

T H E S I S

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A STUDY OF SOME OF THE ESSENTIAL NEEDS
OF
A COURSE OF STUDY IN VOCATIONAL AGRICULTURE
FOR
THE BLACKLAND REGION OF CENTRAL TEXAS

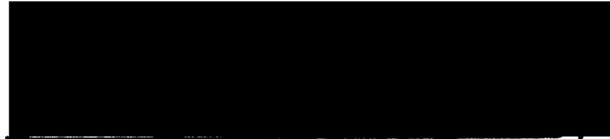
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Submitted by
William Nile Elam
for the Degree of Master of Science
Colorado Agricultural College
Fort Collins, Colorado
June 30, 1928

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APPROVED AND RECOMMENDED
FOR CREDIT



Head of the Department of Rural and Vocational Education
Colorado Agricultural College
Fort Collins, Colorado
June 30, 1928.

56045

THIS THESIS HAS BEEN APPROVED AND RECOMMENDED

FOR

THE DEGREE OF MASTER OF SCIENCE

Chairman and Professor of Zoology



Professor of Horticulture



Professor of Veterinary Pathology

Committee on Advanced Degrees
Colorado Agricultural College
Fort Collins, Colorado

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PART I

Statement of the Problem

This study is based upon eleven Smith-Hughes schools located in the black land region of central Texas. It is an attempt to find* "the nature of the specific enterprises and the agricultural problems which should make up the core of content", in a course of study in vocational agriculture for this immediate region. No attempt is made to set up a complete course of study. But it is the writers opinion that there exists a minimum course content that should be used as a nucleus for making a course of study in vocational agriculture for all the Smith-Hughes schools of this region. And with this assumption in mind the following problem has been used as a basis for this study:

Problem:- TO DETERMINE THE MINIMUM REQUIREMENTS THAT SHOULD BE CONSIDERED IN FORMULATING A COURSE OF STUDY IN VOCATIONAL AGRICULTURE FOR THE BLACK LAND REGION OF CENTRAL TEXAS.

Source of Materials

The material for this thesis was secured from the content of the annual plans submitted by the vocational

*Federal Board for Vocational Education---Bulletin No 90.

teachers to the State Director of Vocational Agricultural Education, Austin, Texas. All the schools selected for this study were located in the black land region of central Texas. The representative schools of the region were selected with the assistance of Mr. C.L. Davis, Director of Vocational Agricultural Education for Texas. The writer's eleven years experience as a teacher of Vocational agriculture in this region; and Mr. Davis's ten years of service as the State Director have together contributed the information that has been used as a basis for the selection of the typical schools used in this study.

Bulletins issued by the Federal Board for Vocational Education and some of the more recent books published on this subject were used freely in verifying the results of this study.

Method of Procedure

The method of attacking this problem consisted in four distinct steps as follows:

1. Determining the farm enterprises that are common to the region.
2. Classifying the enterprises.
3. Determining the common farm problems of the region.
4. Formulating from this data the course content that would be common and essential to this region.

Aims and Objectives

1. The chief aim in making this study is to provide a nucleus around which may be formulated a course of study in vocational agriculture that will fit a student for useful farm employment in the black land region of central Texas.
2. That valuable data may be available to new teachers in organizing their courses of study, thereby preventing the occurrence of any freak courses.
3. That equipment may be more intelligently selected for each school having a vocational agricultural department.
4. To make it possible for district contests to be more intelligently planned.
5. That the major objectives in co-operative effort between the different schools may be determined.
6. To furnish an efficient measuring stick on courses of study to the teachers and supervisors for this region of the state.

Importance of the Problem.

Smith-Hughes teachers, like all others are prone to stress in their teaching that phase of the course which they are best prepared to teach. Yet too often the young graduate who has specialized in livestock

production, finds that he is to teach in a community that grows crops almost exclusively. The teacher beginning in a new region needs a few guide posts to point out the essentials of a course of study for the community in which he is to teach. This need is so apparent that it is recognized by the Federal Board in Bulletin Number 90 page 19 where it states the following:

"The tendency in the State Administration of Vocational Agriculture in the high schools is distinctly away from the formulation of detailed courses of study in Agriculture by a central authority.....
.....At present the tendency is very strong to throw responsibility for making the course upon the teacher in his community.....
.....It is certain however that the administrative office will with the accumulation of records of study of the several regions, and schools of a state, become more and more influential in determining the type of course best suited to the needs of the several schools, even to the point of designating the nature of the specific enterprises and agricultural problems which should make up the core of content. For doing so he will be better equipped in the matter of knowledge of requirements than can be the teacher entering upon the

job for the first time. But always the modification of course content must be with the teacher of agriculture."

PART II

Description of the Black Land Region of Central Texas

This area consists of fifteen counties as shown in the map Figure 1, page 8. The four counties bordering on the west, Bosque, Burnet, Hamilton and Lampassas are on the border line of this black land prairie region and could have been omitted from this study. However over half of their cultivated lands lie in this region and since a number of their schools are applying for the Smith-Hughes work it was thought best to include these four counties in the study.

The following description taken from the United States Soil Survey of Bell County very aptly describes the entire region.

"Bell County lies in a limestone region where the upland soils have been developed under prairie conditions from material accumulated by residual decay from calcareous rocks.....The region is practically treeless.The climatic conditions are essentially uniform over the whole county.

"The Houston black clay is the most important soil of Bell County. This large body represents part of an extensive development of the type throughout the black prairie region of Texas. The surface soil, averaging about 12 inches in depth is very black and tenacious

when wet, giving rise to the local name, "black waxy land". Originally it was a prairie soil, with occasional small clumps of elm, mesquite, hackberry, or live oak. The native grass was mainly broom sedge. The type is highly esteemed as farming land. It supports the densest population in the county and has a higher selling price, as a rule than any other soil.

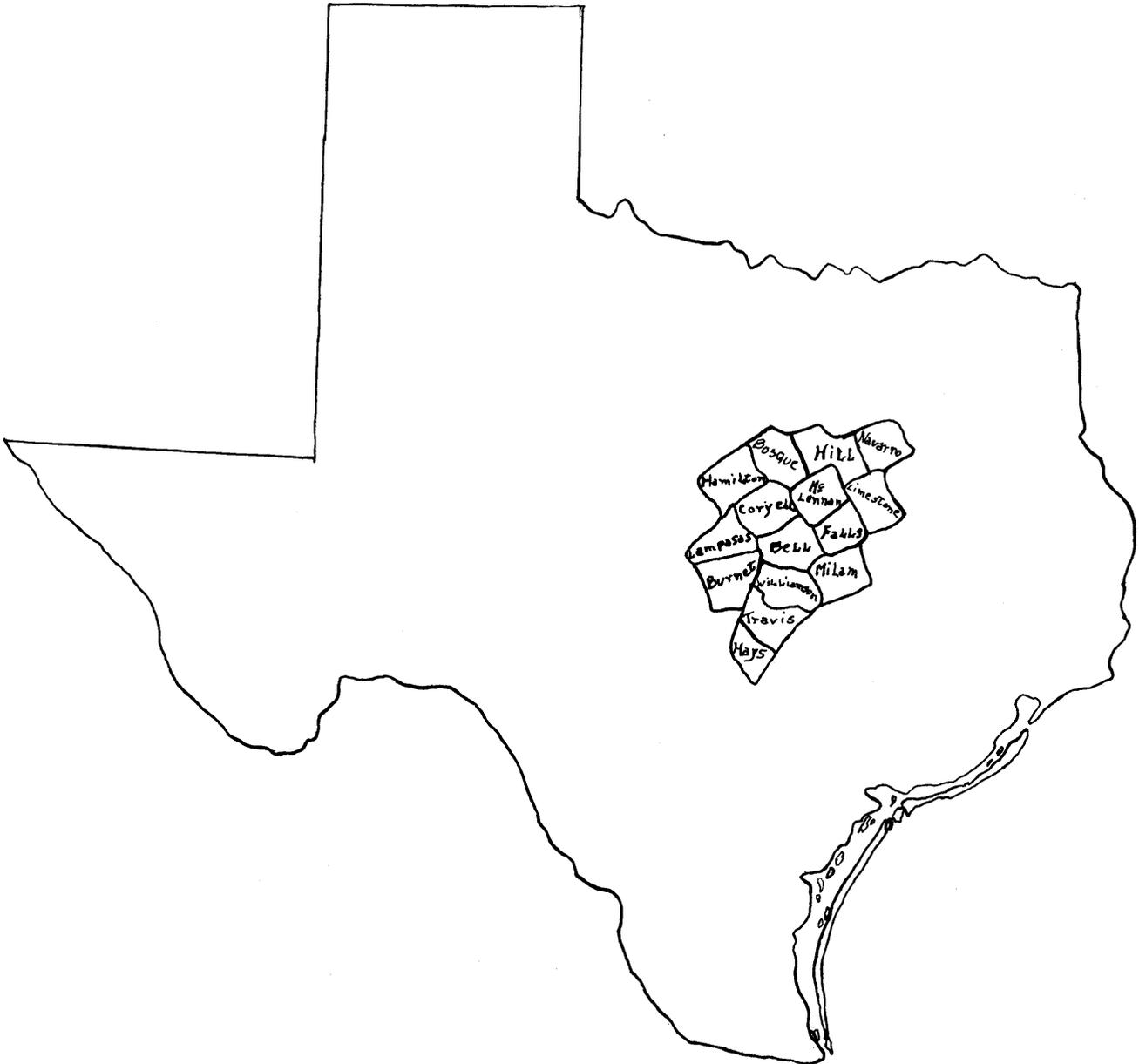
"The surface is undulating to gentle rolling, becoming more rolling in the vicinity of streams. The surface drainage and under drainage are in most places good, but water stands for some time after rains on occasionally nearly level areas. In these places ditching has been done on a small scale, with good results. On drying out, the soil retains moisture well if frequently cultivated, but crops as a rule suffer more in dry seasons than on the lighter types of the region.

"Land of the Houston black clay sells for \$80 to \$150 an acre, the price depending upon the location.

"Crop yields on this soil vary considerably with the seasons and the methods employed. Cotton ordinarily yields from about one-half to three-fourths bale, and occasionally over one bale per acre. Corn yields from 35 to 40 bushels, oats 30 to 60 bushels and wheat 15 to 20 bushels per acre. Sorghum yields from 3 to 5

I---THE AREA COVERED IN THIS STUDY.

THE BLACKLAND REGION OF CENTRAL TEXAS.-



tons of hay per acre, and sudan grass 3 or 4 tons. The gravelly areas apparently are about as productive as the typical soil.

"The most important crops are cotton, corn, oats and wheat. Cotton is the chief cash crop. Corn is grown for feeding work animals and other stock on the farm, the surplus being sold locally or shipped away. Oats are mainly fed on the farm, but are sold in the local markets to some extent.....Wheat is grown in a small way, by some farmers.....A small acreage is devoted to sudan grass. Sorghum is grown by many farmers as feed for the farm stock. Hogs, horses, and cows are raised in a small way, and dairying is carried on inextensively. Some farmers devote little attention to other crops than cotton."

PART III

Determining the Common Farm Enterprises of the Region

In solving this first step of the thesis, four things were carefully measured: (1) the total value of the farm enterprises, as shown in the United States Census for 1920, (2) the size of the farm enterprises on the 225 farms that were surveyed in the eleven communities, (3) the value of the farm enterprises for the 225 surveyed farms, (4) the number engaged in each enterprise. With these four factors in mind the reader can easily determine, by following the data in this chapter, which enterprises are common to all the communities, and which ones are of major and of minor importance. By doing this the insignificant enterprises can be eliminated or given their relative place in the study.

From a study of table I it is evident that cotton is King of all the farm enterprises, of this area. In fact this might be called a specialized farming region if classified according to G.R. Warren, as more than sixty per cent of the farm income is derived from one enterprise. All of the other farm crops are of a minor or contributory nature. The relatively small size of the animal enterprises is also very noticeable. The total value of the crops of the region is almost five

times greater than the total value of the animal enterprises.

The Farm Enterprises of the Region

By compiling the total value of the farm enterprises for the fifteen counties in this region a good idea of the relative importance of the different enterprises may be secured. The data for this table was taken from the United States Census for 1920. These figures do not represent the annual income from each enterprise, as the value of the dairy, poultry, and sheep items includes the value of the animals plus the value of their products. However the rating shows the money involved in each farm unit.

Table I---Value of the Farm Enterprises of the Region

Cotton.....	\$92,576,452
Corn.....	29,212,004
Horses and Mules.....	28,532,792
Oats.....	12,761,873
Dairy.....	12,290,065
Hay and Forage.....	9,068,520
Wheat.....	8,075,852
Poultry.....	7,562,657
Beef.....	5,872,595
Swine.....	3,713,929
Sheep.....	2,243,763
Grain Sorghums.....	360,493
Bees....	173,469

	ACRES COTTON	NO. POULTRY	CORN A.	NO. WORKSTOCK HAY A.	DAIRY NO.	ACRES OATS BEEF NO.	SWINE NO.	SHEEP NO.	NO. GARDENS	NO ORCHARDS	GRAIN S.	ACRES LEGUMES	PECANS A.	BEEF COL. NO. FARMS SURVEYED	
HEIDENHEIMER	1290	2090	418	87	57	39	245	7	98	23	14	12	17	17	16
GRANGER	2623	1393	395	141	124	48	178		56					80	20
GROESBECK	1492	2091	420	99	88	61	30		125		19	8	133	11	20
KYLE	1699	1271	327	138	137	48	56	150	15	400	12		9		15
THRALL	397	514	118	40	48	14	16		18		5	2		40	7
ACADEMY CON.	900	1472	277	57	56	47			33	11	19	8	59	5	15
HOLLAND	1200	2685	525	105	4	48	365		78		17	12	55		20
PRAIRIE HILL	1161	1233	360	113	50	36	154		15		16	7	153		20
BUDA-GOFORTH	2198	2523	519	228	317	113	361	33	98	39	26	7	61	6	26
THORNDALE	345	390	132	40	79	25	35	8	42	1	3	4	15		10
TAYLOR	5070	5126	806	359	408	154	212		66	40	20	10	30	2	56
TOTALS	18375	20788	4297	1407	1368	633	1652	198	744	514	151	70	522	151	225

Land Region of Central Texas.

Table II Enterprise Survey of 225 Farms in the Black-

NOTE: Number of communities surveyed 11.

All that Table II shows is the size of the different farm enterprises in each community. The summarized results of this study are shown in Table III. From this table the entire region may be studied as a whole.

Table III---Size of Farm Enterprises on the 225 Farms

<u>Enterprise</u>	<u>Acres or Number</u>
Cotton.....	18,375
Corn.....	4,297
Oats.....	1,652
Hay and Forage.....	1,368
Grain Sorghums.....	522
Workstock.....	1,407
Poultry.....	20,788
Dairy Cows.....	633
Swine.....	744
Sheep.....	514
Beef.....	198
Gardens.....	151
Orchards.....	70
Bees, colonies.....	217

Since there is so much variation in the different farm animals and in the value of the different crops per acre, it is evident that all the enterprises must

be put upon a common unit of comparison. This is shown in Table IV which places them all on a monetary basis.

Table IV---Value of Farm Enterprises on 225 Central Texas Farms.

	<u>Total Value</u>	<u>% of Value</u>
Cotton.....	\$1,040,249	68
Corn.....	161,522	11
Work Stock.....	151,956	10
Oats.....	36,930	3
Hay and Forage.....	32,832	2
Dairy Cows.....	27,219	2
Poultry.....	18,293	1
Swine.....	17,856	1
Grain Sorghums.....	14,616	1
Beef.....	10,098	.6
Sheep.....	6,168	.3
Bees, Colonies.....	1,085	.1

These values have been computed from average values given to crops and animals in the 1920 United States Census Report, for Texas.

Another way of measuring the scope of the farm enterprises is by the income that may be derived from them. Table IV shows the relative value of the farm enterprises.

Table V
The Number engaged in the Farm Enterprises
of 225 Central Texas Farms.

	COTTON	WORK- STOCK	CORN	DAIRY	POULTRY	SWINE	GARDEN	HAY	OATS	ORCHARDS	BRES	BEEF	SHEEP	LEGUMES	MELONS	PEANUTS	S. POTATOES	PECANS	WHEAT
HEIDENHEIMER	16	16	16	16	16	16	14	14	8	6	7	4	2						
GRANGER	20	20	20	19	19	18	15	20	19	5	5								
GROESBECK	20	20	18	18	20	17	20	11	3	8			4	7	2	8			
KYLE	15	15	15	14	14	5	12	14	8	4		1	5						
THRALL	7	7	7	7	7	7	5	5	3	2	2						6		
ACADEMY CON.	15	15	15	15	15	14	15	10	10	6			2	1			3		
HOLLAND	17	20	20	20	20	18	17	6	12	12	8						3		
PRAIRIE HILL	20	20	25	18	20	13	16	11	9	7									1
BUDA-GOFORTH	26	26	25	24	24	21	26	24	5	7		6	4	1					
THORNDALE	6	10	10	8	8	7	5	8	3	4		6	1						
TAYLOR	56	56	46	54	56	40	42	46	28	22	3		1						
								170		68									
	212	225	212	213	219	176	168		108	1	28	17	15	6	7	2	14	6	1

Number of Persons Engaged in the Different Enterprises.

The only two factors in determining the common farm enterprises of the region that have thus far been considered are the size, and the value. Another factor of importance is the number engaged in maintaining the different enterprises for each community. It will be noticed that the first ten columns of Table V, which shows in detail the number of farms that maintain the different enterprises for each community, are the only ones that are common to all of the communities. For convenience of study, all of the common enterprises of the region have been listed separately in Table VI.

Table VI---The Common Farm Enterprises of the Black Land

Region of Central Texas.

<u>Enterprises</u>	<u>Number of Farmers Engaged in the Enterprise.</u>
Work Stock.....	225
Poultry.....	219
Cotton.....	213
Dairy.....	213
Corn.....	212
Swine.....	176
Gardens.....	168
Hay.....	170
Oats.....	108
Orchards.....	70

PART IV

Classifying the Farm Enterprises of the Region.

The method of classifying the farm enterprises of this region was secured from Bulletin 98 published by the Federal Board for Vocational Education. This grouping divides them into major, minor and contributory enterprises.

1. "Major enterprises are those from which the farmer receives the major part of his income and around which he builds his business.
2. "Minor enterprises are those which are necessary to supply home needs, although the surplus may be sold to supplement the income from the major enterprises.
3. "Contributory enterprises are those which are necessary to the success of the major enterprise, and are necessary if the farming is to be a success."

These definitions were taken from the instructions for making Annual Teaching Plans published by the State Board for Vocational Education, Austin, Texas. They are merely digests taken originally from Bulletin 98 of the Federal Board for Vocational Education.

Table VII based upon this classification is shown on the following page.

Table VII---Classification of Enterprises from Eleven
Central Texas Communities.

Enterprise Number of Communities
Where Ent. is Found.

MAJOR ENTERPRISE

Cotton.....11

CONTRIBUTORY ENTERPRISES

Corn.....11

Workstock.....11

Grain Sorghums.....11

Hay Crops.....11

Oats..... 8

Legumes..... 4

Small Grains..... 3

MINOR ENTERPRISES

Dairy Cows.....11

Poultry.....11

Orchard.....11

Swine.....10

Garden.....10

Bees..... 6

Sheep..... 5

Beef..... 4

Pecans..... 4

Note:-Dairy cows were major on two farms.

PART V.

Determining the Major Farm Problems of the Region

The farm problems in this study were secured directly from the farmers by the teachers of vocational agriculture. A total of 45 problems were furnished by the farmers. Many of these problems were common to all of the farms, in fact the total occurrence of problems were 242 for the entire region, indicating that the same problems were common to many of the farms. When the problems were properly classified they were divided into nine divisions. The number of problems for each division are shown in Table VIII to be as follows:

	<u>No. of Problems</u>
Cotton.....	59
Soils.....	53
Livestock.....	44
Poultry.....	27
Farm Management.....	17
Grain Crops.....	17
Garden.....	9
Farm Shop.....	8
Marketing.....	8

Table VIII on the following page gives the complete tabulation of all the farm problems. From the total Column, it will be seen that many of the problems are unimportant, and occur in only one or two communities.

Table VIII The Farm Problems of the Blackland Region
of Central Texas.

<u>SOIL PROBLEMS:</u>	Weldon- Belcher	Orange	Brazosack	Kyle	Waller	Mohrny Camp	Holland	Prine Hill	Buda- Carrish	Throckmole	Taylor	Totals
1. Rotations.....	1	1	1		1	1	1		1	1	1	9
2. Drainage.....						1		1		1	1	11
3. Terracing.....	1	1	1	1	1	1	1	1	1	1	1	11
4. Increasing humus content...	1	1	1	1	1	1	1	1	1	1	1	11
5. Increasing soil building crops.....	1	1	1	1	1	1	1	1	1	1	1	17
6. Living conditions.....	1		1	1		1	1		1		1	7
<u>COTTON PROBLEMS:</u>												
1. Controlling the boll weevil.....	1	1	1	1	1	1	1	1	1	1	1	11
2. Controlling the leaf worm.....	1	1	1	1	1	1	1		1	1	1	10
3. Controlling the flea hopper.....	1	1	1	1	1	1	1	1	1	1	1	11
4. Controlling the cotton root rot.....	1	1	1	1	1	1	1	1	1	1	1	11
5. One variety Community.. .	1				1	1		1			1	6
6. Marketing the cotton crop.....					1						1	2
7. Use of better seed.....	1	1	1	1	1	1				1	1	8
<u>LIVESTOCK PROBLEMS:</u>												
1. Poor feeding methods.....		1	1	1	1	1			1	1	1	8
2. Producing more feed.....		1	1	1		1		1		1	1	7
3. Low producing dairy cows..	1	1		1	1		1	1	1		1	8
4. Increasing livestock enterprises.....		1	1		1	1			1	1	1	7

LIVESTOCK PROBLEMS CON'T.

	Heiden- Heimer	Granger	Arnsdeck	Kyle	Thrahl	Academy Coun.	Holland	Prarie Hill	Blair- Gardner	Thornlake	Taylor	Totals
5. Controlling parasites.....									1	1		2
6. More pure bred livestock..	1		1	1	1	1	1	1	1			7
7. Better breeding methods...									1	1		2
8. More pastures.....								1				1
9. Feeding more livestock....		1								1		2

POULTRY PROBLEMS:

1. More purebred poultry.....	1			1	1			1				4
2. Poor housing conditions...		1	1		1						1	4
3. Poor breeding methods.....	1	1	1			1	1	1	1		1	8
4. Poor feeding methods.....		1	1	1	1		1	1	1	1	1	9
5. Poor marketing facilities.	1										1	2

GRAIN PROBLEMS:

1. Low grade of mixed corn used.....	1		1	1	1	1	1		1		1	8
2. Controll of chinch bug in corn.....			1					1			1	3
3. Control of corn ear worm.....			1	1			1		1		1	5
4. Contrul insects and rats in stored grain.....									1			1

GARDEN PROBLEMS:

1. Gardens to small--more food.....	1	1	1	1			1				1	6
2. Control of garden insects.					1							1
3. Increasing use of steam cookers.....					1						1	2

FARM SHOP PROBLEMS:

1. Establishing more farm shops.....	1		1	1	1	1		1	1		1	8
---	---	--	---	---	---	---	--	---	---	--	---	---

From Table VIII the major farm problems were taken and grouped into Table IX for convenience of study.

Table IX---The Major Farm Problems of the Black Land
Section of Central Texas.
(Survey of 11 communities).

<u>PROBLEMS</u>	<u>NUMBER OF COMMUNITIES</u> <u>REPORTING THE PROBLEM</u>
SOILS:	
1. Farms need to be terraced.....	11
2. Farms need more humus content.....	11
3. Need of legumes and soil building crops.....	11
4. Farmers should practice better rotations....	9
COTTON:	
1. How to effectively control the boll-weevil..	11
2. How to effectively control the flea hopper..	11
3. How to effectively control root rot of cotton.....	11
4. How to effectively control the leaf worm....	10
5. Farmers need to plant better seed.....	8
6. Communities should be standardized to one variety of cotton.....	6
LIVESTOCK:	
1. Farmers use poor feeding practices.....	8
2. Farmers are using low producing dairy cows..	8
3. More feed should be produced.....	7
4. Live stock enterprises should be increased..	7
5. Farmers should use more pure bred livestock.	7

Table IX---CONTINUED

PROBLEMS	NUMBER OF COMMUNITIES REPORTING THE PROBLEM
POULTRY:	
1. Most of the poultry flocks are grade hens..	8
2. Farmers are using poor feeding practices...	9
CORN:	
1. A low grade of mixed corn planted by farmers.....	8
FARM SHOP:	
1. More farm shops and the doing of more shop jobs needed.....	8
FARM MANAGEMENT:	
1. A more intelligent planning and management of the farm business needed.....	8
2. The living conditions of the home need to be improved.....	7
GARDEN:	
1. More food for the family should be produced.....	6

PART VI

Formulating the Major Farm Problems into a Basic Course
of Study for the Region.

Professor F.W.Lanthrop of the University of Minnesota gives six principles which he says should govern the organization of the subject matter in vocational agriculture:

1. "The farm job should be adopted as the unit of subject matter.
2. The similarity of subject matter in different jobs should be provided by selecting type situations.
3. The order of presentation within a farm job should be: first, specific facts; second, principles; third, general information.
4. Principles should be taught when the need for them arises.
5. The organization of subject matter should be psychological rather than logical.
6. Farm jobs should be arranged in seasonal sequence."

For the purpose of efficient teaching, Professor G.A.Schmidt of the Colorado Agriculture College in his *New Methods in Teaching Vocational Agriculture*, lays down an other important principle where he states on page 57 that, "A few enterprises well taught will give greater vocational efficiency to the student than many

enterprises taught superficially in order to cover the outline. One way to avoid doing superficial work where six or eight enterprises are included, is greatly to reduce the number of jobs to be taken up in some of the enterprises."

Throughout this entire thesis the guiding principle has been to keep the course of study based upon the major farm problems of the important enterprises of the area studied, and to solve the problems by teaching the boys how to do the jobs related to each problem in the enterprises. Professor Schmidt in the same book page 51 clearly states this idea:

"Pedagogically, the principle involved here---basing the instruction on the farm enterprises of the community--- is sound. It makes the instructor meet a real vocational need; it is purposeful; and it is connected with life's activities; and it has very definite objectives and few deferred values."

This chapter is an effort to take the common farm problems and enterprises that this study has revealed and organize them into a basic course of study that can be used effectively by the teachers of the Black Land Region of central Texas. In doing this the writer has tried to take these facts and apply them in keeping with the principles stated by Professor Lanthrop, and Professor Schmidt.

The following nucleus for a course of study is offered in an outline form in order to make it a convenient reference. It is the writer's opinion that all of this basic material should be offered in the first two years of work, as the class mortality during this period is lower than at any subsequent time.

After combining the common major farm problems and enterprises the following divisions of the course content were made:

SOILS	DAIRY
COTTON	SWINE
CORN	POULTRY
HAY	FARM MANAGEMENT
OATS	FARM SHOP
GARDEN AND ORCHARD	LIVESTOCK

Jobs That May be Used in Solving Major Farm Problems
of the Black Land Region of Central Texas.

<u>PROBLEMS</u>	<u>SUGGESTED PROBLEM-SOLVING JOBS</u>
<u>SOILS:</u> 1. The farms need to be terraced.	a-Setting up and testing the farm level. b-Planning the proper disposal of the water from the entire farm

NOTE:- All the major farm problems are taken from Table IX.

PROBLEMS

SUGGESTED
PROBLEM-SOLVING JOBS

SOILS: Continued-

1.
 - c-Establishing the terrace lines.
 - d-Building the terraces.

2. How can more humus be added to the soil?
 - a-Getting rid of the old stalks.
 - b-Utilizing straw, manure and other waste products.
 - c-Increasing the manure crop on the farm.

3. What legumes and other soil building crops can be successfully grown on the black land?
 - a-Selecting the soil building crops suitable for the black land.
 - b-Preparing the seed bed.
 - c-Planting the crop.
 - d-Cultivating.
 - e-Harvesting.
 - f-Utilizing for feed, pasture, or green manure.

4. What crop rotation is the most profitable for the Black Land Region of Central Texas?
 - a-Selecting the crops to be used in the rotation.
 - b-Planning the farm for the cropping system.
 - c-Planning the farm business for the cropping system.

Reference:

Texas Experiment Station Bulletin No. 365.

Opinion From Experiment Station on the Soil Problem

The Texas Experiment Station in its Bulletin No. 365 entitled Crop Rotation in the Black Land Region of Central Texas, clearly states the soil problems of this region as follows:

"It is common knowledge that yields of cotton in the Blackland region of Central Texas are gradually declining. The almost continuous cropping of these soils to cotton year after year without much, if any, effort being made to maintain or increase their productiveness by the use of fertilizers and manures, crop rotations, or the prevention of soil washing, has resulted in a reduction in the productiveness of a region once thought to be inexhaustible in its fertility. The use of fertilizers has not been successful in restoring these soils to their original productiveness. Rotation or changing of crops on the land appears to offer the most promising immediate solution of the problem. Rotation of crops distributes the labor, helps to keep down weeds, controls insect pests and crop diseases, and makes possible the production of feed crops for home use or the production of livestock.

"Cotton, corn, wheat, and oats produced larger yields in rotation than when grown continuously on the same land year after year as shown in 11 years of experiments with several rotation at Temple, Texas. Yields of cotton have been doubled; yields of corn increased 87 per cent; wheat, 55 per cent; and oats, 17 per cent by rotations, as compared with continuous cropping. Rotation of crops reduced root rot of cotton from 39.7 to 4.8 per cent.

"The crops in the three-year rotation of cotton, corn and oats brought the highest comparative net profit per acre, \$15.96, annually for a period of six years. Cotton

planted on the same land continuously showed an average yearly comparative net profit of \$7.33 per acre; corn planted continuously, \$2.32 per acre; oats planted continuously, \$2.25 per acre; and wheat planted continuously, \$2.02 per acre."

PROBLEM

SUGGESTED
PROBLEM-SOLVING JOBS

COTTON:

1. The fundamental cultural jobs of cotton production.
 - a-Selecting the variety to plant.
 - b-Preparing the seed bed.
 - c-Planting.
 - d-Thinning.
 - e-Cultivating.
 - f-Harvesting
 - g-Marketing.
2. How to control the cotton insects.
 - a-Controlling the boll-weevil.
 - b-Controlling the flea hopper.
 - c-Controlling the leaf worm.
3. How to control the root rot of cotton.
 - a-Making the rotations.
 - b-Practicing clean culture.
4. Standardizing the Community to one variety of cotton.
 - a-Getting all varieties tried out.
 - b-Conducting field trips to study varieties and instill the spirit of co-operation.
 - c-Selecting the variety and securing the seed.
 - d-Making growing arrangements for the pure seed.
 - e-Securing a source of pure seed.

PROBLEMS

SUGGESTED
PROBLEM-SOLVING JOBS

CORN: All fundamental productive jobs.

1. A low grade of mixed corn planted by farmers.
 - a-Selecting and field testing both local, outside and improved varieties.
 - b-Co-operative seed buying.

HAY AND OATS:

1. Give the fundamental productive jobs.
 - a-No special problems were given for these enterprises.

FARM MANAGEMENT:

1. A more intelligent planing and management of the farm business.
 - a-Planning an efficient farm layout of farm and equipment.
 - b-Using simple records so that cost accounts for each enterprise may be secured.
2. The living conditions of the home need to be improved.
 - A-Labor saving equipment.
 - a-Installing running water.
 - b-Installing light system.
 - c-Installing hot water system.
 - B-Amusement and recreation.
 - a-Installing radio.
 - b-Securing good music.
 - c-Securing good reading material.
 - C-Home beautification.
 - a-Papering the house.
 - b-Securing good pictures.
 - c-Planning the lawn and flower beds.
 - d-Laying good walks.
 - e-Painting the house.

PROBLEM

SUGGESTED
PROBLEM-SOLVING JOBS.

GARDEN AND ORCHARD:

1. More food should be produced for the family.

- a-Planning large gardens.
- b-Planting the garden.
- c-Controlling garden insects.
- d-Conservation of food with a pressure cooker.
- e-Give fundamental jobs in orcharding.

LIVESTOCK:

1. Farmers use poor feeding practice.

- a-How to balance a ration for any farm animal?
- b-Reducing cost of feeding animals.

DAIRY: All essential productive jobs.

1. Farmers are using low producing cows.

- a-Selecting high producing cows.
- b-Lowering the cost of producing dairy products.
- c-Culling a dairy herd.

2. More feed should be produced.

- a-What feeds are best suited to the community?
- b-Is it cheaper to grow or purchase the feeds used on the farm?
- c-Lowering the cost of producing the feed crops.

PROBLEM

SUGGESTED
PROBLEM-SOLVING JOBS.

LIVESTOCK: CON'T.

3. Livestock enterprises should be increased.

- a-Which livestock enterprises are best suited to any farm?
- b-Can they be produced at a profit?
- c-How might the livestock enterprises be increased?

4. Farmers should use more pure-bred livestock.

- a-Are pure breeds more profitable than grade animals?
- b-Organizing pure bred livestock organizations.
- c-Selecting the animals.
- d-Keeping up the interest in the community by fairs, etc.
- e-Community breeding organizations.

POULTRY: All fundamental productive jobs.

1. Most of the poultry flock are grade hens.

- a-Getting standard bred birds.
- b-Stimulating interest in poultry.

2. Farmers are using poor feeding practice.

- a-How to properly feed poultry for a profit.
- b-Have demonstration feeding tests in the community.

SWINE: All essential productive jobs.

PART VII.

CONCLUSION

In the general conclusion drawn from the discovered facts, a few truths will be stated.

First, the scope of the study is very limited and the value of the work is primarily local in its application.

Second, the basic course in vocational agriculture for the Blackland Region of Central Texas certainly should be centered around the ten farm enterprises that were found common to the eleven communities. Hence it is evident that the units of instruction should be based upon the fundamental productive jobs of these enterprises.

Third, cotton and its contributory enterprise should come first in the course of study, as it is the major enterprise of the region. The survey showed that the financial returns of this crop is greater than all other enterprises combined, and it is the writer's opinion that the continuation projects for this region should be largely made up from the cotton enterprise.

Fourth, the minor enterprises of the region are too small and should be increased in order to provide a better balanced farm business. The minor enterprises that were common to all communities were dairying, swine, poultry,

and garden and orchard. From the results of the study it seems that these are basic enterprises of the region and should be included in the course of study.

No attempt has been made to divide this fundamental material for the course of study, into the different years of work. As this is a prerogative and a responsibility that belongs to the teacher of vocational agriculture. If however, he should base his order of selection of the enterprises on the financial returns, they would appear in the following order:

- | | |
|-------------|------------------|
| 1.Cotton | 5.Hay and Forage |
| 2.Corn | 6.Dairy |
| 3.Workstock | 7.Poultry |
| 4.Oats | 8.Swine |

The major farm problems were all centered about the common farm enterprises except, the ones dealing with farm shop and with farm management. These problems were general and dealt with the farm as a whole, hence no plans were suggested for teaching farm shop as this work should always deal with the enterprise jobs of the community.

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