ABSTRACT OF THESIS

---

# A COURSE IN FARM MECHANICS FOR PITTSFIELD, ILLINOIS, COMMUNITY HIGH SCHOOL

Submitted by

Phil W. Proctor



In partial fulfillment of the requirements
for the Degree of Master of Science
Colorado State College
of
Agriculture and Mechanic Arts
Fort Collins, Colorado

August, 1941

Abstract of Thesis

# A COURSE IN FARM MECHANICS FOR PITTSFIELD, ILLINOIS, COMMUNITY HIGH SCHOOL

by Phil W. Proctor

## Introduction

The problem underlying this thesis was to develop a functioning course in Farm Mechanics to be included in the vocational agriculture course of the Pittsfield, Illinois, Community High School.

The problem arose from a need for the revision of the course in farm mechanics in the above school. The four subordinate problems in this study were:

1. What kinds of farm mechanical work arise on 100 farms in the Pittsfield, Illinois, community?
2. What kinds of mechanical work do successful farmers do and what kinds do they not do?
3. What equipment do these 100 farms have for mechanical work?
4. What should be the teaching content for a course in farm mechanics in the vocational agriculture course of Pittsfield, Illinois, High School that would be functional for the farm boys of this community?

## Methods and procedures

In attempting to set up a functioning 1-year course in farm mechanics for the Pittsfield, Illinois, Community High School, the writer observed the following guiding principles:

1. The only reliable source of training content for effective instruction in farm mechanics is the experience of successful farmers in the community.

2. The practical mechanical activities of farmers in the community, for which the training in farm mechanics is to prepare, should be definitely known before any course is drawn up.

3. The kinds of machinery, tools, and equipment found on farms in a community are an index of the farm mechanical activities in which the farmers in a community engage.

These principles led the writer to the assumption that in order to set up an effective training course in farm mechanics, he needed to secure much information regarding this work from farmers in his community. Information from 100 farmers was considered for purposes of this study. To obtain this information a questionnaire was prepared. A copy of the questionnaire is included in the appendix of this study.

The questionnaire, in addition to questions pertaining to some general information, listed 18 different farm mechanical enterprises. These are:

1. Concrete work
2. Electrical work
3. Harness work
4. Forge work
5. Plumbing
6. Rope work
7. Gasoline engine work
8. Tool sharpening
9. Sheet metal work
10. Window repair work
11. Farm home jobs
12. Field crop equipment
12. Field crop equipment
13. Making shop equipment
14. General farm appliances
15. Repairing machinery
16. Wood finishing
17. Wood appliances
18. a. Swine
    b. Cattle
    c. Sheep
    d. Horses
18. Miscellaneous jobs

Under each of these enterprises the writer listed every job he could think of as arising in the enterprise. For this purpose the writer also used lists of jobs found in different farm mechanics textbooks, which are listed in the bibliography under numbers 19 and 20.

The writer then submitted this list to three key farmers in the community to determine whether the list was complete for each enterprise.

The questionnaire was checked for completeness by Dr. Harry Bradford in charge of the course in Educational Research at the Colorado State College during the summer of 1939 and under whom the writer outlined his problem. Valuable assistance and criticism in the preparation of the questionnaire was received from Dr. G. A. Schmidt, professor of Agricultural Education at the Colorado State College.

Before using the questionnaire the writer consulted three key farmers in his community asking them to check the lists of enterprises and the jobs under each for completeness and to make any additions. These men were of the opinion that the lists were very complete and added very few jobs.

The questionnaire, in regard to each job, called for the following information:

1. Does the job arise on your farm? Yes___ No___

2. Do you do the job? - - - - - - - - Yes___ No___

3. Why do you not do the job?

Lack of training? - - - - - - - - _____

Lack of equipment? - - - - - - - _____

Other reasons? - - - - - - - - - _____

The questionnaire, also, provided a large space for recording any additional farm mechanical enterprises and jobs in which the farmers might engage.

In addition the last page of the questionnaire provided for an inventory of the farmer's machinery, and other equipment; and of the kinds of livestock on the farm.

A list of 100 successful farmers in the neighborhood of Pittsfield, Illinois, was obtained from the heads of the two banks in Pittsfield, from the farm manager of the Strauss Farms, which controls nearly 10,000 acres in the area, and from the soil conservation field men working in the community.

Collection of data.--During the school year 1939-40, the writer personally interviewed 60 of the 100 farmers. He secured from these men the information called for on the questionnaire. Twelve additional questionnaires were filled out in the presence of the writer by members of the evening class of farmers which he was conducting.

The remaining 28 were taken home by students of the all-day classes in vocational agriculture which the writer was teaching. These students were instructed by the writer on how to gather the data. The questionnaires they returned were carefully checked for completeness.

The data secured on these 100 questionnaires were tabulated, analyzed, and studied.

Basis for choosing the enterprises

It was necessary to have some basis for choosing the enterprises to be included in the 1-year course in Farm Mechanics for Pittsfield High School.

All the enterprises were listed and the frequency in which they arose, were done, were not done, and how many farms had the necessary equipment to do them. It was also noted whether or not the school shop had the necessary equipment to teach the jobs.

A fair rule was set up, that if 50 percent of the enterprises occurred, were done, and they possessed equipment for doing the job on these 100 farms, the school had the equipment to teach these jobs, and if they qualified in three of the survey columns the jobs should be taught.

An outline of the proposed course of study is given on page 6.

A YEARLY TEACHING PLAN

For a Course of Instruction in Pittsfield High School

| List of enterprises to be taught in the course to entire class | Weeks to devote to each enterprise |
|---|---|
| 1. Harness work | 2 |
| 2. Forge work | 5 |
| 3. General farm work | 1 |
| 4. Sheet metal work | 1 |
| 5. Miscellaneous jobs | 2 |
| 6. Window repair | 1 |
| 7. Tool sharpening | 2 |
| 8. Rope work | 1 |
| 9. Wood finishing | 1 |
| 10. Woodwork appliances | 5 |
| 11. Concrete and related work | 2 |
| 12. Field crop equipment | 1 |
| 13. Farm home appliances | 2 |
| 14. Repair of machinery | 8 |
| Total for strictly class work | 34 |
| Time allotted for quizzes | 1 |
| Time allotted for extras | 1 |
| Total number of school weeks devoted to the subject | 36 |

The findings

The findings showed that instruction could profitably be given in the following farm mechanical enterprises:

1. Harness work
2. Forge work
3. General farm work
4. Sheet metal work
5. Miscellaneous jobs
6. Window repair
7. Tool sharpening
8. Rope work
9. Wood finishing
10. Woodwork appliances
11. Concrete work
12. Field crop equipment
13. Farm home appliances
14. Repair of machinery

Some of the pertinent findings of this study are:

1. Repairing farm machinery showed the greatest frequency on the 100 farms surveyed, and was engaged in by more farmers than any other enterprise.

2. Next on the list was the "Miscellaneous jobs" such as making single trees, making double trees, handles for tools, and farm gates.

3. Construction and repair of wood appliances for poultry, sheep, hogs, cattle, and horses occurred on a large number of the farms.

4. Farm blacksmithing or forge work occurred to some extent the 100 farms but many of the farmers did not have the equipment or training to perform the different jobs involved in these enterprises. However the school farm shop has the equipment to teach these jobs efficiently. The farmers should be urged to buy the necessary equipment.

In the following enterprises the data showed that the jobs occurred on the 100 farms and that a large number of the farmers actually performed the jobs: sheet metal work, tool sharpening, field crop equipment, farm home appliances, wood finishing, rope work, general farm work, window repair, and harness work.

The following enterprises: (1) electrical work, (2) farm plumbing, (3) tractor and gas engine work, and (4) farm shop appliances, occurred on the 100 farms, but only a few farmers were found to be doing the jobs under these enterprises. Because of this fact it seemed reasonable to eliminate the above mentioned jobs from the proposed course of study.

The course of study

From reliable sources the writer determined minimum time allotments for each enterprise he proposed to be included in the course of study. These follow:

Average time to devote to common farm mechanical enterprises to attain worth while objectives of the enterprise, based on five double periods per week

| Enterprises | Number of weeks (five double periods per week) |
|---|---|
| 1. Making wood work appliances | 2 |
| 2. Plumbing jobs | 1 |
| 3. Harness work | 2 |
| 4. Forge work | 3 |
| 5. General farm jobs | 1 |
| 6. Gas engine tractors | 3 |
| 7. Sheet metal work | 1 |
| 8. Miscellaneous jobs | 3 |
| 9. Window repairing | 1 |
| 10. Tool sharpening | 2 |
| 11. Rope work | 1 |
| 12. Wood finishing | 1 |
| 13. Farm shop appliances | 2 |
| 14. Concrete and related work | 1 |
| 15. Field crops equipment | 1 |
| 16. Electrical work | 2 |
| 17. Farm home appliances | 2 |
| 18. Repair machinery | 6 |

The writer is of the opinion that the 1-year course of study in farm mechanics for Pittsfield, Illinois, Community High School which he proposes will be a decided improvement. He believes that this new course of study will meet the needs of the farm boys in this school, that it is adapted to the facilities of the school, and that it can be justified in light of the findings of the study he has made.

T H E S I S

---

# A COURSE IN FARM MECHANICS FOR PITTSFIELD, ILLINOIS, COMMUNITY HIGH SCHOOL

Submitted by

Phil W. Proctor



In partial fulfillment of the requirements

for the Degree of Master of Science

Colorado State College

of

Agriculture and Mechanic Arts

Fort Collins, Colorado

August, 1941

COLORADO STATE COLLEGE

OF

AGRICULTURE AND MECHANIC ARTS

July 1941

I HEREBY RECOMMEND THAT THE THESIS PREPARED UNDER MY SUPERVISION BY PHIL W. PROCTOR

ENTITLED A COURSE IN FARM MECHANICS FOR PITTSFIELD, ILLINOIS, COMMUNITY HIGH SCHOOL

BE ACCEPTED AS FULFILLING THIS PART OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF SCIENCE

MAJORING IN AGRICULTURAL EDUCATION

CREDITS 3

G. A. Schmidt
In Charge of Thesis

APPROVED G. A. Schmidt
Head of Department

Examination Satisfactory

Committee on Final Examination

G. A. Schmidt
George F. Henry

C. S. Anderson
Carl E. Howard
Geo. T. Camp

V. E. Anderson
Dean of the Graduate School

Permission to publish this thesis or any part of it must be obtained from the Dean of the Graduate School.

## ACKNOWLEDGMENTS

The writer wishes to express his appreciation to Dr. G. A. Schmidt, Professor of Agricultural Education, The Colorado State College;

Dr. Clifford L. Mondart, Associate Professor of Agricultural Education, The Louisiana State University;

Dr. Harry E. Bradford, Professor of Agricultural Education, The University of Nebraska;

Dr. Sherman Dickinson, Professor of Vocational Education, The University of Missouri;

Dr. Gilbert L. Betts, Supervisor of Graduate Research in Education, The Colorado State College;

Dr. C. S. Anderson, Professor of Agricultural Education, The Pennsylvania State College.

The writer also wishes to express his appreciation to the farmers of Pittsfield community for their assistance in securing the necessary data.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF TABLES (continued)

# A COURSE IN FARM MECHANICS FOR PITTSFIELD, ILLINOIS, COMMUNITY HIGH SCHOOL

## Chapter I

## INTRODUCTION

This thesis pertains to the work in farm mechanics which is a part of the training in vocational agriculture that is offered in secondary schools under the provisions of the Smith-Hughes and George-Deen Acts.

The term "farm mechanics" is very broad and includes all the mechanical activities arising on farms in which farmers commonly engage. Some of the more common kinds of farm mechanical activities are as follows:

1. Purchasing, maintaining, adjusting, and repairing all kinds of farm machinery.
2. Purchasing, maintaining, repairing, and overhauling farm tractors, farm trucks, and stationary gas engines.
3. Keeping in good working condition all kinds of tools used on the farm.
4. Keeping harness in good condition and repair.
5. Constructing various kinds of wood appliances needed on the farm.
6. Constructing small buildings.

7. Installing and maintaining water and sewage disposal plants.

8. Purchasing, installing, and maintaining farm electrical motors and electric light system.

9. Repairing all kinds of farm building equipment.

10. Constructing concrete walks and floors, and other necessity jobs involving concrete work.

It is commonly stated that every farmer is of necessity an unspecialized mechanic--a "Jack of all trades"--and engages in innumerable farm mechanical activities. Then, too, every farmer has a large investment in buildings, machinery, and equipment; and to maintain these properly is an important factor in success in farming.

It is, also, commonly known that the major construction and repair work arising on farms are not done by the farmer; for such work he hires specialized mechanics.

A study (4:1) of 273 farmers made in California showed that these farmers devote over ten percent of their working time to various kinds of farm mechanical work. This one fact shows the importance of farm mechanics in farming.

Since the major objective of the course in vocational agriculture is to fit farm boys for proficiency in farming, it must be evident that training in farm mechanics is an important part of vocational agriculture.

Then, too, from a strictly educational point of

view, training in farm mechanics is good education for a boy fitting himself for farming. This is so because it is generally recognized that a large part of one's education consists of acquiring habits, knowledge, attitudes, appreciations, and ideals which render one's present and future actions more efficient and useful.

The commonly stated objectives of the work in farm mechanics (19:10) as a part of the all-day vocational agriculture courses are:

1. To develop the abilities of farm boys to think so that they may be able to solve intelligently the common problems arising in farming.
2. To develop habits and skills which farm boys will need in order to perform efficiently those farm mechanical activities which they may be called upon to perform.
3. To have farm boys acquire knowledge and to develop their abilities to use that knowledge (facts, theories, and principles) which will be useful to them in conducting their farm mechanical activities.
4. To develop in farm boys the right attitude toward all phases of farm mechanics work.
5. To develop the appreciations of farm boys in regard to all farm mechanics activities which a trained farm boy should possess.
6. To stimulate in farm boys the proper ideals in regard to farm mechanical work.

These objectives are stated in very broad terms but they give a good idea of the things that are attempted in instruction of farm mechanics.

The writer is engaged in teaching vocational agriculture in Illinois. The Illinois State Plan for

Vocational Education specifies that the third year in the all-day vocational agriculture course may be devoted to instruction in farm mechanics.

The writer has always been interested in this phase of work. He has been interested, also, in making the 1-year course in farm mechanics offered in his school of greatest benefit to the boys in his classes. This interest has led him to make a study of the problem underlying this thesis.

The writer is of the opinion that in setting up a program for a year's work in any school subject it is first necessary to determine the objectives of the year's work. After these objectives have been established it then becomes necessary to set up some guides or basic educational principles, that will enable one to attain the objectives. The objectives have been stated. Some guiding principles underlying effective training in farm mechanics (19:89) are here stated:

1. The only reliable sources of training content for effective instruction in farm mechanics is the experience of successful farmers in the community.

2. The practical mechanical activities of farmers in the community for which the training in farm mechanics is to prepare should be definitely known before any course is drawn up.

3. The kinds of farm machinery, tools, and equipment found on farms in a community are an index of the farm mechanical activities in which the farmers in a community engage.

4. The things to be most emphasized in the training are those which boys and men do least well in their farming activities.

5. Effective instruction in farm mechanics can only be given where the training jobs are carried on in the same way, with the same operations, the same tools, and the same machines as in the occupation itself.

6. Farm mechanics training will be effective in proportion as it trains the individual directly and specifically in the thinking habits and in the manipulative habits required in the occupation itself.

7. The effective establishment of process habits in any learner will be secured in proportion as the training is given on actual jobs and not on exercises or pseudo jobs.

8. Effective instruction in farm mechanics can only be given to a selected group that needs it, wants it, and can profit by it.

The writer is of the opinion that the way he went about in the solution of the problem involved in this study is in accord with the underlying principles mentioned above. Furthermore, he believes that the program he has formulated is also in accord with those principles involving course content.

The problem involved in this study.--The problem involved in this study is to develop a 1-year course in farm mechanics to be included in the vocational agriculture curriculum in the Pittsfield, Illinois, Community High School.

In attempting to solve this problem the writer felt it necessary to obtain the following data:

1. What kinds of farm mechanical work arise on 100 good farms in the vicinity of Pittsfield, Illinois?

2. What kinds of mechanical work do successful farmers in this region do and what kinds do they not do?

3. Do these 100 farmers have the necessary equipment?

4. What should be the teaching content for a course in farm mechanics in the vocational agriculture curriculum of Pittsfield, Illinois, High School that would be functional for the farm boys in this course?

5. What would be a good yearly outline or program of work for such a course?

## Chapter II

## REVIEW OF LITERATURE

Numerous studies pertaining to the development of a functional course in farm mechanics for vocational agriculture departments in high schools have been made. Because of the fact that very few of these studies are available to the writer; he relied largely upon Bulletin 180 (2).

In this chapter the writer gives a synopsis of those studies pertinent to this study.

M.A. Sharp (20), in his master's thesis, made a study of what should be included in farm mechanics for high schools on the basis of opinions of 500 farmers. In his study he did not determine what the farmers did not do or why they did not do it. However, he agrees that the courses in farm mechanics should be made as practical as possible and that such jobs as furniture making, funnel making, tin cups, butcher knives, and the like, which can be bought cheaply should be eliminated.

L. R. Davis (9), in his master's thesis, investigated the kinds of farm mechanics jobs done by farmers in Colorado. The same questionnaire was sent to farmers of other states and he found it was not advisable to have a rigid farm shop course, but the course

should be suited to community needs. He did not determine why the farmers did or did not do the jobs which were listed on the survey blank.

James Albert Geiger (10) made a study of farm shop work in Florida and found that farmers devote most of their time and effort to farm repair jobs and also that vocational agricultural departments do not have the necessary tools with which to do many farm mechanical jobs.

A. P. Davidson (8) of Kansas reported that 14 different kinds of farm shop activities which he calls enterprises were found in the content of farm shop courses in Kansas. He found that farm machinery activities ranked first, also that wood working ranked very high.

C. J. George and others (11) found in a survey of 15 agricultural departments in western Ohio that there were 74 different kinds of farm shop jobs taught. Types of jobs taught in order of frequency were: Rope work, harness repair, tool fitting and sharpening, plumbing repair, wood construction, power transmission, cold metal work, carpentry repair, hot metal work, painting and finishing. He, however, did not determine why the teachers did not give instruction in certain jobs.

Lester Boyd Pollom (18) made a study of the scope and content of farm mechanics courses taught in

Kansas and the organization for teaching them. The purpose of his study was to find out directly from the farmers the relative importance of the various phases of farm shop. He did not determine what livestock the farmers had or what farm machinery they possessed. He, however, found that farm carpentry ranked above all other jobs.

Sidney Sutherland (21) found from 103 teachers of vocational agriculture in Nebraska, Iowa, South Dakota, and Montana that the majority taught at least 13 types of farm mechanics jobs. Woodwork received more emphasis than any other phase of the work.

A. C. Kennedy (13) gave many valuable suggestions in determining the content of the course in farm mechanics for Ohio teachers. He found that it seemed desirable that the content of the course should be based on the everyday needs of the farm boys at home on the farm as he meets them in his work. He further recommended that the instruction should emphasize care and repair jobs.

G. A. Schmidt, G. A. Ross, and M. A. Sharp give valuable information in setting up objectives and guiding principles in determining the content of the courses in farm mechanics.

## Chapter III

## METHODS AND PROCEDURES

In attempting to set up a functioning 1-year course in farm mechanics for the Pittsfield, Illinois, Community High School, the writer observed the guiding principles mentioned in the close of Chapter I. Particularly did he observe the principle that: "The only reliable source of training content for effective instruction in farm mechanics is the experience of successful farmers in the community." Then too, he observed a somewhat closely related principle also stated in Chapter I; namely, "The practical mechanical activities of farmers in the community for which the training in farm mechanics is to prepare, should be definitely known before any course is drawn up." Perhaps one other of the guiding principles given in Chapter I should be mentioned, for it bears vitally on the problem involved: "The kinds of machinery, tools, and equipment found on farms in a community are an index of the farm mechanical activities in which the farmers in a community engage."

These facts led the writer to the assumption that in order to set up an effective training course in farm mechanics, he needed to secure much information regarding this work from farmers in his community.

Information from 100 farmers was considered for purposes of this study. To obtain this information a questionnaire was prepared. A copy of the questionnaire is included in the appendix of this study.

The questionnaire, in addition to questions pertaining to some general information, listed 18 different farm mechanical enterprises. These are:

1. Concrete work
2. Electrical work
3. Harness work
4. Forge work
5. Plumbing
6. Rope work
7. Gasoline engine work
8. Tool sharpening
9. Sheet metal work
10. Window repair work
11. Farm home jobs
12. Field crop equipment
13. Making shop equipment
14. General farm appliances
15. Repairing machinery
16. Wood finishing
17. Wood appliances
    a. Swine
    b. Cattle
    c. Sheep
    d. Horses
18. Miscellaneous jobs

Under each of these enterprises the writer listed every job he could think of as arising in the enterprise. For this purpose the writer also used lists of jobs found in different farm mechanics textbooks which are listed in the bibliography under numbers 19 and 20.

The writer then submitted this list to three key farmers in the community to determine whether the list was complete for each enterprise.

The questionnaire was checked for completeness by Dr. Harry Bradford in charge of the course in Educational Research at the Colorado State College during the summer of 1939 and under whom the writer outlined his problem. Valuable assistance and criticism was given by

Dr. G. A. Schmidt, professor of agricultural education at Colorado State College.

Before using the questionnaire the writer consulted three key farmers in his community, asking them to check the lists of enterprises and the jobs under each for completeness and to make any additions. These men were of the opinion that the lists were very complete and added very few jobs.

The questionnaire, in regard to each job, called for the following information:

1. Does the job arise on your farm? Yes___ No___
2. Do you do the job? - - - - - - - - - Yes___ No___
3. Why do you not do the job?

   Lack of training? - - - - - - - - _____

   Lack of equipment? - - - - - - - _____

   Other reasons? - - - - - - - - - _____

The questionnaire, also, provided a large space for recording any additional farm mechanical enterprises and jobs in which the farmers might engage.

In addition, the last page of the questionnaire provided for an inventory of the farmer's machinery, and other equipment; and of the kinds of livestock on the farm.

A list of 100 successful farmers in the neighborhood of Pittsfield, Illinois, was obtained from the heads of the two banks in Pittsfield, from the farm manager of the Strauss Farms, which controls nearly

10,000 acres in the area, and from the soil conservation field men working in the community.

Collection of data.--During the school year 1939-40, the writer personally interviewed 60 of the 100 farmers. He secured from these men the information called for on the questionnaire. Twelve additional questionnaires were filled out in the presence of the writer by members of the evening class of farmers which he was conducting. The remaining 28 were taken home by students of the all-day classes in vocational agriculture which the writer was teaching. These students were instructed by the writer on how to gather the data. The questionnaires they returned were carefully checked for completeness.

The data secured on these 100 questionnaires were tabulated and the findings are given in Chapter IV.

## Chapter IV

## THE RESULTS OF THE SURVEY

The data in this chapter were gathered from 100 farmers in the vicinity of Pittsfield, Illinois. These data show the farm mechanical jobs arising on these farms; the jobs the farmers on these farms do and do not do; and, also, reasons for the latter. In addition the data also shows the power machinery, farm implements, and other mechanical equipment found on the farms studied, and also the kinds and number of livestock on these farms.

The farm mechanical jobs were classified into 19 different groups commonly called farm mechanical enterprises. In all, the survey listed 177 different kinds of jobs. Although the survey blank had a space for recording any additional mechanical jobs arising on these farms, none were added to the original list.

The information gathered follows in Tables 1 to 20.

Table 1.--HARNESS WORK ON 100 FARMS

| Jobs | Number | | Why jobs were not done | |
|---|---|---|---|---|
| | Farms on which jobs arose | Farms on which jobs were done | Number lacking training | Number lacking equipment |
| Cleaning - - - | 77 | 66 | 0 | 3 |
| Sewing - - - - | 72 | 55 | 4 | 5 |
| Replacing parts | 85 | 67 | 0 | 2 |
| Splicing tugs - | 73 | 65 | 3 | 5 |
| Oiling harness | 82 | 63 | 0 | 2 |

Harness work on the farms in Pittsfield community is an important enterprise as indicated by the above table. Harness work arose on 72 percent or more of the 100 farms. Over 55 percent of the farmers engaged in this work.

Table 2.--PLUMBING WORK DONE ON 100 FARMS

| Jobs | Number | | Why jobs were not done | |
|---|---|---|---|---|
| | Farms on which jobs arose | Farms on which jobs were done | Number lacking training | Number lacking equipment |
| Repair pump - - | 80 | 58 | 6 | 6 |
| Install water system - - - - | 51 | 27 | 6 | 5 |
| Install septic tank - - - - - | 25 | 0 | 0 | 0 |
| Cut and fit pipe | 65 | 37 | 8 | 11 |
| Repair faucet - | 55 | 41 | 5 | 5 |
| Install house plumbing - - - | 43 | 18 | 10 | 5 |
| Build septic tank - - - - - | 25 | 11 | 8 | 3 |
| Install furnace | 34 | 14 | 8 | 4 |

Plumbing, as evidenced in Table 2, is not an important farm mechanics enterprise on the 100 farms in the community. Jobs in plumbing in most cases were not done by the farmers, with the exception of repairing pumps, cutting and fitting pipe, and repairing faucets. The farmers stated they lacked training and equipment for this type of work.

Table 3.--JOBS DONE IN FORGE WORK ON 100 FARMS

| Jobs | Number | | Why jobs were not done | |
|---|---|---|---|---|
| | Farms on which jobs arose | Farms on which jobs were done | Number lacking training | Number lacking equipment |
| Machine repair | 52 | 19 | 14 | 25 |
| Sharpen cultivator shovels | 83 | 19 | 24 | 39 |
| Sharpen plow shares | 86 | 14 | 24 | 40 |
| Make chisels | 66 | 13 | 25 | 40 |
| Temper tools | 78 | 16 | 21 | 37 |
| Weld | 87 | 14 | 23 | 39 |
| Repair chain links | 84 | 6 | 23 | 36 |
| Shoe horses | 56 | 1 | 17 | 21 |
| Make clevis | 81 | 17 | 21 | 33 |
| Meat hooks | 77 | 15 | 21 | 34 |
| Hay hooks | 80 | 18 | 21 | 35 |
| Gate hooks | 81 | 18 | 20 | 35 |
| End gate rods | 78 | 16 | 22 | 34 |
| Chain links | 77 | 16 | 21 | 34 |
| Staples | 91 | 26 | 36 | 47 |
| Butcher knife | 11 | 2 | ------ | ------ |
| Eye bolts | 74 | 16 | 20 | 32 |
| Wagon irons | 80 | 16 | 20 | 32 |
| Cold chisels | 77 | 16 | 20 | 36 |
| Punches | 76 | 18 | 21 | 34 |
| Wrecking bar | 76 | 17 | 20 | 33 |
| Tools | 69 | 15 | 16 | 33 |

The fact that forge work arises frequently on 100 farms but is done by few farmers indicates it is important. However, there are some causes why it is not done. Table 3 shows that forge work with the exception of making knives arises on over 52 percent of the farms but only 26 percent of the 100 farmers engaged in forge work. The main reasons for not doing it was the lack of equipment and lack of training.

Table 4.--GENERAL FARM WORK JOBS

| Jobs | Number | | Why jobs were not done | |
|---|---|---|---|---|
| | Farms on which jobs arose | Farms on which jobs were done | Number lacking training | Number lacking equipment |
| Saw buck - - | 75 | 74 | 1 | 0 |
| Wagon jack - | 67 | 67 | 2 | 0 |
| Wire stretcher | 42 | 35 | 1 | 0 |
| Medicine cabinet - - | 20 | 18 | 1 | 0 |

According to Table 4 jobs connected with general farm work, like making saw bucks and wagon jacks, are common on the farms. These jobs were done in a large number of cases by the farmers, as is shown in Table 4. Making wire stretchers and medicine cabinets are jobs that arose less frequently, and less than 50 percent of the farmers engaged in these jobs.

Table 5.--GASOLINE ENGINE WORK DONE ON 100 FARMS

| Jobs | Number | | Why jobs were not done | |
|---|---|---|---|---|
| | Farms on which jobs arose | Farms on which jobs were done | Number lacking training | Number lacking equipment |
| Gasoline engines | | | | |
| Adjust carburetors - - - - - | 50 | 50 | 11 | 0 |
| Adjust valves - | 70 | 53 | 23 | 0 |
| Grind valves - | 68 | 44 | 16 | 0 |
| Adjust bearings | 69 | 46 | 15 | 0 |
| Time ignition - | 71 | 44 | 15 | 0 |
| Clean carbon - | 69 | 48 | 15 | 0 |
| Overhaul automobiles - - - | 74 | 27 | 3 | 1 |
| Overhaul tractors - - - - - | 70 | 21 | 3 | 2 |

According to the data in Table 5 the work of overhauling automobiles and tractors was done by a small number of farmers. Adjusting carburetors, adjusting valves, grinding valves, adjusting bearings, timing ignition, and cleaning carbon were done by a large percent of the farmers indicates that minor repairs is an important part of the work in this enterprise.

Table 6.--SHEET METAL WORK DONE ON 100 FARMS

| Jobs | Number | | Why jobs were not done | |
|---|---|---|---|---|
| | Farms on which jobs arose | Farms on which jobs were done | Number lacking training | Number lacking equipment |
| Repair pails - | 75 | 42 | 16 | 5 |
| Make feed troughs - - - | 61 | 25 | 11 | 4 |
| Make funnel - - | 41 | 9 | 7 | 0 |
| Make tin cup - | 36 | 2 | 6 | 0 |
| Make cooking utensils - - - | 31 | 3 | 3 | 0 |
| Repair roofs - | 76 | 49 | 9 | 3 |
| Repair water tanks - - - - | 71 | 48 | 9 | 4 |
| Make feed scoops | 88 | 36 | 9 | 3 |

Table 6 indicates the sheet metal work is confined chiefly to repair work. It is apparent that farmers do not think it important to make feed troughs, funnels, tin cups, and cooking utensils.

Table 7.--MISCELLANEOUS JOBS THAT OCCUR ON 100 FARMS

| Job | Number | | Why jobs were not done | |
|---|---|---|---|---|
| | Farms on which jobs arose | Farms on which jobs were done | Number lacking training | Number lacking equipment |
| Make single trees - - - - | 88 | 69 | 1 | 1 |
| Make double trees - - - - | 93 | 73 | 1 | 0 |
| Make handles for tools - - | 85 | 64 | 2 | 1 |
| Make trailers - | 45 | 22 | 1 | 0 |
| Make stock racks | 70 | 56 | 0 | 0 |
| Iron single trees - - - - | 56 | 45 | 0 | 2 |
| Stock loading chutes - - - - | 88 | 80 | 0 | 2 |
| Make garage - - | 49 | 46 | 1 | 0 |
| Make neck yokes | 78 | 59 | 0 | 1 |
| Make wheel barrows - - - | 58 | 45 | 0 | 0 |
| Make furniture | 30 | 12 | 0 | 0 |
| Make farm gate | 87 | 81 | 0 | 0 |
| Build farm shop | 50 | 40 | 0 | 1 |

The data in Table 7 indicates that there are some jobs of this group that farmers do not do to any extent, such as make furniture and trailers. Their participation in these jobs is governed very largely by whether or not they have the necessary equipment and the training and ability.

Table 8.--WINDOW REPAIR JOBS DONE BY 100 FARMERS

| Jobs | Number | | Why jobs were not done | |
|---|---|---|---|---|
| | Farms on which jobs arose | Farms on which jobs were done | Number lacking training | Number lacking equipment |
| Cut glass - - - | 58 | 38 | 2 | 1 |
| Repair windows | 80 | 63 | 6 | 0 |
| Putty windows - | 82 | 74 | 6 | 0 |

Window repair jobs, as indicated in Table 8, were done by most of the 100 farmers. They did not do much glass cutting. They did not indicate they lacked equipment or training.

Table 9.--TOOL SHARPENING DONE ON 100 FARMS IN PITTSFIELD HIGH SCHOOL COMMUNITY

| Jobs | Number | | Why jobs were not done | |
|---|---|---|---|---|
| | Farms on which jobs arose | Farms on which jobs were done | Number lacking training | Number lacking equipment |
| Plane bits - - | 30 | 96 | 5 | 1 |
| Chisels - - - - | 80 | 73 | 4 | 1 |
| Cross cut saws - | 87 | 66 | 10 | 3 |
| Large wood saws | 83 | 60 | 9 | 3 |
| Drill bits - - | 80 | 69 | 7 | 1 |
| Wood bits - - - | 86 | 66 | 8 | 2 |
| Buck saws - - - | 73 | 61 | 6 | 3 |
| Circle saws - - | 76 | 59 | 6 | 1 |
| Axes - - - - - | 90 | 73 | 3 | 1 |
| Shears - - - - | 83 | 68 | 5 | 1 |
| Meat saws - - - | 72 | 53 | 6 | 1 |
| Skates - - - - | 43 | 29 | 3 | 1 |

Tool sharpening on farms of Pittsfield community, as indicated by the data in Table 9, is very important as a farm mechanical skill. With the exception of sharpening plane bits and skates, 72 percent or more of the jobs listed involved fitting of tools.

Table 10.--ROPE WORK DONE ON 100 FARMS

| Jobs | Number | | Why jobs were not done | |
|---|---|---|---|---|
| | Farms on which jobs arose | Farms on which jobs were done | Number lacking training | Number lacking equipment |
| Long splice - - | 69 | 58 | 24 | 0 |
| Short splice - | 79 | 57 | 20 | 0 |
| Tie knots - - - | 81 | 63 | 15 | 0 |
| Crown ropes - - | 76 | 61 | 12 | 0 |
| Make rope halters - - - - - | 77 | 66 | 11 | 0 |

Rope work, as the data shows in Table 10, is done by over 58 percent of the farmers. Those who did not do the work gave as their main reasons for not doing that they lacked training.

Table 11.--WOODFINISHING JOBS DONE ON 100 FARMS IN PITTSFIELD COMMUNITY

| Jobs | Number | | Why jobs were not done | |
|---|---|---|---|---|
| | Farms on which jobs arose | Farms on which jobs were done | Number lacking training | Number lacking equipment |
| Painting buildings - - - - - | 97 | 81 | 0 | 0 |
| Mixing paints - | 93 | 79 | 0 | 1 |
| Painting furniture - - - - - | 95 | 77 | 0 | 0 |
| Refinishing furniture - - | 90 | 68 | 0 | 1 |
| Painting woodwork - - - - - | 88 | 33 | 1 | 0 |
| Painting floors | 80 | 79 | 0 | 0 |

In Table 11 are shown the jobs in woodfinishing arising on 100 farms. From 80 to 97 percent of the farmers indicated that these jobs occurred on their farms. From 33 to 81 percent of the farmers actually did these jobs. Painting woodwork was done by only 33 percent of the 100 farmers. In only one case was lack of training mentioned for not engaging in this work.

Table 12.--MAKING SHOP EQUIPMENT ON 100 FARMS IN PITTSFIELD COMMUNITY

| Jobs | Number | | Why jobs were not done | |
|---|---|---|---|---|
| | Farms on which jobs arose | Farms on which jobs were done | Number lacking training | Number lacking equipment |
| Farm shops | | | | |
| Cupboards - - - | 43 | 43 | 1 | 0 |
| Tool box - - - | 49 | 47 | 2 | 0 |
| Nail box - - - | 54 | 52 | 0 | 0 |
| Saw horse - - - | 55 | 54 | 0 | 0 |
| Bench (carpenter) | 49 | 47 | 0 | 0 |
| Mitre box - - - | 38 | 36 | 1 | 1 |
| Nail-screw-bolt shelves - - - | 43 | 42 | 1 | 0 |
| Cement float - | 36 | 33 | 2 | 2 |
| File handles - | 43 | 42 | 1 | 0 |
| Drawers - - - - | 45 | 38 | 2 | 0 |
| Saw filing clamp | 42 | 34 | 0 | 0 |

From Table 12 it will be seen the necessity for making shop equipment arose on 36 to 56 percent of the farms studied. The figures further reveal that less than 50 percent of the farmers actually make shop equiment.

Table 13.--WOODWORK APPLIANCES FOR LIVESTOCK THAT ARE MADE ON 100 FARMS

| Jobs | Number | | Why jobs were not done | |
|---|---|---|---|---|
| | Farms on which jobs arose | Farms on which jobs were done | Number lacking training | Number lacking equipment |
| **Poultry** | | | | |
| Make common appliances | 73 | 60 | 1 | 0 |
| Make brooder house | 78 | 63 | 4 | 1 |
| Make poultry house | 73 | 60 | 4 | 1 |
| **Swine** | | | | |
| Watering trough | 96 | 88 | 0 | 0 |
| Individual hog house | 90 | 83 | 1 | 0 |
| Hog hurdles | 73 | 70 | 0 | 0 |
| Panels | 80 | 75 | 0 | 0 |
| Creep | 85 | 83 | 0 | 0 |
| Ringing chute | 81 | 81 | 0 | 0 |
| **Cattle** | | | | |
| Loading chute | 84 | 79 | 0 | 0 |
| Stanchions | 70 | 70 | 0 | 1 |
| Silage cart | 38 | 35 | 0 | 1 |
| Feed bins | 81 | 80 | 1 | 0 |
| Milk stool | 84 | 80 | 0 | 0 |
| **Sheep** | | | | |
| Creep for lambs | 41 | 41 | 0 | 0 |
| Panels | 40 | 37 | 1 | 0 |
| Feed troughs | 41 | 43 | 0 | 0 |
| Drink troughs | 41 | 43 | 0 | 0 |
| Sheep shed | 40 | 41 | 0 | 0 |
| Wool sacker | 35 | 35 | 1 | 0 |
| **Horses** | | | | |
| Harness hooks | 75 | 64 | 2 | 0 |
| Harness washing board | 48 | 40 | 3 | 0 |
| Curry comb rack | 55 | 45 | 2 | 0 |

The data in Table 13 shows that the necessity for making wood appliances for poultry, swine, cattle, and horses exists quite generally on the farms studied. Jobs involving the making of appliances for sheep arise less frequently because sheep are less common on these farms. From the table it will also be noted that farmers generally make equipment for the kinds of livestock they have on their farms.

Table 14.--CONCRETE WORK WHICH AROSE ON THE 100 FARMS

| Jobs | Number | | Why jobs were not done | |
|---|---|---|---|---|
| | Farms on which jobs arose | Farms on which jobs were done | Number lacking training | Number lacking equipment |
| Feeding floors | 69 | 55 | 6 | 2 |
| Foundations - - | 78 | 65 | 8 | 3 |
| Water tanks - - | 40 | 26 | 8 | 2 |
| Hog troughs - - | 43 | 30 | 8 | ------ |
| Walls - - - - - | 64 | 47 | 7 | 4 |
| Septic tanks - | 17 | 9 | 7 | 1 |
| Garage floors - | 49 | 38 | 8 | 1 |
| Laying brick or tile - - - - - | 55 | 31 | 0 | 2 |
| Plastering - - | 56 | 34 | 12 | 1 |
| Fence posts - - | 32 | 20 | 6 | 1 |

Table 14 shows that concrete work with the exception of foundations and feed floor constructions was not done by farmers on the farm. Most of the reasons given were lack of training. It was also indicated there were other reasons for not doing the job.

Table 15.--FIELD CROP EQUIPMENT MADE ON 100 FARMS

| Jobs | Number | | Why jobs were not done | |
|---|---|---|---|---|
| | Farms on which jobs arose | Farms on which jobs were done | Number lacking training | Number lacking equipment |
| Lime spreader - | 30 | 15 | 1 | 3 |
| Seed treating devices - - - | 47 | 25 | 0 | 4 |
| Corn cribs - - | 83 | 70 | 1 | 4 |
| Potato crates - | 23 | 16 | 0 | 0 |
| Hay racks - - - | 89 | 79 | 0 | 1 |
| Wagons - - - - | 77 | 64 | 3 | 5 |

Table 15 indicates the making of equipment for farm crops arises on 30 to 89 percent of the farms. The making of a lime spreader, seed treating devices, and potato crates occurred on less than 47 percent of the farms. From 15 to 79 percent of the 100 farmers engaged in these jobs. Jobs like making lime spreaders and potatoe crates were done by less than 17 of the farmers. Seed treating devices were made by only 25 percent of the farmers. Such equipment as wagons, corn cribs, and hay racks were constructed by a large number of the 100 farmers.

Table 16.--ELECTRICAL WORK

| Jobs | Number | | Why jobs were not done | |
|---|---|---|---|---|
| | Farms on which jobs arose | Farms on which jobs were done | Number lacking training | Number lacking equipment |
| Wiring house - | 54 | 16 | 11 | 0 |
| Wiring barns - | 55 | 14 | 10 | 0 |
| Repair motors - | 50 | 8 | 14 | 0 |
| Repair radio - | 49 | 6 | 15 | 1 |
| Repair door bells | 34 | 7 | 3 | 1 |

Electrical work, as Table 16 shows, does not occur as frequently as other enterprises; a very small number of the farmers do the work. It is evident that it is not an important enterprise for the farmer of this particular area. From 34 to 55 percent of the jobs listed in the table occurred on the farms. However, only 6 to 16 of the 100 farmers actually did the work. The main reasons for not doing the job was lack of training.

Table 17.--FARM HOME JOBS WHICH AROSE ON 100 FARMS

| Jobs | Number | | Why jobs were not done | |
|---|---|---|---|---|
| | Farms on which jobs arose | Farms on which jobs were done | Number lacking training | Number lacking equipment |
| Cupboards - - - | 68 | 29 | 9 | 4 |
| Step ladders - | 66 | 28 | 10 | 4 |
| Medicine cabinet | 75 | 25 | 9 | 4 |
| Flower boxes - | 75 | 50 | 11 | 4 |
| Ironing boards | 69 | 31 | 13 | 2 |
| Lawn chairs - - | 69 | 12 | 11 | 2 |
| Screens - - - - | 81 | 41 | 11 | 3 |
| Tables - - - - | 70 | 27 | 13 | 3 |
| Fruit shelves - | 82 | 42 | 10 | 2 |
| Kitchen stools | 70 | 27 | 12 | 2 |
| Flower trellis | 81 | 44 | 12 | 3 |
| Shoe shining box | 54 | 16 | 11 | 2 |
| Porch furniture | 68 | 24 | 14 | 4 |
| Cedar chest - - | 51 | 12 | 14 | 3 |

Farm home jobs, as indicated by the data in Table 17, were not done by a majority of the farmers. From 51 to 82 percent of the 100 farmers indicated that jobs of the farm home occurred but not all these farmers did the jobs on the farm. A notable exception was the construction of flower boxes.

Table 18.--REPAIRING MACHINERY

| Jobs | Number | | Why jobs were not done | |
|---|---|---|---|---|
| | Farms on which jobs arose | Farms on which jobs were done | Number lacking training | Number lacking equipment |
| Overhaul farm machines - - - | 69 | 63 | 0 | 0 |
| Put in new tongue - - - - | 90 | 83 | 0 | 0 |
| Lace leather belts - - - - | 83 | 63 | 1 | 1 |
| Make wagon bolsters - - - | 81 | 64 | 3 | 1 |
| Babbitt bearings | 78 | 43 | 6 | 1 |
| New section in sickle - - - - | 93 | 85 | 3 | 0 |
| Repair wagon box | 95 | 88 | 2 | 0 |
| Figure pulling speeds - - - - | 55 | 55 | 0 | 0 |
| Paint wagons - | 95 | 85 | 1 | 0 |
| Adjust mowers - | 94 | 85 | 4 | 0 |
| Adjust binders | 92 | 87 | 5 | 0 |
| Sharpen mower sickles - - - | 91 | 90 | 1 | 0 |

Table 18 indicates repairing farm machinery is a very important enterprise on a majority of these 100 farms. The data also show that with the exception of babbiting bearings the majority of the farmers repair their own machinery.

Table 19.--EQUIPMENT ON 100 FARMS

| Kinds of equipment | Number of each kind of equipment |
|---|---|
| Automobile | 112 |
| Truck | 28 |
| Tractor | 68 |
| Gas engines | 67 |
| Electric motors | 92 |
| Implement shed | 107 |
| Wagons | 204 |
| Harvest machinery | |
| 1. Corn combinder | 10 |
| 2. Combine | 18 |
| 3. Binder | 61 |
| 4. Corn sheller | 49 |
| 5. Huller | 0 |
| 6. Scanfier | 0 |
| 7. Corn grader | 21 |
| Cultivating machinery | |
| 1. Cultivator | 233 |
| 2. Harrow | 141 |
| 3. Rotary hoe | 33 |
| 4. Disc | 124 |
| 5. Plow | 233 |
| 6. Roller | 79 |
| 7. Lime spreader | 53 |
| 8. Drill | 79 |
| 9. End gate seeder | 58 |
| Dairy machinery | |
| 1. Milking machine | 1 |
| Spray machines | |
| 1. Power spray | 5 |
| 2. Hand spray | 28 |
| Others | |
| 1. Mower | 67 |
| 2. Rakes | 45 |
| 3. Buck rakes | 10 |
| 4. Manure spreaders | 17 |
| 5. Fan mill | 1 |
| 6. Trailer | 1 |

The data in Table 19 show the amount and kinds of farm equipment on the 100 farms in Pittsfield community.

Table 20.--NUMBER AND KINDS OF LIVESTOCK ON EACH OF THE 100 FARMS OF PITTSFIELD COMMUNITY

| Kinds of livestock | Total number | Number on each farm |
|---|---|---|
| Horses | 483 | 4.83 |
| Mules | 52 | .52 |
| Sheep | 1,717 | 17.17 |
| Poultry | 19,938 | 199.38 |
| Hogs | 11,914 | 119.14 |
| Dairy cattle | 626 | 6.26 |
| Beef cattle | 2,000 | 20.00 |

It is shown by the facts in Table 20 that on the 100 farms there is a considerable number of livestock and the average is high for each farm. This would necessitate a large amount of appliances for livestock as well as mechanical equipment. The data show there is an approximate average of 48 horses, .52 mules, 17 sheep, 200 head of poultry, 119 hogs, 6 dairy cattle, and 20 beef cattle per farm on the 100 farms surveyed.

# Chapter V

## THE 1-YEAR COURSE IN FARM MECHANICS

In this chapter an effort is made to develop a 1-year course in farm mechanics for the boys enrolled in the Pittsfield, Illinois, High School, based on the results of the survey presented in Chapter III.

In Chapter I the general aims of the instruction in farm mechanics were mentioned. These aims, in brief, show that effective instruction in farm mechanics should develop the abilities, so far as possible, that will enable those taking the training to better engage in the varied farm mechanical activities arising on farms in the community where the training is given. The term, abilities, as here used is very broad and includes habits, skills, knowledge, appreciations, attitudes, and ideals.

In Chapter I there were mentioned, also, some guiding principles underlying effective instruction in farm mechanics. The substance of these principles is simply that this instruction in farm mechanics should be life-like; that the farm mechanical activities on the farms in the community and the equipment on these farms are important factors in determining the kind of instruction that should be offered in this work.

Inhibiting factors.--Regardless of the needs for training in farm mechanics, every school is confronted with certain inhibiting factors. These may be the kind, size, and location of the school farm shop; or they may be the kinds of equipment in the shop. Although the Pittsfield High School has a separate shop building suitable for most types of farm mechanical work it lacks equipment for teaching the repair and overhauling of tractors; for teaching jobs connected with gas engines, and for teaching farm plumbing.

School time available for teaching farm mechanics.--The school year of the Pittsfield, Illinois, High School consists of two semesters. In each semester there are 18 weeks or 90 teaching days. Two days each semester are devoted to final examinations, leaving 176 actual teaching days in the school year.

For the purposes of this study, the 1-year course in farm mechanics is made up of a certain number of farm mechanical enterprises. The school time to give to the teaching of these enterprises necessarily depends upon the teaching time available for the subject. The number of farm jobs to include in each enterprise is dependent upon the relative importance of that enterprise.

To obtain information, in addition to that obtained by the survey regarding the school time to devote to each enterprise in a farm mechanics course, the writer

referred to a study made in this connection. This study was developed in the Department of Agriculture Education at the Colorado State College. It represented the opinions of 25 teachers of vocational agriculture regarding the minimum school time that should be given to the different kinds of farm mechanical work.

Table 21 contains the list of common farm mechanic enterprises and the approximate school time needed for each to obtain minimum results on the basis of five double periods a week. In the original time distribution this was worked out on a basis of two double periods per week.

Table 21.--AVERAGE TIME TO DEVOTE TO COMMON FARM MECHANICAL ENTERPRISES TO ATTAIN WORTH WHILE OBJECTIVES OF THE ENTERPRISE, BASED ON FIVE DOUBLE PERIODS PER WEEK

| Enterprises | Number of weeks (5 double periods per week) |
|---|---|
| 1. Making woodwork appliances | 2 |
| 2. Plumbing jobs | 1 |
| 3. Harness work | 2 |
| 4. Forge work | 3 |
| 5. General farm jobs | 1 |
| 6. Gas engine tractors | 3 |
| 7. Sheet metal work | 1 |
| 8. Miscellaneous jobs | 3 |
| 9. Window repairing | 1 |
| 10. Tool sharpening | 2 |
| 11. Rope work | 1 |
| 12. Wood finishing | 1 |
| 13. Farm shop appliances | 2 |
| 14. Concrete and related work | 1 |
| 15. Field crops equipment | 1 |
| 16. Electrical work | 2 |
| 17. Farm home appliances | 2 |
| 18. Repair machinery | 6 |

Basis for choosing the enterprises.--It was necessary to have some basis for choosing the enterprises to be included in the 1-year's course in farm mechanics for Pittsfield High School.

All the enterprises were listed and the frequency in which they arose, were done, were not done, and many farms had the necessary equipment to do them. It was also noted whether or not the school shop had the necessary equipment to teach the jobs.

A fair rule was set up, that if 50 percent of

the enterprises occurred, were done, and they possessed equipment for doing the job on these 100 farms, the school had the equipment to teach these jobs, and if they qualified in three of the survey columns the jobs should be taught. One exception to the qualifications however was if the school shop did not have the tools to teach the enterprise then these enterprises must be eliminated.

After the columns were checked it was found that there were 14 enterprises left to teach on this basis of elimination. The eliminated and selected enterprises follow:

Table 22.--FREQUENCY THAT THE DIFFERENT ENTERPRISES OCCUR ON FARMS IN PITTSFIELD COMMUNITY

| Enterprise | Percentage of frequency | | Necessary equipment | |
|---|---|---|---|---|
| | Arises on farm | Done on farm | On the farm | In the school shop |
| 1. Harness work - - | 1/ 75 | 63 | yes | yes |
| 2. Plumbing work - - | 47 | 25 | yes | no |
| 3. Forge work - - - | 73 | 15 | yes | yes |
| 4. General farm work | 51 | 48 | yes | yes |
| 5. Gasoline engine work - - - - - - | 67 | 41 | yes | no |
| 6. Sheet metalwork - | 59 | 29 | yes | yes |
| 7. Miscellaneous jobs | 67 | 53 | yes | yes |
| 8. Window repair - - | 73 | 58 | yes | yes |
| 9. Tool sharpening - | 77 | 61 | yes | yes |
| 10. Rope work - - - - | 76 | 61 | yes | yes |
| 11. Wood finishing - | 90 | 68 | yes | yes |
| 12. Making shop equipment - - - - - - | 45 | 42 | yes | yes |
| 13. Woodwork appliances - - - - - | 65 | 60 | yes | yes |
| 14. Concrete work - - | 50 | 35 | yes | yes |
| 15. Field crop equipment - - - - - - | 58 | 26 | yes | yes |
| 16. Electrical work - | 48 | 9 | yes | no |
| 17. Farm home jobs - | 69 | 29 | yes | yes |
| 18. Repairing machinery - - - | 90 | 74 | yes | yes |

1/ Decimals were dropped in making the calculation.

Farm enterprises not included in the course of study.--The following four enterprises are not included in the course of study:

1. Electrical work
2. Farm plumbing
3. Making shop equipment
4. Tractors and gas engines

The enterprises were omitted because of one or more of the following reasons:

1. Comparatively few farmers engaged in the enterprise.
2. The school shop lacked necessary equipment.
3. Few farmers had the necessary equipment.

## Typical Jobs to Teach in Each of the 14 Enterprises Included in the Course

1. Harness work
   a. Cleaning and oiling harness
   b. Sewing harness
   c. Replacing parts of harness
   d. Splicing tugs

2. Forge work
   a. Repairing machine
   b. Making chisels
   c. Tempering tools
   d. Welding parts
   e. Repairing chain links
   f. Making clevises
   g. Making meat hooks
   h. Making hay hooks
   i. Making gate hooks
   j. Making end gate hooks
   k. Making chain links
   l. Making staples
   m. Making eye bolts
   n. Making punches
   o. Making wrecking bar

3. Sheet metal work
   a. Repairing pails
   b. Repairing roofs
   c. Repairing water tank
   d. Making feed scoops

4. Miscellaneous jobs
   a. Making single trees
   b. Making double trees
   c. Making handles for tools
   d. Making stock racks
   e. Making stock loading chutes
   f. Making neck yokes
   g. Making farm gate

5. Window repair
   a. Repairing windows
   b. Puttying windows

6. Tool sharpening
   a. Sharpening chisels
   b. Sharpening cross cut saw
   c. Sharpening large wood saws
   d. Sharpening drill bits
   e. Sharpening buck saws
   f. Sharpening axes
   g. Sharpening shears

7. Rope work
   a. Making a long splice
   b. Making a short splice
   c. Tying knots
   d. Crowning ropes
   e. Making rope halters

8. Wood finishing
   a. Painting buildings
   b. Mixing paints
   c. Painting furniture
   d. Refinishing furniture
   e. Painting floors

9. General farm work
   a. Making buck saw
   b. Making a wagon jack

10. Woodwork appliances
    Poultry
    a. Making common appliances for poultry
    b. Making brooder house
    c. Making poultry house

10. Woodwork appliances (continued)

Swine
- a. Making watering trough
- b. Making individual hog houses
- c. Making hog hurdle
- d. Making panels
- e. Making creep
- f. Making ringing chute

Cattle
- a. Making loading chute
- b. Making stanchions
- c. Making feed bins
- d. Making milk stool

Sheep
- a. Making a creep for lambs
- b. Making panels
- c. Making feed troughs
- d. Making drink troughs
- e. Making sheep shed
- f. Making wool sacker

Horses
- a. Making harness hooks
- b. Making curry comb racks

11. Concrete and related work
- a. Making feeding floors
- b. Making foundations
- c. Making walls

12. Field crops equipment
- a. Building corn cribs
- b. Making hay racks
- c. Making wagons

13. Farm home appliances
- a. Making flower boxes
- b. Making screens
- c. Making fruit shelves
- d. Making flower trellis

14. Repairing machinery
- a. Overhaul farm machines
- b. Put in a new tongue
- c. Making wagon bolsters
- d. Lacing leather belts
- e. Putting new section in sickle
- f. Repairing wagon box
- g. Repairing wagons
- h. Adjusting mowers
- i. Adjusting binders
- j. Sharpening mower sickles

## A YEARLY TEACHING PLAN

### For a Course of Instruction in Pittsfield High School

| List of enterprises to be taught in the course to entire class | Weeks to devote to each enterprise |
|---|---|
| 1. Harness work | 2 |
| 2. Forge work | 5 |
| 3. General farm work | 1 |
| 4. Sheet metal work | 1 |
| 5. Miscellaneous jobs | 2 |
| 6. Window repair | 1 |
| 7. Tool sharpening | 2 |
| 8. Rope work | 1 |
| 9. Wood finishing | 1 |
| 10. Woodwork appliances | 5 |
| 11. Concrete and related work | 2 |
| 12. Field crop equipment | 1 |
| 13. Farm home appliances | 2 |
| 14. Repair of machinery | 8 |
| Total for strictly class work | 34 |
| Time allotted for quizzes | 1 |
| Time allotted for extras | 1 |
| Total number of school weeks devoted to the subject | 36 |

# Chapter VI

## SUMMARY AND RECOMMENDATIONS

The purpose of this study is to develop a functioning course of study in farm mechanics to be included in the vocational agriculture course in the Pittsfield, Illinois, High School.

In order to make such a course very practicable and functioning for the boys enrolled in vocational agriculture, the writer felt it necessary to discover the kinds of farm mechanics work arising on farms in the community; the kinds farmers do and do not do; the kinds of equipment on these farms and the kinds of livestock.

To discover these needs for training in farm mechanics work the writer made a survey of 100 farms in his community. He personally interviewed 60 of these farmers in order to gather the necessary information. Information from the remaining 40 was secured by boys in his all-day and part-time classes in vocational agriculture.

The findings.--An analysis of the data secured from the survey showed that instruction could profitably be given in the following farm mechanical enterprises:

1. Harness work
2. Forge work
3. General farm work
4. Sheet metal work
5. Miscellaneous jobs
6. Window repair
7. Tool sharpening
8. Rope work
9. Wood finishing
10. Woodwork appliances
11. Concrete work
12. Field crop equipment
13. Farm home appliances
14. Repair of machinery

Some of the pertinent findings of this study were:

1. Repairing farm machinery showed the greatest frequency of the 100 farms surveyed, and was engaged in by more farmers than any other enterprise.

2. Next on the list was "Miscellaneous jobs" such as making single trees, making double trees, handles for tools, and farm gates.

3. Construction and repair of wood appliances for poultry, sheep, hogs, cattle, and horses occurred on a large number of the farms.

4. Farm blacksmithing or forge work occurred to some extent on the 100 farms, but many of the farmers did not have the equipment or training to perform the different jobs involved in these enterprises. However, the school farm shop has the equipment to teach these jobs efficiently. The farmers should be urged to buy the necessary equipment.

In the following enterprises the data showed that the jobs occurred on the 100 farms and that a large number of the farmers actually performed the jobs: Sheet metal work, tool sharpening, field crop equipment, farm home appliances, wood finishing, rope work, general farm work, window repair, and harness work.

The following enterprises: (1) electrical work, (2) farm plumbing, (3) tractor and gas engine work, and (4) farm shop appliances, occurred on the 100 farms, but only a few farmers were found to be doing the

jobs under these enterprises. Because of this fact it seemed reasonable to eliminate the above mentioned jobs from the proposed course of study.

Also the survey indicated the 100 farms were well equipped with farm machinery, automobiles, tractors, gas engines and electric motors. Livestock, such as dairy cattle, beef cattle, sheep, hogs, and poultry, were common on most of the 100 farms.

Table 19, Chapter IV, contains information showing that automobiles, cultivators, plows, discs, harrows, seed drills, rollers, electric motors, gas engines, mowers, and binders are the most common kinds of equipment on the farms studied.

Summary.--The data assembled in this study show that jobs in the following farm mechanical enterprises arose most frequently on the 100 farms studied:

1. Farm blacksmithing
2. Gasoline engine work
3. Fitting farm tools
4. Making wood appliances
5. Making field crop appliances
6. Harness work
7. Rope work
8. Machinery repair
9. Concrete work
10. Sheet metal work
11. Miscellaneous farm jobs
12. Plumbing
13. Wood finishing
14. General farm work

Farm jobs in the following types of work were least frequently done, primarily because of lack of necessary equipment, training, and other reasons:

1. Farm blacksmithing
2. Farm plumbing
3. Shop equipment
4. Field crop appliances
5. Window repair
6. Concrete work

7. Sheet metal work
8. Farm home jobs
9. Electrical work

Repairing farm machinery showed the greatest frequency and was engaged in by a greater number of farmers than any other enterprise. The results of the survey show that farmers do not lack training for this type of work and also that they do have the necessary equipment to perform the jobs arising in this enterprise.

Miscellaneous jobs were second in importance in frequency on farms to machinery jobs and were engaged in by most of the farmers. The farmers studied had very little training for doing the job; neither were their farms well equipped for the work.

Wood finishing was done by practically all the farmers and the data show that farmers had little training and equipment for this type of work.

Gasoline engine work, especially the simple adjustments and repair, was done by a great many of the farmers. However, these results show that the majority of the farmers did not overhaul tractors, trucks, and automobiles.

Rope work occurred on most of the farms, but many of the farmers lacked training for doing the job.

Making wood appliances for various livestock enterprises was done by the great percentage of farmers. Most all the farmers had equipment for this type of work and felt that they knew enough about it to do a fairly

good piece of work.

Recommendations.--Considering the types of work that these farms are doing, the equipment on their farms and the prevailing kinds of livestock and crop enterprises, the writer is proposing the following 1-year course of study in farm shop for the Pittsfield High School of Pittsfield, Illinois.

Yearly Teaching Plan for a Course of Instruction in Pittsfield High School

| List of enterprises to be taught in the course to the entire class | Weeks to devote to each enterprise |
|---|---|
| 1. Harness work | 8 |
| 2. Forge work | 5 |
| 3. General farm work | 1 |
| 4. Sheet metal work | 1 |
| 5. Miscellaneous jobs | 2 |
| 6. Window repair | 1 |
| 7. Tool sharpening | 2 |
| 8. Rope work | 1 |
| 9. Wood finishing | 1 |
| 10. Woodwork appliances | 5 |
| 11. Concrete and related work | 2 |
| 12. Field crop equipment | 1 |
| 13. Farm home appliances | 2 |
| 14. Repair of machinery | 8 |
| Total | 34 |

Limitations of the study.--A few limitations of this study have presented themselves to the writer. These might have been eliminated if more complete information had been secured from the farmers in the community.

1. More specific reasons why farmers did not do certain jobs in the enterprises could have been ascertained if space in the questionnaire had been provided to obtain this information.

2. Another column could have been in the questionnaire to record the farmer's opinion in regard to whether or not the school should attempt to give training for each job listed.

3. The writer was handicapped by the fact that there was no place on the questionnaire to record why the farmers did not do certain jobs.

There are other problems which present themselves in connection with this study. Some of them are as follows:

1. An investigation should be made as to the kind of training farmers have received for doing farm mechanics work.

2. A study of the young men now farming who have had training in farm mechanics to discover what training they received in this field that has practical value.

3. Another problem that presents itself for study in farm mechanics is one that deals with getting the cooperation of the farmers in the community so that their sons can engage in farm shop work actually arising on the farms.

# APPENDIX

# APPENDIX A

Average time to devote to common farm mechanical enterprises to attain worthwhile objectives of the enterprise

Based on two double periods per week

| Enterprise | Number of weeks |
|---|---|
| 1. Making small wood appliances | 6 |
| 2. Farm drawing and estimating material | 2 |
| 3. Sharpening farm tools | 6 |
| 4. Fitting handles | 2 |
| 5. Rope work | 2 |
| 6. Harness work | 4 |
| 7. Soldering | 2 |
| 8. Simple building and repair work on the farm | 4 |
| 9. Farm blacksmithing | 6 |
| 10. Simple building and construction work on the farm | |
| 11. Simple farm plumbing | 2 |
| 12. Farm machinery I | 4 |
| 13. Farm machinery II | 6 |
| 14. Farm machinery III | 6 |
| 15. Surveying | 2 |
| 16. Fencing | 2 |
| 17. Irrigation | 4 |
| 18. Reading blueprints | 4 |
| 19. Roads | 1 |
| 20. Drainage | 4 |
| 21. Farm water supply | 2 |
| 22. Sewage disposal | 4 |
| 23. Lighting and heating | 2 |
| 24. Simple Auto Mechanics I | 3 |
| 25. Simple Auto Mechanics II | 5 |

APPENDIX B

March 15, 1940

Dear Mr. Farmer:

I want reliable information about the kind of shop work that should be taught in the Pittsfield Community High School Vocational Agriculture department. My work is teaching Farm Mechanics to the boys who take agriculture, therefore, I want to know what you think should be taught to them in Farm Mechanics that would be of most service to them if and when they go back to the farm.

In order to take as little of your time as possible I have listed a number of articles and jobs to be done and wish you would check in the proper column according to your judgement the ones you think I should teach the boys to do. There is a space at the end of the questionnaire to write in other articles you think should be included.

Allow me to thank you for your attention to this matter, and I will appreciate a prompt return of the questionnaire.

Sincerely yours,

Vocational Ag Instructor

Word of Explanation:

This information is strictly confidential. I am using it as a Masters Thesis and no names will be used in the final analysis.

| NAME AGE<br>RENTER OWNER<br>YEARS YOU HAVE FARMED<br>DO YOU HAVE A SEPARATE FARM SHOP? | DOES THE JOB ARISE ON YOUR FARM? | | DO YOU DO THE JOB? | | WHY DO YOU NOT DO THE JOB? | | |
|---|---|---|---|---|---|---|---|
| ARTICLES AND JOBS | YES | NO | YES | NO | LACK OF TRAINING | LACK OF EQUIPMENT | OTHER REASONS |
| Concrete work | | | | | | | |
| Feeding floors | | | | | | | |
| Foundations | | | | | | | |
| Water tanks | | | | | | | |
| Hog troughs | | | | | | | |
| Walls | | | | | | | |
| Septic tanks | | | | | | | |
| Garage floors | | | | | | | |
| Laying brick or tile | | | | | | | |
| Plastering | | | | | | | |
| Fence posts | | | | | | | |
| Sun dials | | | | | | | |
| Bird baths | | | | | | | |
| Electrical work | | | | | | | |
| Wiring house | | | | | | | |
| Wiring barns | | | | | | | |
| Repair motors | | | | | | | |
| Repair radio | | | | | | | |
| Repair Door bells | | | | | | | |
| Harness: | | | | | | | |
| cleaning | | | | | | | |
| sewing | | | | | | | |
| replace parts | | | | | | | |
| splicing tugs | | | | | | | |
| oil harness | | | | | | | |
| Forge | | | | | | | |
| Machine repair | | | | | | | |
| Sharpen cult shovels | | | | | | | |
| Sharpen plow shares | | | | | | | |
| Make chisels | | | | | | | |
| Temper tools | | | | | | | |
| Weld | | | | | | | |
| Repair chain links | | | | | | | |
| Shoe horses | | | | | | | |
| Make clevis | | | | | | | |
| Meat hooks | | | | | | | |
| hay hooks | | | | | | | |
| gate hooks | | | | | | | |
| endgate rods | | | | | | | |
| chain links | | | | | | | |
| staples | | | | | | | |
| butch knife | | | | | | | |
| eye bolts | | | | | | | |
| wagon irons | | | | | | | |
| cold chisels | | | | | | | |
| punches | | | | | | | |
| wrecking bar | | | | | | | |
| tools | | | | | | | |

| DO YOU LIKE TO DO FARM MECHANICS WORK___ ✓ | DOES THE JOB ARISE ON YOUR FARM | | DO YOU DO THE JOB | | WHY DO YOU NOT DO THE JOB | | |
|---|---|---|---|---|---|---|---|
| ARTICLES AND JOBS | YES | NO | YES | NO | LACK OF TRAINING | LACK OF EQUIPMENT | OTHER REASONS |
| Plumbing | | | | | | | |
| Repair pump | | | | | | | |
| Install water system | | | | | | | |
| Install septic tank | | | | | | | |
| Cut and fit pipe | | | | | | | |
| Repair faucet | | | | | | | |
| Install house plumbing | | | | | | | |
| Build septic tank | | | | | | | |
| Install furnace | | | | | | | |
| Rope work | | | | | | | |
| Long splice | | | | | | | |
| Short splice | | | | | | | |
| Tie knots | | | | | | | |
| Crown ropes | | | | | | | |
| Make rope halters | | | | | | | |
| Gasoline engines | | | | | | | |
| Adjust carburetors | | | | | | | |
| Adjust valves | | | | | | | |
| Grind valves | | | | | | | |
| Adjust bearings | | | | | | | |
| Time ignition | | | | | | | |
| Clear carbon | | | | | | | |
| Overhaul autos | | | | | | | |
| Overhaul tractors | | | | | | | |
| Tool sharpening | | | | | | | |
| Plane bits | | | | | | | |
| Chisels | | | | | | | |
| Cross cut saw | | | | | | | |
| Large wood saws | | | | | | | |
| Drill bits | | | | | | | |
| Wood bits | | | | | | | |
| Buck saws | | | | | | | |
| Circle saws | | | | | | | |
| Axes | | | | | | | |
| Shears | | | | | | | |
| Meat saws | | | | | | | |
| Skates | | | | | | | |
| Sheet metal | | | | | | | |
| Soldering | | | | | | | |
| Repair pails | | | | | | | |
| ✓Make feed troughs | | | | | | | |
| ✓Make funnel | | | | | | | |
| ✓Make tin cup | | | | | | | |
| ✓Make cooking utensils | | | | | | | |
| Repair roofs | | | | | | | |
| Repair water tanks | | | | | | | |
| ✓Make feed scoops | | | | | | | |
| Glass | | | | | | | |
| Cut glass | | | | | | | |
| Repair windows | | | | | | | |
| Putty windows | | | | | | | |

| ARTICLES & JOBS | DOES THE JOB ARISE ON YOUR FARM | | DO YOU DO THE JOB | | WHY DO YOU NOT DO THE JOB? | | |
|---|---|---|---|---|---|---|---|
| | YES | NO | YES | NO | LACK OF TRAINING | LACK OF EQUIPMENT | OTHER REASONS |
| HORSES | | | | | | | |
| Harness hooks | | | | | | | |
| Harness washing board | | | | | | | |
| Curry comb rack | | | | | | | |
| Farm home | | | | | | | |
| Cupboards | | | | | | | |
| Step ladders | | | | | | | |
| Medicine Cabinet | | | | | | | |
| Flower boxes | | | | | | | |
| Ironing boards | | | | | | | |
| Lawn chairs | | | | | | | |
| Screens | | | | | | | |
| Tables | | | | | | | |
| Fruit shelves | | | | | | | |
| Kitchen stools | | | | | | | |
| Flower trellis | | | | | | | |
| Shoe shining box | | | | | | | |
| Porch furniture | | | | | | | |
| Cedar chest | | | | | | | |
| FIELD CROPS | | | | | | | |
| Lime spreader | | | | | | | |
| Seed treating devices | | | | | | | |
| Corn cribs | | | | | | | |
| Potato crates | | | | | | | |
| Hay racks | | | | | | | |
| Wagons | | | | | | | |
| FARM SHOPS | | | | | | | |
| Cupboards | | | | | | | |
| Tool box | | | | | | | |
| Nail box | | | | | | | |
| Saw horse | | | | | | | |
| Bench (carpenter) | | | | | | | |
| Mitre box | | | | | | | |
| Nail-screw-bolt shelves | | | | | | | |
| Cemet float | | | | | | | |
| File handles | | | | | | | |
| Drawers | | | | | | | |
| Saw filing clamp | | | | | | | |
| Farm tool box | | | | | | | |
| GENERAL FARM | | | | | | | |
| Saw buck | | | | | | | |
| Wagon jack | | | | | | | |
| Wire stretcher | | | | | | | |
| Medicine Cabinet | | | | | | | |

| | DOES THE JOB ARISE ON YOUR FARM | | DO YOU DO THE JOB | | WHY DO YOU NOT DO THE JOB? | | |
|---|---|---|---|---|---|---|---|
| ARTICLES AND JOBS | YES | NO | YES | NO | LACK OF TRAINING | LACK OF EQUIPMENT | OTHER PERSONS |
| REPAIR MACHINERY | | | | | | | |
| Overhaul farm machines | | | | | | | |
| Put in new tongue | | | | | | | |
| Lace leather belts | | | | | | | |
| Make wagon blosters | | | | | | | |
| Babbitt bearings | | | | | | | |
| New sections in sickle | | | | | | | |
| Repair wagonbox | | | | | | | |
| Figure pulling speeds | | | | | | | |
| Paint wagons | | | | | | | |
| Adjust mowers | | | | | | | |
| Adjust binders | | | | | | | |
| Sharpen mower sickles | | | | | | | |
| WOOD FINISHING | | | | | | | |
| Painting buildings | | | | | | | |
| Mixing paints | | | | | | | |
| Painting furniture | | | | | | | |
| Refinishing furniture | | | | | | | |
| Painting wood work | | | | | | | |
| Painting floors | | | | | | | |
| Painting machinery | | | | | | | |
| WOOD WORK | | | | | | | |
| POULTRY | | | | | | | |
| Make common appliances for poultry | | | | | | | |
| Make brooder house | | | | | | | |
| Make poultry house | | | | | | | |
| SWINE | | | | | | | |
| Watering trough | | | | | | | |
| Individual hog houses | | | | | | | |
| Hog hurdle | | | | | | | |
| Panels | | | | | | | |
| Creep | | | | | | | |
| Ringing Chute | | | | | | | |
| Double Hog houses | | | | | | | |
| CATTLE | | | | | | | |
| Loading chute | | | | | | | |
| Stanchions | | | | | | | |
| Silage cart | | | | | | | |
| Feed bins | | | | | | | |
| Milk stool | | | | | | | |
| SHEEP | | | | | | | |
| Creep for lambs | | | | | | | |
| Panels | | | | | | | |
| Feed troughs | | | | | | | |
| Drink troughs | | | | | | | |
| Sheep shed | | | | | | | |
| Wool sacker | | | | | | | |
| FRUIT | | | | | | | |
| Picking boxes | | | | | | | |
| Props | | | | | | | |
| Market stand | | | | | | | |
| Sorting table | | | | | | | |
| Sorting shed | | | | | | | |

| | DOES THE JOB ARISE ON YOUR FARM | | DO YOU DO THE JOB | | WHY DO YOU NOT DO THE JOB? | | |
|---|---|---|---|---|---|---|---|
| | YES | NO | YES | NO | LACK OF TRAINING | LACK OF EQUIPMENT | OTHER REASONS |
| MISCELLANEOUS | | | | | | | |
| Make single trees | | | | | | | |
| Make double trees | | | | | | | |
| Make handles for tools | | | | | | | |
| Make trailers | | | | | | | |
| Make stock racks | | | | | | | |
| Iron single trees | | | | | | | |
| Stock loading chutes | | | | | | | |
| Make garage | | | | | | | |
| Make neck yokes | | | | | | | |
| Make wheel barrows | | | | | | | |
| Make furniture | | | | | | | |
| Make farm gate | | | | | | | |
| Build farm shop | | | | | | | |
| ANY ADDITIONAL ARTICLES OR JOBS YOU THINK SHOULD BE TAUGHT; ADD BELOW | | | | | | | |
| 1. | | | | | | | |
| 2. | | | | | | | |
| 3. | | | | | | | |
| 4. | | | | | | | |
| 5. | | | | | | | |
| 6. | | | | | | | |
| 7. | | | | | | | |
| 8. | | | | | | | |
| 9. | | | | | | | |
| 10. | | | | | | | |
| 11. | | | | | | | |
| 12. | | | | | | | |
| 13. | | | | | | | |
| 14. | | | | | | | |
| 15. | | | | | | | |
| 16. | | | | | | | |
| 17. | | | | | | | |
| 18. | | | | | | | |
| 19. | | | | | | | |
| 20. | | | | | | | |

HOW MANY OF THE FOLLOWING DO YOU HAVE ON THE FARM?

| LIST OF THINGS | HOW MANY |
|---|---|
| Automobile | |
| Truck | |
| Tractor | |
| Gas Engines | |
| Electric motors | |
| Implement shed | |
| Horses | |
| Mules | |
| Sheep | |
| Poultry | |
| Hogs | |
| Dairy Cattle | |
| Beef Cattle | |
| Wagons | |
| Harvest Machinery | |
| 1. Combinder | |
| 2. Combine | |
| 3. Binder | |
| 4. Corn sheller | |
| 5. Huller | |
| 6. Scanfier | |
| 7. Corn grader | |
| Cultivating Machinery | |
| 1. Cultivator | |
| 2. Harrow | |
| 3. Rotary hoe | |
| 4. Disc | |
| 5. Plow | |
| 6. Roller | |
| 7. Lime spreader | |
| 8. Drill | |
| 9. End gate seeder | |
| Dairy Machinery | |
| 1. Milking Machine | |
| Spray Machines | |
| Power spray | |
| Hand spray | |
| Others | |
| 1. 5. | |
| 2. 6. | |
| 3. 7. | |
| 4. 8. | |

# BIBLIOGRAPHY


1. Ahalt, Arthur M. Teaching farm machinery. Agricultural education magazine, 2:67, October 1938.

2. American vocational association. Agriculture section. Research committee. Summaries of studies in agricultural education. Washington, U.S. Govt. print. off., 1935. 196 p. (U.S. Office of education, Vocational education bulletin, no. 180; Agricultural series, no. 18 ,i.e. 47,)

3. Busing, G.W. Finding education values in farm mechanics. Agricultural education magazine, 12:172-3, March 1940.

4. California, university of. Division of vocational education. Farm mechanics for California schools. Berkeley, Cal., 1922. 45 p. (Its Agricultural education series, no. 2; Division bulletin no. 11.)

5. Carpenter, F.E. Planning a farm mechanical course. Agriculture education magazine, 10:32, August 1937.

6. Colling, F. What do you teach in farm shop? Agriculture education magazine, 10:12, July 1937.

7. Dalton, E.L. Our objectives in farm mechanics. Agriculture education magazine, 10:32, August 1937.

8. Davidson, A.P. A study of farm shop and agricultural engineering. Its relation to vocational agriculture in Kansas high schools. Master's thesis, 1923, Manhattan, Kans., Kansas state college of agriculture. 40 p. ms.

   Abstracted in entry no. 2, pp. 53-4.

9. Davis, L.R. Shop work in vocational education. Master's thesis, 1923. Fort Collins, Colo., Colorado agricultural college. 44 p. ms.

10. Geiger, A.J. A study of farm shop instruction in vocational schools of Florida. Master's thesis, 1932. Gainsville, Fla., University of Florida. 106 p. ms.

Abstracted in entry no. 2, p. 72.

11. George, Chester Jonas and Smith, Walter Wilbur. A farm shop study. Special study, 1932. Columbus, Ohio, Ohio state university. 15 p. mim.

Abstracted in entry no. 2, p. 73.

12. Holloway, K.L. Planning farm mechanics program. Agricultural education magazine, 12:32-3, August 1939.

13. Kennedy, A.C. Determining content for farm shop. Agricultural education magazine, 3:32, August 1938.

14. Klein, R.H. Mechanical trends in farming and their effect on farm mechanics courses. Agricultural education magazine, 11:13, July 1938.

Abstracted in entry no. 2, p. 174.

15. Kolb, W.C. Farm shop program. Agricultural education magazine, 10:38, January 1938.

16. Mullins, D.G. Fitting farm shop into agriculture curriculum. Agriculture education, 9:141-ff, March 1937.

17. Murray, M.E. Fitting farm work shop into the agricultural curriculum. Agriculture education, 7:189, June 1935.

18. Pollum, Lester Boyd. Study of scope and content of farm mechanics and organization for teaching it in vocational agriculture schools of Kansas. Master's thesis, 1928. Manhattan, Kans., Kansas state agriculture college. 45 p. ms.

Abstracted in entry no. 2, p. 142.

19. Schmidt and others. Teaching farm shop work and mechanics. New York, Century company, 1927. 288 p.

20. Sharp, M.A. and Sharp, W.M. Principles of farm mechanics. New York, John Wiley and sons, 1930. 269 p.

Sharp, M.A. A suggestive course of study in farm mechanics. Master's thesis, 1928. Iowa state college. p. 257-65.

21. Sutherland, Sidney S. The relative importance of different phases of farm mechanics in high school courses in vocational agriculture. Master's thesis, 1928. Ames, Ia., Iowa state college. 42 p. ms.

Abstracted in entry no. 2., p. 167-8.

22. Walker, Clyde. Determining the content of farm mechanics courses of study for Smith-Hughes agricultural departments in high schools. Master's thesis, 1931. Lincoln, Neb., University of Nebraska. 80 p. ms.

23. White, Chris. Farm mechanics as a part of the instruction in vocational agriculture in Oklahoma high schools. Master's thesis, 1936. Stillwater, Okla., Oklahoma A. and M. college. 115 p. ms.

24. Wilson, M.R. Farm mechanics now and tomorrow. Agriculture education, 10:52-3, September 1937.