Intensity of cultivation.**—The percentage of land used for crops varied from 79 percent for Area II-A to 37 percent for Area VIII-D (Table 2, Appendix.) For purposes of summarization, the areas were placed in six classes according to the percentage of land in cultivation, Class 1 being composed of areas with the most cultivated land. In general, the areas may be further characterized as follows:

- Class 1.—Nearly all the native pasture and woodland lie along the stream channels; more than 75 percent of the land is under cultivation.
- Class 2.—A small acreage of native pasture and woodland is away from the stream channels, the stream channels being more frequent; between 65 and 75 percent of the land is under cultivation.
- Classes 3 and 4.—More of the land between stream channels was in pasture than in Class 2; consequently, less land was in cultivation.
- Class 5.—Less than 45 percent of the land was cultivated and large bodies of upland were in native pasture.

**Enterprises and intensity of livestock production.**—The identification of predominant types of enterprises for each agricultural area was based on type-of-farming information supplemented by other data such as actual crop acreages, commodity loans, and the personal knowledge of competent observers within the county. For each area the predominating enterprise was listed first. The enterprises were grouped into three classes: Livestock, feed crops, and wheat. Accordingly, the areas in Nemaha county were grouped into six classes, Class 1 being used to indicate the highest degree of livestock production. Area IX placed the most emphasis on the

production of cash feed crops and wheat while in Areas VIII-D and VIII-E livestock was emphasized the most (Table 3, Appendix).

**Size-of-farm distribution and acres per operating unit.—**

The size-of-farm distribution is significant in that it more nearly expresses the actual condition under which the area was operated whereas the average size, taken alone, might be misleading. The average size, however, is significant in that it indicates the possibilities for adjustments in the number of operating units in an area. In this study, Class 1 indicated areas in which there was a large proportion of farms in the larger-sized groups. Class 5 had the largest proportion in the smaller size groups. The range in average size of farm for the areas was from 145 acres in Area II-D to 250 acres in Area VIII-E (Table 4, Appendix).

**Other related factors.—**The agricultural areas varied in the percentage of units operated by tenants from 28 percent for Area II-E to 65 percent for Area VI-C. Area II-A had the highest average Federal Land Bank loan per acre, \$64 and Area VII-A had the lowest, \$29 per acre. The range in tax per acre on land alone varied from 40 cents in Area IX to 72 cents in Area III-C. In a summary of these data, the areas were placed into four classes for tenancy, the areas with the least tenancy expressed as Class 1; four classes for Federal Land Bank loans, with Class 1 being those areas with the lower percentage of units with higher loans to the acre; and three classes for land tax per acre, those areas in Class 1 having the lower tax.

**Index of present success.—**The index of present success is an expression of the relative stability of the prevalent system of agriculture in an area. The relative weight given to the various factors affecting the index is shown by the number of grade classes into which they are classified. Farm finance and condition of farmsteads were considered as important factors and the areas were placed in four classes. Area II-B had only 3.7 percent of the operating units with serious farm finance difficulties and was placed in Class 1, while Area VIII-E had 32.4 percent of the operating units with farm finance difficulties and was placed in Class 4 (Table 5, Appendix). Area II-A had 34, 36, and 21 percent of the farmsteads classed as good, fair, and poor, respectively, and was placed in Class 1, whereas Areas VIII-A, VIII-B, VIII-E, VIII-F, and IX had more than 50 percent of the farmsteads classed as poor and were placed in Class 4 (Table 6, Appendix). For gross receipts, government emergency loans, and erosion, the areas were placed in three classes; for idle land, land bank loan delinquencies, and occupancy of farmsteads (idle houses), into two classes.

The index of present adjustment given in Table 6 is a summation of the various indexes for the individual factors. The spread was from 9 for Areas II-A and II-B to 21 for Areas VI-C and VI-D. Examination of the data showed that the areas could be placed in five significant classes, Class 1 indicating the areas in best adjustment.

TABLE 7.—Recent and desirable trends in the agriculture of Nemaha county, Kansas.

AREA.	Type of farming <sup>1</sup> (farming enterprises).		Acres per farm, 1939. <sup>3</sup>	Number of farms.		Intensity of cultivation.	
	1938. <sup>2</sup>	Desirable trend.		1939. <sup>3</sup>	Desirable trend. <sup>4</sup>	Percentage of land cultivated <sup>5</sup>	Desirable trend. <sup>4</sup>
I.....	L-F-w	L-f-w	221	85	+	62	SC+
II-A.....	L-F-W	L-w-f	201	200	+	81	SC
II-B.....	F-L-W	L-w-f	198	219	+	78	SC
II-C.....	F-L-W	L-w-f	151	228	—	80	SC
II-D.....	F-L-W	L-w-f	145	170	—	77	SC
II-E.....	L-W-F	L-w-f	187	42	SC+	61	+
III-A.....	F-L-W	L-w-f	175	77	SC+	78	SC
III-B.....	F-L-w	L-w-f	171	93	SC	69	SC+
III-C.....	F-L-W	L-w-f	191	116	SC+	71	SC+
III-D.....	F-L-w	L-w-f	214	72	SC+	75	SC
IV.....	F-L-w	L-f-w	206	111	SC+	68	+
V.....	L-F-w	L-w-f	184	56	SC	64	SC
VI-A.....	F-L	L-w-f	240	101	+	75	SC—
VI-B.....	F-L	L-w-f	167	77	—	61	SC+
VI-C.....	F-L-w	L-w-f	181	56	—	74	—
VI-D.....	F-L-W	L-w-f	212	49	SC	68	SC
VII-A.....	L-F	L	171	80	—	67	—
VII-B.....	L-F	L	195	53	SC—	51	SC
VIII-A.....	F-L-w	L	212	64	—SC	59	—SC
VIII-B.....	F-L-W	L	207	105	—SC	62	—
VIII-C.....	F-L-w	L	189	56	—	67	—
VIII-D.....	L	L	227	45	SC	42	SC—
VIII-E.....	L	L	250	34	SC	42	SC—
VIII-F.....	F-L	L	231	47	—	54	—SC
IX.....	F-W-L	L	233	83	SC	55	—

1. L = livestock; F = feed crops; W = wheat; w = minor wheat enterprise; f = minor feed-crop enterprise.

2. Numbers of livestock were comparatively low and acreage of wheat was exceptionally high in 1938.

3. Computed from operating units map.

4. Plus (+) = more; minus (—) = less; SC = slight change if any; SC+ = slight change to more, etc.

5. Computed from physical land-use map and includes idle plowed land.

## SUGGESTED AGRICULTURAL ADJUSTMENTS

### Determination of the Adjustments

The process of determining the adjustments or desirable trends for each area consisted of two parts: First, the area or group of areas under consideration was compared to the other areas with respect to the resources, the ways in which the resources were used, and the factors which indicate the present success of the system of agriculture. The data in Tables 5 and 6, with the more detailed information in the tables (Tables 1 to 7, Appendix, for the more important items) from which Tables 5 and 6 were made, were used for this purpose. If two areas had similar resources but utilized them differently in its agriculture, it was considered desirable to adjust the agriculture of the less successful area to conform more closely with that of the more successful.

The second part of the process of determining adjustments consisted of the preparation of budgets for systems of farming which might be used in each area. A farm budget shows the crops and livestock to be grown, the estimated production and requirements for the crops and livestock, and the estimated receipts and expenses. By preparing several budgets, it is possible to compare the net incomes for different systems of farming and for different sizes of farms. The crop yields used in the budgets are shown in Table 4. Most of the other information used is contained in Tables 9 to 12, Appendix. The summaries of two budgets for 320-acre farms in Area VIII-D are shown in Table 13, Appendix. These summaries show the nature of the farm budgets as an aid in determining adjustments.

The desirable adjustments or trends are shown in summary form in Tables 7 and 8. The following discussions, by areas or groups of areas, give the reasons for these recommendations.

### Adjustments

In this analysis it was not attempted to determine the agricultural adjustments and policies of each farmer or for each parcel of land. The farmer's capabilities and the facilities will, to a large extent, determine his proper farm organization. It is believed, however, that the total of the individual patterns should conform to those suggested for the area.

**Agricultural Area I.**—Table 6 shows no significant evidence of maladjustment in Area I excepting for the factors of farm finance and condition of farmsteads and, for these, Area I ranks in the next to the best class. It may be assumed that the resources as now utilized are capable of supporting at least the present population in a satisfactory manner.

While the land types differ, Area I having largely bottom land, the productive capacity of the soil of Area I is slightly higher than for III-A. The two areas have about the same index of adjustment,

TABLE 8.—Desirable use of each land type in Nemaha county, Kansas.

Land types.	If present use is for	Areas in which the use should be for <sup>1</sup>		
		Crops.	Pasture.	Optional. <sup>2</sup>
4 and 41	Crops	All areas		
	Pasture		All areas but I, II-B, VIII-E	I, II-D, VIII-E
1, 11, and 2	Crops	All areas		
	Pasture	All areas		
23	Crops	All areas		
	Pasture	VIII-A, VIII-B, VIII-C	I, II-B, II-C, II-D	All other areas
3	Crops	All areas except I	I	I
	Pasture	VIII-A, VIII-C	II-B, III-C, VIII-D, VIII-F, IX	All other areas
24	Crops	VI-B, VI-D, VII-B, VIII-A	All areas	All other areas
	Pasture		All areas	All areas
21	Crops			
	Pasture			
231	Crops	VI-B, VI-D, VII-B, VIII-D, VIII-E, VIII-F	All areas but VII-B, VIII-A	All other areas
	Pasture		All areas	VII-B, VIII-A
22, 25, 31, 32, 33	Crops		All areas	
	Pasture		All areas	

1. There are some areas in which some of the land types do not occur. See Table 1, Appendix.  
 2. Use dependent upon characteristics of the individual farm and farmer.

yet Area III-A has smaller farms. The average labor income<sup>5</sup> for three budgets prepared for 160-acre farms in Area I was \$791. Considering \$800 as a minimum desirable labor income for a farm family, an average of 160 acres or slightly more would be sufficient under average management. The average cash expenditure for 127 Kansas farm families in 1939 was \$792 (10). The average size of farm in Area I was 221 acres. These facts indicate that the land-man ratio in Area I is more than ample to furnish an average income of \$800 for its families.

In 1938 the farmers in Area I received the major proportion of their incomes from livestock enterprises. In comparison to the other areas, this appears to be desirable. A wheat enterprise was included in only one of the farm budgets and in this case the labor income was the lowest. A budget was not prepared for a cash-crop farm in Area I, but in other areas those budgets in which cash crops, particularly feed crops, were included had comparatively low labor incomes. In most areas the wheat enterprise was desirable in the farm organization from the standpoint of rotations. Also, in most areas the budgets which included cattle had a higher labor income than those including hogs; however, the hog enterprise compared as favorably with cattle in Area I as in any area. Sales of feed crops and wheat should be of minor importance in Area I.

In deciding which land types should be cultivated and which should be used for pasture or other purposes, it was necessary to recognize the influence of the farm layout, the size of the area of a land type, its relation to other land types, and requirements in the farm organization. In Area I, Land Types 1, 11 and 2 were cultivated for the most part (Table 8, Appendix). A little less than two-thirds of Types 4 and 41 was cultivated. Timber occupied a large part of the remainder of these two types. Since land bodies of Types 4 and 41 were large in Area I, it has been possible to cultivate a larger part of the land of these types than in other areas. The land of the other types comprised a small part of the area and usually should be used for pasture. About 15 percent of Land Types 25 and 33 which had been cultivated at one time was idle in 1939. This indicates the unsuitability of these types for crops.

Because of a comparatively high percentage of Land Types 4 and 41 in Area I in woodland, there probably will and can be a gradual clearing of some of the timber land. This land is optional for cultivation (dependent on the individual characteristics of the farm unit and operator). With this slight increase and with Types 1, 11, and 2 recommended for cultivation, the rest of the land in the area could be in pasture and yet maintain the present acreage of cultivated land. It appears that all of the land of Types 22, 25, 31, 32, and 33 should be in pasture and the present crop land of Types 3, 24, 21, and 231 be optional. With these recommendations

5. Labor income is the net return to the farm operator for his labor and management above the value of farm products used in the home. Interest on the total investment is included in the expenses and all labor requirements above 3,000 man hours per year are included in the expenses.

for Area I, there would be a slight increase in the proportion of the land in cultivation.

**Areas II-A, II-B II-C, and II-D.**—The productive capacities of Areas II-A, II-B II-C, and II-D were about equal. They differed, however, in the character of agriculture and degree of success attained (Tables 5 and 6). The condition of the farmsteads was not so good and the gross receipts were lower in Areas II-C and II-D than in Areas II-A and II-B. Also, farmers of Area II-D had used more government emergency loans. The farms in Areas II-C and II-D were much smaller in size than in the other two areas, averaging 151 and 145 acres, respectively. The farm budgets for the 160-acre farms in these areas averaged \$804 labor income. These observations indicate that conditions in Areas II-C and II-D could be improved by decreasing the number of farms and correspondingly increasing the average size of farm. Observation that Area III-A with lower productive capacity had smaller farms and was nearly as successful as Areas II-A and II-B leads to the conclusion that a better use might be made of the resources of II-A and II-B.

The type of farming in Area II-A had emphasized livestock but in the other three areas feed crops were a more important source of income in 1938. Comparison of Areas II-A and II-B shows that either type of farming is satisfactory. An examination of the budgets prepared for these areas shows that the emphasis should be on marketing the feed crops through livestock.

Tenancy is greater in Areas II-C and II-D than in Areas II-A and II-B and may be a contributing factor to the existing condition of the agriculture. However, there was no apparent relationship between tenancy and the degree of success as measured in this study. Land Types 4 and 41 were not being used so intensively in Area II-D as in the other three areas. Some of the poorer land types were being cultivated more intensively. Some adjustment for these types appears to be advantageous. In these areas, as well as all other areas in the county, it appears that virtually 100 percent of Types 1, 11, and 2 should be cultivated. Most of Land Type 3 could be cultivated; that which is in pasture is optional. The present crop land on Types 21, 24, and 231 is optional. These types are being used for both crops and pasture with about equal success (Table 8, Appendix).

**Area II-E.**—Like Area I, Area II-E can best be compared with Area III-A for suggested changes in the agriculture. In these two areas the systems of agriculture have been used with about equal success as indicated by the index of adjustment. The farmers in Area II-E have emphasized wheat more than in Area III-A and were cultivating a smaller percentage of the land. They probably have succeeded by operating larger farms. It appears from this that equal success could be attained with smaller farms by cultivating more of the land and using it for feed crops to be fed to livestock. The budgets for this area indicated that, with the present proportion of the land cultivated, a farm of nearly 200 acres would

be needed to obtain a labor income of \$800. The present average size is 187 acres. With an increase in the percentage of land cultivated, the size could be reduced slightly. The greatest change needed is to place more emphasis on livestock production.

Land Types 4 and 41, 11, 2, and 3 are not so intensively cultivated in Area II-E as in III-A (Table 8, Appendix). Land Types II and 2 are not wooded, and indications are that the land now in permanent pasture could be used profitably for feed crop production either to improve the condition of those farmers in the area or to support more farm families. The pasture of Type 3 could be used for either crops or pasture. Aside from these land types, the remainder of the land in the areas is of much lower productive capacity and subject to moderate to severe erosion when cultivated (21, 22, 31, 32, and 33). These poorer land types apparently have been utilized with success as permanent pasture. Since they are subject to severe erosion, their best use probably is as permanent pasture.

**Areas III-A, III-B, III-C, and III-D.**—The index of adjustment (Table 6) indicates that Area III-A was in the best condition of these four areas. In this area the farmsteads were in better condition and there were fewer government emergency loans. A larger percentage of farm land in Area III-A was cultivated than in Areas III-B and III-C. Livestock was a more important source of income in Area III-A than in the other three areas. While the average number of acres per farm was about the same in Area III-A as in Area III-B there was a larger proportion of the farms with larger acreages than in Areas III-B and III-C. Area III-D had the largest average acreage per farm.

The foregoing statements indicate that conditions in Areas III-B and III-C could be improved by cultivating more of the better farmland and producing more livestock. The farm budgets indicate that for all four areas 160 acres is sufficient to obtain a labor income of \$800. Producing livestock, particularly summer feeding or the deferred feeding of cattle, a combination of sheep and wheat, or dairying would provide such an income. By increasing the production of livestock, Area III-D could support a few more farms or the incomes of those farmers in the area could be increased.

The increase in cultivated land in Areas III-B and III-C should come primarily from the pasture land of Land Types 3 and 23. Because of the physical characteristics of these land types, soil conservation measures will need to be practiced.

**Area IV.**—Area IV has a productive capacity equal to that of Area II-B. The index of adjustment indicated a lower degree of successful agriculture, the difference being the greater number of government emergency loans and poorer condition of farm finance. The main difference in the agriculture was that a smaller proportion of the area was being cultivated than in Area II-B. Probably success equal to that in Area II-B could be attained by cultivating a larger part of the area. The farm budgets for Area IV indicated that the same adjustments could be made as for Area II-B—more

farms or higher incomes for the existing farmers—but in either case more emphasis should be given to livestock production. It appears that some improvements might be obtained if tenancy could be reduced.

Land Types 11 and 2 could be utilized more intensively, as in Area II-B. Because it usually is adjacent to the better land types, more of Land Type 23 probably could be cultivated. Under soil conservation practices, the pasture land of Type 23 is optional. The crop land of Types 24, 21, and 231 also is optional pasture or crop land, according to the needs of the individual farm for pasture or crops. These three types comprise a small part of the area and are not needed for crop land.

**Area V.**—While Area V was not in the best index class of adjustment, there were no indications of serious maladjustments. Area VI-A is the only other area with the same productive capacity and it had the same index of adjustment. The farms were larger and livestock was relatively less important in Area VI-A than in Area V. The farm budgets indicated that, with emphasis on livestock, a farm of 180 to 200 acres would provide a reasonable income under fair management. It appears that little change is needed in Area V. Probably more of Land Type 3 and less of Land Type 21 should be used for crops.

**Areas VI-A, VI-B, VI-C, and VI-D.**—Areas VI-A, VI-B, and VI-C have the same productive capacities but that of VI-D is slightly higher. They differ widely in the successful use of the resources. Of these areas, VI-A has the highest index of adjustment. A comparison with Area V indicates that there could be more farms in Area VI-A provided there were more livestock and less of the land cultivated. The budgets indicated that this change was desirable. By using Area VI-A as a basis, it appears that in Area VI-B the average number of acres per farm should be larger, with greater emphasis on livestock and possibly a slight increase in the percentage of cultivated land. The change for Area VI-C should also be to larger farms on the average, more livestock, and less of the land cultivated. Much greater emphasis on livestock is the principal need for Area VI-D.

Land Types 24 and 231 have been cultivated more intensively in Areas VI-A and VI-C than in the other two areas. It would be an improvement if less of the land of these types were in cultivation.

**Areas VII-A and VII-B.**—These areas have attained about the same degree of success with about the same resources. The land in Area VII-B was cultivated to a lesser extent, and the farms averaged slightly larger than in Area VII-A. In Area VIII-D, which had the same productive capacity as these two areas, the resources were used more successfully with less of the land cultivated and a larger average size of farm. The farm budgets showed that at least a 200-acre farm would be needed to provide a labor income of \$800. The conditions in both areas, particularly VII-A, might be improved by decreasing the number of farms. It appears that less of the land

in Area VII-A should be cultivated. A large part of the Land Types 24 and 231 was cultivated in Area VII-A. Some of this land should be returned to pasture.

**Areas VIII-A, VIII-B, VIII-C, VIII-D, VIII-E, and VIII-F.**—Areas VIII-E and VIII-F have the lowest productive capacities of any of the areas in the county. Of the six areas, Area VIII-D was used most successfully. Area VIII-D was an intensive livestock area with a large percentage of land in pasture and the average size of farm was 227 acres. Areas VIII-A and VIII-B could be improved by increasing the average size of farm, reducing the percentage of cultivated land, and increasing the number of livestock. The budgets indicate that a farm of approximately 240 acres is needed in these two areas. Producing cattle—which use considerable roughage and pasture along with some grain—dairying, or a combination of sheep and wheat appear to be good farm organizations for Areas VIII-A and VIII-B.

The changes in Area VIII-C should be similar to those in Areas VIII-A and VIII-B but should be more pronounced. A large percentage of some of the poorer land types was cultivated in Area VIII-C. This land should be in pasture.

It is difficult to find from the available data an indication of needed changes for Area VIII-E. The budgets indicated that with the present average size of farm and type of farming there would be a fair income to the usual farm family. The conditions in Area VIII-F probably would be improved by increasing the average size of farm, cultivating less of the poorer land types, and by increasing the number of livestock.

More of Land Type 23 probably should be cultivated in all six areas. In Areas VIII-A, VIII-B, and VIII-C Land Types 24 and 231 probably should be used less intensively. In Areas VIII-E and VIII-F the poorest crop land on Type 24 probably should be returned to pasture.

**Area IX.**—In this area the productive capacity of the resources was about the same as for Area VIII-D, but they were not used so successfully. A larger part was cultivated in Area IX than in Area VIII-D, and in 1938 livestock was the least important source of income. More pasture and feed crops and more livestock are needed in this area. Less of Land Types 24 and 21 should be cultivated.

#### Summary of Adjustments

**Type of farming.**—Livestock should provide the major part of the farm income throughout the county. In the areas with the higher productive capacity a small part of the income may come from the sale of wheat or feed crops. In the other areas there may be some income from wheat because of desirable rotations on the poorer land types. If the farmers followed the farm organizations included in 101 budgets prepared for the county, the greatest proportion of the gross receipts would be from livestock (Table 9). The estimated numbers of the livestock on the farms, if the budgets were

TABLE 9.—Estimated desirable percentage distribution of the gross receipts according to source for Nemaha county, Kansas (based on 101 farm budgets).

SOURCE.	Percent.	SOURCE.	Percent.
Wheat.....	7.6	Beef cattle.....	34.6
Corn.....	0.9	Dairying.....	18.8
Oats.....	0.5	Sheep.....	7.3
Alfalfa.....	2.6	Hogs.....	16.2
Other crops.....	0.5	Poultry.....	8.9
Man and horse labor.....	2.1	Total.....	100.0

TABLE 10.—Estimated desirable numbers of livestock for Nemaha county, Kansas (based on 101 farm budgets).<sup>1</sup>

KIND OF LIVESTOCK.	Number.
Horses.....	8,532
Dairy cows.....	15,493
Beef Cows.....	5,158
Winter-fed calves and yearlings.....	3,328
Deferred-fed steers.....	15,530
Wintered and fed steers and heifers.....	12,791
Wintered calves.....	17,543
Wintered and grazed steers.....	820
Ewes.....	43,699
Sows.....	7,196
Hens.....	287,506

1. Comparable data for 1939 or any other year were not available.

followed, are shown in Table 10. As compared with 1939, there would be decreases in the acreages of wheat and corn and increases in the acreages of oats, sorghums, and legumes (Table 11).

The trend in types of farming in Nemaha county since 1938 appears to be in a desirable direction. The acreages of wheat and sorghums were unusually large and the numbers of livestock unusually small in 1938. Prior to 1938, livestock had been more important, and recent data show that numbers of livestock have increased since 1938.

There may be some years when price relationships will be such that cash-crop farming would be more profitable than producing livestock. Also, there are farms and farm operators who would be more successful with cash crops. However, this will not occur often. In general, it will pay to feed the crops raised and raise the crops needed for feed.

TABLE 11.—*Estimated desirable percentage distribution of the crop land according to use for Nemaha county, Kansas.*

CROP.	Percent.	
	1939.	Based on 101 farm budgets.
Wheat.....	21.7	16.4
Corn.....	43.7	30.7
Oats.....	6.4	17.3 <sup>1</sup>
Grain sorghums.....	4.0	4.5
Sweet sorghums.....		3.7
Alfalfa.....	8.7	12.1
Sweet clover.....	5.5	11.5
Other crops.....	10.0	3.8
Totals.....	100.0	100.0

1. Oats were included in most of the rotations (Table 3).

**Number of farms.**—Variations in the managerial ability of farmers and in the sizes of farm families are important factors accounting for variations in sizes of farms. Because this will continue to be true, it is not recommended that all farms in an area have the same number of acres. Each area is not entirely homogeneous and for this reason, also, there should exist farms with different acreages. A decrease in the number of farms does not necessarily mean a decrease in the number of people the area will support. Some of the farms may need to be combined and one farmer become the employee of another. In the areas where the number of farms may be increased, farm employees may become farm operators.

In those areas where the productive capacity is relatively high, the 160-acre farm or slightly larger would provide a labor income of \$800 under average management. In most of the Areas from VI-B to IX there probably should be fewer farms with some increase in the sizes of the farms. The farms in these areas, in general, are larger than in the other areas. Under average conditions a farm of 200 to 240 acres would be needed, possibly 280 acres in Areas VIII-E and VIII-F.

**Intensity of land use.**—The proportion of the farm land that should be used for crops varies from 40 percent in those areas which are composed primarily of the less productive land types to 80 percent in those areas with the best land types. This means that in most of the better areas there could be an increase in the proportion of the farm land used as crop land and that some of the crop land in the areas with the less productive land types should be returned to pasture.

In Nemaha county there are no large tracts of land which should be retired from agricultural production. There are small areas which might serve man best if converted into lakes, recreational areas, game refuges, or to timber. In a county such as Nemaha the intensity of use refers to intensity of use for agricultural purposes.

**Uses of land types.**—It may be well to repeat that the actual use of a tract of a certain land type depends upon, and also affects, the size and type of farm, the desirable intensity of cultivation, the layout of the farm, and other factors. In an area where all of the land is cultivatable from a physical standpoint, the need for pasture in the farm organization may cause part of it to be used for pasture. However, temporary pasture on crop land may prove more profitable than permanent pasture.

In Nemaha county the land of Types 1, 11, and 2 should be cultivated as fully as possible (Table 8). All of Land Types 22, 25, 31, 32, and 33 should be in permanent pasture. The land of Types 4 and 41 should be used approximately as it was in 1939. The pasture land of Types 21, 24, and 231 should remain as pasture. The crop land of these three types and the pasture land of Types 3 and 23 are optional for cultivation in most of the areas. The crop land of Types 3 and 23 should be used for crops. The less productive land types became important for crops only when it predominated in an area. If the better types were available for crops, the less productive would be used for pasture.

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TABLE 1.—Percentage distribution of the land according to groups of land types, the relative productive capacity, and productivity class for each area, 1939. Nemaha county, Kansas.

AREA.	Total acres.	Land type. <sup>1</sup>								Fertility index.	
		4 and 41.	1 and 11.	2 and 3.	23.	24.	231.	21, 25, and 31.	22, 32, and 33.	Relative productive capacity. <sup>2</sup>	Relative productivity class.
		<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>		
I.....	18,781	61.5	9.8	10.5	1.9	1.9	1.5	5.7	7.2	77.5	1
II-A.....	40,188	11.7	58.5	25.5	0.4	0.4	.....	2.6	1.3	80.6	1
II-B.....	43,324	16.4	46.7	30.4	0.8	0.5	.....	4.1	1.1	79.3	1
II-C.....	39,390	14.1	49.5	24.8	8.1	1.1	.....	2.1	0.3	80.1	1
II-D.....	24,664	14.8	42.4	35.3	1.1	1.6	1.6	2.5	0.7	78.6	1
II-E.....	7,850	8.2	38.3	35.6	.....	.....	.....	11.2	6.7	71.2	2
III-A.....	13,495	16.4	27.2	39.2	0.5	.....	.....	7.0	9.7	71.7	2
III-B.....	15,914	16.6	35.9	33.4	7.1	1.7	1.9	3.4	.....	77.7	1
III-C.....	22,119	17.7	25.0	29.3	11.4	9.2	0.6	3.8	3.0	73.2	2
III-D.....	15,383	13.4	27.6	38.6	7.4	5.6	0.6	6.8	.....	74.1	2
IV.....	22,855	12.5	48.4	7.6	26.2	4.1	0.6	0.6	.....	78.7	1
V.....	10,295	13.0	30.0	29.5	.....	.....	.....	16.1	11.4	66.2	2
VI-A.....	24,280	14.6	2.1	5.7	43.7	21.8	5.6	6.5	.....	63.2	3
VI-B.....	12,854	18.9	16.6	2.0	31.5	24.1	1.8	5.1	.....	67.4	3
VI-C.....	10,144	16.8	5.3	3.2	39.9	21.3	0.7	12.8	.....	63.0	3
VI-D.....	10,393	22.1	17.3	1.7	37.0	12.5	2.0	7.4	.....	69.9	2
VII-A.....	13,650	17.7	1.2	.....	34.8	26.3	5.1	14.9	.....	58.6	4
VII-B.....	10,312	18.8	.....	.....	38.7	15.5	4.6	22.4	.....	58.2	4
VIII-A.....	13,577	20.4	16.8	3.4	8.9	2.4	45.4	0.4	2.3	59.0	4
VIII-B.....	21,683	16.3	10.9	7.9	10.7	19.6	29.6	5.0	.....	57.8	4
VIII-C.....	10,111	17.4	7.3	6.2	27.9	7.5	32.4	1.3	.....	61.1	4
VIII-D.....	10,211	24.6	3.6	5.6	19.2	17.5	13.7	15.8	.....	59.4	4
VIII-E.....	8,497	15.9	.....	.....	18.3	23.0	29.1	13.7	.....	51.1	5
VIII-F.....	10,863	14.6	5.6	0.3	7.9	26.3	40.1	3.9	1.3	50.8	5
IX.....	19,376	18.7	7.3	30.9	2.7	6.4	.....	17.0	17.0	59.5	4

1. See Table 1.

2. Bases of evaluation were: (A) Percentage of land in each type, and (B) relative productive capacity of each group of land types: 90 for 4 and 41 85 for 1 and 11, 75 for 2 and 3, 70 for 23, 45 for 24, 35 for 231, and 25 for others.

TABLE 2.—Percentage distribution of the land in farms according to land use and the relative intensity of cultivation and idle plowed land for each area, 1939. Nemaha county, Kansas.

AREA.	Total acres.	Land use.				Relative intensity.	
		Culti- vated.	Idle plowed land.	Permanent pasture.	Woodland pasture.	Culti- vated.	Idle plowed.
		<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>		
I.....	18,781	61.7	0.4	18.3	19.6	3	1
II-A.....	40,188	79.3	1.9	16.9	1.9	1	1
II-B.....	43,324	77.6	0.9	18.7	2.8	1	1
II-C.....	39,390	78.3	1.6	17.6	2.5	1	1
II-D.....	24,664	74.8	2.6	16.6	6.0	1	1
II-E.....	7,850	59.7	1.0	36.7	2.6	3	1
III-A.....	13,495	76.9	1.4	15.1	6.6	1	1
III-B.....	15,914	64.2	5.3	26.6	3.9	2	2
III-C.....	22,119	67.7	3.6	20.5	8.2	2	2
III-D.....	15,383	72.7	2.3	22.1	2.9	1	1
IV.....	22,855	68.5	3.5	26.9	1.1	2	2
V.....	10,295	63.2	0.6	29.9	6.3	3	1
VI-A.....	24,280	71.4	3.4	21.9	3.3	1	1
VI-B.....	12,854	58.4	2.5	35.2	3.9	3	1
VI-C.....	10,144	70.0	4.0	22.3	3.7	2	2
VI-D.....	10,393	64.4	3.8	25.6	6.2	2	2
VII-A.....	13,650	60.7	6.0	29.9	3.4	2	2
VII-B.....	10,312	47.1	3.9	45.1	3.9	4	2
VIII-A.....	13,577	53.0	5.7	37.1	4.2	3	2
VIII-B.....	21,683	57.5	5.0	31.2	6.3	3	2
VIII-C.....	10,111	60.6	6.2	29.7	3.5	2	2
VIII-D.....	10,211	37.5	4.1	49.1	9.3	5	2
VIII-E.....	8,497	39.0	2.7	55.3	3.0	5	1
VIII-F.....	10,863	47.9	5.6	43.0	3.5	4	2
IX.....	19,376	53.5	1.7	28.0	16.8	3	1

TABLE 3.—Percentage distribution of the farms according to groups of farming enterprises, a summary of farming enterprises, and the relative intensity of livestock production for each area, 1938. Nemaha county, Kansas.

AREA.	Total units considered.	Farming enterprises. <sup>1</sup>											Farming enterprise.		
		Cash crop.		Cash crop—Livestock.					Livestock—Cash crop.				Characterization. <sup>1</sup>	Intensity of livestock.	
		Wheat-Feed.	Feed-Wheat.	Wheat-Feed-Livestock.	Feed-Wheat-Livestock.	Wheat-Livestock-Feed.	Feed-Livestock-Wheat.	Feed-Livestock.	Livestock-Wheat-Feed.	Livestock-Feed-Wheat.	Livestock-Wheat.	Livestock-Feed.			Livestock.
		Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent		
I.....	76	3	3	4	8	14	5	3	28	13	14	4	1	L-F-w	2
II-A.....	211	1	1	9	10	6	6	1	28	10	25	2	1	L-F-W	2
II-B.....	207	1	2	9	6	11	13	1	27	16	12	1	1	F-L-W	5
II-C.....	202	4	5	9	11	7	15	2	22	14	6	4	1	F-L-W	5
II-D.....	133	4	4	14	12	14	8	.....	23	8	9	4	.....	F-L-W	3
II-E.....	31	3	3	16	3	19	7	.....	10	13	23	3	.....	L-W-F	3
III-A.....	55	2	4	5	5	11	12	.....	33	12	14	.....	2	L-F-W	2
III-B.....	79	5	8	4	6	11	11	8	17	15	8	.....	2	F-L-W	5
III-C.....	114	2	2	5	15	16	9	3	15	23	4	5	2	F-L-W	5
III-D.....	66	3	.....	3	17	6	17	.....	23	23	4	4	2	F-L-W	5
IV.....	103	2	3	11	11	3	18	5	15	16	5	1	.....	F-L-w	5
V.....	47	2	2	6	11	2	13	2	24	2	32	2	2	F-L-w	5
VI-A.....	107	2	.....	9	11	1	27	1	18	23	2	5	2	L-F-w	4
VI-B.....	54	.....	2	7	7	5	19	11	16	13	1	16	2	F-L	4
VI-C.....	50	2	4	12	4	4	22	6	8	22	4	8	.....	F-L-w	4
VI-D.....	40	5	.....	12	10	3	12	5	25	18	6	5	2	F-L-W	5
VII-A.....	54	.....	2	2	7	7	13	15	15	13	4	5	.....	F-L-W	5
VII-B.....	51	4	.....	4	4	4	17	10	10	19	12	18	4	L-F	1
VIII-A.....	56	2	5	7	9	14	7	13	11	13	7	14	6	L-F	1
VIII-B.....	69	1	3	10	12	12	14	7	19	12	5	18	2	F-L-w	5
VIII-C.....	49	.....	4	.....	6	14	16	14	13	14	3	6	1	F-L-W	5
VIII-D.....	34	.....	3	.....	6	.....	6	6	26	12	20	13	.....	F-L-w	5
VIII-E.....	24	4	.....	.....	.....	12	17	4	12	30	4	15	3	L	1
VIII-F.....	33	3	.....	.....	9	6	21	21	16	9	3	12	.....	L	1
IX.....	76	1	3	9	17	17	9	3	16	13	8	1	3	F-L	4
														F-W-L	6

1. Characterization based on additional factors than those shown in table; see text. L-F-W = Major-Secondary-Minor enterprise; L = livestock; F = feed crops (corn, oats, sorghum and feed crops); W = wheat; w = minor wheat enterprise.

TABLE 4.—Average acreage per operating unit and percentage distribution of the farms according to the area of the operating unit and the size distribution class for each area, 1939. Nemaha county, Kansas.

AREA.	Total number of units.	Average acreage per unit.	Size of operating unit (acres).									Class.	
			1-40	41-80	81-120	121-200	201-280	281-360	361-440	441-600	601 or more.	Average size. <sup>1</sup>	Size distribution. <sup>1</sup>
			Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent		
I.....	85	221	.....	13	6	30	26	11	8	6	.....	2	1
II-A.....	200	201	.....	9	11	45	16	10	4	4	.....	2	2
II-B.....	219	198	.....	1	8	8	56	15	6	3	.....	1	3
II-C.....	228	151	.....	5	18	5	48	9	12	1	.....	1	5
II-D.....	170	145	.....	6	29	14	32	11	6	1	.....	1	5
II-E.....	42	187	.....	.....	21	7	29	31	5	5	.....	2	3
III-A.....	77	175	.....	9	13	4	45	18	3	4	.....	3	2
III-B.....	93	171	.....	5	25	5	41	11	11	.....	.....	2	4
III-C.....	116	191	.....	3	16	13	43	15	7	.....	.....	1	4
III-D.....	72	214	.....	.....	13	15	44	4	11	6	.....	4	3
IV.....	111	206	.....	1	10	2	52	19	10	3	.....	2	2
V.....	56	184	.....	7	23	11	31	9	14	.....	.....	5	4
VI-A.....	101	240	.....	.....	16	10	36	11	14	6	.....	2	2
VI-B.....	77	167	.....	5	33	7	27	16	10	1	.....	1	5
VI-C.....	56	181	.....	5	16	7	48	18	7	2	.....	2	4
VI-D.....	49	212	.....	.....	16	16	33	21	4	6	.....	2	3
VII-A.....	80	171	.....	1	43	9	24	9	10	1	.....	2	4
VII-B.....	53	195	.....	4	19	7	49	4	11	4	.....	2	3
VIII-A.....	64	212	.....	6	17	3	39	11	10	3	.....	8	3
VIII-B.....	105	207	.....	4	26	4	40	8	10	3	.....	5	3
VIII-C.....	56	181	.....	3	30	14	27	12	4	3	.....	3	4
VIII-D.....	45	227	.....	9	25	20	27	9	2	2	.....	2	4
VIII-E.....	34	250	.....	.....	29	3	41	3	9	3	.....	3	9
VIII-F.....	47	231	.....	2	13	9	38	15	4	4	.....	7	8
IX.....	83	233	.....	.....	8	8	35	27	9	7	.....	2	1

1. Those areas in which there was a relatively strong concentration of farms in the larger size groups were put in class 1, and those areas in which the concentration was in the small size groups were put in class 5.

TABLE 5.—Condition of farm finance and farm finance class for each area, 1939. Nemaha county, Kansas.

AREA.	Operating units in area.	Percentage of operating units with—			Farm finance class.	
		Federal Land Bank loans.	Land owned by credit institutions and Federal Land Bank loans foreclosed, in process, or recommended for foreclosure.	Federal Land Bank loans delinquent.	Lands in poor financial condition. <sup>1</sup>	Federal Land Bank loans delinquent.
I.....	85	Percent 16.5	Percent 10.6	Percent 5.9	2	1
II-A.....	200	26.0	15.0	6.0	2	1
II-B.....	219	20.5	3.7	9.1	1	2
II-C.....	228	15.8	11.0	6.1	2	1
II-D.....	170	20.6	14.7	7.1	2	1
II-E.....	42	19.0	.....	7.1	.....	1
III-A.....	77	14.3	9.1	5.2	2	1
III-B.....	93	19.4	18.3	2.2	3	1
III-C.....	116	17.2	12.9	2.6	2	1
III-D.....	72	25.0	11.1	9.7	2	2
IV.....	111	19.8	18.0	6.3	3	1
V.....	56	21.4	12.5	10.7	2	2
VI-A.....	101	25.7	11.9	6.9	2	1
VI-B.....	77	16.9	13.0	2.6	2	1
VI-C.....	56	25.0	28.6	7.1	4	1
VI-D.....	49	24.5	26.5	10.2	4	2
VII-A.....	80	17.5	23.8	5.0	3	1
VII-B.....	53	20.8	18.9	7.5	3	1
VIII-A.....	64	25.0	12.5	9.4	2	2
VIII-B.....	105	17.1	21.9	2.9	3	1
VIII-C.....	56	16.1	21.4	1.9	3	1
VIII-D.....	45	17.8	15.6	4.4	2	1
VIII-E.....	34	20.6	32.4	5.9	4	1
VIII-F.....	47	25.5	25.6	8.5	4	1
IX.....	83	31.3	10.8	19.3	2	2

1. Based on land owned by credit institutions and Federal Land Bank loans foreclosed, in process, or recommended for foreclosure.

TABLE 6.—Percentage distribution of farmsteads according to condition of farmstead and occupancy, and farmstead classes according to condition and occupancy, 1939. Nemaha county, Kansas.

AREA.	Total number of farmsteads.	Condition of farmstead.				Farmstead class.	
		Good.	Fair.	Poor.	Unoccupied.	Condition.	Occupancy.
		Percent	Percent	Percent	Percent		
I.....	73	16	36	38	10	2	1
II-A.....	197	34	36	21	9	1	1
II-B.....	197	23	49	19	9	1	1
II-C.....	203	16	36	35	13	2	2
II-D.....	128	9	30	50	11	4	1
II-E.....	28	25	31	32	12	2	1
III-A.....	75	28	32	31	9	2	1
III-B.....	79	16	29	44	11	3	1
III-C.....	100	5	30	49	16	4	2
III-D.....	65	20	25	40	12	3	1
IV.....	108	20	36	34	10	2	1
V.....	55	13	42	33	12	2	1
VI-A.....	128	23	25	34	18	2	2
VI-B.....	72	15	32	46	7	3	1
VI-C.....	54	11	24	46	19	4	2
VI-D.....	52	14	17	52	17	4	1
VII-A.....	73	11	36	41	12	3	2
VII-B.....	48	12	33	38	17	3	2
VIII-A.....	69	10	20	53	17	4	2
VIII-B.....	91	14	16	51	19	4	2
VIII-C.....	54	15	33	39	13	3	2
VIII-D.....	45	31	29	31	9	2	1
VIII-E.....	34	3	26	59	12	4	1
VIII-F.....	42	7	33	53	7	4	1
IX.....	63	13	30	51	6	4	1

TABLE 7.—Percentage distribution of operating units according to tenure and the tenancy class for each area, 1939. Nemaha county, Kansas.

AREA.	Kind of tenure.			Tenancy class.
	Owner.	Owner and renter.	Tenant.	
	Percent	Percent	Percent	
I.....	53	5	42	2
II-A.....	51	8	41	2
II-B.....	51	7	42	2
II-C.....	40	8	52	3
II-D.....	41	3	56	4
II-E.....	72	0	28	1
III-A.....	46	8	46	3
III-B.....	43	4	53	3
III-C.....	45	5	50	3
III-D.....	45	5	50	3
IV.....	31	6	63	4
V.....	49	7	44	2
VI-A.....	41	14	45	3
VI-B.....	41	9	50	3
VI-C.....	31	4	65	4
VI-D.....	33	14	53	3
VII-A.....	51	8	41	2
VII-B.....	56	6	38	2
VIII-A.....	41	16	43	2
VIII-B.....	38	9	53	3
VIII-C.....	55	4	41	2
VIII-D.....	60	2	38	2
VIII-E.....	57	3	40	3
VIII-F.....	36	13	51	3
IX.....	54	13	33	1

TABLE 8.—Percentage of each land type which has been in cultivation in each area, 1939. Nemaha county, Kansas.

AREA.	Land types.														Percentage of area cultivated.
	4 and 41	1	11	2	3	23	24	231	21	25	31	22	32	33	
I.....	64	95	94	79	30	49	42	52	65	19	40	14	23	100	62.1
II-A.....	55	95	90	77	69	.....	57	.....	49	.....	55	.....	22	60	81.3
II-B.....	47	96	92	80	.....	66	37	.....	57	27	38	48	12	.....	78.4
II-C.....	50	97	91	79	83	70	51	.....	54	24	57	.....	46	.....	79.9
II-D.....	40	97	92	78	50	88	68	64	60	41	100	64	.....	.....	77.4
II-E.....	39	100	75	68	55	.....	.....	.....	11	.....	31	9	42	.....	60.7
III-A.....	53	99	94	89	89	83	.....	.....	38	.....	60	.....	15	60	78.3
III-B.....	43	.....	86	66	67	72	39	91	100	50	56	.....	.....	.....	69.5
III-C.....	47	.....	90	82	63	79	45	35	98	13	.....	21	7	50	71.3
III-D.....	40	.....	95	84	.....	75	41	100	39	38	.....	.....	.....	.....	75.0
IV.....	40	95	82	70	.....	72	57	69	54	.....	.....	.....	.....	.....	72.0
V.....	50	94	82	81	74	.....	.....	.....	46	.....	45	.....	20	.....	63.8
VI-A.....	47	.....	76	88	.....	83	77	92	.....	46	.....	.....	.....	.....	74.8
VI-B.....	51	.....	75	88	.....	55	51	63	.....	62	.....	.....	.....	.....	60.8
VI-C.....	48	100	76	74	.....	82	90	96	.....	54	.....	.....	.....	.....	74.1
VI-D.....	49	.....	82	97	.....	78	56	56	.....	60	50	.....	.....	.....	68.2
VII-A.....	55	.....	100	.....	.....	72	67	83	.....	61	.....	.....	.....	.....	66.8
VII-B.....	39	.....	.....	.....	.....	60	61	76	.....	34	.....	.....	.....	.....	51.1
VIII-A.....	54	.....	73	.....	55	64	31	57	.....	100	29	.....	50	.....	58.7
VIII-B.....	40	.....	79	72	.....	72	54	71	59	37	.....	.....	.....	.....	62.5
VIII-C.....	49	.....	84	70	35	63	60	78	.....	78	45	.....	.....	.....	66.8
VIII-D.....	44	.....	64	74	.....	43	30	54	.....	22	.....	.....	.....	.....	41.6
VIII-E.....	28	.....	.....	.....	.....	46	38	56	.....	28	.....	.....	.....	.....	41.7
VIII-F.....	50	.....	69	.....	100	59	45	60	.....	26	25	.....	60	.....	53.5
IX.....	41	97	86	67	46	55	36	.....	63	.....	53	43	27	67	55.2

TABLE 9.—Production and feed requirements of livestock used in the farm budgets for Nemaha county, Kansas.<sup>1</sup>

KIND OF ANIMAL.	Production per unit.	Roughage required.				Grain required.		Protein supplement.	
		Non-legumes.	Legumes.	Silage.	Pasture.	Corn or sorghums	Oats.	Kind.	Quantity.
		Tons	Tons	Tons	Acres	Bu.	Bu.		Lbs.
Work horses.....	800 hrs. work.....	1.0	1.0		2.0	27.0	(and) 31.0		
Colts.....		0.5	0.5			4.5	(and) 23.5		
Milk cows.....	175 lbs. butterfat.....	1.0	1.5	2.0 <sup>2</sup>	5.0	4.0	(or) 10.0		
Milk cows.....	300 lbs. butterfat.....		2.0	3.0	5.0	20.0	(or) 40.0		
Beef cows.....	500 lbs.....		1.5	3.0	5.0				
Bull—beef.....		0.5	0.5	2.0	5.0	5.0	(and) 5.0		
Bull—dairy.....		1.5	1.5	1.5		10.0	(and) 10.0	Bran.....	300.0
Creep-fed calves.....	700 lbs.....		0.2	0.5		26.0		C.S.M.....	100.0
Deferred-fed steers.....	500 lbs.....		0.4	2.5	4.0	25.0		C.S.M.....	250.0
Wintered and fed steers.....	500 lbs.....		0.5	2.5		40.0		C.S.M.....	250.0
Wintered and fed heifers.....	350 lbs.....		0.4	2.0		20.0		C.S.M.....	250.0
Winter-fed steers (calves).....	450 lbs. (200 days).....		0.2	1.0		42.0		C.S.M.....	100.0
Winter-fed yearling steers.....	240 lbs. (150 days).....		0.3	1.5		25.0		C.S.M.....	100.0
Wintered steers.....	150 lbs.....		0.3	2.0					
Beef heifer replacements.....			1.5	2.0	4.0	5.0	(or) 8.0		
Dairy heifer replacements.....			0.3	2.0	4.0		10.0		
Dairy calves.....	175 lbs.....		0.2	0.5	1.5		4.0		
Ewes.....	8 lbs. wool.....		0.2		0.8	1.6	(and) 2.8		
Ram.....			0.5		0.5	1.6	(and) 2.8		
Lambs.....	85 lbs.....		0.1			1.4			
Hogs (per cwt.).....	2,000 lbs. per sow.....				0.5 <sup>4</sup>	7.5		Millfeed.....	25.0 <sup>5</sup>
Boar.....					0.2			Tankage.....	5.0
Poultry (per 100 hens).....	666 doz.; 520 lbs.....					110.0 <sup>6</sup>		Tankage.....	40.0
Poultry (per 200 hens).....	1,500 doz.; 1,065 lbs.....					230.0 <sup>6</sup>		Meat scraps.....	1,100.0
Poultry (per 30 hens).....	250 doz.; 165 lbs.....					40.0 <sup>6</sup>		Meat scraps.....	2,200.0
Poultry (per 300 hens).....	3,450 doz.; 1,600 lbs.....					475.0 <sup>6</sup>		Meat scraps.....	375.0
								Meat scraps.....	4,500.0

1. Based upon records and consultations with members of the Kansas Agricultural Experiment Station and Kansas Extension Service.
2. Increase non-legume hay to 1½ when no silage is fed.
3. Cottonseed meal.
4. Per sow.
5. Or 25 gallons of skim milk.
6. Mixed grain.

TABLE 10.—Seed, twine, labor, fuel, and oil required for crop production used in the farm budgets. Nemaha county, Kansas.<sup>1</sup>

Line.	CROP AND METHOD.	Seed per acre.	Twine per acre.	Hours per acre.		Gallons per acre.	
				Man.	Horse.	Fuel.	Oil.
		<i>Bu.</i>	<i>Lb.</i>				
1	Wheat—shock threshed . . . . .	1.25	2.0	10.0	24.0		
2	Wheat—without combine . . . . .	1.25		4.1	16.3		
3	Wheat—shock threshed, plow, and bind with tractor . . . . .	1.25	2.0	7.8	10.0	3.3	.125
4	Wheat—without combine . . . . .	1.25		2.0	6.3	2.5	.100
5	Wheat—work with tractor, combined . . . . .	1.25		2.8		5.0	.150
6	Wheat—without combine . . . . .	1.25		2.2		4.2	.130
7	Oats—shock threshed . . . . .	2.00	2.0	8.0	18.5		
8	Oats—shock threshed . . . . .	2.00	2.0	7.3	6.6	3.3	.110
9	Corn—husked . . . . .	0.10		13.1	37.0		
10	Corn—husked . . . . .	0.10		11.6	24.6	3.5	.125
11	Corn—husked . . . . .	0.10		9.7	10.0	5.6	.167
12	Sorghums—rowed, bound and headed . . . . .	0.20	2.5	13.4	27.2		
13	Sorghums—rowed, plowed, and disked with tractor . . . . .	0.20	2.5	12.5	20.3	2.1	.070
14	Sorghums—rowed, silage <sup>2</sup> . . . . .	0.20	2.5	18.9	33.2	1.8	.120
15	Sorghums—silage and headed . . . . .	0.20	2.5	21.9	36.2	1.8	.120
16	Sorghums—rowed, silage, plow and disc with tractor . . . . .	0.20	2.5	18.0	26.3	3.9	.190
17	Sorghums—silage and headed . . . . .	0.20	2.5	21.0	29.3	3.9	.190
18	Sorghums—hay . . . . .	0.70		10.0	23.0		
19	Alfalfa—put in barn . . . . .			14.1	22.1		
20	Alfalfa—new seeding . . . . .	20.00 <sup>3</sup>		4.8	19.4		
21	Sudan—pasture . . . . .	0.75		4.5	8.0		
22	Sweet clover—pasture . . . . .	20.00 <sup>3</sup>		1.7	6.0		
23	Soybeans—for seed . . . . .	0.50		19.0	50.0		

1. Adapted primarily from data used in the Regional Agricultural Adjustment Project.  
 2. If only horses are used, drop the fuel and oil. Hire tractor and silage cutter.  
 3. Pounds.

AGRICULTURAL ADJUSTMENTS

TABLE 11.—Estimated prices used in preparing the farm budgets. Nemaha county, Kansas.<sup>1</sup>

COMMODITY.	Transaction.	Season marketed.	Unit.	Price.
Veal calves.....	Sold.....		Cwt.	\$7.60
Creep-fed calves <sup>2</sup> .....	Sold.....	Nov.-Dec.....	Cwt.	9.59
Deferred-fed steers <sup>3</sup> .....	Purchased.....	Oct.-Nov.....	Cwt.	7.58
Deferred-fed steers <sup>2</sup> .....	Sold.....	Oct.-Nov.....	Cwt.	9.80
Wintered and fed steers <sup>3</sup> .....	Purchased.....	Oct.-Nov.....	Cwt.	7.58
Wintered and fed steers <sup>4</sup> .....	Sold.....	September.....	Cwt.	10.93
Wintered and fed heifers <sup>3</sup> .....	Purchased.....	Oct.-Nov.....	Cwt.	6.83
Wintered and fed heifers <sup>4</sup> .....	Sold.....	July.....	Cwt.	9.06
Wintered and fed calves <sup>3</sup> .....	Purchased.....	Oct.-Nov.....	Cwt.	7.58
Wintered and fed calves <sup>2</sup> .....	Sold.....	Apr.-May.....	Cwt.	8.95
Winter-fed yearlings <sup>3</sup> .....	Purchased.....	Oct.-Nov.....	Cwt.	6.48
Winter-fed yearlings <sup>2</sup> .....	Sold.....	Feb.-Mar.....	Cwt.	8.78
Wintered calves <sup>3</sup> .....	Purchased.....	Oct.-Nov.....	Cwt.	7.58
Wintered calves <sup>3</sup> .....	Sold.....	May.....	Cwt.	8.13
Beef cows.....	Purchased.....	Aug.-Sept.....	Cwt.	6.17
Dairy cows (culls).....	Sold.....		Head	50.00
Whole milk (by quart).....	Sold.....		Quart	.08
Cream (butterfat).....	Sold.....		Lb.	.30
Hogs.....	Sold.....	Oct. and April.....	Cwt.	7.55
Sows.....	Sold.....	July.....	Cwt.	6.70
Lambs.....	Sold.....	May-June.....	Cwt.	9.00
Ewes (culls).....	Sold.....	August.....	Cwt.	3.75
Ewes (western).....	Purchased.....		Head	6.30
Wool.....	Sold.....		Lb.	.20
Eggs.....	Sold.....		Doz.	.19
Poultry.....	Sold.....		Lb.	.15
Wheat.....	Purchased or sold.....		Bu.	.85
Corn.....	Purchased or sold.....		Bu.	.60
Oats.....	Purchased or sold.....		Bu.	.35
Kafir.....	Purchased or sold.....		Bu.	.55
Alfalfa hay.....	Purchased or sold.....		Ton	8.00
Prairie hay.....	Purchased or sold.....		Ton	5.00
Forage sorghums.....	Purchased or sold.....		Ton	4.50
Silage.....	Purchased or sold.....		Ton	2.50
Pasture.....	Purchased or sold.....		Acre	1.50
Twine.....	Purchased.....		Lb.	.10
Fuel.....	Purchased.....		Gal.	.10
Oil.....	Purchased.....		Gal.	.60
Man labor.....	Purchased or sold.....		Hour	.20
Horse labor.....	Purchased or sold.....		Hour	.08
Threshing wheat.....	Hired.....		Bu.	.07
Threshing oats.....	Hired.....		Bu.	.05
Combining.....	Hired.....		Acre	2.00
Silo filling.....	Hired.....		Acre	1.50
Marketing cattle <sup>6</sup> .....	Hired.....		Cwt.	.50
Marketing hogs <sup>6</sup> .....	Hired.....		Cwt.	.55
Marketing sheep <sup>6</sup> .....	Hired.....		Cwt.	.80
Marketing wheat.....	Hired.....		Bu.	.12
Alfalfa seed.....	Purchased.....		Lb.	.14
Sweet clover seed.....	Purchased.....		Lb.	.08
Sudan seed.....	Purchased.....		Lb.	.05
Sweet sorghum seed.....	Purchased.....		Lb.	.02
Cottonseed meal.....	Purchased.....		Cwt.	2.00
Gray shorts.....	Purchased.....		Cwt.	1.20
Tankage.....	Purchased.....		Cwt.	2.75
Bran.....	Purchased.....		Cwt.	1.00
Meatscraps.....	Purchased.....		Cwt.	2.60
Breeding fee, cow.....	Hired.....		Head	1.00
Breeding fee, sow.....	Hired.....		Head	1.00

1. Estimated in consultation with the Marketing Staff of the Kansas Agricultural Experiment Station. Long-time averages were used as a basis for the prices of the crops and live-stock.

2. Good grade.  
3. Good to choice.  
4. Top of good.  
5. Top of medium.  
6. Trucking, commission, shrinkage, etc.

AGRICULTURAL ADJUSTMENTS

TABLE 12.—Labor requirements and miscellaneous cash expenses per unit of livestock used in the farm budgets. Nemaha county, Kansas.<sup>1</sup>

KIND OF LIVESTOCK.	Unit.	Man hours.	Horse hours.	Cash expenses.
Work horses.....	Head	60	10	\$0.50
Milk cows.....	Head	120	10	0.75
Other dairy cattle.....	Head	15	5	0.25
Hogs.....	Sow	50	25	3.00
Sheep.....	Ewe	5	1	0.25
Poultry.....	100 hens	200	10	2.00
	30 hens	66	4	0.75
Cattle—Creep feeding:				
Calf.....	Head	12.5	3.5	0.25
Cow.....	Head	10.0	3.0	0.50
Bull.....	Head	25.0	7.0	1.00
Heifer.....	Head	12.5	4.0	0.25
Deferred feeding.....	Head	11	3	0.25
Wintering and summer fed.....	Head	11	3	0.25
Winter fed.....	Head	8	3	0.20
Wintering.....	Head	6	3	0.15

1. Adapted from data used primarily in the 1935 Regional Agricultural Adjustment Project.

TABLE 13.—A comparison of the summaries of two budgets for 320-acre farms in area VIII-D. Nemaha county, Kansas.<sup>1</sup>

	A.	B.		A.	B.
	<i>Acres</i>	<i>Acres</i>		<i>Dollars</i>	<i>Dollars</i>
Acres in crops and pasture <sup>2</sup> .....	320	320	Gross income <sup>3</sup> .....	4,099	5,938
Pasture land.....	208	208	Wheat.....	22	222
Crop land.....	112	112	Oats.....	42	42
Wheat.....	16	16	Alfalfa.....	188	
Corn.....	30	28	Other crops.....	3,065	4,422
Oats.....	35	20	Beef.....	415	553
Grain sorghums.....	31	16	Hogs.....	367	566
Alfalfa.....	8	8	Poultry.....		133
Sweet clover.....			Total expenses.....	3,254	4,926
Temporary pasture.....			Livestock purchased.....	948	1,895
	<i>Number</i>	<i>Number</i>	Feeds purchased.....	127	816
Horses.....	4	4	Crop expense.....	130	183
Dairy cows.....	4	6	Livestock expense.....	258	317
Beef cows <sup>4</sup> .....	30		Machinery expense.....	336	336
Winter-fed calves and yearlings.....		40	Hired labor.....	328	254
Deferred-fed steers.....			Taxes.....	241	240
Wintered and fed steers and heifers.....			Building expense.....	135	135
Wintered calves.....	25	10	Miscellaneous expense.....	100	100
Ewes.....	3	4	Interest on investment.....	651	650
Sows.....	3	4	Labor income.....	845	1,012
Hens.....	200	100	Total investment... ..	16,285	16,240
Tractors.....					
Combines.....					

1. These summaries illustrate the nature of the 101 budgets prepared and used in determining adjustments in the various areas of the county.
2. Does not include farmstead, roads, waste, etc.
3. Excludes the value of farm products used in the home and includes sale value of livestock purchased and sold during the year.
4. Milk for home use obtained from beef cows.
5. For creep-fed calves.

