

Prairie View A&M University

Digital Commons @PVAMU

All Theses

4-1945

Determining Courses of Study in Farm Mechanics for Texas Based on the Analysis of the Need of 300 Negro Farmers

Charles A. Harrison
Prairie View State College

Follow this and additional works at: <https://digitalcommons.pvamu.edu/pvamu-theses>

Recommended Citation

Harrison, C. A. (1945). Determining Courses of Study in Farm Mechanics for Texas Based on the Analysis of the Need of 300 Negro Farmers. Retrieved from <https://digitalcommons.pvamu.edu/pvamu-theses/1009>

This Thesis is brought to you for free and open access by Digital Commons @PVAMU. It has been accepted for inclusion in All Theses by an authorized administrator of Digital Commons @PVAMU. For more information, please contact hvkoshy@pvamu.edu.

DETERMINING COURSES OF STUDY IN
FARM MECHANICS FOR TEXAS BASED ON
THE ANALYSIS OF THE NEED OF
300 NEGRO FARMERS

=====

HARRISON

1945

DETERMINING COURSES OF STUDY IN FARM MECHANICS FOR
TEXAS BASED ON THE ANALYSIS OF THE NEED
OF 300 NEGRO FARMERS

5
675.3
H36
1945

By

Charles A. Harrison

A Thesis in Rural Education Submitted
in Partial Fulfillment of the Requirements
for the Degree of

Master of Science

In The

Graduate Division

of

Prairie View State College
Prairie View, Texas



The W. R. Banks Library
Prairie View University
Prairie View, Texas

BIOGRAPHY

Charles A. Harrison was born September 18, 1904, in Selma, Alabama, and after spending the first six years of his life there he came to Prairie View, Texas, to live with an aunt and uncle, Professor and Mrs. P. E. Bledsoe. Professor Bledsoe at that time was an Instructor in Science and Mrs. Bledsoe was a teacher in the grammar school.

Mr. Harrison was trained through the grammar, high, and normal school at Prairie View. After completing his education at Prairie View in 1919, he entered Talladega College where he remained for two years.

In 1921 he began teaching manual training at the Marlin High School in Marlin, Texas. He remained at Marlin for two years. For one year (1923) he was Instructor of Mechanic Arts at Coleman College, which was then located in Gibsland, Louisiana. In 1924 he married while teaching at the Charleton Pollard and Hebert High Schools in Beaumont, Texas.

From 1927 to 1929 he was employed as a Manual Training Teacher in the Central Colored High School, Shreveport, Louisiana. From Shreveport he went to Southern University in Scotlandville, Louisiana, and remained there from 1929 to 1937. While acting as Instructor of Agricultural Engineering at Southern, he received his Bachelor of Science Degree.

His connection with the Prairie View State College faculty began in 1937 as Instructor of Rural Engineering. This position he gave up in 1940 when he was employed in his present position as Supervisor of The Food Production War Training Emergency Program.

ACKNOWLEDGMENTS

The writer acknowledges with sincere appreciation and gratitude the able assistance and kind advice received in the preparation of this manuscript from his Advisory Committee: Dr. E. M. Norris, Chairman, Professor of Rural Education and Chairman of the Division of Graduate Study; Mr. G. L. Smith, Professor of Agriculture and Poultry Husbandry; and Dr. J. M. Coruthers, Professor of Agricultural Economics.

Gratitude for their assistance in the collection of necessary data for the completion of this manuscript is also extended to the following Supervisors and teacher trainers of Agricultural Education:

Mr. J. B. Rutland, State Supervisor of Agricultural Education
Mr. O. J. Thomas, Itinerant Teacher Trainer
Messrs. E. E. Collins, S. E. Palmer, Gus Jones, W. D. Thompson and Paul Rutledge, Area Supervisors in Agricultural Education

The writer further acknowledges his indebtedness to the encouragement of Mrs. C. L. Harrison, Mrs. J. S. Flipper and Mr. J. S. Flipper II, Instructor of Mathematics, in the preparation of this manuscript.

Last but by no means least he is indebted to the vocational agriculture teachers who supplied the data for this study.

TABLE OF CONTENT

CHAPTER I

INTRODUCTION

Purpose of Study	1
Scope of Study	3
Sources and Methods of Securing Data	3
Definition of Terms	6
Criteria	6
The Nature and Characteristic of the Trends of American Agriculture as They Relate to Farm Implements Used	7
The Desirability of the Farmer to use Skill	8
The Appropriateness of the Skill or Knowledge to the Farmer's Style of Farming	9
The Nature and Characteristics of the Farmer's Equipment	9

CHAPTER II

PRESENTATION AND ANALYSIS OF DATA

Criteria of Analysis and Interpretation of Data	11
Distribution of Farm Mechanic Jobs of 300 Negro Farmers in Texas, as to Participation, Importance, Interest and Job Skill Required	11
Analysis of Farm Practices of 300 Negro Farmers in Texas	12

Types of Farming and Farm Tenure	17
Distribution of Home Conveniences of 300 Negro Farmers in Texas	18
Distribution of Farm Machinery and Equipment on 500 Negro Farms in Texas	21

CHAPTER III

DESCRIPTION OF PRESENT CURRICULUM OF NEGRO VOCATIONAL AGRICULTURAL DEPARTMENTS WITH EMPHASIS ON FARM MECHANICS

Description of Farm Shop Situation	28
------------------------------------	----

CHAPTER IV

SUMMARY AND CONCLUSIONS	34
-------------------------	----

CHAPTER V

SUGGESTED COURSE OF STUDY

Concrete Work	38
Farm-Home Conveniences	40
Farm Forge Work	45
Glazing	44
Sheet Metal	46
Rope Work	48
Rural Electrification	50
Painting	52
Terracing	55

Farm Drawing	57
Harness Care and Repair	59
Cold Metal Work	61
Farm Machinery Repairs	62
Tool Repair and Maintenance	64
Farm Carpentry	65

APPENDIX

A Farm Mechanics Inquiring Form	70
Letter Accompanying Inquiry Form	73
Letter---Reminder	74

BIBLIOGRAPHY

75

LIST OF TABLES AND FIGURES

TABLES	PAGE
I Job Inventory in Farm Mechanics of 300 Negro Farmers in Texas	13
II Types of Farming Done by 300 Negro Farmers in Texas	17
III Distribution of Home Conveniences of 300 Negro Farmers in Texas	19
IV Jobs for Which 300 Negro Farmers Have Adequate Tools and Equipment	21
V Distribution of Machinery and Equipment of 300 Negro Farmers in Texas	22
FIGURES	
I Distribution of the Schools Included in Study	6
II Types of Farming Done by 300 Negro Farmers in Texas	16
III Percentages of Farm-Home Conveniences Among 300 Negro Farmers in Texas	18
IV Percentages of Farmers Owning Tools for Jobs	20
V Percentages of Farmers Owning Farm Machinery and Equipment	23

CHAPTER I

INTRODUCTION

Purpose of the Study

The growth of modern education both in the secondary schools and in the institutions of higher learning in America has embraced in the present decade not only new types of school organization, but also entirely new subjects, new methods, and new objectives. The present world crisis with its accelerated program of education and production and planning for post-war readjustments naturally has had positive effects upon our schools and other training centers. One of the programs of training so affected is that of Farm Mechanics.

For some time the writer has been aware of the existence of certain shortcomings in the present course offerings of farm mechanics for Negroes in the state of Texas. Five years of state travel, which provided direct contact with the work of the field, have given the writer these impressions. As teacher-helper in farm shop the writer was able to study the conditions first hand in about 150 training centers. The work in many of these centers has been limited to jobs in woodworking. In some cases the program is largely "busy work" on odd jobs done without any definite relationship to systematic training. Also, many farm shop teachers have not shown appreciable attempts to revamp their procedures and course offerings to utilize effectively the modern equipment and new tools which have been placed at their disposal since the passage of an act by the United States Congress, October, 1940, and known as Public Law No. 812 authorizing the

expenditure of Federal funds to provide training for out-of-school youths between the ages of 17 and 24 years. A sum of \$10,000,000.00 was appropriated for such expenditures. The Act states:

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, that the following sums are appropriated, out of any money in the Treasury not otherwise appropriated, for the support of the Government for the fiscal year ending June 30, 1941, and for other purposes, namely:

* * * * *

(4) For the cost, including the necessary equipment and supplies, of vocational courses and related or other necessary instruction provided by such agencies for out-of-school rural youth who otherwise meet the above requirements whose training is not feasible under subdivisions (1) and (3) hereof, such courses and instruction to be provided pursuant to plans submitted by such agencies and approved by the Commissioner, \$10,000,000.¹

The present world crisis has increased the demand for farm mechanics. With the manpower shortage and increasingly heavy production demands, farmers throughout the country have had to shift more and more to mechanized farming. Also the limitation placed on the manufacture of farm machinery as factories shifted to the production of weapons of war has made it necessary that farmers do more to keep their machinery in repair. Training in the efficient handling of these new types of machines is imperative. Too, the manpower shortage makes it necessary for the farmer to do

¹ Miscellaneous Publication Number 2600, Revised, November 25, 1940, Washington, D. C., United States Office of Education.

much of his own repair work, rather than rely upon men who can "fix things". Roehl, realizing this problem, has suggested a community repair shop in which may be done many of the repair jobs that arise daily on farms. However, in many sections of America's largest state, such community repair shops could not be conveniently located to serve the needs of the farmers who live great distances apart.

In predicting post-war needs one readily sees continued use of modern farm machinery, modernization of farm homes, and nation wide rural electrification. The farmer of the future must be taught the new processes incident to these developments.

In view of the foregoing, it becomes, then, the purpose of this thesis to propose a course of study in farm mechanics designed to meet the specific needs of Negro farmers in the State of Texas.

Scope of the Study

This study involves three hundred Negro farmers located in forty counties where farm mechanics is taught. These farmers live in the northeast, east-central, and southeast sections of Texas. The distribution of the schools represented by the data included in this study is shown in Figure I page 5

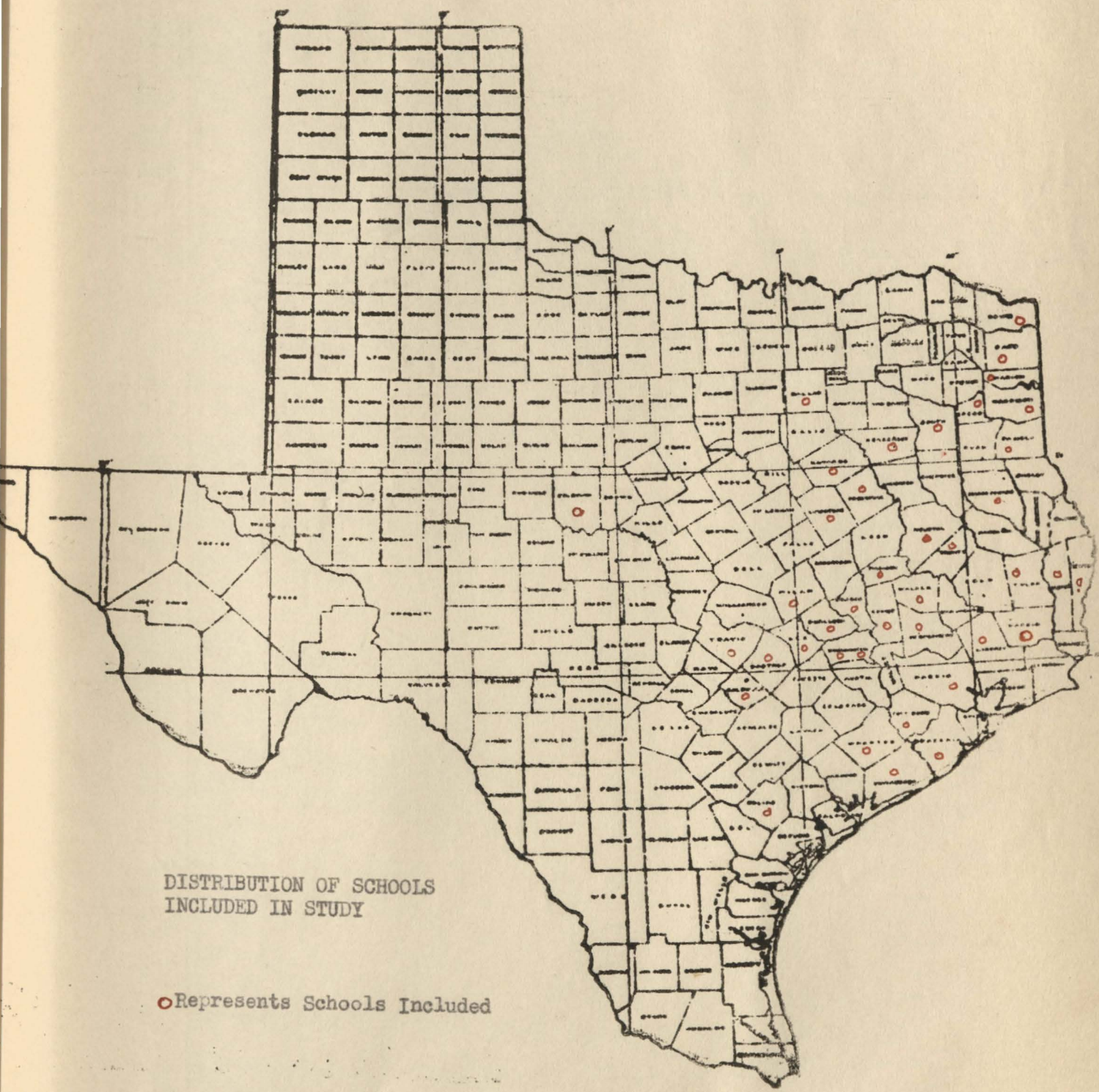
Sources and Methods of Securing Data

Data for this investigation were secured by sending ten inquiry forms to each of forty Negro vocational agriculture teachers

selected at random throughout the northeast, east-central, and southeast sections of the State. A copy of the inquiry form used is shown in the appendix of this thesis. Each instructor receiving these forms was requested to contact ten farmers in his community, execute these forms properly and return same to the writer. Three hundred seventy inquiry forms were returned but only 300 were satisfactory for tabulation. Aside from obtaining small details, the questionnaire was for the purpose of determining the following: (1) kind of farm, (2) farm equipment, (3) farm tools and implements, (4) farm home conveniences, and (5) important farm shop jobs the farmer has done in recent years in connection with his farming program.

Supplementing this source were four other important means of collecting and authenticating information. These were: (1) observation over a seven-year period of vocational agriculture farm shops; (2) personal interviews with vocational agriculture teachers, farmers, and farm youths; (3) experiences as teacher-helper for in-service work in farm machinery throughout the State; and (4) a review of the recent annual reports of Texas Vocational Agriculture Programs.

FIGURE I



DISTRIBUTION OF SCHOOLS
INCLUDED IN STUDY

○ Represents Schools Included

Definition of Terms

For the purpose of this study:

1. Farm Tools are thought of as the instruments used on farms and in farm shops such as hammers, saws, squares, levels, axes, wrecking bars, jacks, pliers, pencil rules, wrenches, trowels, post hole diggers, knives, brushes, hoes, rakes, shovels, etc.
2. Farm machinery is thought of as tractors, automobiles, trucks, gas engines, electric motors, horses, wagons, harvesting machines, cultivating machines, spray machines, peanut thrashers, etc.
3. Farm equipment is thought of as tools, machines and other appliances, such as saw benches, ladders, work benches, tool boxes, etc. used in a farming program for construction and repair for increasing power and motion so as to do work on the farm.
4. A Farm shop is thought of as a control activity for increasing usefulness of farm equipment through construction and repair.

Criteria

In an effort to analyze the data secured in the inquiries for the purpose of formulating courses adequately planned to meet the farmer's needs, it became necessary to devise a schedule of

procedure as a guide.

To determine the approach for setting up courses in Farm Mechanics on the basis of the 300 summarized inquiries, the following information was sought:

1. The nature and characteristic of the trends of American Agriculture as they relate to farm implements used.
2. The desirability of the skill or knowledge for the farmer's style of farming.
3. The appropriateness of the skill or knowledge for the farmer's style of farming.
4. The nature and characteristic of the farmer's equipment.

The Nature and Characteristic of the Trends of American Agriculture as They relate to Farm Implements Used

According to a survey of machines in "Technology on the Farm";

The number of new devices and machines invented since 1900 is impressive, but just as impressive are the improvements (through better design and material) to fit equipment to particular tasks and crops, and to make machines safer, easier to operate, and more durable, efficient, convenient and comfortable.

These inventions and discoveries come in waves; a key practice or device can unlock many related developments. We can, therefore, expect more machines, and improvements of what we have now.

Perhaps an existing machine will gain significance with passing years and lead to many more developments. These may be of three primary kinds, those with equip-

ment for gathering and processing low value crops chiefly for industrial uses; those that fit crops (as in the case of hybrid corn and cotton) to machines, instead of machines to crops; and those that carry out the trend of giving farmers more specialized implements.²

The Desirability of the Farmer to use Skill

In determining farm mechanic jobs to be taught, certain criteria of selection should be considered.

According to Lattig in quoting Sharp and Sharp in their book Principles of Farm Mechanics:

In the first place the project must be true to actual life conditions, or practical. Second, it must be interesting to the boy. Third, it must be a clear and definite job to be done or object to be made. Fourth, it must be of proper scope and difficulty. Fifth, it must make the boy do some real thinking.

When a farmer, or anyone else, is considering doing a certain job, he considers the following points:

1. Will it save time?
2. Will it save money?
3. Will it save labor?
4. Will it give me a feeling of satisfaction?
5. Does it require too much equipment?
6. Is it too difficult for me to do?³

² United States Government Printing Office, A Special Report by an Interbureau Committee and the Bureau of Agricultural Economics of the United States Department of Agriculture, Washington, D. C., 1940, p.101.

³ Lattig, H. E., Practical Methods in Teaching Vocational Agriculture, New York, McGraw-Hill Book Company, 1931, p.202.

The Appropriateness of the Skill or Knowledge to the Farmer's Style of Farming.

When making a course of study in Farm Mechanics the question naturally arises, "What jobs are appropriate for the type of farming practiced?"

As stated by H. E. Lattig:

The relative importance of the jobs to be taught in farm mechanics depends quite largely upon the types of farming in the community, the same principle, of course, which applies to selections of jobs in livestock and crop studies. There is this difference, however. In many shop enterprises such as care and repair of hand tools, harness repair, blacksmithing and auto mechanics, the jobs are quite similar in all parts of the country. Furthermore, the tools used in doing these jobs are almost identical in any two districts. In other words, each boy can profit by acquiring certain skills in these enterprises, provided he follows the vocation of farming. The instructor is then assured in the beginning that he will need to teach his students to sharpen and repair hand tools, to make wood appliances, to do some blacksmithing, etc. His problem resolves itself into selecting the kind of jobs in which these skills will be used. He should realize at the outset that much of the work deals with overhauling and construction.⁴

The Nature and Characteristics of the Farmer's Equipment

During the twentieth century the investment in machinery with American farmers has increased rapidly.

⁴ Lattig, H. E., Practical Methods in Teaching Vocational Agriculture, New York, McGraw-Hill Book Company, 1931, p. 200

According to the United States Census reports on Farm Machinery values from 1900 to 1940, it is shown that improved and more machinery is being used by American farmers. Beginning with 1900, the total values of farm machinery on farms reporting increased from approximately three-fourth billion to over three billion dollars in 1940. The greatest increase was from 1910 to 1920 which was a ratio of 1 to 3, but the year 1930 shows that the value of farm machinery was more than one-fourth billion dollars greater than it was in 1940, although there is no record available for individual farms in the census report for 1910 and 1920. However, the average value per farms reporting for 1930 and 1940 was \$597.00 and \$610.00 respectively.⁵

The present ownership of farm machinery by Negro farmers, the trend toward tractor ownership, and the high percentage of Negro operators, together justify the inclusion of operation, care, and repair of farm machinery in a farm mechanics program.

⁵ United States 1940 Census of Agriculture, Washington, D. C., 1940, Vol III p. 35

CHAPTER II

PRESENTATION AND ANALYSIS OF DATA

Criteria of Analysis and Interpretation of Data

In order to analyze and interpret the data found in the survey a guide for the organization and classification of materials was set up to include:

1. Distribution of farm mechanic jobs which were performed on the basis of importance, interest, and required skills;
2. Types of farming done;
3. Use of home conveniences;
4. Possession of various types of farm tools;
5. Possession of various types of farm machinery and equipment.

Distribution of Farm Mechanic Jobs of 300 Negro Farmers in Texas, as to Participation, Importance, Interest, and Job Skill Required

A job inventory was made of whether or not certain jobs are now being performed by the farmers surveyed, and of their attitude regarding these jobs. In Table I, the jobs which the farmers did, the jobs which they thought important, the jobs which they thought required skill are shown. Also, the Table shows those jobs which the farmer would like to do but does not do.

Those jobs which were being performed in a fashion by the farmers, and those which they thought important have been singled out for emphasis in the suggested course of study.

Analysis of Farm Practices of 300 Negro Farmers in Texas

Ten inquiry forms were sent to each of forty teachers of vocational agriculture selected at random throughout the northeast, east-central, and southeast sections of the State. These teachers in turn used the inquiry form for collecting information from farmers in their respective communities and returned the executed forms to the writer. From three hundred and seventy forms returned, the writer selected three hundred to which number the study was confined.

A detailed report of the results summarized in special figures 1, 2, 3, 4, 5, 6 and Tables I, II, III, IV, V is included in this chapter. These special tables were made for questions 6, 10, 11, 12, 13, which were believed to be of great value in determining course offerings in farm mechanics.

It is believed that if one-third or more of the farmers included in the study can to some measurable degree be associated with a job or skill, then such job or skill can be justifiably placed in a suggested course.

Replies to the question "Would you like to do the job but do not?" were not consistent with answers given to the other three questions. These discrepancies may be accounted for as follows:

TABLE I

Job Inventory in Farm Mechanics of 300 Negro Farmers in Texas

List of Jobs	Farmer does the Job	Farmer Thinks Job Important	Farmer Would Like to do but does not
Making roughwood farm appliances	259	250	58
Making finished farm appliances	109	160	117
Building rough buildings	210	222	62
Building a house	109	155	92
Painting	141	170	86
Rough concrete work	111	154	79
Finished concrete work	64	108	81
Building fences	255	216	62
Glazing	57	78	73
Freehand sketching	38	73	65
Farm drawing	37	78	78
Farm surveying	50	96	69
Land clearing	37	140	41
Land leveling and checking	62	98	73
Drainage	99	136	78
Terracing	141	161	86
Ditching	99	111	47
Operation, upkeep and repair of pumps	71	96	79
Riveting harness	72	117	82
Harness stitching	47	89	76
Rope splicing	103	186	126
Belt splicing	60	98	76
Installing shafting	21	61	61
Electric wiring	47	105	99
Pipe fitting	62	110	99
Soldering	95	166	119
Simple forging	95	150	123
Welding	58	120	126
Tool grinding and sharpening	161	211	102
Saw filing	118	177	105
Overhauling imple- ments	126	175	84
Overhauling gas engines	40	79	105
Operation, upkeep, and repair of tractors	59	102	78
Operation, care, and repair of automo- biles	81	140	108
Babbitting bearings	34	62	56

(1) The farmer was unfamiliar with job and thus was unable to determine whether or not he would like to do the job; (2) owing to the ages of these farmers surveyed (most of them were over 40 years old), it is highly probable that these men desired that their farm-hands or younger persons in their own families learn these new jobs; and (3) some farmers perhaps thought that the job required skill beyond their reach or a period of training prohibitive in length.

Most of the jobs were thought to be important by at least one-third of the farmers surveyed (see column 2 of Table I. This information supports the criterion on "appropriateness of the skill or knowledge for the farmer's style of farming." One tends to believe important those things which occur most frequently in daily life. A feeling of the importance of the job, then, may be considered a better indicator of need than the desire to do the job. Only 11 of the 35 jobs listed in Table I were checked as important by less than 100 of the 300 farmers surveyed. of these 11 two were considered important by 98 farmers and another two by 96 farmers. Hence these four jobs were listed as having one-third positive replies. This leaves, then, seven jobs with the rating "unimportant".

These jobs are: (1) glazing, (2) free-hand sketching, (3) farm drawing, (4) harness stitching, (5) installing shafting, (6) overhauling gas engines, and (7) babbitting bearings.

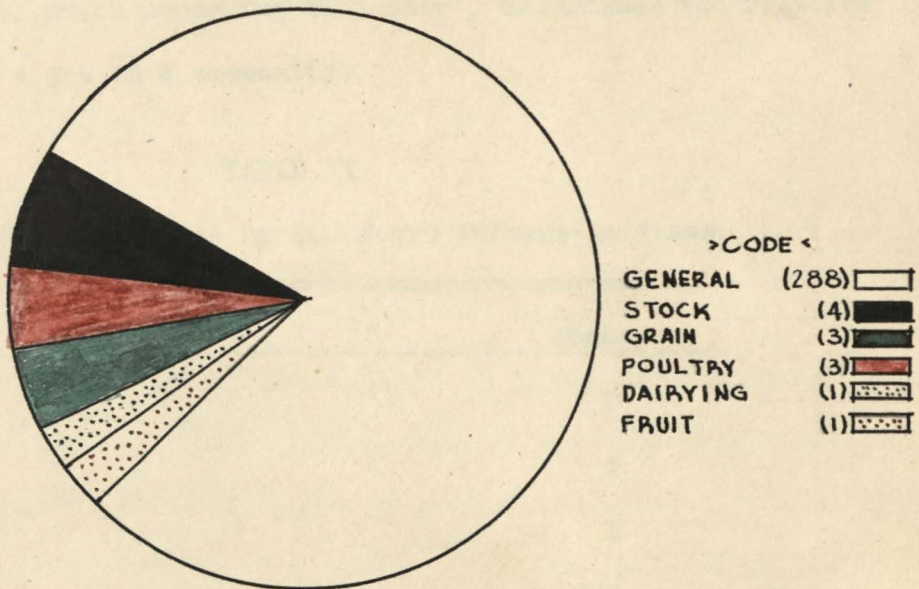
However it is further revealed that although these jobs rate unimportant to the farmers surveyed, when considered from a standpoint of efficient farming requiring semi-skilled and skilled workmen, these jobs compare favorably with the number of farmers who own farm machines (the safe and efficient operation of same require these types of skills) requiring skills in these types of jobs. In projecting a course of study designed to keep pace with the characteristic trends in the manufacturing of farm machinery, it appears advisable to plan courses so as to provide a type of training which will prepare the farmer to meet these trends in operating, caring for and repairing improved farm machinery.

There is a discrepancy in the number of farmers who desire to do, and who express themselves as doers in harness stitching as compared to the number shown in Table I page 13 who own horses and wagons. Although only 16 per cent of the farmers did harness repair, 93 per cent of the farmers surveyed owned horses and wagons. This latter figure indicates a very urgent need for this type of training although the need was not expressed by the farmers surveyed.

Only the farmers who envisioned the advantages of improved farm machinery and the construction of modern farm buildings and farm homes with modern conveniences would be interested in such jobs as those referred to in this "unimportant" class with the exception of harness stitching.

As pointed out by Sharp⁶ only the best and most interested farmer would place emphasis on courses to be taught in farm machinery involving modern improved farm machinery and modern home conveniences for the future of the farm youth of America. He also shows in his study that courses are often justifiable even though less than one-third of the farmers included in a survey express a need for that type of training.

FIGURE 2



Types of Farming Done by 300 Negro Farmers in Texas

⁶ Sharp, M. A., A Suggested Course of Study in Farm Mechanics
Ames, Iowa, January, 1929, p. 2.

Types of Farming and Farm Tenure

Figure 2 and Table II show that 288 of the 300 farmers classified their farming programs as general as contrasted with 12 farmers who did specialized farming in the following enterprises: grain, dairying, livestock production, poultry production and fruit. Over two-thirds of the 300 farmers, 213 to be exact, are farm owners. This fact is important, for owners are usually more concerned about maintenance of their farms and farm homes than renters who usually worry very little about upkeep. Too, owners are more interested than renters in modernizing their farms and farm homes, which according to Lattig⁷, determines the relative importance of a job in a community.

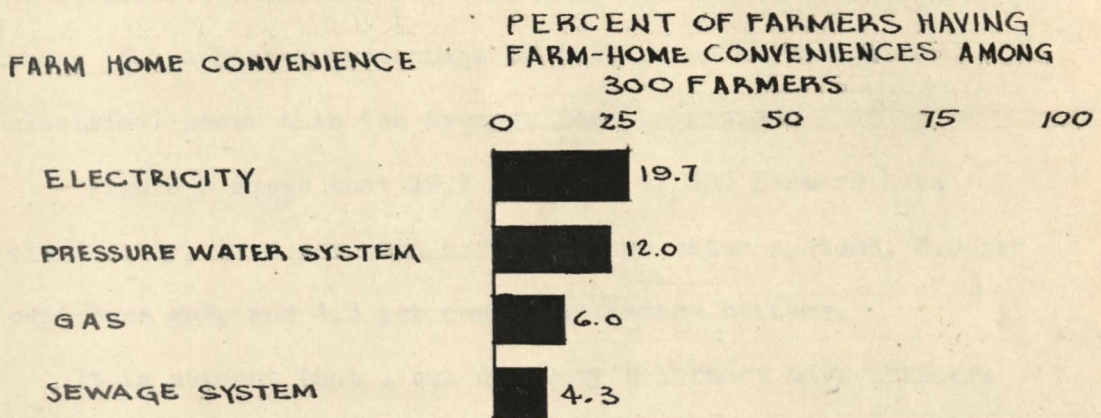
TABLE II

Types of Farming Done by 300 Negro Farmers in Texas

Kind of Farm	Number
Grain	3
Stock	4
Fruit	1
General	288
Dairy	1
Poultry	3
Total:	<u>300</u>

⁷ Lattig, H. E., Practical Methods of Teaching Vocational Agriculture, p. 200

FIGURE 3



Percentages of Farm-Home Conveniences Among 300 Farmers

Distribution of Home Conveniences of 300 Negro Farmers in Texas

Figure 3 shows that only 19.7 per cent of the 300 farmers surveyed use electricity as a means of increasing certain home conveniences and providing power for efficiency in their farming program. R. T. Beall in discussing the lag in rural electrification states: "Several reasons might be advanced to explain why only 10 per cent of the Nation's farmers purchase electricity. These are (1) The lack of interest by operating companies in rural electrification; (2) High cost of line construction because of the expensive type of line used; (3) Onerous restrictions covering line extensions; and (4) High rates."⁸

⁸ United States Year Book of Agriculture, 1940, p. 791.

In comparing the number of farmers on a national basis who have received these services with the 300 farmers studied, it is shown that a higher percentage of this group studied have electrical power than the average for the nation.

Figure 3 shows that 19.7 per cent of 300 farmers have electricity, 12.0 per cent have pressure water systems, 6.0 per cent have gas, and 4.3 per cent have sewage systems.

It is evident that 1 out of every 8 farmers have pressure water systems. "The first essential for good health is an adequate, clean and pure water supply, but the carrying of water from the well to the house in a pail does not contribute to good health."⁹

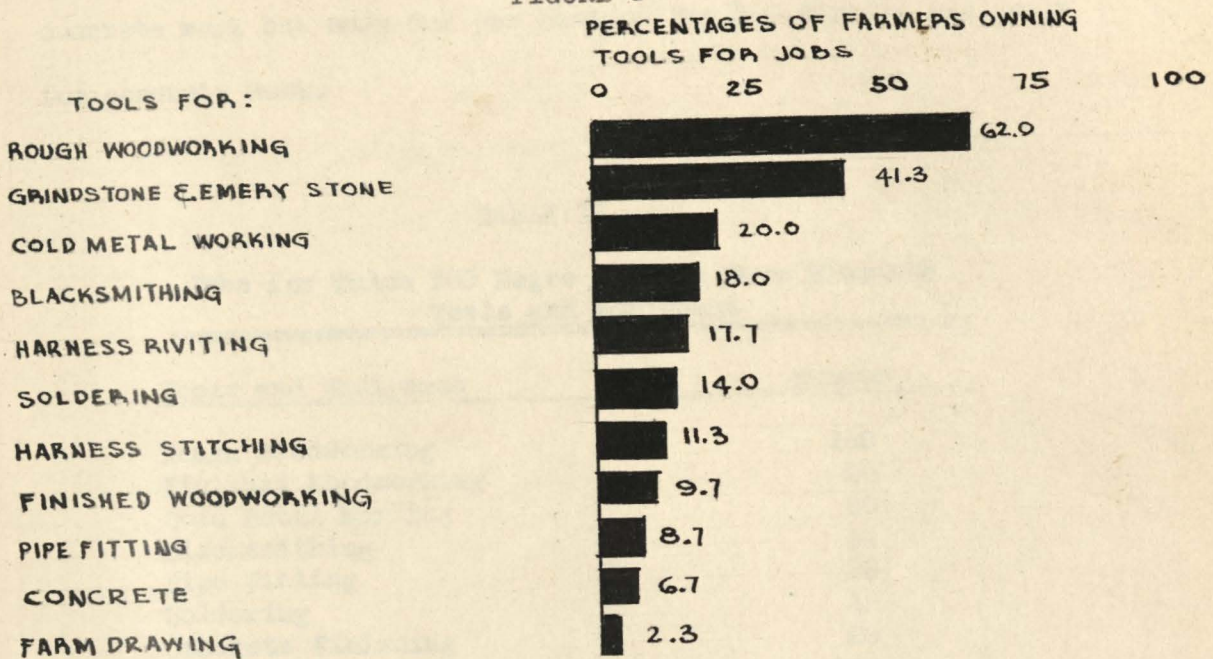
TABLE III

Distribution of Home Conveniences of 300 Negro Farmers in Texas

Home Conveniences	Number
Pressure Water System	36
Sewage System	13
Electricity	59
Gas	18

⁹ Davis, K. C., Farm Enterprise Mechanics, Chicago, J. B. Lippincott Co., 1935, p. 365

FIGURE 4



Percentages of Farmers Owning Tools for Jobs

Distribution of Farm Tools of 300 Negro Farmers

As shown in Figure 4, most of the farmers have tools for unskilled or semi-skilled woodworking. This is also brought out in the number of tools used in farm drawing. Intermediate jobs for which tools are available, such as blacksmithing and harness repair account for 52 per cent of all tools owned by the 300 farmers. The percentages of the tools owned for the activities just mentioned are as follows: Metal work, including blacksmithing, cold and hot metal work, and soldering, is 52 per cent and harness repair including riveting and stitching is 29 per cent.

As shown in Table I, there were 111 farmers who did rough concrete work but only 6.7 per cent of the 300 farmers had tools for concrete work.

TABLE IV

Jobs for Which 300 Negro Farmers Have Adequate Tools and Equipment

<u>Tools and Equipment</u>	<u>Number</u>
Rough Woodworking	189
Finished Woodworking	29
Cold Metal Working	60
Blacksmithing	54
Pipe Fitting	26
Soldering	42
Concrete Finishing	20
Grinding	124
Farm Drawing	7
Harness Riveting	53
Harness Stitching	33

It was revealed from the inquiry form that 288 of the 300 farmers surveyed were general farmers, and the type of farming engaged in necessarily suggests that such practical jobs in concrete as construction of feed and watering troughs for livestock and poultry might well be done.

Distribution of Farm Machinery and Equipment on 300 Negro Farms in Texas

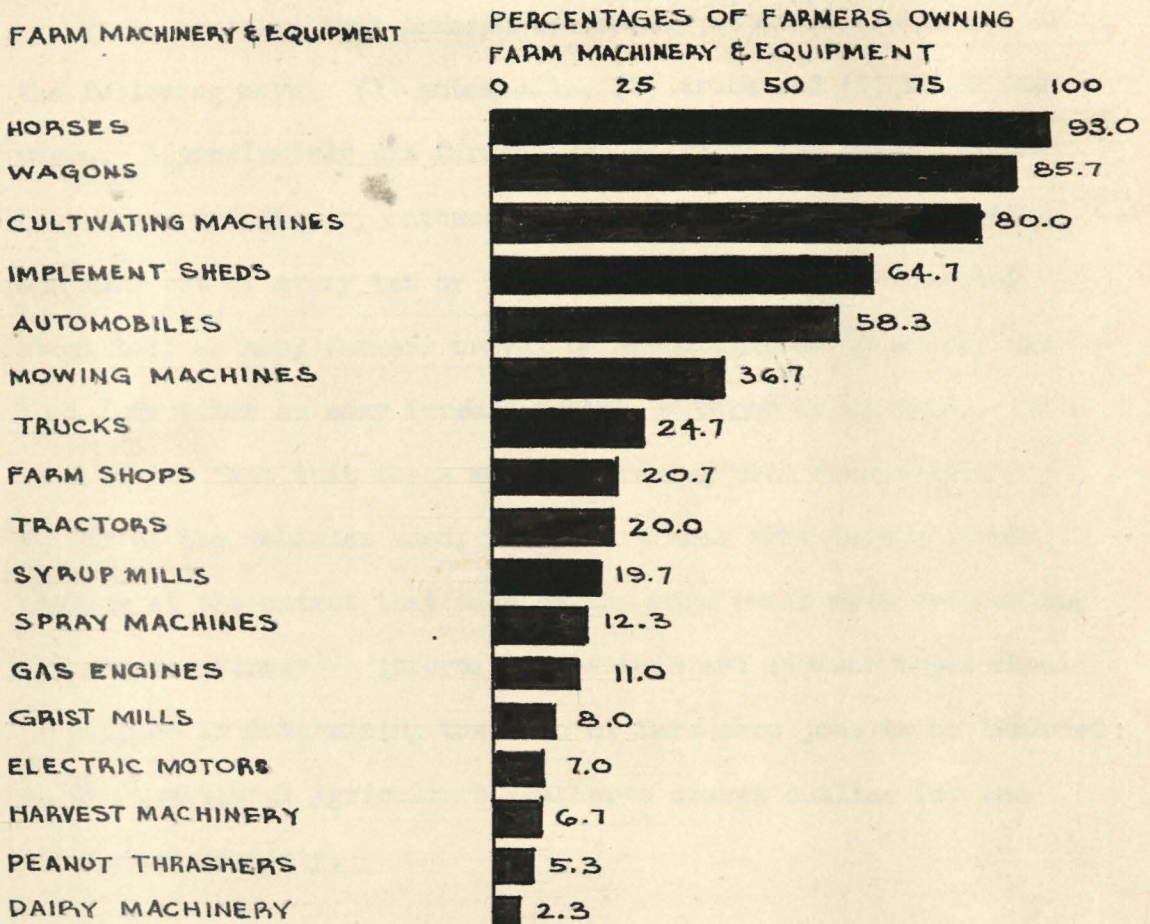
A summary and computation of percentages of the various types of farm machinery and equipment found on the 300 farms studied revealed that wagons, cultivating machines and mowing machines predominated. The relative percentages for this farm machinery

TABLE V

Distribution of Machinery and Equipment of 300 Negro Farmers
in Texas

Machinery and Equipment	Number
Automobile	175
Truck	74
Tractor	60
Gas Engines	33
Electric Motor	21
Farm Shop	62
Implement Shed	194
Horses	279
Wagons	257
Harvest Machinery	19
Cultivating Machine	240
Spray Machine	37
Dairy Machinery	7
Grist Mill	24
Syrup Mill	59
Mowing Machine	110
Peanut Thrasher	16

FIGURE 5



Percentages of Farmers Owning Farm Machinery and Equipment

and equipment were as follows: Wagons 85.7 per cent, cultivating machines 80 per cent; and mowing machines 36.7 per cent. The survey indicated that the interest of these 300 farmers, centered around the convenience, services and importance of these farm machines or equipment, in which they had made investments.

Figure 5 shows that 93.0 per cent of farmers have horses and 85.7 per cent have tractors. As shown, most of the farmers

surveyed have operative power.

It is revealed that transportation may be available in one of the following ways: (1) automobile, (2) truck and (3) horse and wagon. Approximately six farmers out of every ten or 58 per cent have transportation by automobile, one out of every four by truck, and nine out of every ten by horse and wagon. This shows that about half as many farmers travel by automobile as by wagon, and that four times as many farmers travel by wagon as by truck. In view of the fact that these modes of travel will necessitate repair of the vehicles used, it appears that "The farmer should realize at the outset that much of the work deals with overhauling and construction."¹⁰ Information of this and similar types should be a guide in determining the kind of farm shop jobs to be included in the Vocational Agriculture teacher's course outline for the particular locality.

¹⁰ Lattig, H. E., Practical Methods in Vocational Agriculture
New York, N. Y., McGraw-Hill Company Inc., 1931, p. 201.

CHAPTER III

DESCRIPTION OF PRESENT CURRICULUM OF NEGRO VOCATIONAL AGRICULTURAL DEPARTMENTS WITH EMPHASIS ON FARM MECHANICS

In this chapter the writer makes a brief presentation of data collected on the curriculum of Negro vocational agricultural departments, particularly in farm mechanics. As pointed out in the introduction, teaching procedures in farm mechanics for Negroes throughout the State are not in harmony with modern farming because of lack of time and equipment.

It was found on visits that many of the vocational agriculture teachers attempted an adjustment of their course outlines to meet the needs of the farmers in their respective localities. This is evident in some of the teaching plans observed in the departments visited.

Vocational agriculture teachers in Texas are encouraged to organize a curriculum designed to fit the sectional or local needs of their communities. Course offerings in vocational agriculture include soil conservation; improving plants; growing and harvesting crops; feeding, caring for, and improving livestock and poultry; controlling diseases and insects of livestock and poultry; controlling diseases and insects of plants; producing a living at home; farm shop and/or rural engineering; marketing farm products; managing the farm business; beautifying the home surroundings; etc. In short, the curriculum includes agronomy, animal husbandry,

dairying, horticulture, rural education, and rural engineering. In addition to these course offerings the vocational agricultural program utilizes supplementary activities such as agricultural conferences, exhibits, fairs, and contests; N F A work; and joint activities.

The Texas Plan states in regard to method of instruction:

Methods of instruction in vocational agriculture in Texas Public Schools shall be on the problem basis with the actual planning and carrying out of problems to completion in a vocational situation. The problems selected from farming situations are of such size, scope, and type as will prepare the pupil (1) to meet with growing efficiency and happiness the demands of a progressive vocation of farming, and (2) to meet the present and immediate agricultural needs of the pupil who lives on the farm. . .¹

The above suggests again that the teacher of vocational agriculture is to keep constantly in mind that the students' needs constitute the paramount criterion for any teaching unit in the previously described curriculum.

Farm shop classes in most vocational agriculture departments begin by acquainting students with tools and equipment in the shops. This practice on the part of instructors of such classes appears to grow out of the assumption that their students already possess understanding of the purposes of farm shop courses. Some of the typical teaching plans differ on this point of procedure.

¹ Woods, L. A., "Texas State Plan for Vocational Education and Rehabilitation," Bulletin of the State Department of Education, Austin, Texas, Vol XIV, No 8, 1938, pp. 24-25.

Educators advocate "purposeful activities";¹² psychologist contend that "the whole precedes its parts."¹³ Allying these two concepts and applying them to the subject under consideration, it appears that the first duty is to inform beginning students of the over-all objectives of farm mechanics so that all subsequent activities may be understood as purposeful activities. An initial over-all picture describing the whole field of farm mechanics is as important to the student as acquainting students with tools and equipment in the shops.

The second step taken by nearly all instructors of farm shops is to have students proceed in the use of tools found in the shop; for example, measuring accurately and sawing to a mark. Following these are units on rafter cutting and roof shingling, perhaps.¹⁴ According to Cook, Scranton and McColly, the logical sequence of this learning situation necessitates rearranging.

Some of the things which should be studied before actually beginning work in the shop are: 1. a study of tool classification--- know the common kinds of tools and their use. 2. a study of common kinds of woods. 3. some study of sketching. 4. a study of hardware.¹⁵

Lectures or lessons in caring for tools and equipment in the shop and precautions to be taken in handling should precede the actual use of these things in a job situation.

¹² Caswell, H. L. and Campbell, O. S., Curriculum Development New York, American Book Company, 1935, pp. 385-386.

¹³ Wheeler, R. H., The Science of Psychology, New York, Thomas Crowell Company, 1928, p. 251.

¹⁴ Moody, R. A., Long Time Programs an Annual Teaching Plans for the Sam Schwarz Training School, Hempstead, Texas, 1942.

¹⁵ Cook, G. C., Scranton, L. L. and McColly, H. F., Farm Mechanics Text and Handbook, Danville, Illinois, Interstate Printers and Publishers, 1939, p. 31.

Some of the typical teaching plans show that farm shop course content covers farm home conveniences (that is, plumbing, sanitation, sewage disposal system, and water supply), farm forge work, glazing, farm carpentry and farm tool repair and maintenance, all rather thoroughly. To a limited degree the problem of farm machinery repair is also covered in some schools because of the limited amount of tools and equipment.

In checking over lists of study units for farm shop courses, one will often find for a week's program units of study which seldom render coherence. There will be found periods devoted to discussions of units on poultry house construction, installation of sinks, and making sanitary garbage cans. Such practices are actually exhibited in many schools.

Many farm shop teachers make no effort to utilize the summer for giving students opportunities to work on special home projects or jobs. Some teachers do not make absolute omission of the summer project assignment, but wait until the termination of the junior year. It appears that such summer assignments might be made to students in the first and second year as well.

Description of Farm Shop Situation

For the past four years communities throughout the State have enlarged their farm shop buildings. This step in the growth of farm shops was made possible by an act of Congress, passed in October 1940, providing funds for the purchase of tools and

and equipment necessary for the teaching of farm mechanics.

Prior to the passing of this act, the majority of the farm shops in Texas had equipment sufficient to do only a few jobs in woodwork. Today, however, the equipment and tools in practically all shops are adequate to meet the present demands or needs of Negro farmers and farm youths.

The following inventories of tools and equipment in two representative farm shops located in the central and southwestern parts of the area studied are fairly typical of the facilities to be found in over 80 per cent of the departments.

Inventory of Tools and Equipment at the Farm
Shops at West Columbia and Elkhart, Texas
(June 30, 1943)

TOOLS	NUMBER
Anvils - - - - -	3
Apron- - - - -	2
Bars, pinch- - - - -	3
Bars, crow and tamp- - - - -	2
Belts, safety - with tool loops- - - - -	1
Bits, auger- - - - -	2 sets
Bits, countersinks - - - - -	6
Bits, dull - - - - -	2 sets
Bits, expansive- - - - -	2
Bits, extension- - - - -	2
Bits, extra long electricians' - - - - -	1
Bits, hollowspoke - dado - - - - -	2
Bits, screw drivers assorted- - - - -	6
Bleeder, hydraulic brake - - - - -	1
Block, clenching - - - - -	1
Bob, plumb - - - - -	1
Board, mortar- - - - -	1
Box, horseshoer- - - - -	1
Box, measuring cu. feet- - - - -	1
Brace, angle inn - - - - -	2
Brake, plier type- - - - -	3
Braces, ratchet- - - - -	6
Brush, wire wheel- - - - -	1
Buster, rivet- - - - -	1
Calipers, inside and out - - - - -	4
Can, gasoline safety- - - - -	1
Cans, squirt, assorted sizes - - - - -	6
Chisels, cold- - - - -	6
Chisels, wood- - - - -	2 sets of 12
Clamp bar- - - - -	2 sets
Clamps, C - - - - -	6
Clamps, saw - - - - -	2
Clamps, splicing - - - - -	2
Cleaner, ring-groove - - - - -	2
Clippers, bolt - - - - -	1
Coppers solder - - - - -	4
Coppers, electric soldering- - - - -	1
Creepers, auto - - - - -	1
Cutters, glass - - - - -	1 set of 6 as needed for job

TOOLS	NUMBER
Cutters, handled-hot eye - - - - -	2
Cutters, handled-cold eye - - - - -	1
Cutter, pipe - - - - -	1
Die, ratchet - - - - -	1
Digger, long handled post hole- - - - -	1
Dresser, emery wheel - - - - -	1
Dividers, wing - - - - -	2
Drill, hand - - - - -	1
Drill, heavy duty electric - - - - -	1
Drill, Post - - - - -	11
Drill, star assorted - - - - -	1 set
Drill, wood - - - - -	2 sets
Drivers, insulated - - - - -	6
Drivers, off set screw- - - - -	2
Drivers, screw assorted - - - - -	12
Easy outs - - - - -	1 set
Edger, concrete - - - - -	1
Floats, metal and wood - - - - -	1 each
Forge - - - - -	2
Gage, thickness - - - - -	1
Gage, American standard wire - - - - -	1
Gage, leather draw - - - - -	1
Grinder, electric (6" to 10" wheel) - - - - -	1
Grinder, valve reseater - - - - -	1
Grinder, sickle - - - - -	1
Goggles, grinder and welding - - - - -	6 prs.
Groover, concrete - - - - -	1
Gun, alemite - - - - -	1
Gun, Oil- - - - -	1
Hafts, awl, assorted - - - - -	1
Hammers, ball pein - - - - -	4
Hammers, cross pein - - - - -	3
Hammers, sledge- - - - -	2
Hammers, straight and curved claw - - - - -	12
Hammers, tinners - - - - -	2
Hammers, Horseshoer's - - - - -	2
Hardies - - - - -	4
Hatchets - - - - -	3
Hoist- - - - -	1
Horses, automotive - - - - -	3
Jack, auto - - - - -	1
Jointer, saw - - - - -	1
Knife, draw - - - - -	2
Knives, putty - - - - -	6
Knives, saddler's - - - - -	1
Ladles, melting - - - - -	2
Level, builders - - - - -	1
Level, spirit - - - - -	2
Lifter, valve - - - - -	2
Mallets- - - - -	2

TOOLS

NUMBER

Meter, volt - - - - -	1
Micrometer- - - - -	2
Nippers, hoof-farriers- - - - -	2
Nipper, nail - - - - -	2
Oilers, hand- - - - -	1
Planes, jack- - - - -	6
Planes, block - - - - -	3
Planes, jointer - - - - -	2
Plate, screw - - - - -	11
Pliers, combination - - - - -	6
Pliers, adjustable- - - - -	6
Pliers, diagonal- - - - -	2
Pliers, Long nose - - - - -	2
Pliers, linesman- - - - -	3
Pincers, shoe pulling - - - - -	1
Points, spoke- - - - -	1
Puller, cotter pin - - - - -	1
Puller, gear- - - - -	3
Punches, center - - - - -	6
Punches, handled- - - - -	2
Punches, starter - - - - -	2
Punches, sheet metal - - - - -	3
Rasp, hoof - - - - -	6
Rock, harness- - - - -	2
Reamer- - - - -	6
Remover, piston ring - - - - -	2
Riveter, tubler - - - - -	6
Rules- - - - -	6
Rule, steel tape - - - - -	2
Refacer, valve- - - - -	1
Saws, compass - - - - -	6
Saws, adjustable hack - - - - -	3
Saws, crosscut- - - - -	12
Saws, rip - - - - -	1
Saws, tilting table - - - - -	1
Seamer, hard - - - - -	1
Set, rivets - - - - -	1
Set, nails - - - - -	6
Sets, saw - - - - -	3
Scrapers - - - - -	3
Shields, welding - - - - -	2
Screen, gravel - - - - -	1
Shovels, long handled- - - - -	2
Snips, tin - - - - -	4
Spikes, pole climbing - - - - -	2
Spoke, shave- - - - -	3
Square, combination - - - - -	3
Squares, framing- - - - -	3

TOOLS	NUMBER
Stones, oil - - - - -	6
Stretcher, wire- - - - -	1
T-bevels- - - - -	3
Tongs, bolt - - - - -	3
Tongs, straight lip - - - - -	2
Tongs, plow share - - - - -	2
Toll, edge leather - - - - -	1
Torches, blow - - - - -	3
Torches, acetylene- - - - -	1
Torch, arc welding - - - - -	1
Trowel, concrete - - - - -	3
Vise, woodworking - - - - -	6
Vise, blacksmith - - - - -	1
Vise, Drill press- - - - -	1
Vise, machinist- - - - -	2
Vise, pipe- - - - -	1
Wrenches, adjustable - - - - -	6
Wrenches, combination box and open end - - - - -	1 set
Wrenches, monkey - - - - -	3
Wrenches, socket - - - - -	1 complete set
Wrenches, pipe - - - - -	3
Wrenches, end - - - - -	1 " "
Working benches- - - - -	6
1 Electric Drill Press*	
1 Electric jointer *	
1 Band saw*	

* In West Columbia shop only.

CHAPTER IV

SUMMARY AND CONCLUSIONS

It appears that the Negro farmers of Texas have many unsolved problems in farm mechanics which aside from being numerous, are varied and necessitate the development of more skill. Skill in any type of work requires not only experience but proper training. The majority of farm shops are now equipped for the teaching of courses that will provide a variety of experiences to the farmers and farm youths in their farming program.

In view of the foregoing analysis of the needs of 300 Negro farmers in Texas and the related investigation of the present curriculum of the Negro vocational agriculture department, the following general conclusions are made:

1. There are two important factors to be considered in determining course offerings in farm mechanics. These are: (1) the objectives of farm shop instruction, and (2) the local needs of farmers and farm youths residing in the community.
2. Course offerings in farm mechanics for Negroes in Texas should include the following: (1) tool repair and maintenance, (2) farm drawing, (3) farm carpentry, (4) terracing and surveying, (5) concrete work, (6) farm home conveniences, (7) glazing, (8) harness care and repair, (9) farm forge work,

(10) farm machinery repair, (11) cold metal work, (12) painting, (13) rural electrification, (14) sheet metal, and (15) rope work.

3. Not only must these courses be included in the curriculum but sufficient time must be allotted for adequate subject matter coverage which in turn should produce a fair degree of proficiency on the part of farmers in doing these jobs.
4. Voicing the sentiments of Professors G. C. Cook and C. Walker, it is believed from twenty to fifty per cent of the time of all teachers of vocational agriculture should be given to farm shop courses.¹⁶

Supplementing these general conclusions are summarizing statements of a more specific nature. Such specific conclusions and recommendations are:

1. Farm mechanics courses for Negroes in Texas should be inclusive enough to afford adequate coverage of a general farming program. Wherever necessary, special emphasis may be given to meet local demands.
2. It is the duty of all teachers of vocational agriculture to keep farmers and farm youths ever mindful

¹⁶ Cook, G. C. and Walker, C., Practical Methods in Teaching Farm Mechanics, Danville, Illinois, The Interstate Printers and Publishers, 1941, p. 10.

of modern trends in agriculture with emphasis upon mechanization in farming, improved rural sanitation, rural electrification and heating, and terracing.

3. The present ownership of tractors by Negro farmers, the trend toward tractor ownership, and the high percentage of Negro operators, together justify the inclusion of operation, upkeep and repair of tractors in teaching farm machinery repair. In general, the entire course in farm machinery repair has been inadequately treated.
4. The teacher of vocational agriculture must instill in the minds of farmers and farm youths the desire to replace obsolete home facilities with more modern conveniences. And further, he should encourage and assist in immediate installment of such conveniences which inevitably will lead to the making of happier and healthier home life.
5. The teaching of care and upkeep of tools as well as modern trends in carpentry should be included in farm shop programs.

CHAPTER V

SUGGESTED COURSE OF STUDY

The following courses are suggested as subjects to be taught in farm mechanics:

Each course outline is divided into three sections; namely, 1. Objectives; 2. Problems for Study and Discussion; and 3. Practical Jobs.

These jobs are not arranged to be taught in sequence, but may be taught as the need arises in the farm enterprises.

Concrete Work

I. Objectives:

1. To develop an appreciation of the value of concrete as a practical building material well adapted for a great variety of farm construction needs.
2. To test sand for impurities.
3. To find out where materials for concrete can be secured.
4. To select sand and gravel suitable for concrete construction on the farm.
5. To mix, pour, finish, and cure concrete according to standard recommendations.
6. To perform jobs needed in a farming program.
7. To use concrete for some purpose about the farm.

II. Jobs for study and discussion:

1. Determine the importance of concrete on the farm.
2. Study the uses of concrete on a progressive farming program.
3. Learn about the essential qualities of good concrete.
4. Find out what precaution must be taken in selecting materials.
5. Make sand tests for impurities.
6. Select the equipment necessary for concrete mixing and using concrete.
7. Find out where materials for concrete making may be secured.
8. Learn about the recommended mixtures for various types of construction work on the farm.

III. Practical Jobs:

1. Fence posts.
2. Watering trough.
3. Septic tanks.
4. Manure pit.
5. Milk cooling tank.
6. Feed trough.
7. Floors.
8. Walks.
9. Steps.
10. Feeding floor.
11. Foundation for wall.
12. Building blocks.
13. Foot scrapers.
14. Milk house.

Farm - Home Conveniences

I. Objectives:

1. To develop the ability to appreciate home conveniences.
2. To select Farm Plumbing equipment.
3. To install and repair plumbing fixtures.
4. To select and install farm water systems.
5. To establish farm sewage disposal systems.
6. To select, install and maintain farm heating systems.
7. To do ordinary jobs needed in the students farming program.
8. To develop a desire for home.
9. To develop a desire for home improvement.

II. Jobs for study and discussion:

1. Determine the importance of plumbing on the farm.
2. Develop the plans for a farm plumbing system.
3. How much plumbing should a farmer be able to do.
4. Determine the equipment needed for plumbing jobs on a progressive farm.
5. Make out a bill of material, showing what pipe, fixtures, fittings, drain traps and other equipment should be ordered to do a good job of plumbing which will meet the State Sanitary Code.
6. Determine the water requirements of a farm.
7. What are the sources of water supply and types of systems.
8. Means of water purification.
9. Calculate the cost of progressive farm water system.

10. Care of the water system.
11. Importance of sewage disposal.
13. What are the principal parts of a modern sewage plant and method of sewage disposal.
14. The common methods of heating farm homes.
15. What are the requirements of a good heating system.
16. Advantages and disadvantages of a hot water and hot air heating systems.
17. Types of fuel and heating values of the various types.
18. How heat may be conserved by building construction.
19. The importance of building construction.

III. Practical plumbing jobs:

A. Learn to do the following:

1. Install a hot water line.
2. Install a pump.
3. Repair a pump.
4. Install stock tank float.
5. Septic tank.
6. Stock water system.

IV. Practical Heating Jobs:

A. Learn to construct and repair the following:

1. Poker.
2. Chimney Cleaner.
3. Ash Scoop.
4. Splitting wedges.
5. Weather strip windows and doors.

- IV. 6. Storm windows.
- 7. Stove doors.
- 8. Home insulating.
- 9. Stove and heater repair.

Farm Forge Work

I. Objectives:

1. To develop appreciation for forge work on the farm.
2. To select equipment for forge work on the farm.
3. To perform the ordinary jobs needed in the farmers and farm youths farming program.
4. To weld and set up projects needed on the farm.

II. Jobs for study and discussion:

1. Determine the importance of farm forge work.
2. Study the various types of forges for the farm.
3. Select equipment and supplies needed for farm forge work.
4. Locate and place equipment.
5. Study the need for welding on the farm.
6. Learn how to weld.
7. Learn what types of iron and steel are necessary for farm machines and implements.

III. Practical Jobs:

- A. Construct and repair the following.
 1. Trailer.
 2. Hay Hooks.
 3. Sign.
 4. Stove poke.
 5. Pinch bar.
 6. Repair broken chain.
 7. Hog scolding hook.
 8. Welding ring.

- 9. Single tree hook.
- 10. Tree planting bar.
- 11. Double eye bolts.

Glazing

I. Objectives:

1. To appreciate importance of glazing on the farm.
2. To prepare a sash for fitting and fastening the glass.
3. To prepare putty.
4. To use putty on glass windows.

II. Jobs for study and discussion:

1. Determine the importance of glazing on the farm.
2. Learn how to cut glass.
3. Fit and fasten glass in the sack.

III. Practical Jobs:

A. Glaze windows for:

1. Brooder house.
2. Dairy barn.
3. Hen house.
4. Farm home.
5. Horse barn.
6. Church building.
7. Community building.

Sheet Metal

I. Objectives:

1. To develop appreciation of importance of sheet metal work on the farm.
2. To select proper equipment for sheet metal work commonly done on a progressive farm.
3. To do ordinary jobs needed in a farm youth farming program.
4. To select correct grades of sheet metal for farm repair or construction.

II. Jobs for study and discussion:

1. Determine equipment necessary for sheet metal work common to progressive farms.
2. Select grades and sizes of sheet metal for use about the farm.
3. Study methods of developing patterns for making funnels, chimney caps, brooder covers.
4. Learn how to rivet.
5. Acquire the ability to solder, copper, galvanize iron, cast iron, zinc, enamelware and lead pipe.

III. Practical Jobs:

A. Construct the following:

1. Water trough.
2. Chimney caps.
3. Brooder cover.
4. Cooling vat for milk.

III.

5. Exhaust box.
6. Water pans.
7. Sign.
8. Medicine cabinet

Rope Work

I. Objectives:

1. To develop ability to select kinds and sizes of ropes suitable for needs on the farm.
2. To splice a rope.
3. To set up a block and tackle and use it to best advantage on the farm.
4. To make knots, hitches and slings that are most useful on the farm.
5. To make a rope halter.
6. To handle and care for rope to obtain the maximum service from it.

II. Jobs for study and discussion:

1. Determine binds, uses and care of rope for the farm.
2. Learn about the properties and construction of rope.
3. Find out how rope is sold and the more common sizes.
4. Study the advantages of using pulleys and tackles.
5. Examine the sizes of rope used on hay forks.
6. Investigation of what knots or hitches are more commonly used on the farm.
7. Learn how knots and hitches are made.

III. Practical Jobs:

A. Make the following:

1. Rope halter.
2. Splicing hay rope

III.

3. Splice rope.
4. Replace broken strand.
5. Finishing rope end.
6. Soften rope.
7. Lead rope.
8. Assemble block and tackle.
9. Replacing hay fork rope.

Rural Electrification

I. Objectives:

1. To develop an appreciation for electricity in the farm home.
2. To select wiring equipment motors and household appliances wisely.
3. To plan a system of wiring for the entire farm.
4. To do ordinary farm wiring and repair jobs.
5. To use the necessary precaution in doing maintenance work.
6. To keep electrical appliances in good condition on the farm.
7. To possess a general understanding of how a farm building should be wired.
8. To evaluate work done.

II. Jobs for Study and Discussion:

1. Determine importance of rural electrification.
2. Acquire basic principles of electricity.
3. Learn about the sources of electricity on the farm.
4. Apply the precaution necessary in doing electrical maintenance work.
5. Study the various types of wire, switches, receptacles, appliances, and motors necessary on the farm and in the home.
6. Gather data on the cost of operation and upkeep of a farm power plant.
7. Investigate how to get service to the farm.
8. Study the need of grounding.
9. Determine what electrical work a farmer should do.

III. Practical Jobs:

A. Elementary electricity, including operation, care, and repair of electrical equipment.

1. Electrical brooder
2. Electric fence
3. Check farm building for proper wiring and outlets.
4. Sign light.
5. Shop electrification.
6. Automatic light switch.
7. Electric hotbed.
8. Oiling electric motors.
9. Installing and connecting motors.
10. Rigging up a portable motor.
11. Installing pulley-driven motor equipment.
12. Replacing motor brushes and bearings.
13. Replacing generator armatures and bearings.
14. Adjusting generator charging rates.
15. Testing and care of storage batteries.
16. Installing a transformer.
17. Setting poles and string wire.
18. Wiring a farm building for light and power.
19. Repairing household electrical equipment.
20. Installing flood lights.

Painting

I. Objectives:

1. To appreciate the importance of using good paint on the farm.
2. To mix and apply paint.
3. To prepare surface for painting.
4. To apply white wash and calcimine.
5. To refinish furniture.
6. To do a neat and complete job of refinishing entire farm home.
7. To study the composition of paint and calcimine.
8. To keep all farm buildings painted.

II. Jobs for Study and Discussion:

1. Determine the importance of painting on the farm.
2. Find out about the ingredients of paints.
3. What are the values in ready mixed paint; home mixed paint?
4. Study the common types of paint used on the farm.
5. Find out how many square feet of area are covered by one gallon.
6. Learn the proper manner of mixing paints.
7. What forms the skin on paint?
8. Study the types of paint brushes used and the methods of cleaning them.
9. Why is it so important to prepare the surface before painting?
10. What are the common painting defects?
11. Study the various methods of paint removal.
12. Where is whitewash used?
13. How is whitewash applied?

14. Study the methods of using calcimine.

III. Practical Jobs:

A. Do the following paint jobs:

1. Brooder house.
2. Wagon box.
3. Trailer.
4. House.
5. Barn.
6. Harness room.
7. Wagon seat.
8. Sign
9. Medicine kit.
10. Milkhouse.
11. manger and stall partitions.
12. Orchard ladder.
13. Wagon jack.
14. Farm gate.
15. Farm machines.
16. Fence.
17. Barn
18. Implement sheds.
19. Hen house.
20. Garage.

Calcimine Jobs.

1. Farmhouse interior.

Whitewash Jobs.

1. Broder house interior.
2. Hen house interior.
3. Barn interior.

Terracing

I. Objectives:

1. To develop an appreciation for terracing.
2. To select tools and equipment for the construction of terraces.
3. To determine when a farm is terraced.
4. To determine the cost of terracing a farm.

II. Jobs for Study and Discussion:

1. Learn how to make the different types of terraces.
2. Make a farm survey.
3. Land cleaning.
4. Land leveling and checking.
5. Drainage.
6. Terracing.
7. Ditching.

III. Practical Jobs:

A. Learn to do the following:

1. Farm mapping.
2. Farm questionnaires.
3. Tabulation and summarizing for survey.
4. Use of farm survey.
5. Calculation of light and heavy infestation of underbrush.
6. Deadening of trees and underbrush.
7. Cleaning land of stumps.
8. Burning brush.
9. Cultural practices.
10. Controlling gullies.

11. Vegetative outlets.
12. Sodded outlets.
13. Underdrains.
14. The use of open ditches.
15. Types of terraces.
16. Making preliminary survey for terracing.
17. Land preparation.
18. Instruments for running terrace lines.
19. Adjusting the Telescope Level.
20. Running the terrace lines.
21. Building a V Drag.
22. Building the terrace.
23. Maintenance of terrace.
24. Draining the gullies.
25. Opening ditches.
26. Methods of constructing or digging ditches.
27. Machinery used in terrace construction.

Farm Drawing

I. Objectives:

1. To develop the ability to read blueprints.
2. To make such drawings as farmers may be called upon to make.
3. To make simple sketches.
4. To do drawing necessary in the student's supervised farm program.
5. To construct a farm project from a working drawing.
6. To plan.
7. To print.

II. Jobs for Study and Discussion:

1. Determine the importance of blue print reading and making working drawings of a farmer.
2. Learn what symbols are used to represent building material.
3. Study the importance of using universal symbols in drafting.

III. Practical Jobs:

A. Drawing the following:

1. Sign
2. Medicine cabinet
3. Wheel barrow
4. Feed bins
5. Milk stool
6. Shoeing tool box
7. Hot bed frame
8. Brooder house
9. Candling box

III.

10. Trap nest
11. Dry mash hopper
12. Texas type poultry house
13. Self feed for chicks
14. Drinking troughs
15. Brooder coop
16. Hay rack
17. Wagon box
18. Stock shipping crate.
19. Gate
20. Shed roof house
21. Simple house plan

Harness Care and Repair

I. Objectives:

1. To appreciate the importance of harness care and repair.
2. To develop the ability to care and repair harness.
3. To learn the names of harness parts.
4. To acquire a knowledge of the various kinds of team hitches.
5. To learn how to fit and adjust the harness properly.
6. To develop the ability to clean harness.
7. To set leather.
8. To make splices and repair by stitching.
9. To make repairs by riveting.
10. To oil the harness.

II. Jobs for Study and Discussion:

1. Determine the equipment necessary for harness care and repair.
2. Study the types or grades of leather needed for repair work.
3. What are the names of the different parts of a harness?
4. Learn how to make a stitched splice.
5. Determine what type of rivets to use for making a given splice.
6. Study the various methods of attaching snap and buckles.
7. Learn how to clean a harness properly.
8. Determine method of oiling a harness.
9. Kinds of oils used for harness.

III. Practical Jobs:

A. Make and repair the following:

1. Harness repair.
2. Repair traces.
3. Replace home staple and clips.
4. Make a rivet splice.
5. Make a stitched splice.

Cold Metal Work

I. Objectives:

1. To develop an appreciation for cold metal work as applied on the farm.
2. To learn the terms common to cold metal work for the farm.
3. To do the ordinary jobs needed in a farming program.

II. Jobs for Study and Discussion:

1. Determine importance of cold metal work.
2. Learn what types of metal are best suited for metal work on the farm.
3. Learn the various methods used for twisting, bending and fastening.
4. Develop skill in drilling and tapping cold metal.
5. Study the methods of cutting threads on bolts and nuts.
6. Learn what types of bolts are used on the farm.

III. Practical Jobs:

A. Execute the following:

1. Riveting metal appliances.
2. Tapping a nut.
3. Threading a bolt.
4. Rethreading a battered bolt.
5. Filing a key to fit a lock.
6. Fitting a key into a key way.
7. Rebabbitting a bearny.
8. Redressing a cold chisel on a screw driver.
9. Making and repairing metal appliances.

Farm Machinery Repairs

I. Objectives:

1. To develop ability to repair farm machinery.
2. To gain knowledge about farm machinery.
3. To know how to keep all farm machines in good repair.
4. To do needed jobs in connection with farmers and farm youths supervised study.

II. Jobs for Study and Discussion:

1. Determine the importance of farm machinery repair work on the farm.
2. Learn how to adjust and repair farm machinery.
3. Acquire the ability to dismantle and assemble farm machinery.
4. Learn how to prepare farm machinery for winter storage.
5. Study the advantages of painting machinery.
6. Investigation of the importance of proper lubrication.

III. Practical Jobs:

A. Adjusting, care and repair of the following:

1. Walking plows.
2. Riding plows.
3. Disc harrows.
4. Harrows.
5. Stalk cutters.
6. Grain drills.
7. Corn planters.
8. Listers.

III.

9. Cotton planters.
 10. Shovel cultivators.
 11. Disc cultivators.
 12. Mowers.
 13. Hay racks.
 14. Hay presses.
 15. Manure spreaders.
 16. Fertilizer distributors.
 17. Farm wagons.
- B. Operation, care and repair of trucks, tractors and automobiles.
1. Operating trucks.
 - a. Starting
 - b. Stopping
 - c. Driving
 - d. Backing
 - e. Loading
 - f. Un-Loading
 2. Operating tractors.
 - a. Starting
 - b. Stopping
 - c. Driving
 - d. Loading and dumping a fresno
 - e. Terracing lands
 - f. Grading roads

3. Operating automobiles

- a. Starting
- b. Stopping
- c. Backing
- d. Driving

4. Servicing trucks, tractors, and automobiles.

- a. Cleaning
- b. Lubricating; checking and changing oil.
- c. Changing, repairing and inflating tires.
- d. Testing and watering batteries.
- e. Checking and cleaning cooling system.
- f. Servicing and cleaning.
- g. Adjusting lights.

5. Repair trucks, tractors and automobiles

- a. Packing water pumps.
- b. Adjusting brakes.
- c. Setting up front wheel bearing.
- d. Adjusting steering gears.
- e. Grinding valves.
- f. Replacing piston rings.
- g. Replacing bearings.
- h. Replacing axles.

Tool Repair and Maintenance

I. Objectives:

1. To develop the ability to do ordinary jobs needed with students farming program.
2. To appreciate the importance for tool repair and maintenance in a farming program.
3. To select proper repair parts.
4. To fit handles.
5. To sharpen farm tools.
6. To arrange tools in home farm work shop.
7. To provide for extra replacement parts to be kept on hand.
8. To maintain sharp farm working tools.
9. To select proper grinding equipment for the farm.

II. Jobs for Study and Discussion:

1. Determine the importance of the tool repair and maintenance on the farm.
2. What grinding equipment is necessary for tool maintenance on the farm.
3. Value of tool orderliness and placement in the home farm shop.
4. How to grind edge tools.
5. Necessary to have extra replacement parts on hand.

III. Practical Jobs:

A. Sharpening Jobs:

1. Plane bits.
2. Axe blades.
3. Auger bits.
4. Saws, cross cut, ripping and circular.
5. Hoes
6. Pick axes.
7. Grub hoes.

B. Handle Fitting:

1. Fit handle to pick.
2. Fit handle to hoes.
3. Fit handle to hammers.
4. Fit handle to chisels.
5. Fit handle to hay forks.
6. Fit handle to manure forks.
7. Fit handle to shovel.
8. Fit handle to axes.
9. Fit handle to sickle.

Farm Carpentry

I. Objectives:

1. To develop an appreciation for farm carpentry.
2. To select tools for the farm workshop.
3. To read blue prints of farm projects.
4. To construct farm projects.
5. To construct a frame building
6. To use the framing square.
7. To figure out a bill of material.

II. Jobs for Study and Discussion:

1. Determine the importance of carpentry work on the farm.
2. Learn how to select farm shop tools.
3. Learn what factors must be considered when purchasing lumber.
4. Plan some practical jobs for the farm shop.
5. Study the importance of knowing how to use the framing square doing rafter cutting.
6. Find the meanings of the terms; seat cut, plumb cut, span, pitch, run, rise.
7. Study the common types of roofs.

III. Practical Jobs:

A. Construction.

1. Laying out a foundation.
2. Building a foundation form.
3. Constructing a foundation.

III.

4. Framing a building.
5. Cutting and setting rafters.
6. Siding a building.
7. Roofing a building
8. Flooring a building.
9. Hanging doors and setting windows.
10. Attaching builders, hardware.
11. Installing downspouts and gutters.
12. Screening a building.
13. Painting a building.
14. Building steps.

B. Maintenance and repair:

1. Repairing a leaking roof.
2. Repairing a foundation.
3. Replacing defective and decayed timbers.
4. Replacing window glass.
5. Rehanging doors.
6. Repairing and replacing locks.
7. Repairing chimneys.
8. Repairing valleys, gutters and downspouts.

C. Make the following:

1. Corn drying rack.
2. Corn crib.
3. Potato crate.
4. Hay rack.

III.

5. Hot bed frame.
6. Trailer.
7. Seed potato cutting rack.
8. Wagon box.
9. Wagon seat.
10. Wheel barrow.
11. Sign
12. Loading chute.
13. Gate.
14. Milk loading chute.
15. Stock shipping crate.
16. Medicine cabinet.
17. Harness wash rack.
18. Shoeing tool box.
19. Carpentry tool box.
20. Water trough.
21. Harness hooks.
22. Feed box.
23. Brooder coop.
24. Door and window frames.
25. Wall nest.
26. Trap nest.
27. Dropping board.
28. Dry mash hopper.
29. Dusting board.

III.

30. Grit hopper.
31. Feeding trough.
32. Running board crate.
33. Self feeders for chickens.
34. Self feeder for hens.
35. Self feeder for hogs.
36. Type A. hog house.
37. Hog moving crate.
38. Pit type toilet.

APPENDIX

A FARM MECHANICS INQUIRING FORM

(To be filled in by Agriculture teacher questioning the farmer)

1. Name of farmer _____ 2. Age _____ 3. Place _____

4. Size of farm _____ Acres _____ 5. Distance from town _____

6. Kind of farm (check one) Grain _____ Stock _____ Fruit _____
General _____ Dairy _____ Poultry _____

7. Is it terraced? _____ 8. How long has he farmed? _____ years

9. Is he owner? _____ Cash renter? _____ Share renter? _____

10. What and how many of the following are on his farm?

- | | |
|---|----------------------|
| 1. Automobile _____ | 11. Truck _____ |
| 2. Gas Engines _____ | 12. Tractor _____ |
| 3. Electric Motor _____ | 13. Farm Shop _____ |
| 4. Implement Shed _____ | 14. Horses _____ |
| 5. Cultivating Machines _____ | 15. Wagons _____ |
| 6. Spraying Machines _____ | 16. Grist Mill _____ |
| 7. Dairy Machinery _____ | 17. Sirup Mill _____ |
| 8. Mowing Machines _____ | 18. _____ |
| 9. Peanut Thrasher _____ | 19. _____ |
| 10. Harvest Machinery, Specify kind _____ | 20. _____ |

11. Has he the following in his farm home?

- | | |
|---------------------------------|---------------------------------------|
| 1. Pressure Water System? _____ | 5. Electricity _____ |
| 2. Sewage System _____ | 4. Gas (type) natural or butane _____ |

12. Has he the following group of tools complete to do the work they are intended for?

- | | |
|-------------------------------|------------------------------|
| 1. Rough Woodworking _____ | 7. Concrete Finishing _____ |
| 2. Finished Woodworking _____ | 8. Grindstone or Emery _____ |
| 3. Cold Metal Working _____ | 9. Drawing Instruments _____ |
| 4. Blacksmithing _____ | 10. Harness Riveting _____ |
| 5. Pipe Fitting _____ | 11. Harness Stitching _____ |
| 6. Soldering _____ | 12. _____ |

13. Check once those things the farmer has done in the last few years in connection with his farm work. Check twice those he says are important and make a note of those he would like to do if he could.

List of Jobs	Does he do job? Check if yes.	Is job im- portant?	Would he like to do job but does not.	Does job require skill?
1. Making rough wood farm appliances	_____	_____	_____	_____
2. Making finished farm appliances	_____	_____	_____	_____
3. Building rough buildings	_____	_____	_____	_____
4. Building a house	_____	_____	_____	_____
5. Painting	_____	_____	_____	_____
6. Rough concrete work	_____	_____	_____	_____
7. Finished concrete work	_____	_____	_____	_____
8. Building fences	_____	_____	_____	_____
9. Glazing	_____	_____	_____	_____
10. Freehand sketching	_____	_____	_____	_____
11. Farm Drawing	_____	_____	_____	_____
12. Farm Surveying	_____	_____	_____	_____
13. Land leveling and checking	_____	_____	_____	_____
14. Land drainage	_____	_____	_____	_____
15. Terracing	_____	_____	_____	_____
16. Land clearing	_____	_____	_____	_____
17. Ditching	_____	_____	_____	_____
18. Operation, upkeep and repair of pumps	_____	_____	_____	_____
19. Riveting harness	_____	_____	_____	_____
20. Harness stitching	_____	_____	_____	_____
21. Rope splicing	_____	_____	_____	_____
22. Belt splicing	_____	_____	_____	_____
23. Installing shafting	_____	_____	_____	_____
24. Electric wiring	_____	_____	_____	_____
25. Pipe fitting	_____	_____	_____	_____
26. Soldering	_____	_____	_____	_____
27. Simple forging	_____	_____	_____	_____
28. Welding	_____	_____	_____	_____
29. Tool grinding and sharpening	_____	_____	_____	_____
30. Saw filing	_____	_____	_____	_____
31. Overhauling gas engines	_____	_____	_____	_____
32. Overhauling implements	_____	_____	_____	_____

List of jobs.	Does he do job? Check if yes	Is job im- portant?	Would he like to do job but does not.	Does job require skill?
---------------	---------------------------------	------------------------	---	-------------------------------

- | | | | | |
|---|-------|-------|-------|-------|
| 33. Operation, upkeep
and repair of
automobiles | _____ | _____ | _____ | _____ |
| 34. Operation, upkeep,
and repair of tractors | _____ | _____ | _____ | _____ |
| 35. Babbitting bearings | _____ | _____ | _____ | _____ |

14. About what part of his working time does he spend in repair and construction work such as listed above? _____

Prairie View State College
Prairie View, Texas
June 17, 1944

Dear Mr. -----

Enclosed you will find a Farm Mechanics Inquiry Form. Please contact ten farmers in your community, execute the form and return it to me at your earliest convenience. Please make it no later than ten days.

Yours truly,

C. A. Harrison, Supervisor
Food Production War Training
for Negro Persons

Prairie View, Texas
June 23, 1944

Dear Mr.-----

This is just to remind you to please return the questionnaire I mailed to you a few days ago. The ten days are nearly up and it is very urgent that the form be returned to me on time.

I thank you for your consideration in this matter.

Yours very truly,

C. A. Harrison, Supervisor,

Food Production War Training
for Negro Persons

CAH:W

BIBLIOGRAPHY

Better Farm Equipment and Methods, Vol. XV, No. 2, November-December, 1942; Vol. XVI, No. 1, September-October, 1943, (Pamphlet published by Midland Publishing Co., St. Louis)

Cook, Glen C., Handbook on Teaching Vocational Agriculture, Danville, Illinois, Interstate Publishing Co., 1938

Cook, G. C., Scranton, L. L., and McColly, H. F., Farm Mechanics Text and Handbook, Danville, Illinois, Interstate Publishing Co., 1941

Cook, G. C. and Walker, Clyde, Practical Methods in Teaching Farm Mechanics, Danville, Illinois, Interstate Publishing Co., 1941

Davis, Kary C., Farm Enterprise Mechanics, Chicago, J. B. Lippincott, 1935

Deere, John, The Operation, Care and Repair of Farm Machinery, Sixteenth Edition, Moline, Illinois, (Published by Author), N. D.

Lattig, H. E., Practical Methods in Teaching Vocational Agriculture, New York, McGraw-Hill Book Company, 1931

Merson, J. F., "This Month in Farm Mechanics", The California Future Farmers Magazine, XIII, P. 8 (December, 1943)

Michigan Vocational Outlook, Vol. 6, No. 2, December, 1943, (Pamphlet published by State Board of Control for Vocational Education, Lansing, Michigan)

Moody, R. A., Long-Time and Annual Teaching Plans for the Sam Schwarz Training School, Hempstead, Texas, MS in Prairie View College Library

Morrison, Ivan G., Repairing Farm Machinery, Danville, Illinois, Interstate Publishing Co., 1940

Proceedings of the Twenty-Second Annual Conference of Colored Teachers of Vocational Agriculture in Texas, May 29, 30, 31; June 1, 2, 1939, pp. 58-65

Roehl, L. M., The Farmer's Shop Book, Milwaukee, Wisconsin, Bruce Publishing Co., 1940

Schmit, G. A., Ross, W. A. and Sharp, M. A., Teaching Farm Shop Work and Farm Mechanics, New York, Century Publishing Co, 1927

Sharp, M. A. and Sharp, W. M., Principles of Farm Mechanics, New York, John Wiley and Sons, Inc., 1939

Stewart, W. F., "Planning a Summer Program of Work", Agricultural Education Magazine, XII, (May, 1940)

Technology on the Farm, United States Government Printing Office, Washington, D. C., 1940