

## Safety And Health Attitudes And Beliefs Of Entry-Year Agriculture Teachers In Texas

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### Abstract

Creating healthy safety climates within the agricultural education programs is the responsibility of teachers managing these programs. This is of particular concern for entry-year teachers due in part to stress and time management anxiety. Administrators and teachers are legally recognized as standing *in loco parentis* to the students under their supervision. Thus, the necessity for agriculture teachers to exhibit safe practices and behaviors thus creating a positive safety climate, is important to reduce future preventable injuries, not only while the student is in school, but also when they enter the workforce. The purpose of this descriptive study was to gather baseline data describing agricultural safety attitudes and perceptions of curricula used by Texas agriculture teachers with less than two years of teaching experience.

From a census of entry year Texas agriculture teachers (N=118), teachers' pre-service safety and health preparation and training were reviewed in addition to soliciting perspectives on available safety and health curricula, usage and practices. Responding teachers (n=74; 57 males, 17 females) were well distributed both by Texas FFA region and school enrollment.

Teachers agreed all shops should have a working fire extinguisher, and a clean and well-organized shop reflected a safe environment. To a lesser degree, teachers agreed that proper protective equipment should always be worn during agricultural work and having emergency phone numbers posted by the phone was beneficial but the majority did not have emergency phone numbers nor emergency directions posted in their homes. The majority of the teachers did not wear seatbelts when driving tractors, however most always made sure the PTO shields were in place.

Teachers began driving tractors and agricultural equipment at average age of 11.8 years, while they allowed students or children drive at an average age of 14.87 years old. Surprisingly, teachers indicated that children must be 11 years or older to help with working livestock.

When doing agricultural work, teachers utilized personal protective equipment, although not consistently overall with only one quarter always wearing appropriate protective equipment. Although a large majority sporadically used appropriate equipment, the limitedness in safety attitudes and safety climates are amplified in the school setting.

Teacher preparation programs should place a much larger emphasis on instilling and developing safety attitudes and skills with pre-service teachers. Workshops should be organized and offered on safety education including topics concerning modeling safety attitudes and actions. It was recommended that this study should be repeated annually and supported with similar research efforts identifying safety and health attitudes of all agriculture education teachers and the overall safety environment of agricultural education programs.

## Introduction

The National Safety Council reported there were 24 deaths per 100,000 agricultural workers and 140,000 disabling farm-related injuries (National Safety Council, 1996). This situation presents a special challenge for career and technology education programs that are tied to dangerous occupations such as agricultural education is to agriculture. Healthy People 2000 (DHHS, 1990) suggested that ages 15 through 24 are a time when young people develop behaviors that may become permanent and that health and safety issues need to be clarified.

Under current civil law, administrators and teachers are recognized as standing in loco parentis to the students under their supervision. Thus, the necessity for agriculture teachers to model safe practices and behaviors and to create a positive safety climate, is important to reduce future preventable injuries, not only while the student is in school, but also when they enter the workforce. Based on the relationship between teacher carelessness and incidence of student injury, Lawver and Frazee (1995) recommended Texas agriscience teachers receive more pre-service and in-service education in the areas promoting positive safety attitudes and decreasing teacher carelessness.

Research addressing safety standards, safety attitudes and other concerns is presented in countless texts, journals and magazine articles. Safety concerns have been revealed across the country and illuminated most specifically by the following studies: Berkey, 1981 & 1989; Kigin, 1983; Gleim and Hard; Lawver, 1994; Schlautman and Silletto, 1992; Swan, 1993; Hubert, 1996; and Ullrich, 1997. Even with this volume of evidence that there are major safety concerns little if any research has been conducted upon the preparedness of these teachers to deal with emergency illnesses or injuries.

Students desiring employment in a hazardous occupation need proper safety instruction both for the present and the future. Such is the case with students preparing to enter into production agriculture and many of its support industries. Students in agricultural education programs commonly use equipment and devices, identical to that used in industry. Sullivan (1990) acknowledged vocational teachers are responsible for the safety of their students because of moral obligations and assigned duties for providing a safe environment for their students. It is also understood that preventable and unfortunate, accidents occasionally occur in classrooms, laboratories, during field experiences and while managing supervised agricultural experience programs. Consequently, Daniels (1980) concluded the most important responsibility of the agriculture instructor was to ensure safety of the students.

In 1989, Johnson found that eleven of the top 18 agricultural mechanics laboratory competencies were safety based. A Swan (1993) study recommended designating local and federal funds for use in improving safety and emergency equipment and instruction available to instructors and students. Furthermore, the development of a positive and continuous safety climate within an agricultural education program is directly influenced by the personal attitudes, beliefs and skills of the teachers managing that program.

If agricultural education programs are to prepare students for careers in agriculture the issue of acknowledging the dangers of this industry and reducing injuries and illnesses is paramount. A sense of urgency must be created to infuse a continuous positive safety climate in agricultural education programs. As such, a need has been established to determine the personal safety beliefs and attitudes of entry-year teachers in agricultural education.

## **Purpose / Objectives**

The purpose of this descriptive study was to provide baseline data for the description of attitudes and perceptions of agricultural safety issues and curricula by Texas agriculture teachers with less than one and one-half years of teaching experience. Two objectives were developed to guide this study.

1. Describe selected characteristics of Texas agricultural science teachers with less than one and one-half years of teaching experience.
2. Determine personal beliefs and attitudes regarding common agricultural safety and health issues for Texas agricultural science teachers with less than one and one-half years of teaching experience.

## **Methods/Procedure**

The target population was Texas agriculture teachers with one and one-half years of teaching experience. These teachers were selected from a database of over 1400 Texas Agricultural Science teachers. The Vocational Agricultural Teachers Association of Texas (VATAT) database of first year teachers served as the sampling frame, and 98 teachers were identified as meeting the selection criteria. Duplicates and foreign elements were removed. Missing elements were identified from university entry-year teacher lists and added which adjusted the sample to 118 identified teachers. A census of the target population was surveyed. The inferential population was considered to be all entry-year agriculture science teachers.

Descriptive research methodologies were employed to collect data. The instrument designed was a booklet style questionnaire. The instrument contained six sections: (I) demographics, (II) agricultural curricula and teaching materials, (III) classes taught 1998-99, (IV) personal health and safety training, (V) personal beliefs and (VI) personal practices. Teacher educators, and state agricultural education staff from Texas and Oklahoma served as a panel of experts to review the instrument for face and content validity. Appropriate revisions were completed based on comments. To insure reliability, the instrument was administered to several agricultural science teachers in southeast Texas. Following review and revision the instrument was distributed to the target population. To ascertain internal consistency, Cronbach's alphas for Sections IV (personal health and safety training), V (personal beliefs) and VI (personal practices) were calculated with results being .71, .62 and .57, respectively. The relatively low internal consistency for the personal practices may be because the items included statements that, while individually important as safety practices, may be unrelated to each other (e.g. "I was when I first operated a tractor equipment alone") or due to the small number of items in this section.

Data were collected over an eight-week period during the spring of 1999. The instrument, cover letter, self-addressed, postage-paid envelopes and detailed instructions were mailed during first week of April 1999. After approximately two weeks, reminder postcards were sent to those failing to respond. Two weeks later a second survey was mailed. Non-respondents from both mailings were phoned. A final attempt to secure data on the target population was conducted via recruitment and curricula distribution booths at the 1999 Texas

FFA convention and VATAT Professional Improvement Conference.

Completed instruments were collected from 74 of the identified 118 agriculture teachers with one and one-half years of experience (63% response rate). Descriptive statistics, ANOVA, T-tests, and regression procedures were conducted and all results analyzed at the .05 level of significance. For the purpose of this study demographic, personal beliefs and personal practices data will be used to make recommendations concerning safety issues of entry-year teachers.

### Findings

Of the 74 teachers meeting the entry year qualification 57 (77.03 %) were male and 17 (22.97 %) were female. This was a larger percentage of females than the overall rate (8.98%) for Texas agricultural science teachers. Combined mean age was 27.31 years. Teachers were placed into age groupings for the purpose of data analyses. The groupings were a more traditional age group “20-25 years” (n=40) and a non-traditional age group of “26 years or greater” (n=32). Males were evenly distributed between the two groupings (29 and 28 respectively) while almost twice as many females were in the younger grouping (11 and 6 respectively).

Entry year teachers were well distributed throughout the state. The Vocational Agriculture Teachers Association of Texas follows the area associations established by the Texas FFA Association. The ten Texas Areas are illustrated in Figure 1.

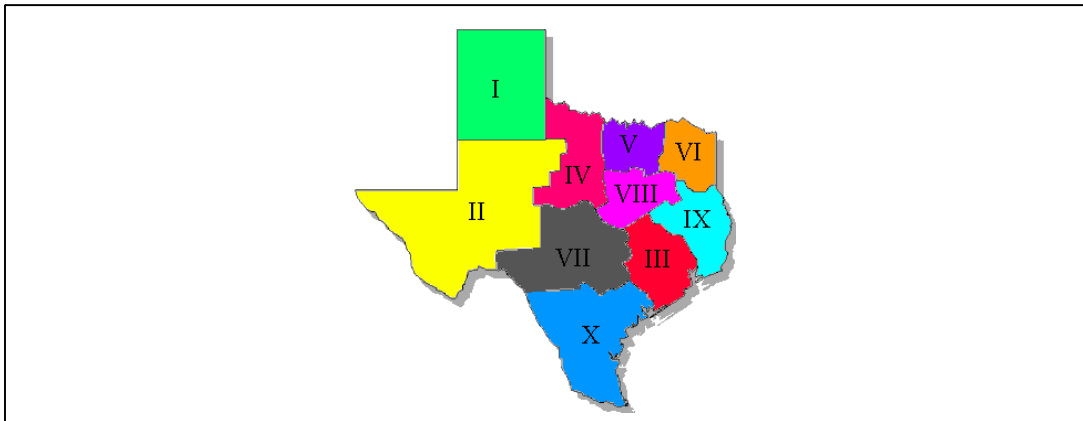


Figure 1. Texas Vocational Agriculture Teachers Association of Texas (VATAT) Areas

The largest numbers of entry year respondents by area were from Areas III (14, 18.92 %), IX (10, 13.51%), and X (8, 10.81%). The remaining seven Areas had between four (5.41%) and seven (9.46%) respondents per area. This indicated that these new teachers were reasonably distributed throughout the state. Table 1 provides the delineation of teachers by area.

To check the distribution of new teachers by school size, respondents were asked to identify the enrollment size of school by University Interscholastic League (UIL) conference.

Table 1. Texas Entry Year Teachers Distribution by Area.

	<u>Area</u>										
	<u>I</u>	<u>II</u>	<u>III</u>	<u>IV</u>	<u>V</u>	<u>VI</u>	<u>VII</u>	<u>VIII</u>	<u>IX</u>	<u>X</u>	<u>N</u>
Number of teachers	4	7	14	7	5	6	6	7	1	8	74

The divisions of Texas high schools for competitions for the 1998-99 school years were based on enrollment figures and are divided as follows: 5A—1,780 students or greater; 4A—780-1,779 students; 3A—345-779 students; 2A—160-344 students; and 1A—159 students or fewer (University Interscholastic League, 1999). The distribution of new teachers by UIL conference / school enrollment are presented in Table 2. Data indicated that on average there were 146.16 students enrolled in these agriculture education programs (range 16-625) of which 91.18 were FFA members (range 5 to 350).

Table 2. Teacher Distribution by UIL Conference / School Enrollment

	<u>Conference Classification</u>					
	<u>1A</u>	<u>2A</u>	<u>3A</u>	4A	5A	N
Number of teachers	15	15	19	13	10	72

Teachers were asked to give their opinions to a series of questions concerning their personal beliefs and attitudes regarding common agricultural safety and health issues. On a forced response four point Likert-type scale (1 = highly agree, 2 = agree, 3 = disagree and 4 = highly disagree) respondents were highly agreeable that all shops should have a properly working fire extinguisher (M=1.22), and that a clean well-organized shop reflects a safe working environment (M=1.25). Teachers also perceived that wearing proper protective equipment was very important (M=1.30), having emergency numbers posted by the phone were slightly less important (M=1.40), and that seatbelts should be worn and that safety devices in place when operating tractors and farm machinery (M=1.48). Respondents agreed that fences around farm ponds and stock tanks and lagoons are effective safety precautions (M=1.9). To a lesser degree teachers agreed (M=2.06) that mandatory age requirements should be established to operate tractors and / or equipment (Table 3).

Table 3. Texas Agriculture Teachers' Personal Beliefs and Attitudes.

	<u>M</u>	<u>SD</u>	<u>N</u>
All shops should have a properly working fire extinguisher.	1.22	.71	73
A clean and well-organized shop reflects a safe environment.	1.25	.59	73
Proper protective equipment should always be worn when doing agricultural work.	1.30	.73	73
Emergency numbers posted by the phone are a good idea.	1.40	.79	73
Seatbelts should be worn and safety devices in place when operating tractors and farm machinery.	1.48	.66	73
Fences around farm ponds / stock tanks and lagoons are an effective safety precaution.	1.90	.80	72
Mandatory age requirements should be established to operate tractors and / or equipment.	2.06	.73	73

Note: 1= highly agree, 2=agree, 3=disagree, 4=highly disagree

The answers to questions concerning personal safety practices of entry-year teachers are reported in Table 4 and are indicators of teacher attitudes about a positive safety climate. Considering the teachers that responded to the question asking if they wear a seatbelt when driving a tractor 22 or 34.92% indicated that they did while 65.08% did not. Eleven of the respondents indicated that the question was not applicable. An overwhelming majority (82.26%) indicated that they made sure that when they operated a tractor that the PTO shields were in place, 17.74% did not follow this basic safety precaution, while eight teachers identified that this question was not applicable. When asked if their home shop had a properly working and accessible fire extinguisher 69.39% stated that they did, 30.61% did not and twenty-four of the teachers did not have a home shop.

Two additional questions were asked to identify if the teachers were prepared for emergencies at their homes. Fifty-one (69.86%) of the 74 respondents stated that they did not have emergency phone numbers posted by all phones while 22 (30.14%) had phone numbers posted. Only ten (13.51%) of the teachers had directions to their home / property posted by phones for emergency use.

In Table 5, data on entry-year teachers age and opinions on age requirements are noted. The researchers were interested in determining the age of responding teachers when they first operated a tractor or piece of agricultural equipment alone. The average age was found to be 11.80 years, the range was from 21 years old to 47 years old with a standard deviation of 6.63. These teachers allow trained drivers with a mean age of 14.87 while they began driving tractors and farm machinery when they were 11.80 years old. Furthermore, teachers felt children should be 11.02 years old to assist when working with livestock.

Table 4. Personal Safety Practices of Entry-Year Texas Agriculture Teachers.

	<u>Yes (%)</u>	<u>No (%)</u>	<u>N</u>	<u>N/A</u>	<u>N</u>
When operating a tractor I wear a seatbelt.	22 (34.92%)	41 (65.08%)	63	11	74
When operating a tractor I make sure PTO shields are in place.	51 (82.26%)	11 (17.74%)	62	8	70
My shop at home has properly working and accessible fire extinguishers.	34 (69.39%)	15 (30.61%)	49	24	73
I have emergency phone numbers posted by all phones.	22 (30.14%)	51 (69.86%)	73	--	73
I have directions to our house / property posted by all phones for use in an emergency.	10 (13.51%)	64 (86.49%)	74	--	74

Table 5. Teacher Safety Information and Opinions on Age

	<u>M</u>	<u>SD</u>	<u>N</u>
How old were you when you first operated a tractor or equipment alone? *	11.80	6.63	73
I allow trained drivers age _____ and older to drive tractors and farm equipment alone. *	14.87	2.15	73
Children must be _____ years old to assist when working with livestock. *	11.02	3.30	73

\*Mean is calculated as years of age.

Additional personal safety practices were evaluated. Respondents always wear appropriate protective equipment while working at a rate of 22.36% and almost always 68.42% of the time. Few teachers rarely (9.21%) and never (1.31%) wear protective equipment. Similarly, these teachers always or almost always followed recommended directions when mixing chemicals. This data is illustrated in Table 6.

Table 6. Personal Safety Practices of Teachers

	<u>Always</u>	<u>Almost Always</u>	<u>Rarely</u>	<u>Never</u>	<u>M</u>	<u>SD</u>	<u>N</u>
While doing agricultural work, I _____ wear the appropriate protective equipment. **	17 (22.36%)	52 (68.42%)	7 (9.21%)	1 (1.31%)	1.90	.60	70
I _____ follow recommended directions when mixing chemicals for application. **	60 (77.92)	17 (22.08%)	0 (0%)	0 (0%)	1.22	.42	77

\*\*Note: 1=Always, 2=Almost Always, 3=Rarely and 4=Never

### Conclusions

The demographic data revealed that females are entering the field of agricultural education in larger numbers than in the past. This data also indicated that teachers with less than one and one-half years of teaching experience are older than traditionally thought. The schools with teachers with less than one and one-half years of experience are spread quite evenly across the state indicating the scope of the state teacher shortage.

In general these teachers have strong personal safety beliefs and safety attitudes. When reviewing the data, nearly all highly agreed or agreed with the safety statements indicating that they have an excellent understanding of what is required in a well-defined safety climate.

It is also obvious that these same teachers who possess an excellent awareness of what is required to have a well-defined safety climate do not follow appropriate personal safety practices. Furthermore, it is interesting to note that these teachers do not always wear appropriate protective equipment when doing agricultural work nor when mixing chemicals. This is indicative of an attitude of “do like I say, not like I do.” As role models for students in agricultural education programs this is an ethical dilemma that cannot be ignored. The researchers’ concern is that the teachers seem to understand the safety concerns but do not follow the safety practices that will protect them from injury.

Basic safety issues such as wearing seatbelts when operating a tractor, posting emergency phone numbers and directions were largely ignored. To a lesser degree these teachers had an acceptable compliance of checking PTO shields when operating a tractor and of having fire extinguishers in their home shop facility. Yet again many of these teachers failed in their ethical and moral obligations by modeling improper safety attitudes and practices.

It is also noteworthy that these respondents recognize the dangers of allowing children to operate tractors and farm equipment. This is indicated by the differences in the age at which they first operated tractors and equipment, compared to the age at which they now allow children to be involved in the same activity.

## Recommendations

Based upon the conclusions and major findings of the research, the following recommendations were made:

1. As a means of improving teachers' awareness of the importance of modeling proper safety attitudes and actions teacher preparation programs should place a much larger emphasis on instilling and enforcing these attitudes and skills on pre-service teachers.
2. Workshops should be organized and offered during the Professional Improvement Conference on safety education including topics concerning modeling safety attitudes and actions.
3. Although no significant differences were found when comparing gender and age groups within the various sections further research is necessary to address the unique concerns of females and older teachers with less than one and one-half years of experience.
4. This study should be repeated annually with similar research identifying safety and health attitudes of all agriculture education teachers and the overall safety environment of agricultural education programs.

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## **Safety And Health Attitudes And Beliefs Of Entry-Year Agriculture Teachers in Texas**

### **A Critique**

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Safety issues have been, and continue to be, of the utmost importance in agricultural education programs. Teaching students about safety issues affords teachers to provide instruction in the affective domain, the domain of learning in which the least amount of instruction typically occurs in our programs. Yet we know that to change one's attitude toward safety issues can be a monumental task. Therefore, agricultural education teachers must accept the responsibility to be a role model for students in promoting safe practices in agricultural education.

This paper is part of a larger study conducted by the authors to assess the knowledge, attitudes, and perceptions of agricultural education teachers regarding agricultural safety issues and curricula. This paper specifically addresses the attitudes and beliefs of agricultural education teachers regarding agricultural safety and health issues. The authors provide a solid background and theoretical framework for the study. I also commend the authors for having a clearly stated purpose and objectives for the study. Descriptive research methods were used to collect data for the study and appropriate analysis procedures were used.

The results of the study proved to be very interesting. It would appear that teachers were honest in their responses regarding safety and health issues. It would also appear that there were discrepancies regarding the information in Table 5. I would be curious to know what the ranges for all were to see how different the teachers thought about these questions.

My question would be to teachers who participated in the study, "If you know that you are not following proper safety procedures 100 percent of the time, then why do you not change your practices yourself?" After all, are teachers not role models for safe practices? If teachers are setting a poor example, then students will practice unsafe practices as well. It makes one wonder where these teachers learned about health and safety issues. I would hope some type of instruction was provided in their undergraduate program.

I encourage the authors to continue their research in this area, but would encourage them to look in other areas than agricultural mechanics or production agriculture, as somewhat indicated in the results. In agriscience programs today, there many more safety practices which must be followed. Agricultural education teachers will have to model these practices as well.