AN ASSESSMENT OF AGRICULTURAL MECHANICS SAFETY INSTRUCTION CONDUCTED AT AGRICULTURAL TEACHER EDUCATION PROGRAMS ACROSS THE UNITED STATES

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I especially thank God above, for His love to me and my family from day to day.

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INTRODUCTION

The passage of the Smith-Hughes Act of 1917 envisioned agricultural mechanics instruction to be an integral part of the vocational agriculture program. However, the very nature of the agricultural mechanics laboratory or shop is conducive to safety hazards and the potential for possible accidents. Always a danger existed. Yet there is today a broadened scope and complexity in agriculture shops across the states. Brown (8) stated that modern complex machinery found in today's agriculture shops can efficiently process woods and metal. This same machinery can efficiently severe a limb or blind a young person also.

Agriculture instructors should be concerned with keeping their students safe and free from harm. They should strive to eliminate a potential hazard and take steps to prevent accidents in the agriculture shop. This is no easy task as the problems of sophisticated equipment, overcrowded class sizes and shop facilities place a burden on the public school and more directly on the vocational agriculture instructor. Agriculture teachers have a legal and moral responsibility to act with caution and prudence to keep their shops free from accidents and hazards.

Teachers are responsible for:

1. Failure to adequately instruct pupils in correct methods of using dangerous machinery.

2. Failure to warn of dangers that arise from disobeying safety rules.

3. Allowing safety devices to be ignored.

4. Personal protection not being worn.

Agricultural teacher education programs across the states are responsible for preparing future agriculture teachers for competency in many areas of study. Agricultural mechanics is one of the areas and safety is one crucial aspect of agricultural mechanics. The health and safety of students should always be the primary consideration of any school program. Some teacher trainers have recently expressed misgivings over the sufficient or insufficient influence being exerted by the individual teacher training programs for agriculture mechanics.

A 1973 study by Salmon (30) attempted to answer questions pertaining to what is actually being taught in the area of agricultural mechanics. One hundred and one agricultural institutions across the United States were surveyed. A major finding from Salmon's study was that undergraduate courses in agricultural mechanics and related safety instruction were not keeping pace with technological and industry changes. Newer, powerful, and more advanced equipment necessitates skilled, safe operators. A good safety program is based on sound instruction and a positive example. Proper safety habits and practices that a student may be exposed to apply to him long after he leaves the local program. If proper concepts and practices are to be formed, the agriculture teacher himself must have the necessary training and expertise. He needs it to instill these very things in his own students.

A 1980 study by Reece (28) analyzed and compared agricultural mechanics safety practices and policies of Oklahoma vocational

agriculture instructors. Out of a total population of 364 vocational agriculture departments, 346 departments representing 95.05% of all programs responded to the instrument utilized in the conduct of this study. A major conclusion of this study was that teachers had only an average of 2.8 hours of formal safety training and only 9.02 hours of on-the-job safety training. It was found that vocational agriculture teachers had very little training in the area of farm shop safety. However, the fact that vocational agriculture teachers taught an average of 15.2 hours of safety to their students indicates that vocational agriculture instructors are aware of the need and value of safety training.

Other major conclusions from Reece's study were:

1. That vocational agriculture teachers consider safety training instruction to be of significant importance in their agricultural mechanics programs.

2. Based upon the findings, vocational agriculture teachers want and need formal safety training.

Statement of the Problem

There is a need to know what's being done in the area of agricultural mechanics safety instruction conducted in agricultural teacher education programs across the United States. This study attempted to help meet that need.

Purpose of the Study

The purpose of this study was to assess selected areas of safety instruction in agricultural mechanics conducted at agricultural teacher education programs across the United States.

Objectives of the Study

In order to accomplish the intent of this study, the following objectives were developed:

1. To determine the amount of importance currently placed on selected areas of safety instruction by agricultural teacher education programs.

2. To determine the amount of time spent on selected areas of safety instruction.

3. To determine the amount of training agricultural mechanics teacher trainers have had in selected areas of safety.

4. To determine where agricultural mechanics teacher educators received their training or preparation in selected content areas of safety instruction.

5. To determine the level of safety preparation of agricultural education students across the United States.

6. To determine the academic homes and teaching assignment of the agricultural mechanics teacher educators.

Rationale for the Study

Teacher trainers in land-grant institutions have a responsibility to train future agricultural teachers. The training in safety is part of that responsibility. This study can be a means of helping university and college educators improve their individual programs. By carefully scrutinizing and evaluating their existing agricultural mechanics program, they can assess the strengths and weaknesses related to safety instruction. This study should provide information useful to the State

Department of Vocational Agricultural Education and the Oklahoma State University Departments of Agricultural Education and Agricultural Engineering. Finally, it is hoped this study may directly or indirectly reduce the hazards and tragedies that may occur in the local shop that affect our program's greatest resource--the student.

Definitions

For the purpose of this study the following terms seemed pertinent and relevant:

1. Agricultural Mechanics - Refers to the instructional areas which develop the mechanical skills and abilities of students needed in on-form and off-form agricultural occupations.

2. In-Service Training - Refers to the preparation received by the teachers in workshops sponsored by agricultural education departments and state departments of education to improve the quality of instruction.

3. AAVIM - Refers to the American Association for Vocational Instructional Materials, a nonprofit, nationwide organization supported by colleges, universities, and divisions of vocational education in all the 50 states.

4. OSHA - Occupational Safety and Health Administration, a governmental agency authorized to conduct inspections of work areas and make a determination as to the degree of safety which is afforded individuals employed or training in these environments.

CHAPTER II

REVIEW OF LITERATURE

This chapter's purpose was to present for the reader an overview of literature which was related to selected areas of safety instruction. The presentation of this background information was divided into three major areas and a summary. The areas of concern were safety environment, safety education, and safety enforcement.

Safety Environment

According to the National Safety Council (24, p. 16), "The responsibility of the school for the physical protection of its pupils has long been accepted by school people and by communities throughout the country." The need for early safety education is now well recognized, and the schools have been given the responsibility to teach safe living to the young. Vocational agriculture teachers as instruments of the school, are before the firing line to provide safety instruction. These vocational agriculture teachers must also provide pupils with a safe environment. They must incorporate the safety lessons they teach with their own school practices to safeguard pupils from injury. Safety instruction related to the students' environment involves many things.

W. G. Johnson (18), former general manager of the National Safety Council, in remarks made at the 1966 convention of the Association of School Business Officials, said:

> I truly believe a school system with an employee and student population of 10,000 has a wider range of safety problems than a factory with 10,000 employees. Yet, in a plant we would find staff skilled in safety engineering involving and providing for a safe environment. We simply don't find this type of professional in a school system that size (p. 51).

Environment involves providing many things, among them quality equipment for the vocational student, knowledge of safe and proper shop layouts, and a factor often neglected by the vocational agriculture teachers, shop equipment maintenance. Salmon (30), in a 1973 study, raised serious questions. He asked if teacher trainers at land-grant institutions were exerting sufficient influence on all phases of the agricultural mechanics phase of training for prospective vocational agricultural teachers. Is safety instruction provided that deals with considerations related to safe environments? He concluded that there is no consistency of agreement on how to train prospective vocational agricultural teachers in agricultural mechanics. No one is taking the major responsibility for determining what the agricultural mechanics curriculum should be in safety or otherwise.

Color dynamics and maintenance are part of the shop safety environment. A special project in shop environment was developed in Minnesota. It promoted safety instruction concerning the shop environment. Barduson and Bear (5) reported that in 1969, a special student teaching "block" couse in agricultural mechanics safety was offered. Sixteen agricultural education seniors at the University of Minnesota enrolled in a course on methods of teaching agricultural shop. Through a cooperating local school, these prospective agricultural teachers were given an opportunity to color code a new shop and install work lanes. Maintenance to all existing shop equipment was completed by course participants.

This six weeks course of instruction was geared toward teaching teachers to provide a safe environment through shop layout control. Eustace (12), a guest editorialist in Agricultural Education, stated that modern agriculture has produced modern and high powered technology. Taking care of up-to-date complex machinery is a responsibility of the local agriculture teacher whether he likes it or not. This applies to his shop program and his shop equipment. According to Frye (16), at the time of the initial organization of the FFA and implementation of local agriculture programs, a large percentage of the farms were still operating with horse power. New equipment brought new and more significant hazards with which the teachers and students must cope. Brown (8) believed, as an agricultural educator, that maintenance of shop equipment created a safer environment and it also protected the teacher from a possible lawsuit as a result of negligence on the part of the agriculture teacher. It provided for an environment that was a safe teaching/learning situation.

Safety Education

"Torch Explodes Gasoline Can in School Shop" read the headlines in a 1967 issue of the Kansas City Times (32). Contrary to the instruction of the local teacher, a student took an empty gasoline drum into the shop and began cutting the top with an acetylene torch. An explosion shattered 27 windows of the high school vocational agriculture workshop. The torch operator and three other students escaped serious injury. This was an unfortunate incident, and yet, the student had been instructed in safety involving the safe use of the cutting torch and he ignored the warnings of his teacher.

Educating the students in all phases of safety is one major responsibility that the agriculture teacher has. Even with instruction in safety practices, accidents and tragedy can occur. However, as Williams (33), chairman of the Department of Vocational Education, Pennsylvania State University, maintained in a 1972 article in School Shop magazine, safety instruction can provide one form of evidence. The evidence should support the instructor in that he has provided and taught safety rules and instruction in the event of a lawsuit resulting from a shop injury to a student.

When schools undertake the obligation of providing shop and laboratory experiences for youths and adults, they accept responsibility. This responsibility includes a program of education which will emphasize effective safety practices in an accident-free environment. The teacher of vocational agriculture bears the brunt of this responsibility. He must seek ways of educating his students to prevent them from harm. Prakken (27), in a 1972 editorial, charged vocational educators to make an effort to educate and protect their students. Vocational teachers need preparation themselves to provide safety instruction as an integral part of their local courses of study.

Author Dennis Kigin (19) reported in his study on teacher liability in school-shop accidents that teachers need to have an established and well functioning safety education program. Safety education may vary with the academic discipline, and because of diversity of activities involved, are not necessarily convenient to implement. In fact, developing an adequate program can be inconvenient but so is learning Braille, tying shoes without a thumb, or fighting a lawsuit.

Vocational agriculture teachers and teacher trainers need to work together to promote and provide safety education principles and procedures. Expertise needs to be developed as vocational agriculture shops are affected like any other program. Ninety-six percent of the farm mechanics instructors in Michigan were involved in a 1960 study. Pfister (26) investigated the number of accidents per hour of student work in agricultural shops. The major findings were:

1. Average accident frequency rate was found to be 1571 accidents per million student hours of work. This was equivalent to 659 hours of work per accident. A total of 770 school shop accidents were reported, averaging 4.1 accidents per school year.

2. Physicians' services were required in 37 cases with the balance receiving first aid only.

3. A statistically significant decrease was found between the accident rate during the first and second semester of instruction.

4. The accident, severity ratio was one injury requiring a doctor's care for every 14 first aid injuries. The severity ratio between major and minor injuries increased as grade level increased.

5. It was found that current safety education practices are used to a greater degree by lower accident rate schools.

The education of vocational agriculture students in safety encompasses many areas. Teaching that includes many different aspects of instruction can be effective and produce positive results. According to Williams (33), periodic safety shop talks as the occasion presents itself is effective. Others include:

1. Periodic safety demonstrations.

2. General safety rules and regulations.

3. Safe operation of power mechanics.
4. Safe use of hand tools.
5. Field trips to industrial plants.
6. Using safety specialists.
7. Safety posters.
8. Safety literature.
9. Safety films and visuals.

Agriculture teachers should strive to teach safety, to educate their students. According to Krejcie (21), attitudes can be developed and even taught. Attitudes are the most important physiological aspect of safety. A teacher must provide a learning situation in the school shop that lends itself to development of positive safety attitudes. Vocational agriculture teachers have an opportunity if they use the right tools to educate and develop safety ideals in their students.

Safety Enforcement

Dr. Clyde Knight (20), Safety Instructor and National Safety Council member, disclosed in a recent interview that, "I believe the secret to success is providing a safe environment for our students. Also, a follow up to the educational aspect of safety instruction is total teacher supervision." According to Foster (15), the enforcement aspect of the safety program can save lives and money. If the agricultural teacher enforces all rules and regulations and is involved in supervision of the students, he saves the school many dollars. If state aid is based on average daily attendance, absences caused by accidents are costly in dollars not received. One state discovered that its local schools lost nearly $500,000 in one year as a result of accident-related absences.

Strong (31) reported that an organized system of accident reporting can contribute to the success of enforcement. This is a part of a total management of the enforcement concept. Enforcement of safety in the agriculture shop must come as a result of some kind of safety policy. A policy from the local school board makes the agriculture teacher duty bound to enforce safety in his shop. Not only does he abide by local school policies and guidelines but he protects himself from litigation. Enforcement has been compared by some administrators as to safety and sports, the best offense being a good defense through prevention of accidents.

Before the OSHA movement and legislation ever appeared on the national scene, industrial safety regulations and safety enforcement were applied to local schools. In Lehman vs. Los Angeles City Board of Education in a 1957 decision, the higher court of appeals ruled in favor of the plaintiff, Lehman. The school maintained that the student, Lehman, who lost a hand, was not an employee and the school was not of a governmental function and, therefore, not subjected to the requirement of a public liability act. The higher court reasoned, however, that even though the law was written to apply to employees under specific conditions, the need for broader interpretation of these laws are necessary because the need for safety measures is the same in all situations where dangers exist. The significance of this case occurring 23 years ago was: where vocational shops exist, the need for following all rules of conduct and enforcing conduct is imperative for the sake of the students. This again points out the need for competent teachers for vocational shops.

Enforcement of safety in the local agriculture shop is a task that involves many things. One task that the agriculture teacher must perform daily is in the enforcement of eye protection for his students. Oklahoma as well as 33 other states have enacted eye safety laws applicable to vocational programs and their students. Biggam (7) reported in a study on eye safety that most states, if it came to court litigation, would pin the responsibility of an eye related accident on the supervising individual or the person in charge. Not only must the vocational agriculture teacher enforce the safety rules applied to the wearing of protective goggles or other suitable eye protection for his students, but 34 states require that the instructor also wear eye protection devices. The vocational agriculture teacher, in his total safety program, must set the example.

The Vermont Supreme Court said once in a decision that in essence, a teacher owes his pupils a duty of safety enforcement and supervision and must set the example for all aspects of shop safety. Albrite (3), in a 1970 study, stated that in a teacher-pupil relationship, the teacher has to take all reasonable precautions to protect pupils against the possibility of harm. A teacher cannot escape liability if he fails to conduct himself reasonably and prudently, to set the example.

Every day and in every way, agricultural teachers must conduct themselves in a manner of professionalism and concern in the area of shop safety. Legal actions have become a part of school life and are increasing in complexity. Until recently, teachers and most administrators have regarded the possibility of liability with indifference. However, the alarming increase in school related injuries have caused considerable concern. Vocational agriculture teachers need to be

prepared in all areas of safety related to the shop. This is due in part to the changing clientele of the community and a greater awareness on the part of parents to sue to get monetary recovery in the event of an accident. Legal actions against teachers who fail in their example, who fail to try to enforce safety, and are negligent are increasing every day.

Safety can be developed. Negligence on the part of the instructor only increases the dangers and limits the safety effectiveness in his local shop. Safety to be effective must be spontaneous. Kigin (19) believed that teachers can transcend carelessness and, through conception, reason, and judgments develop a safety conscientious attitude. He maintained that the most conscientious and able teachers have the least difficulties in safety instruction and in school related accidents occurring.

Summary

This review of literature presented background information with emphasis on the areas: safety environment, safety education, and safety enforcement.

The responsibility of the school for the physical protection of its students has long been accepted by school people and communities. The need for safety education is recognized by all parties concerned from the administration on down to the teacher. However, the local vocational agriculture teacher, like the other types of teachers, is before the firing line daily. The responsibility of providing safety instruction falls upon his shoulders.

An essential part of any safety program deals with the environment provided to the students. Many school districts do not have teachers who are trained as in industry. They are to provide safe environments for their students. In the area of agricultural mechanics preparation for future agriculture teachers, questions have been raised by teacher trainers as to what kind of influence is being exerted in all phases of agricultural mechanics. This question also applies to safety instruction. Color coding and shop layout preparation is an important part of a safe environment for agriculture shops. Some colleges have worked with prospective teachers along these lines. Maintenance of potentially dangerous equipment is a consideration included in safety environment. It has to be provided for students of vocational agriculture. There has been new hazards to cope with as the days of horsepower are gone and modern machinery was introduced into the local shops.

Educating the student in safety practices and rules of conduct is a major area of responsibility for the agriculture teacher. At least an educational effort on the part of the local teacher can be some form of evidence in the event of tragedy. Enforcement involves total supervision by the instructor at all times to be effective. The review of literature showed that enforcement of safety by the local teacher can save individual school districts thousands of dollars. With most states now having some form of eye safety legislation, local agriculture teachers must enforce eye safety for their students and in many cases, for themselves.

A teacher in the shop must conduct himself prudently and reasonably. He must set the example and this is one form of safety instruction he can't escape. Morally and legally, he is, by his very actions, responsible for his students' lives.

CHAPTER III

METHOD AND PROCEDURE

The purpose of this chapter is to describe the methods and procedures used in developing and conducting this study. These were dictated by the purpose of the study, which was to assess selected areas of safety instruction in agricultural mechanics conducted at agricultural teacher education programs across the United States.

Development of the Study

When the writer began his advanced degree program at Oklahoma State University, he took several shop-oriented and safety courses. During this coursework, questions were raised as to the type of safety instruction in agricultural mechanics that future vocational agriculture instructors were receiving in agricultural teacher education programs. These courses helped create an awareness of the need for adequate training in safety as part of the career preparation of future agriculture teachers.

The information for this study was compiled through two basic steps. The first task was to identify selected areas of agricultural mechanics safety instruction which are most common to agricultural teacher education programs nationwide. This was accomplished by interviewing and corresponding with faculty members working in the areas of safety and agricultural mechanics at Oklahoma State University as well as other

state institutions. The second step was securing the opinions of graduate students, local vocational agriculture teachers, and Oklahoma State University agricultural education faculty on issues pertaining to agricultural teacher education safety instruction in agricultural mechanics, which should be included in this study. These individuals also aided the writer in identifying selected areas of safety instruction in agricultural mechanics. The areas thus identified for study pertained to shop environment, safety education, and enforcement-accident prevention.

Specific objectives relating to the design of the study had to be identified. In order to collect the information necessary to accomplish the purpose of the study, the following tasks had to be completed:

1. Determine a population.
2. Develop a suitable instrument for collecting data.
3. Collect data.
4. Use the proper methods for analyzing the data.

Population

In October of 1980, the researcher corresponded with Mr. Harold Parady, Executive Director of the American Association for Vocational Instructional Materials, to obtain information providing the names and addresses of each agricultural mechanics teacher educator(s) at each agricultural teacher education program in the United States. A list of 50 identified teacher educators in agricultural mechanics was supplied. Additional names and addresses were secured from the 1980-81 edition of the Agricultural Teachers Directory (1) and from the writer's committee members. Eighteen department heads in agricultural education

programs across the states provided the names of the faculty member(s) primarily responsible for agricultural mechanics teacher training at their respective institution. This was accomplished by the writer's providing a self-addressed card for them to fill out and return. The population of this study consisted of 103 agricultural mechanics teacher educators and faculty from 87 agricultural teacher education programs across the United States.

Development of the Instrument

The information needed for the study was obtained through the use of a questionnaire. The questionnaire was developed with the aid of faculty members of Oklahoma State University working in the areas of safety, vocational agriculture teachers, graduate students, and the author's committee. In addition, instructional areas in agricultural mechanics safety instruction were developed with the aid of AAVIM's publication Developing Shop Safety Skills (17).

The first part of the questionnaire dealt with specific questions concerning the academic home and teaching assignments of the respondents. Another question dealt with the FFA Region of which the respondents were a part. These questions were:

1. Do you hold faculty status in agricultural engineering?
2. Do you hold faculty status in agricultural education?
3. Do you hold a joint appointment?
4. Is your assignment with another department? What other department?
5. Is your teaching assignment full time agricultural mechanics instruction?

6. What are your teaching assignments?

7. Please check the FFA region of which you are a part.

Eastern ___
Southern ___
Western ___
Central ___

The second part of the questionnaire listed 36 selected content areas of safety instruction in agricultural mechanics. These content areas fell under the categories of shop environment, safety education, and enforcement-accident prevention. Respondents were given an opportunity to add additional instructional areas that fell under these three categories. First, the instrument permitted the respondents to indicate on a five-point scale the amount of importance they felt should be placed on each content area. Next, the agricultural mechanics teacher educators were asked to check the number of hours spent in shop and classroom instruction per semester on each listed content area. The respondents also were given an opportunity to indicate the amount of training they had in each area. The scale for amount of training the respondents had in each area and also for importance felt included the categories "none," "little," "some," "much," and "very much." Real limits were set at:

1. 3.50 to 4.00 for "very much"
2. 2.50 to 3.49 for "much"
3. 1.50 to 2.49 for "some"
4. 0.50 to 1.49 for "little"
5. 0.00 to 0.49 for "none"

The agricultural mechanics teacher educators had the opportunity to report where they secured their training or preparation in each of

the selected content areas of safety instruction. The options included:

1. In-Service Workshop
2. Factory or Industry Schools
3. College or University Schools
4. Professional or Association Meetings
5. Past Employment in Other Fields
6. Individual Preparation or Study
7. Other

In the last section, the respondents were to assess the level of safety preparation their agricultural education students possessed and to check one of three categories. The categories were "very well prepared, " "adequately prepared," and "adequate for first year teacher but a need for additional training." The number of teacher trainers who responded and the percentage of response for each category was tabulated for each FFA region, as was the non-response.

Collection of Data

The questionnaires were mailed to 85 teacher trainers in agricultural mechanics on January 9, 1981. Another 18 questionnaires were sent out the following week as more teacher trainers' names became available to the researcher. A self-addressed, stamped envelope was enclosed to encourage a prompt response and return. A cover letter from the researcher was enclosed explaining the importance and value of the study and its relationship to the continued success of agricultural teacher education across the United States. As a gesture of appreciation, a packet of instant coffee was included with each

questionnaire sent out. The respondents were encouraged to enjoy a cup of coffee while they filled out the questionnaire.

The first mailing resulted in 61 returns from the agricultural mechanics teacher trainers. On January 29, a follow-up letter was mailed to the non-respondents stressing the importance of their participation in the study.

The follow-up letter netted an additional 25 responses for a total of 86 instruments. On February 13, 1981, 10 random telephone calls were made to those non-respondents in the population, which provided nine responses. Total response was 95, or a 92.23% return.

Analysis of Data

The respondents of this study included 95 of the 103 teacher educators in agricultural mechanics at agricultural teacher education programs across the United States. After consulting with the author's advisers, it was decided that descriptive statistics would be the most appropriate treatment to use. The descriptive statistics selected were frequency distributions, percentages, and mean responses. For each of the areas of the questionnaire, a frequency count and percentage response for each category were calculated along with mean response. This gave an average response as well as an indication of the dispersion of the responses in each FFA-teacher education region across the United States.

CHAPTER IV

PRESENTATION AND ANALYSIS OF DATA

Introduction

The primary purpose of this study was to assess selected areas of safety instruction in agricultural mechanics conducted at agricultural teacher education programs across the states. This was done by obtaining from 95 agricultural mechanics teacher educators the importance and time spent on selected areas of safety instruction provided in their agricultural mechanics instruction. The amount of training, where trained, and the adequacy of their agricultural education students in safety preparation was also obtained from the respondents.

In order to accomplish the purpose of the study, the following specific objectives were established:

1. To determine the amount of importance currently placed on selected areas of safety instruction by agricultural teacher education programs.
2. To determine the amount of time spent on selected areas of safety instruction.
3. To determine the amount of training agricultural mechanics teacher trainers have had in selected areas of safety.
4. To determine where agricultural mechanics teacher educators received their training or preparation in selected content areas of safety instruction.
5. To determine the level of safety preparation of agricultural education students across the United States.
6. To determine the academic homes and teaching assignment of the agricultural mechanics teacher educators.

Population

The population of this study was 103 agricultural mechanics teacher educators from 87 agricultural teacher education programs in the United States. The instruments used in the study were received from 95 respondents, which represented a 92.23% return. A copy of the instrument used to collect data for this study is included in Appendix A.

Findings of the Study

The remaining portion of this chapter is an attempt to present and analyze data collected relative to the responses of the population by region and an overall national description of the population's response to safety instruction in agricultural mechanics teacher education. In order to facilitate presentation of the findings, data will be analyzed under selected major topic headings as found in the instrument administered.

Importance Placed on Selected Aspects of Safety Instruction

Data in Table I present the mean responses and importance categories of selected aspects of shop environment by region. All aspects of shop environment were perceived to be of "much" or "very much" importance by the teachers from all four FFA regions. Respondents from the central region indicated that all the content areas were considered to be of "much" importance. The 31 respondents from the western region indicated they felt that controlling fumes, organizing the shop,

TABLE I

REGIONAL COMPARISON OF PERCEIVED IMPORTANCE OF SELECTED ASPECTS OF SHOP ENVIRONMENT

Shop Environment	Mean Responses as to Importance by Region				
	Western Region (N=31)	Central Region (N=26)	Eastern Region (N=21)	Southern Region (N=17)	National (N=95)
Color coding of shop	3.02 (Much)	2.82 (Much)	3.18 (Much)	3.08 (Much)	3.02 (Much)
Locating fire extinguishers	3.45 (Much)	3.18 (Much)	3.40 (Much)	3.49 (Much)	3.38 (Much)
Locating safety equipmt.	3.38 (Much)	3.22 (Much)	3.32 (Much)	3.43 (Much)	3.33 (Much)
Locating exits	2.75 (Much)	2.84 (Much)	3.21 (Much)	3.40 (Much)	3.05 (Much)
Locating work stations	2.99 (Much)	3.10 (Much)	3.05 (Much)	3.20 (Much)	3.08 (Much)
Locating stationary power equipmt.	3.15 (Much)	3.18 (Much)	3.25 (Much)	3.22 (Much)	3.20 (Much)
Controlling fumes	3.50 (Very Much)	3.24 (Much)	3.37 (Much)	3.67 (Very Much)	3.44 (Much)
Controlling noise pollution	3.05 (Much)	2.62 (Much)	2.90 (Much)	3.34 (Much)	2.97 (Much)
Using main power disconnect systems	2.96 (Much)	2.70 (Much)	2.87 (Much)	3.34 (Much)	2.96 (Much)
Using safety signs	3.16 (Much)	3.30 (Much)	2.59 (Much)	3.22 (Much)	3.07 (Much)
Using safety lanes	2.85 (Much)	2.74 (Much)	2.77 (Much)	3.02 (Much)	2.84 (Much)
Organizing the shop	3.67 (Very Much)	3.30 (Much)	3.56 (Very Much)	3.67 (Very Much)	3.55 (Very Much)
Storing combustibles	3.23 (Much)	3.32 (Much)	2.68 (Much)	3.64 (Very Much)	3.21 (Much)
Storing project materials	3.04 (Much)	2.76 (Much)	2.87 (Much)	3.40 (Much)	3.01 (Much)
Keeping house	3.59 (Very Much)	3.39 (Much)	3.37 (Much)	3.94 (Very Much)	3.57 (Very Much)

and keeping house were of "very much" importance as content areas of safety instruction. The aspect of organizing the shop received a mean response of 3.56 from the eastern region which placed it in the "very much" category of importance. The southern region had four content areas of shop environment with mean responses which placed them in the category of "very much" importance. These were controlling fumes (3.67), organizing the shop (3.67), storing combustibles (3.64), and the highest mean level found in the table (3.94) for the content area of keeping house. When compiled into a set of national mean responses, the data obtained from 95 agricultural mechanics teacher educators indicated that 11 15 content areas of shop environment were considered of "very much" or "much" importance. Two areas, organizing the shop and keeping house, fell into the category of "very much" importance, with mean levels of 3.55 and 3.57, respectively.

Data presented in Table II indicated that most of the respondents felt that selected aspects of safety education were of "much" or "very much" importance. On the national level, only the item of maintaining student medical data was felt to be of "some" importance, with a mean response of only 2.18. The selected aspects of using stationary equipment, using hand tools, using chemicals and solvents, keeping student safety records, recognizing shop emergencies, establishing emergency procedures, developing and locating emergency aid stations, and presenting CPR and first aid training were all considered of "much" importance nationally. It is interesting to note that respondents from all four regions were in agreement on the importance of using gas cutting and welding equipment. The four region's mean responses fell in the category of "very much" importance. Other

TABLE II

REGIONAL COMPARISON OF PERCEIVED IMPORTANCE OF SELECTED ASPECTS OF SAFETY EDUCATION

Safety Education for:	Mean Responses as to Importance by Region: Western Region (N=31)	Central Region (N=26)	Eastern Region (N=21)	Southern Region (N=17)	National (N=95)
Using stationary equipmt.	3.51 (Very Much)	3.28 (Much)	3.37 (Much)	3.58 (Very Much)	3.43 (Much)
Using hand tools	3.45 (Much)	3.14 (Much)	3.58 (Very Much)	3.61 (Very Much)	3.44 (Much)
Using portable power equipmt.	3.55 (Very Much)	3.26 (Much)	3.63 (Very Much)	3.79 (Very Much)	3.55 (Very Much)
Using chemicals & solvents	3.25 (Much)	2.89 (Much)	3.37 (Much)	3.25 (Much)	3.25 (Much)
Using arc welding equipmt.	3.64 (Very Much)	3.24 (Much)	3.85 (Very Much)	3.67 (Very Much)	3.60 (Very Much)
Using gas cutting & welding equipmt.	3.64 (Very Much)	3.61 (Very Much)	3.83 (Very Much)	3.79 (Very Much)	3.71 (Very Much)
Keeping student safety records	2.76 (Much)	2.54 (Much)	2.63 (Much)	3.05 (Much)	2.74 (Much)
Maintaining tools & equipmt.	3.42 (Much)	3.35 (Much)	3.73 (Very Much)	3.79 (Very Much)	3.57 (Very Much)
Recognizing shop emergencies	3.49 (Much)	3.05 (Much)	3.28 (Much)	3.17 (Much)	3.24 (Much)
Establishing emergency procedures	3.26 (Much)	3.18 (Much)	3.35 (Much)	3.40 (Much)	3.29 (Much)

TABLE II (Continued)

Safety Education for:	Mean Responses as to Importance by Region Western Region (N=31)	Central Region (N=26)	Eastern Region (N=21)	Southern Region (N=17)	National (N=95)
Developing & Locating emergency aid stations	3.18 (Much)	2.87 (Much)	3.18 (Much)	3.40 (Much)	3.15 (Much)
Presenting Red Cross, CPR & First Aid training	2.37 (Some)	2.43 (Some)	2.46 (Some)	2.75 (Much)	2.50 (Much)
Maintaining student medical data	1.95 (Some)	2.10 (Some)	2.53 (Much)	2.16 (Some)	2.18 (Some)

content areas placed within the "very much" category of importance nationally were: using portable power equipment, with a mean response of 3.55; maintaining tools and equipment (3.57); and using arc welding equipment (3.60). Table II further reveals that the content area of presenting CPR and first aid training barely fell within the category of "much" importance nationally, with a 2.50 response. Regionally, the western, central, and eastern mean responses fell within the "some" importance category. However, the mean level for the southern region was 2.75, which placed it in the "much" category of importance.

Table III was developed to show a regional comparison of importance of selected aspects of enforcement - accident prevention. Table III reveals that respondents from all four regions placed "very much" importance on the content area of protecting the eyes. The southern region, with a mean response of 3.88, had the highest mean response for the protecting the eyes content area, while the central region had the lowest response at 3.61. The data in Table III also reveal that in every content area except two (using safety tests and using safety inspection), the southern region had the highest mean responses of the four regions compared. These content areas were disciplining students in the shop (3.66), supervising students (3.94), developing general safety rules (3.70), developing specific safety rules for tools and equipment (3.79), protecting the eyes (3.88), and providing protective equipment (3.79). The national mean responses indicated that supervising students (3.66), developing specific safety rules (3.50), protecting the eyes (3.72), and providing protective equipment (3.58) were felt to be of "very much" importance. Using

TABLE III

REGIONAL COMPARISON OF PERCEIVED IMPORTANCE OF SELECTED ASPECTS OF ENFORCEMENT - ACCIDENT PREVENTION

Enforcement - Accident Prevention	Mean Responses as Importance by Region				
	Western Region (N=31)	Central Region (N=26)	Eastern Region (N=21)	Southern Region (N=17)	National (N=95)
Using safety tests	3.34 (Much)	3.01 (Much)	2.80 (Much)	3.28 (Much)	3.10 (Much)
Using safety inspections	3.20 (Much)	3.30 (Much)	3.11 (Much)	3.20 (Much)	3.20 (Much)
Disciplining students in the shop	3.47 (Much)	2.99 (Much)	3.30 (Much)	3.66 (Very Much)	3.35 (Much)
Supervising students	3.55 (Very Much)	3.45 (Much)	3.73 (Very Much)	3.94 (Very Much)	3.66 (Very Much)
Developing general safety rules	3.44 (Much)	3.28 (Much)	3.32 (Much)	3.70 (Very Much)	3.43 (Much)
Developing specific safety rules for tools & equipmt.	3.43 (Much)	3.37 (Much)	3.42 (Much)	3.79 (Very Much)	3.50 (Very Much)
Protecting the eyes	3.80 (Very Much)	3.61 (Very Much)	3.59 (Very Much)	3.88 (Very Much)	3.72 (Very Much)
Providing protective equipmt.	3.62 (Very Much)	3.34 (Much)	3.59 (Very Much)	3.79 (Very Much)	3.58 (Very Much)

safety tests was found to have the lowest mean response at 3.10, while protecting the eyes had the highest mean response with a 3.72 mean value.

Regional Comparison of Shop and Class Hours Spent per Semester on Selected Aspects of Shop Environment, Safety Education, and Enforcement - Accident Prevention

The information presented in Table IV gives the number responding and percentages by region for the 15 selected aspects of shop environment. Table IV reveals that of all the teachers from all four regions of the country, at least 47.6% or more of them spent from one to five hours of class and shop time on color coding, while 27 teacher trainers or 87.1% from the western region also reported spending the same amount of time on color coding. Four teachers or 15.4% of the central region respondents indicated they spent 6-10 hours of time on color coding. Of the 95 respondents involved, only two teachers from the western region spent 11 or more hours on color coding. In comparing the regional responses within the one to five hours category in Table IV, it is revealed that for the topics of locating fire extinguishers and locating safety equipment, the teacher trainers from the western region have a much larger response than the other three regions. Twenty-six or 83.9% of the western region respondents reported spending one to five hours on locating fire estinguishers, while only 73.1% or 19 of the 26 respondents from the central region spend the same amount of time. Ninety-three and one-half percent or 29 teachers from the

TABLE IV

REGIONAL COMPARISON OF SHOP AND CLASS HOURS SPENT/SEMESTER ON SELECTED ASPECTS OF SHOP ENVIRONMENT

Shop Environment	Regional Distribution of Hours/Semester: 1-5 Hours								6-10 Hours								11+ Hours								Non-Response							
	West		Cent.		East.		South.		West		Cent.		East.		South.		West		Cent.		East.		South.		West		Cent.		East.		South.	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Color coding of shop	27	87.1	15	57.7	10	47.6	15	88.2			4	15.4	2	9.5			2	6.5									1	3.2	1	4.8		
Locating fire extinguishers	26	83.9	19	73.1	14	66.7	11	64.7			2	7.7	1	4.8			1	3.2			1	5.9							2	9.5	1	5.9
Locating safety equipment	29	93.5	21	80.8	15	71.4	10	58.8					2	9.5	1	5.9	1	3.2									2	7.7	1	4.8	2	11.8
Locating exits	21	67.7	18	69.2	8	38.1	10	58.8					1	4.8			1	3.2											2	9.5	2	11.8
Locating work stations	27	87.1	17	65.4	9	42.9	11	64.7	1	3.2	2	7.7	3	14.3																		
Locating stationary power equipmt.	27	87.1	19	73.1	12	57.1	12	70.6	1	3.2	2	7.7	2	9.5			1	3.2											2	9.5	4	23.5
Controlling fumes	4	12.9	20	76.9	10	47.6	12	70.6	1	3.2			3	14.3	1	5.9	1	3.2									2	7.7	2	9.5	4	23.5
Controlling noise pollution	4	12.9	16	61.5	10	47.6	11	64.7					1	4.8	1	5.9	1	3.2									2	7.7	1	4.8		
Using main power disconnect systems	3	9.7	16	61.5	6	28.6	11	64.7	1	3.2			2	9.5	1	5.9	1	3.2									2	7.7	2	9.5	1	5.9
Using safety signs	5	16.1	18	69.2	12	57.1	11	64.7					1	4.8			1	3.2			1	5.9					2	7.7	2	9.5	1	5.9
Using safety lanes	1	3.2	17	65.4	11	52.4	11	64.7					1	4.8			1	3.2			1	5.9					2	7.7	2	9.5	1	5.9
Organizing the shop	14	45.2	17	65.4	16	76.2	11	64.7	3	9.7	2	7.7	2	9.5			6	19.4	2	7.7	4	23.5					2	7.7	1	4.8	1	5.9
Storing combustibles	4	12.9	22	70.96	14	66.7	13	76.5	1	3.2							2	6.5			1	5.9	1	6.5			2	7.7	2	9.5	1	5.9
Storing project materials	7	22.6	20	76.9	14	66.7	13	76.5	4	12.9			2	9.5			2	6.5									2	7.7	1	4.8	1	5.9
Keeping house	10	32.3	19	73.1	11	52.4	10	58.8	6	19.4	1	3.8	4	19.0	4	23.5	5	16.1	2	7.7	1	5.9							3	14.3	1	5.9

Note: Following is the number of responses per region--Western, N=31; Central, N=26; Eastern N=21; Southern, N=17; Total = 95.

west reported spending one to five hours on locating safety equipment, followed next by 21 central region teacher trainers responding to spending the same amount of time.

In Table IV it is also revealed that the majority of time spent on all 15 selected aspects of shop environment fell within one to five hours. Only six respondents from the western region reported they spent from 6-10 hours of class and shop time on keeping house. In the 11+ hours category, five western respondents spent 11+ hours on keeping house, while another six respondents from the western region spent 11+ hours on the content area, organizing the shop. This represented 19.4% of the 31 respondents from the western region.

In teaching the selected aspects of locating work stations and locating stationary power equipment, the data found in Table IV revealed that the same number of respondents from the western region (27) reported spending one to five hours of class and shop per semester. The largest number of non-respondents for all the regions reporting were only four.

Table V was developed to compare the shop and class hours spent per semester on aspects of safety education. It was revealed that the amount of time spent on any one content area of safety education was from one to five hours. Only nine items out of the 13 topics found in Table V merited a response from the teacher trainers in the category of 11+ hours. However, from 6-10 hours of time spent per semester on aspects of safety education was reported by a fairly high percentage of the respondents in each region. Thirteen of the 17 southern region respondents representing 76.5% spent 6-10 hours on the area of using gas cutting and welding equipment, while only five

TABLE V

REGIONAL COMPARISON OF SHOP AND CLASS HOURS SPENT/SEMESTER ON SELECTED ASPECTS OF SAFETY EDUCATION

Safety Education for:	Regional Distribution of Hours/Semester																			
	1-5 Hours								6-10 Hours								11+ Hours								Non-Response							
	West.		Cent.		East.		South.		West.		Cent.		East.		South.		West.		Cent.		East.		South.		West.		Cent.		East.		South.	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Using stationary equipmt.	24	77.4	16	61.5	15	71.4	9	52.9	3	9.7			3	14.3	6	35.3	4	12.9	9	34.6	2	9.5	1	5.9					1	4.8	1	5.9
Using hand tools	22	70.9	14	53.8	13	61.9	9	52.9	3	9.7	3	9.7	4	19.0	6	35.3	6	19.4	5	19.2	3	14.3	1	5.9			2	7.7	1	4.8	1	5.9
Using portable power equipmt.	20	64.5	19	73.7	12	57.1	12	70.6	4	12.9	2	7.7	5	23.8	4	23.5	7	22.6	4	15.4	2	9.5							1	4.8		
Using chemicals & solvents	26	83.8	21	80.8	14	66.7	13	76.5	2	6.5			1	4.8			1	3.2					1	5.9					1	4.8	1	5.9
Using arc welding equipmt.	15	48.4	11	42.3	10	47.6	8	47.1	5	16.1	6	23.1	5	23.8	8	47.1	10	32.3	5	19.2	5	23.8	1	5.9	1	3.2	2	7.7	1	4.8		
Using gas cutting & welding equipmt.	15	48.4	10	38.5	10	47.6	4	23.5	5	16.1	7	26.9	5	23.8	13	76.5	10	32.3	5	19.2	5	23.8			1	3.2	2	7.7	1	4.8		
Keeping student safety records	24	77.4	15	57.7	9	42.9	12	70.6	1	3.2	2	7.7	2	9.5					1	3.8									2	9.5	1	5.9
Maintaining tools & equipmt.	22	70.9	15	57.7	14	66.7	9	52.9	8	25.8	3	11.5	5	23.8	5	29.4	1	3.2	4	15.4			1	5.9					2	9.5	1	5.9
Recognizing shop emergencies	27	87.1	22	84.6	12	57.1	14	82.4	1	3.2			1	4.8			2	6.5					1	5.9					2	9.5	1	5.9
Establishing emergency procedures	28	80.7	19	73.7	11	52.4	15	88.2	1	3.2			1	4.8			1	3.2					1	5.9			2	7.7	1	4.8		
Developing & locating emergency aid stations	27	87.1	16	61.5	11	52.4	11	64.7	1	3.2													1	5.9			2	7.7	2	9.5	1	5.9
Presenting Red Cross, CPR, & First Aid training	16	51.6	8	30.8	5	23.8	7	41.2	1	3.2			2	7.7									1	5.9			1	3.8			1	5.9
Maintaining student medical data	14	45.2	10	38.5	6	28.6	5	29.4	1	3.2																	2	7.7	2	9.5	2	11.8

Note: Following is the number of responses per region--Western, N=31; Central, N=26; Eastern, N=21; Southern N=17; Total = 95.

eastern respondents or 23.8% indicated spending the same amount of class and shop time. The information in Table V further reveals that in the one to five hours time category, for nine of the 13 content areas the western region had the highest number and percentage reported. These areas were using stationary equipment, using hand tools, using chemicals and solvents, using gas cutting and welding equipment, keeping student safety records, maintaining tools and equipment, establishing emergency procedures, and presenting Red Cross, CPR, and First Aid training. Table V also indicates that only one or two of the teacher trainers from each region failed to respond to the questionnaire when it asked for shop and class time spent per area.

Inspection of data in Table VI gives the reader information on class and shop hours spent on aspects of enforcement - accident prevention on a regional basis. The distribution of responses in Table VI reveals that the eight content areas of enforcement - accident prevention are primarily covered within one to five hours time. In the area of using safety tests, 30 of the 31 teachers from the western region spent one to five hours on this subject area, while only 8 of 21 eastern region respondents spent 1-5 hours of shop and class time on safety tests.

Table VI also reveals that in every content area, either the western or southern region had the highest number of respondents and percentage. Twenty-seven teachers reported covering safety inspections in shop and class in five hours time or less. In the same time period, 20 teachers taught supervising students, for a 64.5% response, 26 teachers reported covering safety rules, for a 83.8 percentile. These areas show the western region having the highest number and

TABLE VI

REGIONAL COMPARISON OF SHOP AND CLASS HOURS SPENT/SEMESTER ON SELECTED ASPECTS OF ENFORCEMENT - ACCIDENT PREVENTION

Enforcement - Accident Prevention	Regional Distribution of Hours/Semester: 1-5 Hours								6-10 Hours								11+ Hours								Non-Response							
	West.		Cent.		East.		South.		West.		Cent.		East.		South.		West.		Cent.		East.		South.		West.		Cent.		East.		South.	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Using safety tests	30	96.8	20	76.9	8	38.1	14	82.4					2	9.5					2	7.7									1	4.8	1	5.9
Using safety inspections	27	87.1	20	76.9	13	61.9	13	76.5	1	3.2									4	15.4									2	9.5	4	23.5
Disciplining students in the shop	24	77.4	16	61.6	13	61.9	14	82.4	2	6.5			1	4.8	1	5.9	4	12.9	4	15.4	1	4.8	1	5.9			1	3.8	2	9.5	1	5.9
Supervising students	20	64.5	11	42.3	10	47.6	7	41.2	2	6.5	8	30.8	4	19.0	4	23.5	8	25.8	6	23.1	5	23.8	5	29.4			1	3.8	1	4.8	1	5.9
Developing general safety rules	26	83.8	16	61.6	14	66.7	12	70.6	1	3.2	3	11.5	2	9.5	4	23.5	3	9.7	3	11.5					1	3.2	2	7.7	2	9.5	1	5.9
Developing specific safety rules for tools & equipmt.	26	83.8	19	73.1	14	66.7	16	94.1	1	3.2	6	23.1	2	9.5			4	12.9			1	4.8							1	4.8	1	5.9
Protecting the eyes	24	77.4	13	50.0	15	71.4	14	82.4	2	6.5	3	11.5	1	4.8	1	5.9	4	12.9	4	15.4	2	9.5	2	11.8					1	4.8		
Providing protective equipmt.	25	80.6	18	69.3	15	71.4	14	82.4	3	9.7	3	11.5	1	4.8			3	9.7	1	3.8	3	14.3	2	11.8			2	7.7				

Note: Following in the number of responses per region--Western, N=31; Central, N=26; Eastern, N=21; Southern, N=17; total = 95.

percentage of teachers spending one to five hours of time in instruction. The southern region had the highest percentage and number that reported spending one to five hours of time in the content areas disciplining the students (82.4%), developing specific safety rules (94.1%), protecting the eyes (82.4%), and providing protective equipment (82.4%). Eight of the 26 central region educators representing 30.8% of the respondents did report spending 6-10 hours of shop and class time on the content area of supervising the students. Eight or 25.8% of the western region respondents spent 11+ hours on the subject area of supervising students.

Table VI reveals that the southern region had four teachers who did not respond to the part of the questionnaire dealing with amount of time spent on teaching using safety inspections. This represents 23.5% of the total number of respondents from the southern region.

Shop and Class Hours Spent Teaching

Comparison of Content Areas Not Being Taught

Table VII was developed to show the distribution by region of areas not being taught in selected aspects of shop environment. On a national level, Table VII reveals that 32 respondents, or 33.6% were not teaching using main power disconnect systems as part of their instruction. Another 27 teachers, or 28.4% of the teachers, taught no aspects of controlling noise pollution. Table VII also reveals that in the area of using safety lanes, 24 respondents, or 25.2%, did not teach it in their safety instruction program. The areas that had the fewest number of responses were keeping house, with eight responses

TABLE VII

REGIONAL COMPARISON OF CONTENT AREAS NOT BEING TAUGHT IN SELECTED ASPECTS OF SHOP ENVIRONMENT

Shop Environment	Distribution of Areas Not Being Taught by Region								National	
	Western Region (N=31)		Central Region (N=26)		Eastern Region (N=21)		Southern Region (N=17)		(N=95)	
	N	%	N	%	N	%	N	%	N	%
Color coding of shop	2	6.5	6	23.1	8	38.1	2	11.8	18	18.9
Locating fire extinguishers	4	12.9	5	19.2	4	19.0	4	23.5	17	17.8
Locating safety equipmt.	2	6.5	3	11.5	3	14.3	4	23.5	12	12.6
Locating exits	9	29.0	8	30.8	10	47.6	5	29.4	22	23.1
Locating work stations	2	6.5	5	19.2	7	33.3	2	11.8	16	16.8
Locating stationary power equipmt.	2	6.5	5	19.2	5	23.8	1	5.9	13	13.6
Controlling fumes			4	12.9	7	33.3	4	23.5	15	15.7
Controlling noise pollution	7	22.6	8	30.8	8	38.1	4	23.5	27	28.4
Using main power disconnect systems	7	22.6	10	38.5	11	52.4	4	23.5	32	33.6
Using safety signs	1	3.2	6	23.1	6	28.6	4	23.5	17	17.8
Using safety lanes	6	19.4	7	26.9	7	33.3	4	23.5	24	25.2
Organizing the shop	1	3.2	3	11.5	2	9.5	1	5.9	7	7.3
Storing combustibles			2	7.7	5	23.8	2	11.8	9	9.4
Storing project materials	1	3.2	4	15.4	4	19.0	3	17.7	12	12.6
Keeping house	1	3.2	3	11.5	3	14.3	1	5.9	8	8.4

and storing combustibles with nine. It is revealed in Table VII that only the western region had an area reported to be taught by all 31 respondents. This area was storing combustibles. Twenty-nine percent, or nine, of the western region respondents did not teach locating exits. Table VII further reveals that 10, or 38.5%, of the central region teachers did not teach the area of using main power disconnect systems and that 26.9% of the teachers did not teach using safety lanes. Table VII data reveal that almost half, or 47.6%, of the eastern region teachers devoted no time to the area of locating exits. The highest number that reported not teaching an area of shop environment was from the southern region. Five, or 27.4%, reported spending no time on the area of locating exits.

Inspection of Table VIII allows for a regional comparison of content areas not being taught in selected aspects of safety education. Table VIII reveals that, on a national level, 53 teachers, or 55.7%, reported spending no time teaching Red Cross, CPR, and First Aid training, nor maintaining student medical data. Data further reveal that 27.3%, or 26, teachers spent no time teaching in the area of keeping student safety records. Twenty-three teacher educators, or 24.2% of the respondents, did not teach developing and locating emergency aid stations. A regional comparison in Table VIII also reveals that except for the areas of presenting Red Cross, CPR, and First Aid training and maintaining student medical data, most teachers taught the other 11 content areas listed. It is interesting to note that Table VIII reveals that not one teacher trainer from the western, eastern, or southern regions reported not teaching the content areas using stationary equipment, using hand tools, using arc welding equipment, and using gas welding equipment.

TABLE VIII

REGIONAL COMPARISON OF CONTENT AREAS NOT BEING TAUGHT IN SELECTED ASPECTS OF SAFETY EDUCATION

Safety Education for:	Distribution of Areas Not Being Taught by Region								National	
	Western Region (N=31)		Central Region (N=26)		Eastern Region (N=21)		Southern Region (N=17)		(N=95)	
	N	%	N	%	N	%	N	%	N	%
Using stationary equipmt.			1	3.8					1	1.0
Using hand tools			2	7.7					2	2.1
Using portable power equipmt.			1	3.8	1	4.8	1	5.4	3	3.1
Using chemicals & solvents	2	6.5	5	19.2	5	23.8	2	11.8	14	14.7
Using arc welding equipmt.			2	7.7					2	2.1
Using gas cutting & welding equipmt.			2	7.7					2	2.1
Keeping student safety records	6	19.4	8	30.8	8	38.1	4	23.5	26	27.3
Maintaining tools & equipmt.			4	15.4			1	5.9	5	5.2
Recognizing shop emergencies	1	3.2	4	15.4	6	28.6	1	5.9	12	12.6
Establishing emergency procedures	1	3.2	5	19.2	7	33.3	1	5.9	14	14.7
Developing & locating emergency aid stations	3	9.7	8	30.8	8	38.1	4	23.5	23	24.2
Presenting Red Cross, CPR, & First Aid training	14	45.2	17	65.4	14	66.7	8	47.1	53	55.7
Maintaining student medical records	16	51.6	14	53.8	13	61.9	10	58.8	53	55.7

Table IX allows for a regional comparison of selected aspects of enforcement - accident prevention not being taught. Table IX reveals that, nationally, 17 respondents, or only 17.8% of the respondents, did not teach using safety tests as part of their safety instruction. It is also revealed in Table IX that only 3.1%, or three teachers, indicated they did not teach the area of providing protective equipment. Data in Table IX further reveals that of the eight content areas listed for enforcement - accident prevention, the southern region had only two teachers who reported not teaching using safety tests. The other seven areas of using safety instructions, disciplining students in the shop, supervising students, developing general safety rules, developing specific safety rules for tools and equipment, protecting the eyes, and providing protective equipment were taught by the 17 respondents from the southern region. Table IX reveals also that the western region's 31 respondents all taught developing general safety rules, developing specific safety rules for tools and equipment, and providing protective equipment as part of their program of safety instruction.

Regional Comparison of Amount of Training in
Selected Aspects of Safety Instruction

In Table X, data indicate that on the national level, agricultural mechanics teacher educators have received "some" amount of training in selected aspects of shop environment. Table X also reveals that only in the content areas of organizing the shop (2.89), storing combustibles (2.55), and in keeping house (2.68) have teacher trainers received "much" training. The lowest mean response nationally

TABLE IX

REGIONAL COMPARISON OF CONTENT AREAS NOT BEING TAUGHT IN SELECTED ASPECTS OF ENFORCEMENT - ACCIDENT PREVENTION

Enforcement - Accident Prevention	Western Region (N=31) N	%	Central Region (N=26) N	%	Eastern Region (N=21) N	%	Southern Region (N=17) N	%	National (N=95) N	%
Using safety tests	1	3.2	4	15.4	10	47.6	2	11.8	17	17.8
Using safety inspections	3	9.7	2	7.7	6	28.6			11	11.5
Disciplining students in the shop	1	3.2	5	19.2	4	19.0			10	10.5
Supervising students	1	3.2			3	14.3			4	4.2
Developing general safety rules			2	7.7	3	14.3			5	5.2
Developing specific safety rules for tools & equipmt.			1	3.8	3	14.3			4	4.2
Protecting the eyes	1	3.2	1	3.8	2	9.5			4	4.2
Providing protective equipmt.			2	7.7	1	4.8			3	3.1

TABLE X

REGIONAL COMPARISON OF AMOUNT OF TRAINING IN SELECTED ASPECTS OF SHOP ENVIRONMENT

Shop Environment	Mean Responses as to Training by Region: Western Region (N=31)	Central Region (N=26)	Eastern Region (N=21)	Southern Region (N=17)	National (N=95)
Color coding of shop	2.68 (Much)	2.33 (Some)	2.06 (Some)	2.37 (Some)	2.36 (Some)
Locating fire extinguishers	2.39 (Some)	2.28 (Some)	2.08 (Some)	2.28 (Some)	2.25 (Some)
Locating safety equipmt.	2.34 (Some)	2.24 (Some)	1.87 (Some)	1.81 (Some)	2.06 (Some)
Locating exits	2.44 (Some)	1.80 (Some)	2.32 (Some)	2.02 (Some)	2.14 (Some)
Locating work stations	2.62 (Much)	2.45 (Some)	2.27 (Some)	2.16 (Some)	2.37 (Some)
Locating stationary power equipmt.	2.52 (Much)	2.33 (Some)	2.37 (Some)	2.08 (Some)	2.32 (Some)
Controlling fumes	2.31 (Some)	2.51 (Much)	2.03 (Some)	2.37 (Some)	2.30 (Some)
Controlling noise pollution	2.18 (Some)	1.99 (Some)	1.82 (Some)	1.90 (Some)	1.97 (Some)
Using main power disconnect systems	2.31 (Some)	1.91 (Some)	1.96 (Some)	2.43 (Some)	2.15 (Some)
Using safety signs	2.40 (Some)	2.14 (Some)	2.03 (Some)	1.72 (Some)	2.07 (Some)
Using safety lanes	2.37 (Some)	2.06 (Some)	2.03 (Some)	2.19 (Some)	2.16 (Some)
Organizing the shop	2.91 (Much)	3.07 (Much)	2.75 (Much)	2.84 (Much)	2.89 (Much)
Storing combustibles	2.60 (Much)	2.78 (Much)	2.53 (Much)	2.31 (Some)	2.55 (Much)
Storing project materials	2.58 (Much)	2.16 (Much)	2.15 (Some)	2.52 (Much)	2.35 (Some)
Keeping house	2.91 (Much)	2.68 (Much)	2.35 (Some)	2.78 (Much)	2.68 (Much)

was found for the aspect of shop environment involving controlling noise pollution (1.97), while the highest mean response was 2.89 for the area of organizing the shop. This placed it within the training category of "much." All four regions had mean responses categorized as "some" for the content areas color coding the shop, locating fire extinguishers, locating safety equipment, locating exits, controlling noise pollution, using main power disconnect, using safety signs, and using safety lanes. Table X data further indicates that for the first six content areas, the western region had the highest mean response. The central region had the highest mean response (2.51) for the item controlling fumes, which placed it within the category of "much" training. The lowest mean level within the four regions was 1.81, which was calculated for the southern region for the content area of locating safety equipment. Table X reveals that the highest mean response recorded was 2.91 for the western region's mean response to the content area of keeping house. It is interesting to note that all four regions had a mean response of "much" for the amount of training received in organizing the shop.

Table XI was developed to present data comparing the amount of training in selected aspects of safety education by region. On a national level, teacher trainers received "much" training in the areas of using stationary equipment (2.91), using hand tools (3.08), using portable power tools (3.00), using arc welding equipment (3.28), using gas cutting and welding equipment (3.20), and maintaining tools and equipment (2.92). Content areas, whose national mean responses placed them within the training category of "some," included using chemicals and solvents (2.44), keeping student safety records (2.22), recognizing

TABLE XI

REGIONAL COMPARISON OF AMOUNT OF TRAINING IN SELECTED ASPECTS OF SAFETY EDUCATION

Safety Education for:	Mean Responses to Training by Region: Western Region (N=21)	Central Region (N=26)	Eastern Region (N=21)	Southern Region (N=17)	National (N=95)
Using stationary equipmt.	3.20 (Much)	2.82 (Much)	2.92 (Much)	2.72 (Much)	2.91 (Much)
Using hand tools	3.26 (Much)	3.22 (Much)	3.04 (Much)	2.81 (Much)	3.08 (Much)
Using protable power equipmt.	3.36 (Much)	2.85 (Much)	2.98 (Much)	2.81 (Much)	3.00 (Much)
Using chemicals & solvents	2.68 (Much)	2.64 (Much)	2.25 (Some)	2.22 (Some)	2.44 (Some)
Using arc welding equipmt.	3.43 (Much)	3.32 (Much)	3.18 (Much)	3.22 (Much)	3.28 (Much)
Using gass cutting & welding equipmt.	3.52 (Very Much)	2.97 (Much)	3.06 (Much)	3.25 (Much)	3.20 (Much)
Keeping student safety records	2.39 (Some)	2.02 (Some)	1.77 (Some)	2.72 (Much)	2.22 (Some)
Maintaining tools & equipmt.	3.12 (Much)	2.85 (Much)	2.87 (Much)	2.84 (Much)	2.92 (Much)
Recognizing shop emergencies	2.81 (Much)	2.26 (Some)	2.32 (Some)	1.78 (Some)	2.29 (Some)
Establishing emergency procedures	2.44 (Some)	2.03 (Some)	2.03 (Some)	2.06 (Some)	2.16 (Some)

TABLE XI (Continued)

Safety Education for:	Mean Responses as to Training by Region: Western Region (N=31)	Central Region (N=26)	Eastern Region (N=21)	Southern Region (N=17)	National (N=95)
Developing & locating emergency aid stations	2.42 (Some)	2.10 (Some)	1.99 (Some)	1.55 (Some)	2.01 (Some)
Presenting Red Cross, CPR & First Aid training	2.28 (Some)	1.64 (Some)	1.68 (Some)	1.84 (Some)	1.86 (Some)
Maintaining student medical data	1.65 (Some)	1.49 (Little)	.96 (Little)	1.40 (Little)	1.37 (Little)

shop emergencies (2.29), establishing emergency procedures (2.16), developing and locating emergency aid stations (2.01), and presenting Red Cross, CPR, and First Aid training (1.86). Table XI reveals that only the content area of maintaining student medical data fell within the training category of "little" with a mean response of 1.37. Only the western region had a mean response that placed a content area within the training category of "very much." This was using gas cutting and welding equipment which had a mean response of 3.52. Table XI reveals "little" training for the content area of maintaining medical records in three of the four regions. Table XI also reveals the eastern region's mean response was only .96. The highest regional response for this content area was only 1.65 (western region), which was categorized as "some."

Table XII reveals the regional comparison of amount of training in selected aspects of enforcement - accident prevention by mean response. It is interesting to note that Table XII reveals that only the western region had mean responses that all fell within the training category of "much," with the lowest mean level being 2.76. This was for the item of developing general safety rules. The lowest mean response reported in Table XII was from the eastern region, which had a mean response of only 1.76 ("some") for the content area of using safety tests. This deviates quite a bit from the western, central, and northern regions' mean responses of 2.84, 2.53, and 2.37, respectively. Data in Table XII also reveal that nationally, all training in enforcement - accident prevention fell within the response categories of "much" or "some." The first two content areas of using safety tests and using safety inspections fell within the training category

TABLE XII

REGIONAL COMPARISON OF AMOUNT OF TRAINING IN SELECTED ASPECTS OF ENFORCEMENT - ACCIDENT PREVENTION

Enforcement - Accident Prevention	Mean Responses as to Training by Region				
	Western Region (N=31)	Central Region (N=26)	Eastern Region (N=21)	Southern Region (N=17)	National (N=95)
Using safety tests	2.84 (Much)	2.53 (Much)	1.75 (Some)	2.37 (Some)	2.37 (Some)
Using safety inspections	2.81 (Much)	2.47 (Some)	1.99 (Some)	2.46 (Some)	2.43 (Some)
Disciplining students the shop	3.15 (Much)	2.58 (Much)	2.15 (Some)	2.96 (Much)	2.71 (Much)
Supervising students	3.25 (Much)	1.93 (Some)	2.51 (Much)	2.96 (Much)	2.66 (Much)
Developing general safety rules	2.76 (Much)	2.47 (Some)	2.44 (Some)	2.61 (Much)	2.57 (Much)
Developing specific safety rules for tools & equipmt.	3.04 (Much)	2.62 (Much)	2.63 (Much)	2.66 (Much)	2.73 (Much)
Protecting the eyes	3.17 (Much)	2.80 (Much)	2.32 (Some)	2.02 (Some)	2.57 (Much)
Providing protective equpmt.	3.13 (Much)	2.58 (Much)	2.42 (Some)	2.64 (Much)	2.69 (Much)

of "some" with mean responses of 2.37 and 2.43. Table XII indicates that the remaining six content areas fell within the category "much" in regards to training received. Areas reported as being trained "much" in were disciplining students in the shop, supervising students, developing general safety rules, developing specific safety rules, protecting the eyes, and providing protective equipment. The content area revealed in Table XII to have received the highest mean response nationally was developing specific safety rules, with a response of 2.73. The item of disciplining students had a similar mean responses of 2.71.

Responses as to Where Teacher Trainers Received Their Training

The data found in Table XIII reveals the number and percentage responding as the where their training was secured in the aspects of shop environment. Respondents were instructed to check each area of training that applied for each content area of shop environment. Table XIII reveals that, except for two of the 15 selected aspects of shop environment, more respondents reported training and preparation on an individual basis than by any other means. Table XI further reveals that 59 respondents, or 62.1%, of them indicated individual training and preparation as to where trained in storing project materials. However 63 teacher trainers, or 66.3%, reported receiving training in this area from university or college work. Data from Table XII reveals that 62, or 65.2%, of the respondents checked both individual preparation and college or university work as to where they were trained in organizing the shop. The training categories of individual preparation or study, college or university preparation, and in-service workshops

TABLE XIII

OVERALL RESPONSE RELATED TO TRAINING SECURED IN SELECTED ASPECTS OF SHOP ENVIRONMENT

Shop Environment	Distribution of Responses as to Where Trained (N=95)															
	In-Service Workshop		Factory or Ind. Schools		College or Univ. Prep.		Prof. or Assoc. Meetings		Post Emp.		Ind. Preparation or Study		Other		Non-Response	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Color coding of shop	37	38.9	12	12.6	54	56.81	32	33.6	15	15.7	67	70.5	6	6.3	6	6.3
Locating fire extinguishers	32	33.6	8	8.4	48	50.5	16	16.8	22	23.1	62	65.2	7	7.3	6	6.3
Locating safety equipmt.	28	29.4	9	9.4	53	55.7	18	18.9	20	21.0	64	67.3	5	5.2	7	7.3
Locating exits	22	23.1	9	9.4	49	51.5	15	15.7	17	17.8	55	57.8	7	7.3	8	8.4
Locating work stations	29	30.5	10	10.5	62	65.2	19	20.0	18	18.9	66	69.4	4	4.2	10	10.5
Locating stationary power equipmt.	26	27.3	8	8.4	61	64.2	19	20.0	21	22.1	67	70.5	4	4.2	1	1.1
Controlling fumes	30	31.5	7	7.3	51	53.6	22	23.1	15	15.7	62	65.2	3	3.1	8	8.4
Controlling noise pollution	28	29.4	7	7.3	53	55.7	13	13.6	11	11.5	77	81.0	4	4.2	4	4.2
Using main power disconnect systems	25	26.3	7	7.3	53	55.7	16	16.8	17	17.8	55	57.8	7	7.3	6	6.3
Using safety signs	27	28.4	5	5.2	49	51.5	21	22.1	79	20.0	62	65.2	8	8.4	6	6.3
Using safety lanes	28	29.4	8	8.4	54	56.8	21	22.1	17	17.8	61	64.2	8	8.4	5	5.2
Organizing the shop	32	33.6	9	9.4	62	65.2	22	23.1	20	21.0	62	65.2	7	7.3	6	6.3
Storing combustibles	33	34.7	8	8.4	52	54.7	23	24.2	26	27.3	63	66.3	4	4.2	4	4.2
Storing project materials	28	29.4	8	8.4	63	66.3	18	18.9	20	21.0	59	62.1	5	5.2	6	6.3
Keeping house	28	29.4	10	10.5	56	58.9	20	21.0	26	27.3	62	65.2	11	11.5	5	5.2

were the most often cited means of training in aspects of shop environment. Data from the table indicates that for the content areas of storing combustibles and keeping house, 26 or 27.3% of the respondents reported receiving training in these areas from past employment experiences. It is interesting to note that data in Table XII reveal that most of the 95 respondents reported receiving training by one or more of the seven categories of training listed. However, 10, or 10.5%, of the total respondents did not respond at all in the area of locating work stations.

Table XIV was developed to give the reader data on the distribution of responses as to where training was received in selected aspects of safety education. For the first three content areas of using stationary equipment, using hand tools, and using portable power tools, Table XIV reveals that a high percentage of respondents indicated being trained by college or university preparation. These were 77, 78, and 75 respondents, or 81%, 82.1%, and 78.9%, of the teachers, respectively. The content areas of using chemicals and solvents, recognizing shop emergencies, establishing emergency procedures, presenting Red Cross and CPR training, and maintaining student medical data are shown in Table XIV to have more respondents indicate means of individual preparation and study as to where trained. Data reveal that 60, or 63.1%, of teacher trainers received training in chemicals and solvents through individual training as in recognizing shop emergencies. Fifty-six, or 58.9%, reported individual training in establishing emergency procedures. Table XIV further reveals that 42 teachers were prepared through individual study in Red Cross and CPR, while 40, or 42.1%, reported

TABLE XIV

OVERALL RESPONSE RELATED TO TRAINING SECURED IN SELECTED ASPECTS OF SAFETY EDUCATION

Safety Education for:	Distribution of Responses as to Where Trained (N=95)																	
	In-Service Workshop		Factory or Ind. Schools		College or Univ. Prep.		Prof. or Assoc. Meetings		Post Emp.		Ind. Preparation or Study		Other		Non-Response	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Using stationary equipmt.	34	35.7	18	18.9	77	81.0	18	18.9	29	30.5	65	68.4	9	9.4	4	4.2
Using hand tools	36	37.8	17	17.8	78	82.1	17	17.8	32	33.6	65	68.4	8	8.4	4	4.2
Using portable power equipmt.	34	35.7	16	16.8	75	78.9	17	17.8	32	33.6	66	69.4	7	7.3	4	4.2
Using chemicals & solvents	31	32.6	13	13.6	59	62.1	17	17.8	22	23.1	60	63.1	9	9.4	6	6.3
Using arc welding equipmt.	38	40.0	18	18.9	78	82.1	23	24.2	27	28.4	63	66.3	11	11.5	5	5.2
Using gas cutting & welding equipmt.	41	43.1	17	17.8	78	82.1	25	26.3	27	28.4	65	68.4	10	10.5	4	4.2
Keeping student safety records	29	30.5	10	10.5	60	63.1	14	14.7	17	17.8	52	54.7	8	8.4	6	6.3
Maintaining tools & equipmt.	37	38.9	14	14.7	64	67.3	15	15.7	25	26.3	54	56.8	9	9.4	3	3.1
Recognizing shop emergencies	29	30.5	14	14.7	56	58.9	25	26.3	25	26.3	60	63.1	11	11.5	5	5.2
Establishing emergency procedures	29	30.5	12	12.6	50	52.6	20	21.0	22	23.1	56	58.9	12	12.6	6	6.3
Developing & locating emergency aid stations	22	23.1	10	10.5	65	68.4	12	12.6	18	18.9	51	53.6	15	15.7	7	7.3
Presenting Red Cross, CPR, & First Aid training	25	26.3	11	11.5	32	33.6	12	12.6	15	15.7	42	44.2	14	14.7	2	2.1
Maintaining student medical data	18	18.9	7	7.3	33	34.7	8	8.4	11	11.5	40	42.1	12	12.6	17	17.8

individual training in maintaining medical data. The highest number of respondents shown to be trained by in-service workshops was 37 teachers, or 38.9%, of the respondents who were trained in maintaining tools and equipment. Data reveal that 15 teacher trainers reported being trained by other means for the content area developing and locating emergency aid stations. Seventeen, or 17.8%, did not respond as to where trained in maintaining student medical data.

Table XV reveals the distribution of responses related to training secured in aspects of enforcement - accident prevention. Data in Table XV reveal that for the seven training categories included in the table, college or university preparation, individual preparation or study, and in-service workshops were cited most frequently as to where trained. The table further reveals that for every content area but one, the teachers indicated college or university training most frequently. Only using safety inspections was reported more often as requiring individual preparation or study as a means of training rather than college or university preparation. Fifty-seven, or 60%, of the respondents indicated individual preparation or study, while only 49, or 51.5%, reported training through college or university preparation. It is revealed in Table XV that a fairly constant number of teacher trainers reported in-service workshops as to where their training was received. The number of respondents varies from 33 responding for the content area of using safety tests, to 27, or 28.4%, responding as to receiving in-service training in the content area of disciplining students in the shop. The table shows that very few teacher trainers reported receiving training in enforcement - accident prevention aspects through factory or industry schools. The highest

TABLE XV

OVERALL RESPONSE RELATED TO TRAINING SECURED IN SELECTED ASPECTS OF ENFORCEMENT - ACCIDENT PREVENTION

Enforcement - Accident Prevention	Distribution of Responses as to Where Trained (N=95)																	
	In-Service Workshop		Factory or Ind. Schools		College or Univ. Prep.		Prof. or Assoc. Meetings		Post Emp.		Ind. Preparation or Study		Other		Non-Response	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Using safety tests	33	34.7	8	8.4	68	71.5	18	18.9	16	16.8	45	47.3	9	9.4	8	8.4
Using safety inspections	29	30.5	10	10.5	49	51.5	15	15.7	20	21.0	57	60.0	10	10.5	9	9.4
Disciplining students in the shop	27	28.4	10	8.4	71	74.7	12	12.6	19	20.0	47	49.4	13	13.6	6	6.3
Supervising students	33	34.7	11	11.5	71	74.7	16	16.8	27	28.4	57	60.0	10	10.5	6	6.3
Developing general safety rules	33	34.7	13	13.6	66	69.4	17	17.8	18	18.9	57	60.0	8	8.4	7	7.3
Developing specific safety rules for tools & equipmt.	31	32.6	15	15.7	72	75.7	15	15.7	12	12.6	49	51.5	8	8.4	8	8.4
Protecting the eyes	33	34.7	16	16.8	66	69.4	23	24.2	26	27.3	59	62.1	9	9.4	6	6.3
Providing protective equipmt.	33	34.7	14	14.7	52	54.7	17	17.8	24	25.2	44	46.3	8	8.4	6	6.3

response for that training category was 16, or 16.8%, of the teachers reported being trained through factory-industry schools in the area of protecting the eyes. The highest number of non-respect, as revealed in the table, concerned the area of using safety inspections. Nine teachers, or 9.4%, of the 95 respondents did not report any means of training in this content area.

Comparison of the Preparation of Agricultural Education Students in Selected Aspects of Shop Environment Safety Education, and Enforcement - Accident Prevention

The information presented in Table XVI gives the number responding and percentage by region for the level of safety preparation of agricultural education students in selected aspects of shop environment. Table XVI reveals that for the category of "very well prepared," all four regions had a low number of respondents. The highest number of respondents that perceived their students to be "very well prepared" in any area was from the western region. Only eight teacher trainers, or 25.8%, of the western region respondents felt their students were "very well prepared" in the content area of organizing the shop. Only three respondents out of 21 from the eastern region felt their students were "very well prepared" in the areas of locating work stations and keeping house. Data further reveal that only two southern region teacher educators felt their students were "very well prepared" in the areas of locating power equipment, using safety lanes, and in keeping house. In the "adequately prepared" category found in Table XVI, over 50% of the 31 respondents from the western region felt their students

TABLE XVI

REGIONAL COMPARISON OF ADEQUACY OF AGRICULTURAL EDUCATION STUDENTS IN SELECTED ASPECTS OF SHOP ENVIRONMENT

Shop Environment	Level of Safety Preparation: Very Well Prepared								Adequately Prepared								Adequately Prepared for 1st Year Teacher								Non-Response							
	West		Cent.		East		South.		West		Cent.		East		South.		West		Cent.		East		South.		West		Cent.		East		South.	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Color coding of shop	4	12.9	5	19.2					18	58.1	8	30.8	6	28.6	6	35.3	9	29.0	12	46.2	11	52.4	11	64.7			1	3.8	4	19.0		
Locating fire extinguishers	2	6.5	4	15.4	2	9.5	1	5.9	20	64.5	11	42.3	9	42.9	6	35.3	9	29.0	10	38.5	6	28.6	9	52.9			1	3.8	4	19.0	1	5.9
Locating safety equipment	2	6.5	4	15.4	1	4.8			20	64.5	9	34.6	8	38.1	9	52.9	8	25.8	12	46.2	8	38.1	6	35.3	1	3.2	1	3.8	4	19.0	2	11.8
Locating exits	3	9.7	2	7.7	1	4.8	1	5.9	17	54.8	11	42.3	10	57.6	5	29.4	11	35.5	12	46.2	7	33.3	9	52.9			1	3.8	3	14.3	2	11.8
Locating work stations	5	16.1	3	11.5	3	14.3	2	11.8	17	54.8	10	38.5	8	38.1	9	52.9	9	29.0	12	46.2	7	33.3	6	35.3			1	3.8	3	14.3		
Locating stationary power equipmt.	3	9.7	2	7.7			1	5.9	16	51.6	11	42.3	9	42.9	9	52.9	12	38.7	13	50.0	8	38.1	6	35.3					4	19.0	1	5.9
Controlling fumes	3	9.7	2	7.7					13	41.9	6	23.1	6	28.6	8	47.1	15	48.4	18	69.2	11	52.4	9	52.9					4	19.0		
Controlling noise pollution	1	3.2	2	7.7			1	5.9	9	29.0	3	11.5	6	28.6	6	35.3	19	61.3	19	73.1	12	57.1	10	58.8	2	6.5	2	7.7	3	14.3		
Using main power disconnect systems	2	6.5	1	3.8					16	51.6	8	30.8	8	38.1	6	35.3	13	41.9	13	50.0	10	57.6	10	58.8			4	15.4	3	14.3	1	5.9
Using safety signs	3	9.7	4	15.4					16	51.6	11	42.3	8	38.1	9	52.9	12	38.7	11	42.3	9	42.9	7	41.2					4	19.0	1	5.9
Using safety lanes	1	3.2	2	7.7	1	4.8	2	11.8	20	64.5	14	53.8	4	19.0	6	35.3	10	32.3	8	30.8	13	61.9	9	52.9			2	7.7	3	14.3		
Organizing the shop	8	25.8	4	15.4	1	4.8	4	23.5	12	38.7	13	50.0	9	42.9	7	41.2	10	32.3	8	30.8	7	33.3	6	35.3	1	3.2	1	3.8	4	19.0		
Storing combustibles	3	9.7	2	7.7	1	4.8			18	58.1	13	50.0	9	42.9	7	41.2	10	32.3	10	38.5	7	33.3	10	58.8			1	3.8	4	19.0		
Storing project materials	3	9.7	2	7.7	1	4.8			17	54.8	13	50.0	8	38.1	8	47.1	11	35.5	11	42.3	8	38.1	9	52.9					4	19.0		
Keeping house	6	19.4	4	15.4	3	14.3	2	11.8	21	67.7	14	53.8	8	38.1	9	52.9	4	12.9	8	30.8	6	28.6	6	35.3					4	19.0		

Note: Following is the number of responses per region--Western, N=31; Central, N=26; Eastern, N=21; Southern, N=17; Total = 95.

were "adequately prepared" in 12 of the 15 content areas listed. The exceptions were controlling fumes (41.9%), controlling noise pollution (29.9%), and organizing the shop (38.7%). Central region respondents felt their students were "adequately prepared" in the areas of keeping house and using safety lanes, with 14 teachers, or 53.8%, of the respondents checking these two areas. Table XVI also reveals that 47.6%, or 10, of the 21 eastern region teacher trainers perceived their students "adequately prepared" in locating exits. Fifty-two percent, or nine, of the 17 southern region respondents indicated their students were "adequately prepared" for the areas locating exits, locating work stations, controlling fumes, using safety signs, and keeping house.

It is interesting to note that in Table XVI, a high percentage of central region respondents indicated their students training was "adequate for a first year teacher but a need for additional training." This was for every content area listed. Nineteen, or 73.1%, of the central region respondents felt their students training was "adequate for a first year teacher but a need for additional training" in the area of controlling noise pollution. Most of the teacher trainers reported their students as being "adequately prepared" for the 15 content areas. However, four of the eastern region teacher trainers did not report their students' adequacy in several aspects of shop environment.

Table XVII was developed to compare the level of safety preparation of agricultural education students in selected aspects of safety education. It is revealed that for the category of "very well prepared," only the western and eastern region teacher trainers felt their students were "very well prepared" in every content area listed. Not

TABLE XVII

REGIONAL COMPARISON OF ADEQUACY OF AGRICULTURAL EDUCATION STUDENTS IN SELECTED ASPECTS OF SAFETY EDUCATION

Safety Education for:	Level of Safety Preparation: Very Well Prepared								Adequately Prepared				Adequately Prepared for 1st Year Teacher				Non-Response			
	West		Cent.		East		South.		West	Cent.	East	South.	West	Cent.	East	South.	West	Cent.	East	South.
	N	%	N	%	N	%	N	%	N %	N %	N %	N %	N %	N %	N %	N %	N %	N %	N %	N %
Using stationary equipmt.	10	32.3	3	11.5	4	19.0			13 41.9	12 46.2	9 42.9	7 41.2	8 25.8	10 38.5	6 28.6	10 58.8		2 3.8	2 9.5	
Using hand tools	11	35.5	4	15.4	2	9.5	1	5.9	13 41.9	14 53.8	10 57.6	7 41.2	7 22.6	8 30.8	6 28.6	9 52.9			3 14.3	
Using portable power equipmt.	11	35.5	2	7.7	2	9.5			11 35.5	11 42.3	9 42.9	7 41.2	8 25.8	13 29.0	8 38.1	10 58.8	1 3.2		2 9.5	
Using chemicals & solvents	4	12.9	2	7.7	1	4.8	1	5.9	10 32.3	6 23.1	7 33.3	4 23.5	17 54.8	17 65.4	10 47.6	12 70.6		1 3.8	3 14.3	
Using arc welding equipmt.	13	41.9	10	38.5	4	19.0			15 48.4	8 30.8	8 38.1	8 47.1	3 9.7	7 26.9	8 38.1	9 52.9		1 3.8	1 4.8	
Using gas cutting & welding equipmt.	13	41.9	8	30.8	4	19.0			15 48.4	9 34.6	8 38.1	8 47.1	3 9.7	9 34.6	8 38.1	9 52.9			1 4.8	
Keeping student safety records	4	12.9	1	3.8	1	4.8	1	5.9	13 41.9	12 46.2	4 19.0	6 35.3	14 45.2	12 46.2	13 61.9	10 58.8		1 3.8	3 14.3	
Maintaining tools & equipmt.	8	25.8	2	7.7	2	9.5			14 45.2	10 38.5	8 38.1	8 47.1	9 29.0	13 50.0	8 38.1	9 52.9		1 3.8	3 14.3	
Recognizing shop emergencies	5	16.1			1	4.8			14 45.2	10 38.5	8 38.1	5 29.4	12 38.7	16 61.5	10 57.6	9 52.9			2 9.5	3 17.7
Establishing emergency procedures	4	12.9			1	4.8			10 32.3	8 30.8	5 23.8	9 52.9	17 54.8	18 69.2	12 57.1	7 41.2			3 14.3	1 5.9
Developing & locating emergency aid stations	4	12.9			1	4.8			13 41.9	6 23.1	5 23.8	6 35.3	14 45.2	17 65.4	12 57.1	10 58.8		3 11.5	3 14.3	1 5.9
Presenting Red Cross, CP CPR, & First Aid training	4	12.9			1	4.8			5 16.1	4 15.4	5 23.8	5 29.4	19 61.3	19 73.1	12 57.1	9 52.9	3 9.7	3 11.5	3 14.3	3 17.7
Maintaining student medical data	4	12.9			1	4.8			4 12.9	6 23.1	5 23.8	3 17.7	18 58.1	20 76.9	10 57.6	10 58.8	5 16.1		5 23.8	4 23.5

Note: Following is the number of responses per region--Western, N=31; Central, N=26; Eastern N=21; Southern, N=17; Total = 95.

one teacher trainer from the central or southern region felt their students were "very well prepared" in recognizing shop emergencies, establishing emergency procedures, developing and locating emergency aid stations, presenting Red Cross, CPR, and First Aid training, and maintaining student medical data. Thirteen, or 41.9%, of the western region teacher trainers classified their students as being "very well prepared" in the areas of using arc welding equipment and using gas cutting and welding equipment. Table XVII also reveals that the 17 southern region respondents reported that none of their students were "very well prepared" for the same two content areas.

Table XVII also reveals that for the "adequately prepared" category, every content area but two had a high response. These two were: presenting Red Cross, CPR, and First Aid training, and maintaining student medical data. Fifty-four percent, or 17, of the western respondents and 70.6%, or 12, of the 17 southern region respondents felt their students' training "adequate for first year teacher but a need for additional training" in the area of using chemicals and solvents. Twenty respondents, or 76.9%, of the central region educators believed their students' training to be "adequate for a first year teacher but a need for additional training" in the area of maintaining student medical data. Most of the teacher trainers from each region reported their students' adequacy or level of safety preparation. The table reveals, however, that four southern region respondents did not respond to some parts of the questionnaire. This was also true of the eastern region respondents.

Table XVIII was developed to present data comparing the level of safety preparation by region for selected aspects of enforcement -

TABLE XVIII

REGIONAL COMPARISON OF ADEQUACY OF AGRICULTURAL EDUCATION STUDENTS IN SELECTED ASPECTS OF ENFORCEMENT - ACCIDENT PREVENTION

Enforcement - Accident Prevention	Level of Safety Preparation: Very Well Prepared								Adequately Prepared								Adequately Prepared for 1st Year Teacher								Non-Response							
	West		Cent.		East		South.		West		Cent.		East		South.		West		Cent.		East		South.		West		Cent.		East		South.	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Using safety tests	6	19.4	6	23.1	1	4.8	1	5.9	16	51.6	8	30.8	4	19.0	6	35.3	9	29.0	11	4.23	11	52.4	9	52.9			1	3.8	5	23.8	1	5.9
Using safety inspections	2	6.5	2	7.7	2	9.5	1	5.9	16	51.6	12	46.2	5	23.8	4	23.5	12	38.7	11	42.3	9	42.9	10	58.8	1	3.2	1	3.8	5	23.8	2	11.8
Disciplining students in the shop	4	12.9	1	3.8	2	9.5	1	5.9	17	54.8	10	38.5	5	23.8	9	52.9	10	32.3	13	52.0	9	42.9	6	35.3			2	7.7	5	23.8	1	5.9
Supervising students	8	25.8	2	7.7	2	9.5			15	48.4	12	46.2	8	38.1	8	47.1	8	25.8	11	42.3	6	28.6	9	52.9			1	3.8	5	23.8		
Developing general safety rules	6	19.4	2	7.7	2	9.5	1	5.9	16	51.6	14	53.8	8	38.1	10	58.8	8	25.8	10	38.5	6	28.6	5	29.4	1	3.2			5	23.8	1	5.9
Developing specific safety rules for tools and equipmt.	5	16.1	2	7.7	1	4.8	1	5.9	17	54.8	14	53.8	8	38.1	10	58.8	7	22.6	8	30.8	7	33.3	5	29.4	2	6.5	2	7.7	5	23.8	1	5.9
Protecting the eyes	10	32.3	7	26.9	4	19.0	2	11.8	16	51.6	12	46.2	6	28.6	9	52.9	5	16.1	6	23.1	6	28.6	6	35.3			1	3.8	5	23.8		
Providing protective equipmt.	6	19.4	5	19.2	2	9.5	3	17.7	16	51.6	12	46.2	8	38.1	9	52.9	9	29.0	8	30.8	6	28.6	4	23.5			1	3.8	5	23.8	1	5.9

Note: Following is the number of responses per region--Western, N=31; Central, N=26; Eastern, N=21; Southern, N=17; Total = 95.

accident prevention. Table XVIII reveals that 10, or 32.3% of the western region respondents felt their students were "very well prepared" in the area of protecting the eyes. Only two, or 11.8%, of the southern region respondents indicated their students to be "very well prepared" in the area of supervising students. Over 50% of the western region respondents felt their students were "adequately prepared" in each content area listed, with only one exception. Only 15, or 48.4%, of the western region teachers felt their students to be "adequately prepared" in supervising students. Only 19.0%, or 4 out of 21, eastern teacher trainers indicated their students to be "adequately prepared" in using safety tests. Eight, or 38.1%, of the eastern respondents reported their students to be "adequately prepared" in the content areas supervising students, developing general safety rules, developing specific safety rules for tools and equipment, and providing protective equipment. Table XVIII further reveals that five, or 23.8%, of the 21 eastern region educators did not respond to any listed aspects of enforcement - accident found in the questionnaire.

Academic Homes/Teaching Assignment of the Agricultural Mechanics Teacher Trainers

Table XIX shows the faculty status and teaching assignment of the respondents from each FFA region and also the national breakdown of specific academic appointment assignments. Table XIX reveals that 50%, or 13, of the 26 teacher trainers from the central region held 100% agricultural engineering faculty status, while only six respondents, or 19.4%, of the western region teacher trainers held the same status.

TABLE XIX

FACULTY STATUS AND TEACHING ASSIGNMENT OF AGRICULTURAL MECHANICS TEACHER TRAINERS BY REGION

Status/Assignment	Western Region (N=17) N	%	Central Region (N=26) N	%	Eastern Region (N=21) N	%	Southern Region (N=17) N	%	National (N=95) N	%
Academic Appointment										
100% Agr. Engineering	6	19.4	13	50.0	7	33.3	5	29.4	31	32.6
100% Agr. Education	12	38.7	4	15.4	3	14.3	10	58.8	29	30.5
Joint Appointment	8	25.8	6	23.0	5	23.8	2	11.8	21	22.1
Within Another Dept.	5	16.1	3	11.6	6	28.6	0	0	14	14.8
Total	31	100.0	26	100.0	21	100.0	17	100.0	95	100.0
Teaching Assignment										
100% Teaching Assignment in Agr. Mechanics										
Yes	17	54.8	16	61.6	6	28.6	2	11.8	41	43.2
No	14	45.2	10	38.4	15	71.4	15	88.2	54	56.8
Total	31	100.0	26	100.0	21	100.0	17	100.0	95	100.0

Only four respondents, or 15.4%, from the central region held the same status in agricultural education. Twenty-nine, or 30.5% of the 95 teacher trainers surveyed held 100% agricultural education faculty status. Table XIX further reveals that the western region had the highest percentage and number of respondents with joint appointments, while both the central and eastern region were very similar in number and percentage.

The lowest number of joint appointments were six and 23.0% and five and 23.8%, respectively. These were reported for the central and eastern regions. The southern region had no faculty with status within another department. Table XIX also shows that only 14 teacher trainers, or 14.8%, of the entire population surveyed held joint appointments.

One of the statements in the questionnaire asked whether or not the respondents had a 100% teaching assignment in agricultural mechanics. Table XIX reveals that 41, or 43.2%, of the respondents answered "yes," while 54, or 56.8%, indicated they did not have a 100% teaching assignment in agricultural mechanics. Sixty-one percent of the central region teachers had a full-time teaching assignment. Of the 54 respondents who reported they did not have a 100% teaching assignment, 15 were from the southern region. These 15 respondents represented 88.2% of the teachers from the southern region.

Other Data

Several of the 95 respondents included additional information and comments in the research questionnaire they returned to the researcher. It was discovered that 4 of the 21 agricultural mechanics teacher trainers from the eastern FFA region had no shop facilities

in which to teach safety instruction to their agricultural education students. Another teacher from the eastern region reported that only 5-10% of his shop students each semester are agricultural education majors, which were required to take only one course in agricultural engineering. One of the respondents stated that he had some difficulty filling out the questionnaire and in giving his input; he found himself "confusing instruction with safety instruction in answering the questions."

Two interesting comments were received from the southern FFA region teacher trainers. One respondent replied, "We do not provide safety instruction as such. We don't have time. We simply stress caution in the use of tools." Another educator reported that in his 25 years of teaching and working in shop, his program had only experienced one minor accident.

Several of the central FFA region educators expressed the need to have included a poor or inadequate category in the research questionnaire. They felt some of their agricultural education students were not adequately prepared in at least some of the content areas listed on the questionnaire.

The western FFA region teacher educators had comments related to use of media and time spent teaching. One respondent reported spending over 10 hours/semester of class and shop time with films. These films were on various aspects of safety education. Three teacher trainers reported spending class and shop time on areas of safety instruction, but they were of less than an hour in duration. One educator strongly replied, "Why waste class and shop time on the area of developing general safety rules? Rules have already been developed on every aspect of shop."

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Purpose

The major purpose of this study was to assess selected areas of agricultural mechanics safety instruction conducted at agricultural teacher education programs across the United States. Also presented in this chapter are conclusions and recommendations which are based on analysis of data collected and observations made by the author in the conduct of this study.

Specific Objectives

The following specific objectives were established to accomplish the major purpose of this study:

1. To determine the amount of importance currently placed on selected areas of safety instruction by agricultural teacher education programs.

2. To determine the amount of time spent on selected areas of safety instruction.

3. To determine the amount of training agricultural mechanics teacher trainers have had in selected areas of safety.

4. To determine where agricultural mechanics teacher educators received their training or preparation in selected content areas of safety instruction.

5. To determine the level of safety preparation of agricultural education students across the United States.

6. To determine the academic homes and teaching assignment of the agricultural mechanics teacher educators.

Procedures Used in the Study

Following a review of literature and research pertaining to the study, the following tasks were involved in the collection and analysis of data to satisfy the purpose and objectives of the study: (1) determine the population, (2) develope the instrument, (3) collect the data, and (4) analyze the results.

Design and Conduct of the Study

Mailed questionnaires were utilized to collect data for the study. One hundred and three agricultural mechanics teacher trainers from 87 agricultural teacher education programs across the United States were sent a questionnaire. The respondents of the study numbered 95.

Findings

The research findings in summary form are presented for each of the areas investigated.

Perceived Importance of Selected Aspects of Shop Environment, Safety Education, and Enforcement - Accident Prevention

Shop Environment

Fifteen topics were listed in the content areas of shop environment.

The following statements or content areas received a mean response in the category of "very much" importance: organizing the shop (3.55), and keeping house (3.57). All other content areas received mean responses in the category of "much" importance. They were as follows:

1.	Controlling fumes	(3.44)
2.	Locating fire extinguishers	(3.38)
3.	Locating safety equipment	(3.33)
4.	Storing combustibles	(3.21)
5.	Locating stationary power equipment	(3.20)
6.	Locating work stations	(3.08)
7.	Using safety signs	(3.06)
8.	Locating exits	(3.05)
9.	Color coding of shop	(3.02)
10.	Storing project materials	(3.01)
11.	Controlling noise pollution	(2.97)
12.	Using main power disconnect systems	(2.96)
13.	Using safety lanes	(2.84)

Safety Education

Combined mean responses from all regions indicated that "very much" importance was attached to the following aspects of safety education as perceived by agricultural mechanics teacher educators:

1.	Using gas cutting and welding equipment	(3.71)
2.	Using arc welding equipment	(3.60)
3.	Maintaining tools and equipment	(3.57)
4.	Using portable power equipment	(3.55)

The following aspects of safety education received a mean response in the category of "much" importance:

1.	Using hand tools	(3.44)
2.	Using stationary equipment	(3.43)
3.	Establishing emergency procedures	(3.29)
4.	Using chemicals and solvents	(3.25)
5.	Recognizing shop emergencies	(3.24)
6.	Developing and locating emergency stations	(3.15)
7.	Keeping student safety records	(2.74)
8.	Presenting Red Cross, CPR, and First Aid training	(2.50)

Only one content area of safety education received a mean response in the category of "some" importance. Agricultural mechanics teacher educators perceived the area of maintaining student medical data (2.18) to be of "some" importance.

Enforcement - Accident Prevention

Eight content areas were investigated in the area of enforcement - accident prevention. Four of the areas received mean responses in the category of "very much" importance. These areas and computed means are as follows:

1.	Protecting the eyes	(3.72)
2.	Supervising students	(3.66)
3.	Providing protective equipment	(3.58)
4.	Developing specific safety rules for tools and equipment	(3.50)

The following enforcement - accident prevention content areas received a mean response in the category of "much" importance:

1.	Developing general safety rules	(3.43)
2.	Disciplining students in the shop	(3.35)
3.	Using safety inspections	(3.20)
4.	Using safety tests	(3.10)

Shop and Class Hours Spent/Semester on the Three Areas of Safety Instruction

For the 36 content areas of safety instruction in agricultural mechanics involving aspects of shop environment, safety education, and enforcement - accident prevention, the majority of teachers spent from one to five hours of instruction. However, in aspects of safety education, almost 20% or more of the respondents from each region reported spending 6-10 hours of class and shop time on the safe use of

arc welding equipment and on the safe use of gas cutting and welding equipment. In the enforcement - accident prevention area of supervising students, an unusually large percentage (29.4%) of the southern region respondents reported spending 11+ hours of class and shop time.

Content Areas Not Being Taught in the Three Areas of Shop Environment, Safety Education, and Enforcement - Accident Prevention

A fairly high percentage of the teacher trainers were not teaching the content areas of using main power disconnect systems, using safety lanes, controlling noise pollution, and locating exits. Over 50%, or 33 teachers, did not teach CPR, Red Cross, and First Aid, nor maintaining student medical data. Seventeen, or 17.8%, of the respondents did not teach the use of safety tests.

Amount of Training in Selected Aspects of Safety Instruction

Shop Environment

Only in three content areas associated with aspects of shop environment did the teachers perceive themselves as having "much" training. The content areas and computed means are as follows:

1. Organizing the shop (2.89)
2. Keeping house (2.68)
3. Storing combustibles (2.55)

The teachers perceived themselves as having "some" training in the other 12 content areas of shop environment.

Safety Education

The teacher trainers perceived themselves as having "much" training in the six areas of using stationary equipment (2.91), using hand tools (3.08), using portable power equipment (3.00), using arc welding equipment (3.28), using gas cutting and welding equipment (3.20), and maintaining tools and equipment (2.92). Teacher trainers perceived themselves as having "little" training in the area of maintaining student medical data.

Enforcement - Accident Prevention

The teachers felt they had "much" training in six of the eight content areas of enforcement - accident prevention. Only the areas of using safety tests and using safety inspections were areas perceived as having had "some" training.

Where Training was Secured

In two areas of safety instruction: shop environment and enforcement - accident prevention, the teacher trainers indicated that they received most of their training from individual preparation and study. In the area of safety education a higher number and percentage of the teachers indicated being trained in a college or university for the 13 content areas listed. The training categories that received the highest responses as to where trained were individual preparation or study, college or university, and in-service workshops.

Preparation of Agricultural Education Students in Selected Aspects of Safety Instruction

Shop Environment

Very few teachers felt their students were "very well prepared" in any aspect of shop environment. Most teacher trainers in agricultural mechanics believed their students to be "adequately prepared" in selected aspects of shop environment with a high percentage indicating a need for additional training of first year teachers in the area of controlling noise pollution. Several teacher trainers from the eastern region did not respond to this part of the questionnaire.

Safety Education

With the exception of a few teachers from the western region, most of the respondents did not feel their students were "very well prepared" in the 12 content areas of safety education. Most of the respondents felt their students were "adequately prepared" in aspects of safety education, except for the areas pertaining to first-aid instruction.

Enforcement - Accident Prevention

Very few teacher educators in agricultural mechanics perceived their students as being "very well prepared" in aspects of enforcement - accident prevention. A fairly high percentage of the respondents from each region perceived their students to be "adequately prepared" in the eight content areas listed. Five teacher trainers, or 23.8%, of

the eastern region respondents did not report their agricultural education students' adequacy.

Academic Homes and Teaching Assignment of the Agricultural Mechanics Teachers Participating in the Study

Of the 95 teachers who participated in the study, 31, or 32.6%, had 100% academic appointments in agricultural engineering. Fifty percent of the central region's teachers held 100% faculty status in agricultural engineering, while only 19.4%, or six, of the western region teachers did. Twenty-nine teacher trainers, or 30.5%, of the respondents had 100% academic appointments in agricultural education. Nationally, 21 respondents, or 22.1%, held joint appointments, while only 14 teachers, or 14.8%, held academic appointments within another department. The southern region had no teachers who held faculty status within another department. Six of the eastern region teachers held academic appointments within another department.

Forty-one percent of the teachers had a 100% teaching assignment in agricultural mechanics. Fifty-four, or 56.8%, of the respondents did not have a full-time teaching assigment in agricultural mechanics.

Conclusions

An analysis of the data collected in this study was used to develop certain conclusions. The investigator feels justified in concluding the following:

1. In teacher education in agricultural mechanics, the enforcement - accident prevention aspects of safety are apparently

considered most important because these are stressed more strongly than others.

2. Teacher educators are spending more time on topics related to the safe use of tools and equipment while devoting too little time to topics on creating a safe environment in which to work and on prevention of accidents in the shop.

3. Agricultural mechanics teacher educators are better trained in aspects of safe use of tools and equipment and on enforcement of safety rules and accident prevention, but have limited training in creating a safe shop environment.

4. Today's teacher educators in agricultural mechanics were not adequately prepared in safety but had to secure much of their training on their own.

5. Overall, teacher educators believe their students are competent in safety. However, they also feel that many graduate with insufficient preparation in the area of first aid instruction.

6. It would appear that teacher educators in agricultural mechanics have an identity problem, due to the fact that there is no set pattern to the academic homes and teaching assignments of agricultural mechanics teacher educators, and few teacher trainers have full-time teaching assignments in agricultural mechanics.

7. Agricultural education graduates from other than the eastern FFA region are better trained in safety, perhaps due to the lack of agricultural mechanics facilities at several teacher education programs in that region.

8. While teacher trainers feel very strongly about the need and importance of safety instruction in agricultural mechanics, much of

their instruction on topics of safety appears to be incidental in nature without structured or formal sequence.

9. Some agricultural education graduates have little opportunity to develop safety competency due to the fact that several teacher education programs require their students to enroll in only one or two agricultural mechanics-related courses.

10. In considering all aspects of safety instruction in agricultural mechanics, today's teacher education programs contain a minimal amount of experiences and instruction designed to develop teacher competency in the area of safety.

Recommendations

The following recommendations are made by the author as a result of this study:

1. That agricultural teacher education programs appropriate funds for and require their teacher trainers in mechanics to be further trained in aspects of creating a safe shop environment through postdoctorate opportunities such as sabbaticals and National Safety Council field schools, seminars, and other types of in-service educational activities.

2. That agricultural teacher education programs and state departments of vocational education initiate a series of in-service summer workshops and training schools in the area of emergency first aid care for both new and experienced agriculture teachers.

3. That teacher education programs offer a formal safety class in agricultural mechanics complete with a supplemental lab section which would be a part of a required curriculum for all agricultural education majors.

4. That individual agricultural education programs with no agricultural mechanics facilities implement a cooperative arrangement with local area vocational-technical schools and local departments of vocational agriculture who have adequate shop facilities that allow the agricultural mechanics teacher trainers to teach safety in an actual shop setting.

5. That teacher education programs explore ways to fund the creation of a full-time faculty position in agricultural mechanics teacher education with one responsibility of that faculty member to include safety instruction.

6. It is recommended that further research be continued in agricultural mechanics safety instruction that involves the development of a core of safety curriculum materials specifically for agricultural mechanics teacher education.

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APPENDIXES

APPENDIX A

INSTRUMENT

BACKGROUND INFORMATION - Check (✓) one.

Do you hold faculty status in Agricultural Engineering? _____
Do you hold faculty status in Agricultural Education? _____
Do you hold a joint appointment? _____
Is your assignment with another department? _____
What other department? _____
Is your teaching assignment full time Agricultural Mechanics Instruction? _____
What are your teaching assignments? _____

Please check the FFA Region of which you are a part. Eastern _____
Southern _____
Western _____
Central _____

Please respond to the following statements as to your safety instruction in Agricultural Mechanics.

FOR EACH ITEM IN THE LEFT HAND COLUMN BELOW, PLEASE RESPOND TO EACH ITEM TO THE RIGHT CHECK (✓) ONE	IMPORTANCE YOU FEEL SHOULD BE PLACED ON EACH AREA					SHOP AND CLASS HOURS SPENT IN EACH AREA PER SEMESTER					AMOUNT OF TRAINING YOU HAVE HAD IN EACH AREA					WHERE YOU SECURED TRAINING OR PREPARATION (CHECK ALL THAT APPLY)								LEVEL OF SAFETY PREPARATION OF YOUR AG EDUCATION STUDENTS		
	None	Little	Some	Much	Very Much	0	1-2	3-5	6-10	11+	None	Little	Some	Much	Very Much	In-Service Workshop	Factory or Industry Schools	College or University Courses	Professional or Association Meetings	Past Employment in Other Fields	Individual Preparation or Study	Other		Very Well Prepared	Adequately Prepared	Adequate for 1st Year Teacher But a Need for Additional Training
SHOP ENVIRONMENT																										
Color coding of the shop																										
Locating fire extinguishers																										
Locating safety equipment																										
Locating exits																										
Locating work stations																										
Locating stationary power equipment																										
Controlling fumes																										
Controlling noise pollution																										
Using main power disconnect systems																										
Using safety signs																										

Using safety lanes																													
Organizing the shop																													
Storing combustibles																													
Storing project materials																													
Keeping house																													
Other (Please specify) _____																													
SAFETY EDUCATION FOR:																													
Using stationary equipment																													
Using hand tools																													
Using portable power equipment																													
Using chemicals and solvents																													
Using arc welding equipment																													
Using gas cutting & welding equipment																													
Keeping student safety records																													
Maintaining tools and equipment																													
Recognizing shop emergencies																													
Establishing emergency procedures																													
Developing and locating emergency aid stations																													
Presenting Red Cross, CPR & First Aid training																													

Maintaining student medical data																									
Other (Please specify) ______________________																									
ENFORCEMENT - ACCIDENT PREVENTION																									
Using safety tests																									
Using safety inspections																									
Disciplining students in the shop																									
Supervising students																									
Developing general safety rules																									
Developing specific safety rules for tools and equipment																									
Protecting the eyes																									
Providing protective equipment																									
Other (Please specify) ______________________																									

APPENDIX B

CORRESPONDENCE

OKLAHOMA STATE UNIVERSITY • STILLWATER

Department of Agricultural Education 74078
(405) 624-5129

December 20, 1980

Dear Sir:

I am presently conducting my doctoral research on a very important subject--that of Safety in Agricultural Mechanics. An assessment of Agricultural Mechanics safety instruction in Agricultural Teacher Education programs across the United States requires me to seek your assistance. My goal is to survey each faculty member(s) whose main responsibility includes Agricultural Mechanics Teacher Education at each teacher education program in the nation.

Most of the faculty member's names I have secured. Some, however, I need your help on. On the enclosed, self-addressed postcard, could you provide me the name or names and addresses of the individual(s) who works primarily with your Agricultural Education Department in Agricultural Mechanics Teacher Education? I realize that many faculty are within separate departments such as Agricultural Engineering. Also, if you would indicate so, I will be happy to provide you with a copy of the major findings of this study.

Thank you for your cooperation!

Sincerely,

Steve Forsythe
Graduate Teaching Assistant
Agricultural Education -
Agricultural Mechanics

SP:ssa
Enclosure

OKLAHOMA STATE UNIVERSITY • STILLWATER

Department of Agricultural Education
(405) 624-5129

74078

January 2, 1981

Dear Sir:

Agricultural Mechanics is an integral part of the vocational agriculture program. The vo-ag instructor should provide knowledge and skills related to safety in the agricultural shop. The agricultural instructor must have an instructional program that will provide for a safe environment for his students to engage in mechanical activities in the agricultural shop. If the vo-ag teacher is to provide knowledge and skills in safety to his individual students, he must first have the appropriate Agricultural Mechanics safety instruction.

I am presently conducting an assessment of Agricultural Mechanics Safety Instruction provided at Agricultural Teacher Education programs across the United States.

As faculty involved in Agricultural Mechanics Teacher Education, your response to the enclosed questionnaire will help provide the necessary information for completion of this study. Your responses will be used in the strictest confidence and no individual or school will be identified in this study. I have enclosed a self-addressed, stamped envelope for your convenience. Please return the questionnaire to me as soon as possible.

I appreciate your cooperation in this matter and will provide a copy of the major findings of the study if your would like one. Distance prohibits us from visiting in person and having a cup of coffee. However, I'll do the next best thing! Please enjoy a cup of coffee on me while you fill out the questionnaire. It's just a small way of saying thanks for your time and trouble.

Respectfully yours,

Steve Forsythe
Graduate Teaching Assistant

George E. Cook
Teacher Educator, Ag. Mech.

Robert Terry
Professor and Head, Ag. Ed.

SF:ssa
Enclosures

Oklahoma State University
DEPARTMENT OF AGRICULTURAL ENGINEERING

STILLWATER, OKLAHOMA 74074
109 AGRICULTURAL HALL
(405) 624-5431

January 28, 1981

Dear Colleague,

Recently you should have received a questionnaire concerning safety instruction. My graduate teaching assistant, Steve Forsythe, is conducting an assessment of Agricultural Mechanics Safety Instruction conducted at Agricultural Teacher Education Programs across the United States. His response percentage has been fair but he needs more input to make his study valid. Please lend your cooperation to this study and respond.

Hopefully, this research will strengthen our Agricultural Mechanics Safety Instruction at each Teacher Training Institution across the states.

If by chance you have misplaced the questionnaire, Steve has enclosed another one for your convenience. Please disregard this letter if you have already sent in your questionnaire. Thank you for your assistance.

Sincerely,

George E. Cook
Associate Professor
Teacher Trainer-Ag Mechanics

GEC:fh

Enclosure

APPENDIX C

SUMMARY OF RETURNS TABLES

TABLE XX

SUMMARY OF RETURNS - IMPORTANCE

	Range of Regional Mean Responses	National Means of Category Importance
Shop Environment		
Color coding of shop	2.82 - 3.18	3.02 Much
Locating fire extinguishers	3.18 - 3.49	3.38 Much
Locating safety equipment	3.22 - 3.43	3.33 Much
Locating exits	2.75 - 3.40	3.05 Much
Locating work stations	2.99 - 3.20	3.08 Much
Locating stationary power equipment	3.15 - 3.25	3.20 Much
Controlling fumes	3.24 - 3.67	3.44 Much
Controlling noise pollution	2.62 - 3.34	2.97 Much
Using main power disconnect systems	3.34 - 2.70	2.96 Much
Using safety signs	2.59 - 3.30	3.06 Much
Using safety lanes	2.74 - 3.02	2.84 Much
Organizing the shop	3.30 - 3.67	3.55 Very Much
Storing combustibles	2.68 - 3.64	3.21 Much
Storing project materials	2.76 - 3.40	3.01 Much
Keeping house	3.37 - 3.94	3.57 Very Much
Safety Education for:		
Using stationary equipment	3.28 - 3.58	3.43 Much
Using hand tools	3.14 - 3.61	3.44 Much
Using portable power equipment	3.26 - 3.79	3.55 Very Much
Using chemicals and solvents	2.89 - 3.37	3.25 Much
Using arc welding equipment	3.24 - 3.85	3.60 Very Much
Using gas cutting and welding equipment	3.61 - 3.83	3.71 Very Much
Keeping student safety records	2.54 - 3.95	2.74 Much
Maintaining tools and equipment	3.35 - 3.79	3.57 Very Much

TABLE XX (Continued)

	Range of Regional Mean Responses	National Means of Category Importance
Safety Education for: (Cont.)		
Recognizing shop emergencies	3.05 - 3.49	3.24 Much
Establishing emergency procedures	3.18 - 3.40	3.29 Much
Developing and locating emergency aid stations	2.87 - 3.40	3.15 Much
Presenting Red Cross, CPR, and First Aid training	2.37 - 2.75	2.50 Much
Maintaining student medical data	1.95 - 2.53	2.18 Some
Enforcement - Accident Prevention		
Using safety tests	2.80 - 3.34	3.10 Much
Using safety inspections	3.11 - 3.30	3.20 Much
Disciplining students in the shop	2.99 - 3.66	3.35 Much
Supervising students	3.45 - 3.94	3.66 Very Much
Developing general safety rules	3.28 - 3.70	3.43 Much
Developing specific safety rules for tools and equipment	3.37 - 3.79	3.50 Very Much
Protecting the eyes	3.59 - 3.88	3.72 Very Much
Providing protective equipment	3.34 - 3.79	3.58 Very Much

TABLE XXI

SUMMARY OF RETURNS - TRAINING

	Range of Regional Mean Responses	National Mean	Category of Training
Shop Environment			
Color coding of shop	2.06 - 2.68	2.36	Some
Locating fire extinguishers	2.08 - 2.39	2.25	Some
Locating safety equipment	1.81 - 2.34	2.06	Some
Locating exits	1.80 - 2.44	2.14	Some
Locating work stations	2.16 - 2.62	2.37	Some
Locating stationary power equipment	2.08 - 2.52	2.32	Some
Controlling fumes	2.03 - 2.51	2.30	Some
Controlling noise pollution	1.82 - 2.18	1.97	Some
Using main power disconnect systems	1.91 - 2.43	2.15	Some
Using safety signs	1.72 - 2.40	2.07	Some
Using safety lanes	2.03 - 2.37	2.16	Some
Organizing the shop	2.75 - 3.07	2.89	Much
Storing combustibles	2.31 - 2.78	2.55	Much
Storing project materials	2.15 - 2.58	2.35	Some
Keeping house	2.35 - 2.91	2.68	Much
Safety Education for:			
Using stationary equipment	2.72 - 3.20	2.91	Much
Using hand tools	2.81 - 3.26	3.08	Much
Using portable power equipment	2.81 - 3.36	3.00	Much
Using chemicals and solvents	2.22 - 2.68	2.44	Some
Using arc welding equipment	3.18 - 3.43	3.28	Much
Using gas cutting and welding equipment	2.97 - 3.52	3.20	Much

TABLE XXI (Continued)

	Range of Regional Mean Responses	National Mean	Category of Training
Safety Education for: (Cont.)			
Keeping student safety records	1.77 - 2.72	2.22	Some
Maintaining tools and equipment	2.84 - 3.12	2.92	Much
Recognizing shop emergencies	1.78 - 2.26	2.29	Some
Establishing emergency procedures	2.03 - 2.44	2.16	Some
Developing and locating emergency aid stations	1.55 - 2.42	2.01	Some
Presenting Red Cross, CPR, and First Aid training	1.64 - 2.28	1.86	Some
Maintaining student medical data	.96 - 1.65	1.37	Little
Enforcement - Accident Prevention			
Using safety tests	1.75 - 2.84	2.37	Some
Using safety inspections	1.99 - 2.81	2.43	Some
Disciplining students in the shop	2.15 - 3.15	2.71	Much
Supervising students	1.93 - 3.25	2.66	Much
Developing general safety rules	2.44 - 2.76	2.57	Much
Developing specific safety rules for tools and equipment	2.62 - 3.04	2.73	Much
Protecting the eyes	2.02 - 3.17	2.57	Much
Providing protective equipment	2.42 - 3.13	2.69	Much

APPENDIX D

CURRENT LIST OF AGRICULTURAL MECHANICS TEACHER EDUCATORS ACROSS THE UNITED STATES

Current Agricultural Mechanics Teacher Educators Across the United States as Identified by FFA Region

Eastern Region

Mr. John B. Greiner
U-15 Dept. of Agr. Engineering
University of Connecticut
Starrs, Conn. 06268

Dr. Edward Jones
Delaware State College
Dover, Delaware 19901

Mr. William Nichol
Dept. of Agr. Engineering
University of Delaware
Rm. 056, Ag Hall
Newark, Delaware 19711

Dr. Robert Rhoads - Agr. Educ.
University of Maine at Orono
College of Life Sciences & Agr.
Orono, Maine 04469

Prof. Thomas H. March
Thompson School of Applied Sci.
Putnam Hall
Univ. of New Hampshire
Durham, N.H. 03824

Dr. William Smith
Waller Hall - Cook College
Rutgers University
New Brunswick, N.J. 08903

Dr. Fred Lechner
Dept. of Agr. Engineering
Cornell University
Ithaca, N.Y. 14850

Dr. Lee P. Grant
Dept. of Agr. Engineering
Univ. of Maryland
College Park, Md. 20742

Dr. Cecil Massie
Dept. of Agr. Engineering
Univ. of Maryland
College, Park, Md. 20742

Dr. Harrell Smith
Agr. Education
Univ. of Maryland-Eastern Share
Princess Ann, Md. 21853

Prof. Lester Whitney
Prof. Ed. Pira
Dept. of Agr.
Univ. of Massachusetts
Amherst, Mass 01003

Dr. Joe Gleim
Dept. of Agr. Engineering
The Ohio State University
2073 Neil Ave.
Ives Hall
Columbus, Ohio 43210

James C. Papritan
Dept. of Agr. Engineering
The Ohio State University
2073 Neil Ave.
Ives Hall
Columbus, Ohio 43210

Dr. James Hilton
Dept. of Agr. Education
The Pennsylvania State Univ.
University Park, Pa. 16802

Mr. George Blum
Dept. of Agr. Engineering
North Carolina State University
111 Weaver Hall
Raleigh, N.C. 27650

Mr. Ezra Howell
Agr. Engineering Dept.
North Carolina State University
111 Weaver Hall
Raleigh, N.C. 27650

Mr. L. A. Yates
Agr. Mechanics
A & T State University
Greensboro, N.C. 27411

Prof. C. Jordan Hudson
Dept. of Agr. Education
Virginia State University
Petersburg, Va. 23803

Dr. Don McCreight
Chairman - Agr. Education
Univ. of Rhode Island
Rodman Hall
Kingston, R.I. 02881

Dr. Alan Zimmerman
Dept. of Vocational Educ. & Tech.
University of Vermont
Burlington, Vt. 05405

Dr. Gale Hagee
Agr. Education
VPI and State University
Blacksburg, Va. 24061

Dr. Marion Kimmons
142 Agr. Science Annex
West Virginia University
Morgantown, W. Va. 26506

Central Region

Dr. Roland Espenschied
Dept. of Agr. Engineering
University of Illinois
Urbana, Illinois 61801

Mr. Richard Patterson
Agr. Education & Mechanization
Southern Illinois University
Carbondale, Illinois 62901

Dr. Robert L. Wolff
Agr. Mechanization
Southern Illinois University
Carbondale, Illinois 62901

Dr. Eldon Heathcott
Agr. Education
Dept. of Agriculture
Murray State University
Murrah, Kentucky 42071

Dr. Robert Snyder
Agr. Mechanics
Dept. of Agriculture
Bowling Green, Kentucky 42101

Dr. Harry Hoerner
Dept. of Agriculture
College of Applied Sciences
Western Illinois University
Macomb, IL. 61455

Dr. Reginald Henry
Dept. of Agriculture
Illinois State University
Normal, Illinois 61761

Dr. Leonard Sigler
Dept. of Agriculture
Illinois State University
Normal, Illinois 61761

Prof. Mack Strickland
Dept. of Agr. Engineering
Purdue University
West Lafayette, Indiana 47907

Dr. Thomas Hoerner
Agr. Engineering
208 Davidson Hall
Iowa State University
Ames, Iowa 50010

Dr. Joe Bendixen
Teacher Educator
Dept. of Agriculture
Morehead State University
Morehead, Kentucky 40351

Dr. Thomas Burkhardt
Dept. of Agr. Engineering
Michigan State Univ.
East Lansing, Mich. 48824

Mr. George Brown
Dept. of Agr. Engineering
Michigan State Univ.
East Lansing, Michigan 48824

Dr. Forrest Bear
Dept. of Voc. & Tech. Education
University of Minnesota
130 Classroom Office Bldg.
St. Paul, Minn. 55108

Mr. Charles Moilanen
Agr. Education Dept.
North Dakota State University
Morrell Hall
Fargo, North Dakota 58105

Mr. Lawrence Helt
Agr. Education Dept.
North Dakota State University
Morrell Hall
Fargo, North Dakota 58105

Mr. Van Kelly
Agr. Engineering Dept.
South Dakota State University
Brookings, S. D. 57007

Dr. Roberg Loberger
Agr. Educ./Mechanization
Univ. of Wisconsin
Platteville, Ws. 53818

Prof. Gordon Barrington
Agr. Engineering Dept.
Univ. of Wisconsin
Madison, Ws. 53706

Dr. Paul Stevenson
Dept. of Agr. Engineering
Seaton Hall
Kansas State University
Manhattan, Ks. 66506

Dr. Earl Baugher
Agr. Mechanics
Holton Hall
Kansas State University
Manhattan, Ks. 66506

Dr. Hubert Casada
Agr. Mechanics
Dept. of Agr. Engineering
University of Kentucky
Lexington, Kentucky 40506

Dr. Richard Linhardt
Agr. Engineering Dept.
University of Missouri
Columbia, Mo. 65211

Teacher Educator
Agr. Mechanics
c/o Agr. Education Dept.
Central Missouri State Univ.
Warrensburg, Mo. 64093

Dr. Mervin Bettis
Agr. Mechanics Specialist
Northwest Missouri State Univ.
Maryville, Mo. 64468

Dr. Jim Frisbee
Dept. of Agr. Engineering
Univ. of Missouri
Columbia, Mo. 65211

Dr. Thomas Stilletto
Agr. Engineering Dept.
Univ. of Nebraska
Lincoln, Nebraska 68583

Dr. Jack Schinstock
Agr. Engineering Dept.
Univ. of Nebraska
Lincoln, Nebraska 68583

Prof. Marvin Thompson
Agr. Education Dept.
Wisconsin State Univ.
River Falls, Wisc. 54022

Southern Region

Dr. Prince Preyer, Jr.
Dept. of Agribusiness Educa.
Alabama A & M University
Normal, Alabama 35726

Dr. Remus Shade
Dept. of Agribusiness Educa.
Alabama A & M University
Normal, Alabama 35726

Dr. Gorden Patterson
Agr. Education
Auburn University
5032 Haley Center
Auburn, Alabama 36830

Dr. Pete Braker
Dept. of Agr. Engineering
University of Arkansasa
Fayetteville, Ark. 72701

Dr. Jim Scanlon
Dept. of Agr. Education
University of Arkansas
Fayetteville, Ark. 72701

Dr. Amos B. Rougeau
Arkansas State University
State University, Ark. 72467

Mr. James Albritton
Agr. Engineering
Louisiana Tech. University
Ruston, La. 71271

Mr. Stephen Langlinais
Agr. Engineering
University of S. W. Louisiana
Lafayette, La. 70501

Prof. Bob Fitz
Agr. Mechanics
University of Arkansas at
Pine Bluff
Pine Bluff, Ark. 71601

Prof. W. D. Shoup
Agr. Engineering Dept.
6 Rogers Hall
University of Florida
Gainesville, Fla. 32601

Dr. Beechum
Teacher Educator - Agr. Educa.
Florida A & M University
Tallahassee, Fla. 32307

Mr. Cecil Beggs
Dept. of Agr. Engineering
University of Georgia
Athens, Ga. 30602

Dr. Ira Hicks - Teacher Educa.
Agr. Education
Fort Valley State College
Fort Valley, Ga. 31030

Dr. Joe Kotrlik
Agr. Education
Stubbs Hall
Louisiana State University
Baton Rouge, La. 70803

Mr. James Simmons
Dept. of Agr. Engineering
Tennessee State University
Nashville, Tn. 37203

Dr. Lee Roy Kiesling
Agr. Education Dept.
University of Tennessee
Martin, Tn. 38238

Mr. Johnny Patterson
Agr. Mechanics
Southern University
Baton Rouge, La. 70813

Dr. S. Clifton Ricketts
Dept. of Agriculture
Middle Tennessee State Univ.
Box 127
Murfreesboro, Tn. 37130

Dr. Glenn Shinn
Dept. of Agr. & Extension Education
Mississippi State University
Mississippi State, Ms. 39762

Mr. P. Fluker
Agr. Education
Alcorn State University
Lorman, Ms. 39096

Dr. James H. Daniels
Dept. of Agr. Educa.
Clemson University
Clemson, SC 29631

Dr. Willie Cheetham
Dept. of Agr. Education
Univ. of Tennessee
Knoxville, Tn. 37916

Western Region

Alaska (has no agr. mech. teacher education)

Dr. Ramsey Groves
Agr. Education
Colorado State University
Ft. Collins, Colo. 80523

Dr. Clinton O. Jacobs
Dept. of Agr. Education
Univ. of Arizona
Tucson, Az. 85721

Hawaii (has no agr. mech. teacher education)

Prof. Michael O'Brien
Univ. of California
Agr. Engineering
3042 Bainer Hall
Univ. of California - Davis
Davis, Ca. 95616

Dr. Louis E. Riesenberg
Agr. Educa./Agr. Eng.
Agr. Engineering Bldg.
Univ. of Idaho
Moscow, Id. 83843

Dr. Joe Sabol
Calif. Polytechnic State Univ.
Agr. Education Dept.
San Luis Obispo, Ca. 93407

Dr. Kenneth Bruwelheide
Dept. of Agr. & Indus. Educa.
Montana State University
Bozeman, Montana 59717

Dr. Richard Rogers
Agr. Education
California State Univ. - Fresno
Fresno, Ca. 93740

Dr. Ronald Squires
Div. of Agr. & Ind. Mechanics
Univ. of Nevada
Reno, Nevada 89507

Dr. Floyd Matthews
Agr. Engineering Dept.
Cal. State Polytechnic Univ.
Kellog-Voorhis
3801 West Temple Ave.
Pomona, Ca. 91768

Dr. Jimmy Dean
Agr. Engineering Dept.
New Mexico State Univ.
Las Cruces, NM 88003

Mr. Ron Borge
Agr. Education Dept.
Cal. State Univ. - Chico
Chico, Ca. 95926

Prof. George E. Cook
Agr. Mechanics
Rm. 109, Ag Hall
Oklahoma State University
Stillwater, Ok. 74078

Dr. Marvin Cepeca
Dept. of Agr. Education
Texas Tech University
Lubbock, Tx. 79409

Agr. Mechanics Teacher Trainer
c/o Dr. Tom Quarles
Agr. Education
Stephen F. Austin Univ.
Nacogdockes, Tx. 75962

Agr. Mechanics Teacher Trainer
c/o Dr. Eugene Jekel
Texas A & I University
Kingsville, Tx. 78363

Dr. Ted Ford
Agr. Mechanics
Tarleton State University
Stephenville, Tx. 76402

Dr. Cecil Strickland
Agr. Education
Prairie View A & M University
Prairie View, Tx. 77445

Dr. Pat Pruitt
Agr. Mechanics
Utah State University
Logan, Utah 84322

Dr. Von Jarrett
Dept. of Agr. Engineering
Utah State University
Logan, Utah 84322

Dr. William Symons
Agr. Education
Washington State University
Pullman, Wn. 99164

Mr. Larry Hough
c/o Ag. Education Dept.
Panhandle State Univ.
Goodwell, Ok. 73939

Dr. Herbert Hansen
Dept. of Agr. Education
Oregon State University
Gilmore Hall
Corvallis, Oregon 97331

Dr. Chester Darcey
Dept. of Agr. Engineering
Texas A & M University
College Station, Tx. 77843

Dr. Charlie Jones - Head
Agr. Education
East Texas State Univ.
East Texas Station
Commerce, Tx. 75428

Dr. Billy Harrell
Agr. Dept.
Box 2088
Sam Houston State Univ.
Huntsville, Tx. 77341

Dr. Lon Shell
Dept. of Agr. Mechanics
Southwest Texas State Univ.
San Marcos, Tx. 78666

Dr. Les Farmer
Dept. of Agr. Mechanics
Southwest Texas State Univ.
San Marcos, Tx. 78666

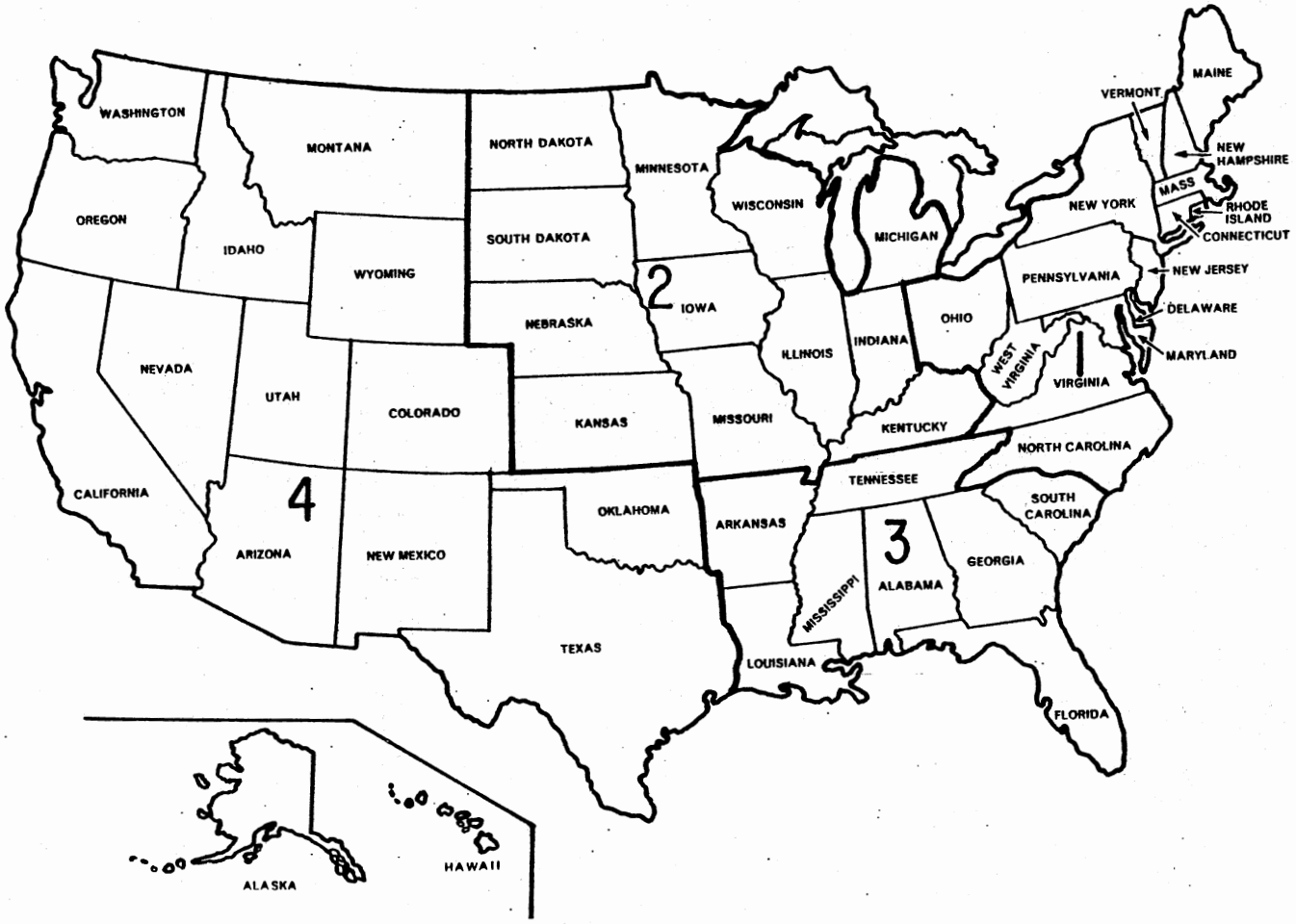
Dr. Lewis Eggenberger
Dept. of Agr. Education
Texas Tech University
Lubbock, Tx. 79409

Dr. Marvin Kleene
Agr. Education
Washington State University
Pullman, Wn. 99164

Dr. Carl Reynolds
Dept. of Voc. Education
Univ. of Wyoming
Laramie, Wy. 82071

APPENDIX E

MAP OF FFA REGIONS IN THE UNITED STATES



FFA REGIONS BY NUMBER:

1. Eastern Region
2. Central Region
3. Southern Region
4. Western Region

Figure 1. Map of the United States Showing FFA regions

VITA

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