

A STUDY OF THE ROLE OF VOCATIONAL AGRICULTURE
TEACHERS IN ENVIRONMENTAL AWARENESS
IN OKLAHOMA

By

KENNETH DEAN BRINK
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Oklahoma State University

Stillwater, Oklahoma

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Thesis Approved:

Robert R. Price

Thesis Adviser

James P. Key

Earl D. Van Eaton

N. N. Durham

Dean of the Graduate College

891264

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will play a major role in developing public awareness of the efforts that are required in maintaining a livable environment. The wise use of resources will determine man's survival.

Rationale

In many farming communities of Oklahoma, the vocational agriculture teacher is looked to for assistance and guidance concerning modern agricultural practices. It is felt that environmental quality is an educational matter and should be emphasized in vocational agriculture in conjunction with efficiency of production. Agriculture teachers, because of training and experience, have a great deal of expertise in the management of natural resources. This expertise is the nucleus of environmental education and should be designed to meet the agricultural needs of the people they serve.

Usefulness of the Study

This study could assist vocational agriculture teachers in determining their role in environmental awareness and assist in establishing guidelines for incorporating and integrating environmental education subjects into the vocational agriculture curriculum.

Statement of the Problem

There is a pressing need for information regarding the role of the vocational agriculture teacher in environmental awareness in Oklahoma.

CHAPTER I

INTRODUCTION

Need

Man's concern for the effect of his activities on the natural environment is fairly recent with the full implications of the effects remaining very incomplete. Through the years, agriculturists have shown little concern about pollution because of the emphasis on increased production. With population increasing at an accelerated rate, agriculture has become highly organized, specialized and mechanized in an attempt to keep pace with food demands. Intensive crop and livestock production practices have occurred in response to the need for greater production efficiency. As agricultural practices become intensified, the effects on the environment are also intensified. Pressures on environment quality will increase accordingly.

Importance

Recent legislation concerning environmental quality should cause farmers to be more concerned about agricultural practices (Council on Environmental Quality, 1973). The restriction of certain chemicals and requirements for management of waste by-products could result in decreased efficiency and increased costs. New methods and different farm practices may be required to maintain production while satisfying various environmental quality legislation. Environmental education

Purpose of the Study

The major purpose of the study was to determine the role of vocational agriculture teachers in environmental awareness in Oklahoma. To accomplish this purpose, the following objectives had to be attained:

- (1) to determine the attitude of vocational agriculture teachers regarding agricultural pollution,
- (2) to determine what vocational agriculture teachers are teaching about pollution in agriculture, and
- (3) to determine what teachers feel they should teach about pollution in agriculture.

Assumptions Basic to the Study

For the purpose of this study, the following assumptions were accepted by the investigator:

- (1) that departments selected for the study were representative of the other departments in the respective supervisory districts of Oklahoma,
- (2) that vocational agriculture teachers could provide evaluations of environmental quality and environmental education in their local areas,
- (3) that the attitudes expressed by the teachers were honest expressions of their opinions.

Limitations of the Study

Implications of the study may not be applicable to some vocational agriculture departments because of the farming practices within their

geographical location and the random selection of respondents from each of the five supervisory districts of vocational agriculture in Oklahoma.

Definitions

The following definitions of terms are furnished to provide concise meanings of terms as used in this study.

- (1) Environmental Education is education for living effectively in a livable environment. It is the educational process dealing with man's relationship with his natural and man-made surroundings. Includes the relation of population, pollution, resource allocation and depletion, conservation, transportation, technology, and urban and rural planning to the total human environment. (United States Congress, 1971, 1312).
- (2) Environmental Pollution refers to an unfavorable alteration of surroundings as a by-product of man's actions through direct or indirect effects of changes in energy patterns, radiation levels, chemical and physical constitution, and abundances of organisms. (President's Science Advisory Committee, 1965).
- (3) Environmental Quality Legislation refers to federal or state laws restricting the use of certain practices or materials in order to improve or maintain the environment.
- (4) Farm Practices are methods of farming to achieve the greatest production efficiency at the least cost in order to maximize profits.
- (5) Livable Environment is a geographic surrounding in which all

matter lives in complete harmony, and if that environment has been modified by man, then care should be taken to satisfactory balance those factors which maintain or improve on the quality of the living conditions in the area.

Scope of the Study

This study consisted of a stratified random sample of vocational agriculture teachers located in the five supervisory districts of vocational agriculture in Oklahoma.

CHAPTER II

REVIEW OF LITERATURE

Awareness

Rachel Carson's (1962) book, "Silent Spring," dramatically focused public attention on the poisoning of entire food chains by agriculturalists. Since then, countless words have been written and spoken concerning the pros and cons of the effects of pollution on environmental quality. Man has deliberately disturbed the balance of nature by altering his ecosystems in keeping pace with a sharply rising population curve and the inability to move on to virgin and unspoiled areas. Although the natural ecological systems can absorb many of the effluents of human activity and reprocess them into substances that are usable, or at least harmless, there is a period in time when the natural absorptive mechanisms become saturated and civilizations could collapse.

Limiting Factor

Rapid growth in population and production may not continue indefinitely on a finite earth without encountering certain limits to growth. According to Meadows (1972), the controlling limit is uncertain as to whether it will be food production, natural resources, environmental pollution, or something else. Regardless of the limiting factor, control of one factor has an impact on others and emphasizes

the importance and interrelationship of all disciplines associated with environmental quality. Ivany (1972) supported the multidisciplinary approach and indicated that teachers of all subjects should share the responsibility of providing opportunities to solve ecological problems. Education appears to hold the key for determining the wise use of resources in maintaining the environment and improving the quality of life.

Agricultural Pollution

The specific role of agriculture in the over-all environmental quality picture is relatively unknown in comparison to contributions from industrial and domestic sources. Because agriculture requires the use of fertilizers and chemicals, emotion-charged speeches and literature sometimes give the impression that farmers indiscriminately pollute the environment. In 1970, some of the agricultural environmental problem areas involving animal waste disposal, reliance on pesticides, effect of fertilizers, soil erosion, and expansion of agriculture production were identified by Bentley (1972) as requiring research. He indicated that educators should play the major role in stressing the values and necessity of environmental quality.

Turk (1972) and Hodges (1973) presented excellent discussions of the major types of environmental pollution and their effects on man and the environment. The effects of pollution on agriculture as well as some of the environmental problems caused by agriculture are discussed in detail.

Environmental Education

The need for interdisciplinary education to cope with the inter-related nature of the environment was reiterated by the Council on Environmental Quality in its first annual report (1970). The report recognized that environmental education is the key in developing an understanding of how the natural world works, how man is changing it, how economic system and political institutions influence reactions within the environment, and how personal values can be changed to make people willing to control pollution. Upon passage of the Environmental Education Act in 1970, (U. S. Congress, 1971) a new role for education has emerged. This act, called Public Law 91-516, affects the entire continuum of American education and is a design for reform to enhance environmental quality and maintain ecological balance. Full implementation of the act should improve philosophies of life and help citizens acquire new and more viable life styles. Marland (1971) explained the act and emphasized that the objective is to bring environmental education concepts into every aspect of learning.

Challenges of Education

The challenges of environmental education presented by Wagar (1970) outlined the importance of changing basic cultural values in seeking something more than merely surviving environmental disaster. This "something more" is being recognized by many colleges as well as various secondary and elementary schools. Examples of what certain schools are doing about environmental education were described by

Weidner (1970) and others. This education has added an environmental component to each major curriculum area without replacing other subject disciplines (Vivian and Henderson, 1971). A survey of environmental education programs conducted by the National Education Association (1970) revealed that most programs are aimed at giving students an appreciation of nature and a general awareness of the relationship of man to his environment. Increased efforts are needed to expand environmental awareness through public education.

Involvement by Agriculturalists

A new educational program called "The World of Agricology" was described by Caserta (1971) as being under consideration for implementation in the Washoe County School District of Nevada. This program merged the subjects of agriculture and ecology in an out-of-doors setting that was designed to focus attention on the natural world and its related fields of agriculture. It was anticipated that the finalized program will put additional educational and agricultural college students in the classroom as student teachers, instructional aids, resource persons, and outdoor supervisors.

In Oklahoma, district conservationists in cooperation with the Soil Conservation Service have been assisting elementary schools by providing teachers with informational materials and suggestions on where additional materials on environmental controls can be obtained (Stillwater News-Press, 1973). However, very little is written concerning the specific role of the vocational agriculture teacher in environmental awareness. The expected role of the vocational agriculture teacher will play a major part in determining what they do or should do.

Potential Role for Agriculture Teachers

An exploratory analysis of the role and role conflicts of vocational teachers in Oklahoma was researched by Sutker, Egermeier, and Twyman (1967). Generally, vocational agriculture teachers possessed a high degree of satisfaction in their role but the potential for role conflict appeared to be increasing. One of the conclusions to reduce the potential for role conflict was for agriculture teachers to get involved in subjects within the school system other than vocational agriculture. The vocational agriculture teacher is viewed as an authority figure in small communities but the importance of the position may be lessening within the school system because of pressures to meet the goals of work-oriented groups and the increasing urbanization of Oklahoma.

Certain roles can be influenced greatly by peers according to Forrest (1970) by a survey asking seven groups of respondents whether vocational agriculture teachers should or should not engage in various activities. An implication of the study was that certain roles will have a higher probability of succeeding if local teachers and administrators feel that the role is appropriate. Changes in expectations at the local level may dictate what the agriculture teacher's future role will be. Zubler (1972) recognized the responsibility of vocational agriculture teachers to assist in designing continuing resource education programs for participation by all students. Besides working closely with other teachers in planning and organizing environmental activities, the vocational agriculture teacher in Penns Valley Area High School of Pennsylvania teaches an elective course in environmental education for twelfth grade students. This is

one example of the role of the vocational agriculture teacher in environmental awareness.

Overview

Environmental awareness appears to be a problem of education involving all disciplines of the educational field. Efforts should begin now to achieve a greater balance between nature and human environments before limiting factors for growth are reached. Present environmental education programs are oriented towards nature studies and the relationship of man to his environment. Opportunities for agriculturalists to participate in environmental education are available and should be further developed for complete involvement. The specific role of the vocational agriculture teacher is vague but the potential role can be influenced for increasing environmental awareness.

CHAPTER III

PROCEDURES

Introduction

The major purpose of this study was to determine the role of vocational agriculture teachers in environmental awareness in Oklahoma. To accomplish this purpose, the following objective had to be attained:

- (1) to determine the attitude of vocational agriculture teachers regarding agricultural pollution,
- (2) to determine what vocational agriculture teachers are teaching about pollution in agriculture, and
- (3) to determine what teachers feel they should teach about pollution in agriculture.

The purpose of this chapter is to describe the design of the study, including selection of the population, development of the instrument used to collect data, and the method of data collection.

Design

It was determined from the review of literature that the role of the vocational agriculture teacher in environmental education is relatively unknown. An opinion-type questionnaire was developed to randomly survey the feelings and attitudes of vocational agriculture teachers in Oklahoma about pollution and efforts to improve the environment in their local areas. Questions were developed to determine what

vocational agriculture teachers feel, what they are teaching, and what they feel they should teach about pollution in agriculture. The results of the survey were compiled and analyzed to determine the role of the teacher in environmental awareness.

Population

According to the latest roster provided by the Oklahoma State University Agriculture Education Department, Oklahoma has four hundred and fifty-five agriculture teachers teaching in three hundred and fifty-five schools organized into five supervisory districts. The population sample for this study was one hundred vocational agriculture teachers who were teaching in the school year 1973-74. Twenty teachers were selected by random from each of the five supervisory districts by an unbiased person.

Instrument

The instrument used in this study is a closed-type questionnaire asking for opinions from vocational agriculture teachers about their local area. The questionnaire is a researcher-made instrument and was pilot tested prior to mailing. Questions were developed to obtain opinions that have a bearing on the respondent's attitude regarding environmental awareness to include what is being taught and what should be taught in the sampled high schools.

Collection of Data

Teachers randomly selected were mailed a cover letter explaining the purpose of the questionnaire and a copy of the complete instrument.

They were asked to complete the questionnaire and to return it in a stamped, self-addressed envelope at their earliest convenience. A follow-up postcard was sent three weeks after the initial mailing of the forms to encourage maximum returns.

CHAPTER IV

PRESENTATION AND ANALYSIS OF THE DATA

Introduction

The major purpose of the study was to determine the role of vocational agriculture teachers in environmental awareness in Oklahoma. To accomplish this purpose, the following objectives had to be attained: (1) to determine the attitude of vocational agriculture teachers regarding agricultural pollution, (2) to determine what vocational agriculture teachers are teaching about pollution in agriculture, and (3) to determine what teachers feel they should teach about pollution in agriculture. Findings relative to the objectives of the study are presented in this chapter.

The data presented in this chapter was gathered from ninety-two vocational agriculture teachers selected at random from each of the five supervisory districts in Oklahoma. Questionnaires were mailed to one-hundred vocational agriculture teachers who were teaching during the 1973-74 school year. From the one-hundred teachers who were sent questionnaires, ninety-two percent responded with the distribution by district as shown in Table I.

Grouping of Questions by Objectives

The items on the questionnaire were grouped under each objective. The criterion for grouping was whether or not the data furnished by

TABLE I
COMPARISON OF NUMBER AND PERCENTAGE OF RESPONSES
BY SUPERVISORY DISTRICT

| NORTHWEST | NORTHEAST | CENTRAL | SOUTHWEST | SOUTHEAST | STATE |
|-----------|-----------|---------|-----------|-----------|--------|
| 95% | 85% | 100% | 100% | 80% | 92% |
| (N=19) | (N=17) | (N=20) | (N=20) | (N=16) | (N=92) |

the item was pertinent to the objective under consideration.

Questions grouped under objective I, "to determine the attitudes of vocational agriculture teachers regarding agricultural pollution," are as follows:

7. Do you feel there is a problem of agriculture pollution in your community?

8. Do you feel the majority of the farmers are more interested in the efficiency of production than they are in environmental quality?

9. Do farmers in your area practice methods to improve environmental quality in their farming?

10. If question 9 is yes, approximately how many farmers practice improvement methods?

11. Do you discuss methods to improve environmental quality with farmers in your area?

12. If question 11 is yes, do farmers initiate the discussion?

19. What effect has environmental quality legislation had on production in your community?

22. Do you feel environmental education (other than vocational

agriculture subjects) should be taught in high school?

23. If question 22 is yes, how should environmental education subjects be taught?

24. Would you volunteer to teach a class in environmental education if such a class was included in the curriculum as an elective subject and approved by the State Department of Vocational Agriculture?

25. If environmental education is included in the curriculum as a separate subject, who do you feel should be the primary instructor for the subject?

Questions grouped under objective II, "to determine what vocational agriculture teachers are teaching about pollution in agriculture," are as follows:

13. Did your department teach or plan to teach any classes for adults or young farmer groups during the 1973-74 academic year?

14. If question 13 is yes, were subjects involving environmental pollution included?

15. Do you teach methods to improve environmental quality in conjunction with your regular vocational agriculture subjects?

16. Do you teach environmental quality as a separate subject in vocational agriculture classes?

17. Do you teach any classes not considered to be vocational agriculture classes?

18. What subjects do you teach in vocational agriculture concerning pollution in agriculture?

Questions grouped under objective III, "to determine what teachers feel they should teach about pollution in agriculture," are as follows:

26. What subjects do you feel should be taught in vocational agriculture concerning agricultural pollution?

27. What do you feel that you need to be able to effectively teach a class in environmental education?

The following questions are not grouped under a specific objective but have a bearing on the overall problem in determining the role of vocational agriculture teachers in environmental awareness.

6. Concerning your relationship with other teachers in your school during the school day, do you feel that you have insufficient, sufficient, or too much opportunity to be in contact with them?

20. Is environmental education taught in your high school?

21. Do other teachers coordinate with you or ask you for your assistance concerning the use of natural resources or environmental quality?

Determining Attitudes

In determining the attitudes of vocational agriculture teachers toward agricultural pollution, it was first necessary to determine if an agriculture pollution problem exists in Oklahoma. The data presented in Table II indicates that 81.5% of the agriculture teachers surveyed did not recognize agriculture pollution to be a problem in their communities. Those teachers answering in the affirmative indicated that the problem of agriculture pollution resulted from erosion, animal waste disposal, and insecticide misuse. The problem of agricultural pollution appears to be less evident in the southern portion of the state.

The farm practices within each community can influence the

TABLE II
 COMPARISON OF NUMBER AND PERCENTAGE RESPONSES RECOGNIZING
 THE PROBLEM OF AGRICULTURE POLLUTION
 BY SUPERVISORY DISTRICT

| POLLUTION PROBLEM | NW | NE | C | SW | SE | STATE |
|-------------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Exists | 21.1 (N=4) | 29.4 (N=5) | 20.0 (N=4) | 15.0 (N=3) | 6.2 (N=1) | 18.5 (N=17) |
| Not Recognized | 78.9 (N=15) | 70.6 (N=12) | 80.0 (N=16) | 85.0 (N=17) | 93.8 (N=15) | 81.5 (N=75) |

attitudes of the people living and working in the area. Referring to the findings shown in Table III, responses reveal that teachers recognize only 21.7% of the farmers are interested in environmental quality while the majority (78.3%) are more interested in efficiency of production. It was further stated by the teachers that 63.0% of the farmers are actually practicing some form of environmental improvement in their farming methods. The type of farm practice methods mentioned most by respondents to improve environmental quality dealt with soil conservation, animal waste disposal, use of pesticides, and control of excessive water run-off. It appears that certain environmental improvement methods could enhance or complement various aspects of production efficiency.

Vocational agriculture teachers in the southeast supervisory district indicate that they discuss methods to improve the environment

with farmers more often than do teachers in the other districts. Data presented in Table IV show that the percentages ranged from 42.1% in the northwest to 75% in the southeast. Overall, teachers initiated the discussions on environmental quality less than half (41.8%) of the time with the southeast district teachers again recording the higher percentages of responses. These findings indicate that vocational agriculture teachers are probably less interested in methods to improve environmental quality than farmers are.

TABLE III

COMPARISON OF NUMBER AND PERCENTAGE RESPONSES INDICATING FARMERS' INTEREST IN ENVIRONMENTAL QUALITY AND THOSE PRACTICING IMPROVEMENT METHODS BY SUPERVISORY DISTRICT

| RECOGNITION BY TEACHERS | NW | NE | C | SW | SE | STATE |
|---|----------------|----------------|----------------|----------------|----------------|----------------|
| Farmers Interest in: | | | | | | |
| Efficiency | 78.9 (N=15) | 70.6 (N=12) | 80.0 (N=16) | 85.0 (N=17) | 75.0 (N=12) | 78.3 (N=72) |
| Environmental Quality | 21.1 (N=4) | 29.4 (N=5) | 20.0 (N=3) | 15.0 (N=4) | 25.0 (N=4) | 21.7 (N=20) |
| Improvement Methods Practiced by Farmers | 84.2 (N=16) | 64.7 (N=11) | 50.0 (N=10) | 65.0 (N=13) | 50.0 (N=8) | 63.0 (N=58) |

TABLE IV
 COMPARISON OF NUMBER AND PERCENTAGE OF TEACHERS DISCUSSING
 METHODS TO IMPROVE ENVIRONMENTAL QUALITY
 WITH FARMERS BY SUPERVISORY DISTRICT

| DISCUSSION BY TEACHERS | NW | NE | C | SW | SE | STATE |
|---|---------------|----------------|----------------|----------------|----------------|----------------|
| Environmental Quality Discussed: | 42.1 (N=8) | 58.8 (N=10) | 70.0 (N=14) | 55.0 (N=11) | 75.0 (N=12) | 59.8 (N=55) |
| Discussion Initiated by Agriculture Teachers: | 25.0 (N=2) | 40.0 (N=4) | 35.7 (N=5) | 36.4 (N=4) | 66.7 (N=8) | 41.8 (N=23) |

Analyzing the data presented in Table V show that 84.4% of the vocational agriculture teachers surveyed feel that environmental education should be taught in high school. Also, 86.8% of these teachers indicate that they feel that environmental education subjects should be incorporated within regular subjects rather than being taught as separate subjects. Teachers in the northwest and northeast districts recorded a greater number of responses against teaching environmental education than teachers in other districts.

When vocational agriculture teachers were asked if they would volunteer to teach a class in environmental education if such a class was included in the curriculum as an elective subject and approved by the State Department of Vocational Agriculture, they responded with the findings as summarized in Table VI. With the exception of the

TABLE V

COMPARISON OF PERCENTAGE AND NUMBER OF RESPONSES INDICATING
THE FEELINGS OF VOCATIONAL AGRICULTURE TEACHERS ABOUT
ENVIRONMENTAL EDUCATION BY SUPERVISORY DISTRICT

| ENVIRONMENTAL EDUCATION | NW | NE | C | SW | SE | STATE |
|---------------------------------------|--------|--------|--------|--------|--------|--------|
| Should be taught: | 84.2 | 62.5 | 95.0 | 89.5 | 87.5 | 84.4 |
| | (N=16) | (N=10) | (N=19) | (N=17) | (N=14) | (N=76) |
| Taught as separate subjects: | 6.3 | 10.0 | 10.5 | 29.4 | 7.1 | 13.2 |
| | (N=1) | (N=1) | (N=2) | (N=5) | (N=1) | (N=10) |
| Incorporated within regular subjects: | 93.7 | 90.0 | 89.6 | 70.6 | 97.9 | 86.8 |
| | (N=15) | (N=9) | (N=17) | (N=12) | (N=13) | (N=66) |

TABLE VI

SUMMARY OF PERCENTAGE AND NUMBER OF VOCATIONAL AGRICULTURE TEACHERS
VOLUNTEERING TO TEACH AN ELECTIVE SUBJECT IN ENVIRONMENTAL
EDUCATION BY SUPERVISORY DISTRICT

| TEACH ELECTIVE | NW | NE | C | SW | SE | STATE |
|----------------|--------|--------|--------|--------|-------|--------|
| Yes | 36.8 | 29.4 | 55.0 | 30.0 | 50.0 | 40.2 |
| | (N=7) | (N=5) | (N=11) | (N=6) | (N=8) | (N=37) |
| No | 63.2 | 70.6 | 45.0 | 70.0 | 50.0 | 59.8 |
| | (N=12) | (N=12) | (N=9) | (N=14) | (N=8) | (N=55) |

central and southeast districts, most of the respondents answered in the negative. Some of the comments associated with these answers had to do with "too busy," "not enough time," and "too large a load." One comment rejected the term "volunteer" but would teach the elective class if directed to.

Most of the vocational agriculture teachers (64.1%) feel that the primary instructor for environmental education subjects should be the science teacher. Referring to the findings shown in Table VII, only 22.8% of the teachers feel the subject should be taught by the vocational agriculture instructor. Teachers in the northeast, central, and southwest districts tended to favor the agriculture teacher as the primary instructor more so than the other respondents from the remaining districts. Five respondents, listed as "other," feel that this type of class should be taught by an instructor specializing in environmental science.

The last question asked to assist in determining attitudes of vocational agriculture teachers toward agricultural pollution was the effect of environmental quality legislation on production in the various communities.

Data presented in Table VIII depict the rank order by importance of the effect of environmental legislation as seen by the vocational agriculture teacher. The ordering was determined by dividing the number of responses into the sum of the rank order for each effect. Responses that were marked other than by ordinal data were treated as equal in importance for each effect indicated. The data partially confirms the data presented in Table II concerning the problem of agricultural pollution in Oklahoma but it does point out the fact that

TABLE VII

COMPARISON OF PERCENTAGE AND NUMBER OF RESPONSES INDICATING
 VOCATIONAL AGRICULTURE TEACHERS' FEELINGS CONCERNING
 THE PRIMARY INSTRUCTOR FOR ENVIRONMENTAL EDUCATION
 SUBJECTS BY SUPERVISORY DISTRICT

| PRIMARY INSTRUCTOR | NW | NE | C | SW | SE | STATE |
|------------------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Vocational Agriculture | 15.8 (N=3) | 29.4 (N=5) | 20.0 (N=4) | 30.0 (N=6) | 18.8 (N=3) | 22.8 (N=21) |
| Social Studies | 5.3 (N=1) | 5.9 (N=1) | 10.0 (N=2) | 10.0 (N=2) | 6.2 (N=1) | 7.6 (N=7) |
| Science | 78.9 (N=15) | 58.8 (N=10) | 60.0 (N=12) | 55.0 (N=11) | 68.8 (N=11) | 64.1 (N=59) |
| Other | --- --- | 5.9 (N=1) | 10.0 (N=2) | 5.0 (N=1) | 6.2 (N=1) | 5.5 (N=5) |

TABLE VIII

RANK ORDER BY IMPORTANCE OF THE EFFECT OF ENVIRONMENTAL
 LEGISLATION ON PRODUCTION BY SUPERVISORY DISTRICT

| EFFECT | NW | NE | C | SW | SE | STATE |
|--|----|----|---|----|----|-------|
| No appreciable effect | 2 | 1 | 1 | 1 | 1 | 1 |
| Farmer's production costs increased | 1 | 2 | 4 | 2 | 3 | 2 |

TABLE VIII (CONTINUED)

| EFFECT | NW | NE | C | SW | SE | STATE |
|---|----|----|---|----|----|-------|
| Farmer's changed certain farm practices | 3 | 4 | 3 | 4 | 2 | 3 |
| Changed attitudes regarding environmental awareness | 5 | 3 | 2 | 3 | 5 | 4 |
| Reduction in yield | 4 | 6 | 5 | 4 | 5 | 5 |
| Feedlot owners reduced | 6 | 5 | 6 | 5 | 6 | 6 |

strong environmental legislation would probably lead to changes in farm practices and tend to increase environmental awareness.

Determining What is Taught

In determining what is being taught about pollution in agriculture, respondents were asked questions concerning adult or young farmer groups as well as their regular vocational agriculture classes. The findings shown in Table IX represent a summary of vocational agriculture departments teaching or planning to teach adult or young farmer classes by supervisory districts and whether or not environmental pollution subjects were presented. Of the 84.8% departments conducting adult

classes, only 26.9% included subjects involving environmental pollution during the 1973-74 academic year. Respondents from the central district recorded the highest percentage of classes involving environmental pollution.

TABLE IX

SUMMARY OF PERCENTAGE AND NUMBER OF VOCATIONAL AGRICULTURE DEPARTMENTS TEACHING OR PLANNING TO TEACH ADULT OR YOUNG FARMER CLASSES DURING 1973-74 ACADEMIC YEAR BY SUPERVISORY DISTRICT

| ADULT OR YOUNG FARMER CLASSES | NW | NE | C | SW | SE | STATE |
|---|--------|--------|--------|--------|--------|--------|
| Being conducted: | 78.9 | 88.2 | 90.0 | 80.0 | 87.5 | 84.8 |
| | (N=15) | (N=15) | (N=18) | (N=16) | (N=14) | (N=78) |
| Subjects involving environmental pollution: | 26.7 | 20.0 | 38.9 | 25.0 | 21.4 | 26.9 |
| | (N=4) | (N=3) | (N=7) | (N=4) | (N=3) | (N=21) |

A fairly high percentage (82.6%) of the vocational agriculture departments teach methods to improve environmental quality in conjunction with their regular agriculture subjects as reflected by the data in Table X. The findings in this table also show that only 8.7% of the departments teach environmental quality as a separate subject. When teachers were asked if they taught any other classes not considered to be vocational agriculture classes, only three teachers in the north-

west district responded in the affirmative. Classes involved were health counseling and everyday living. Teachers in the southwest and southeast districts responded more in the affirmative in teaching environmental quality than the teachers in the other districts.

Findings presented in Table XI is the rank order by importance of subjects taught in vocational agriculture concerning agricultural pollution as determined by responses of teachers surveyed. The most important subject rated by all teachers was the effects of soil erosion and sediments on the environment. Only two respondents indicated that none of the subjects were taught in their departments. The ordering of importance of the subjects taught was determined by dividing the number of responses into the sum of the rank order for each subject. Responses that were marked other than by ordinal data were treated as equal in importance for each subject indicated.

TABLE X

SUMMARY OF PERCENTAGE AND NUMBER OF VOCATIONAL AGRICULTURE DEPARTMENTS TEACHING ENVIRONMENTAL QUALITY IN CONJUNCTION WITH AGRICULTURE SUBJECTS BY SUPERVISORY DISTRICT

| DEPARTMENTS TEACHING ENVIRONMENTAL QUALITY | NW | NE | C | SW | SE | STATE |
|--|----------------|----------------|----------------|----------------|----------------|----------------|
| Taught in conjunction with agriculture subjects: | 78.9 (N=15) | 82.3 (N=14) | 75.0 (N=15) | 90.0 (N=18) | 87.5 (N=14) | 82.6 (N=76) |
| Taught as separate subjects | 15.8 (N=3) | --- | 15.0 (N=3) | 5.3 (N=1) | 6.7 (N=1) | 8.7 (N=8) |

TABLE XI
RANK ORDER BY IMPORTANCE OF SUBJECTS TAUGHT IN VOCATIONAL
AGRICULTURE CONCERNING POLLUTION IN AGRICULTURE IN
SUPERVISORY DISTRICT

| SUBJECTS | NW | NE | C | SW | SE | STATE |
|--|-----|-----|---|----|-----|-------|
| Effect of soil erosion and sediments on the environment | 1 | 1 | 1 | 1 | 1 | 1 |
| Effects of pesticides on pests, wildlife, and humans | 3 | 2 | 2 | 2 | 3 | 2 |
| Effects and proper disposal of farm animal wastes | 2 | 4 | 3 | 4 | 2 | 3 |
| Effects of commercial fertilizers on air and water pollution | 5 | 3 | 4 | 3 | 4 | 4 |
| Effects of burning plant residues on the atmosphere | 4 | 5 | 5 | 5 | 5 | 5 |
| Alternative methods of pest control | 6 | 6 | 6 | 6 | 6 | 6 |
| None | --- | --- | 7 | 7 | --- | 7 |

Determining What Should be Taught

Findings exhibited in Table XII indicate that the overall ranking by importance of subjects that teachers feel should be taught in vocational agriculture concerning agricultural pollution is the same as the rank order by importance of the subjects being taught. The rank order of subjects within each supervisory district differs only slightly between Tables XI and XII except in the northeast and central

districts which are ranked identically. In general, teachers are teaching the same subjects they feel they should teach about pollution. It is interesting to note that two teachers feel that none of these subjects should be taught, but these two teachers are from different districts than the two who previously indicated that none of the subjects are presently taught in their departments.

With reference to Tables V and VI concerning environmental education, respondents were asked what they feel they need to be able to effectively teach a class in environmental education. The data depicted in Table XIII indicate that teachers feel college courses in environmental science, additional literature and physical materials are the most important items needed prior to teaching environmental education classes. The ordering of importance of the subjects that should be taught (Table XII) and what teachers feel they need to effectively teach a class in environmental education (Table XIII) was determined by dividing the number of responses into the sum of the rank order for each element. Responses that were marked other than by ordinal data were treated as equal in importance for each item indicated.

Role Conflicts

Information related to the overall role of the vocational agriculture teacher in environmental awareness, but not necessarily related to a specific objective, is summarized by the data appearing in Tables XIV and XV. Vocational agriculture teachers were asked to indicate whether they felt the extent of their contact with other teachers at their school was sufficient, insufficient, or too much

during the school day. Findings presented in Table XIV indicate that 82.6% of all respondents felt they had sufficient contact with other teachers in their schools. However, teachers in the northwest and northeast districts tended to be more satisfied with the extent of their contact with other teachers than were the teachers in the other districts. Only one teacher in the central district indicated he felt he had too much opportunity to be in contact with other teachers.

TABLE XII

RANK ORDER BY IMPORTANCE OF SUBJECTS TEACHERS FEEL SHOULD BE TAUGHT
IN VOCATIONAL AGRICULTURE CONCERNING AGRICULTURAL
POLLUTION BY SUPERVISORY DISTRICT

| SUBJECTS | NW | NE | C | SW | SE | STATE |
|--|----|----|-----|-----|-----|-------|
| Effects of soil erosion and sediments on the environment | 1 | 1 | 1 | 1 | 1 | 1 |
| Effects of pesticides on pests, wildlife, and humans | 2 | 2 | 2 | 2 | 2 | 2 |
| Effects and proper disposal of farm animal wastes | 3 | 4 | 3 | 4 | 3 | 3 |
| Effects of commercial fertilizers on air and water pollution | 4 | 3 | 4 | 3 | 4 | 4 |
| Effects of burning plant residues on the atmosphere | 5 | 5 | 5 | 6 | 5 | 5 |
| Alternative methods of pest control | 6 | 6 | 6 | 5 | 6 | 6 |
| None | 7 | 7 | --- | --- | --- | 7 |

TABLE XIII

RANK ORDER BY IMPORTANCE OF WHAT TEACHERS FEEL THEY NEED TO BE
ABLE TO EFFECTIVELY TEACH A CLASS IN ENVIRONMENTAL
EDUCATION BY SUPERVISORY DISTRICT

| ITEMS NEEDED | NW | NE | C | SW | SE | STATE |
|---|----|----|---|----|----|-------|
| College courses in environmental science | 2 | 1 | 1 | 1 | 3 | 1 |
| Additional literature | 1 | 2 | 3 | 2 | 1 | 2 |
| Physical materials | 3 | 4 | 2 | 3 | 4 | 3 |
| Guidance from the state department | 4 | 3 | 4 | 4 | 2 | 4 |
| Support from local teachers and administrators | 5 | 6 | 6 | 6 | 7 | 5 |
| Support from local people in community | 6 | 5 | 5 | 7 | 6 | 6 |
| Nothing | 7 | 7 | 7 | 5 | 5 | 7 |

In a companion question, vocational agriculture teachers were asked if environmental education was taught in their high schools. As summarized by the data in Table XV, only 28.3% of the teachers responded that subjects dealing with living in the environment were taught. Also only 20.7% of the vocational agriculture teachers indicated that other teachers coordinated or asked them for assistance concerning the use of natural resources or environmental quality. It appears that only the teachers in the northwest and southwest districts were fully utilized as resource personnel for assistance in environmental education classes.

TABLE XIV

SUMMARY OF PERCENTAGE AND NUMBER OF RESPONSES INDICATING
ADEQUACY OF CONTACT BY VOCATIONAL AGRICULTURE TEACHERS
WITH OTHER TEACHERS DURING THE SCHOOL DAY
BY SUPERVISORY DISTRICT

| EXTENT OF CONTACT | NW | NE | C | SW | SE | STATE |
|--------------------------|--------|--------|--------|--------|--------|--------|
| Insufficient Opportunity | 10.5 | 5.9 | 20.0 | 25.0 | 18.7 | 16.3 |
| | (N=2) | (N=1) | (N=4) | (N=5) | (N=3) | (N=15) |
| Sufficient Opportunity | 89.5 | 94.1 | 75.0 | 75.0 | 81.3 | 82.6 |
| | (N=17) | (N=16) | (N=15) | (N=15) | (N=13) | (N=76) |
| Too Much Opportunity | --- | --- | 5.0 | --- | --- | 1.1 |
| | --- | --- | (N=1) | --- | --- | (N=1) |

TABLE XV

SUMMARY OF PERCENTAGE AND NUMBER OF HIGH SCHOOLS TEACHING
ENVIRONMENTAL EDUCATION AND AMOUNT OF COORDINATION BY
OTHER TEACHERS CONCERNING USE OF NATURAL RESOURCES
OR ENVIRONMENTAL QUALITY BY SUPERVISORY DISTRICT

| | NW | NE | C | SW | SE | STATE |
|--|-------|-------|-------|-------|-------|--------|
| Environmental Education Taught | 21.1 | 29.4 | 40.0 | 25.0 | 25.0 | 28.3 |
| | (N=4) | (N=5) | (N=8) | (N=5) | (N=4) | (N=26) |
| Coordination or Assistance Asked for by Other Teachers | 21.1 | 23.5 | 20.0 | 25.0 | 12.5 | 20.7 |
| | (N=4) | (N=4) | (N=4) | (N=5) | (N=2) | (N=19) |

Additional Comments

Following are some interesting comments about environmental awareness as expressed by vocational agriculture teachers responding to the opinion questionnaire:

"I am dead set against the environmentalist movement. I think it has been taken over by a bunch of wild-eyed dreamers that know nothing of the problems of farming and think more of a wild duck than a baby calf."

"Sometimes I wish I had some good defense material for teaching purposes when the agriculture department is blamed for pollution."

"We need strong legislative action on oil pollution. Oil companies have the advantage in field production."

"I strongly agree with environmental protection but it is definitely a two way street."

"I feel that the news media has over emphasized environmental problems to the extent that it has become a political football that has cost the average citizen thousands of dollars."

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

The major purpose of the study was to determine the role of vocational agriculture teachers in environmental awareness in Oklahoma. To accomplish this purpose, the following objectives had to be attained: (1) to determine the attitude of vocational agriculture teachers regarding agricultural pollution, (2) to determine what vocational agriculture teachers are teaching about pollution in agriculture, and (3) to determine what teachers feel they should teach about pollution in agriculture.

Data was collected by the use of a mailed questionnaire that was sent to twenty vocational agriculture teachers selected at random from each of the five supervisory districts. The instrument used consisted of information data to supply teacher information and closed-type questions to obtain teacher's opinions toward environmental awareness. A 92 percent return was received on the questionnaire.

Summary of Findings

The following is a summary of the findings based on the objectives of the study:

1. Teachers feel that the problem of agriculture pollution in Oklahoma is minor at the present time.

2. Teachers indicate that farmers are more interested in production efficiency than environmental quality, however, farmers practice environmental improvement in their farming methods.

3. Vocational agriculture teachers discuss environmental quality with farmers but generally the discussion concerning environmental quality is initiated by farmers.

4. Teachers concur that environmental education should be taught in high schools incorporated within regular subjects.

5. Most agriculture teachers are hesitant in volunteering to teach an elective subject in environmental education.

6. Teachers agreed that the primary instructor for environmental education subjects should be the science teacher in high schools.

7. Teachers generally agree that environmental legislation could increase environmental awareness.

8. Agriculture teachers could increase environmental awareness by including additional subjects involving environmental pollution in adult and young farmer classes.

9. Vocational agriculture teachers teach methods to improve environmental quality in conjunction with their regular agriculture subjects to high school students.

10. Teachers agreed that the rank order by importance of subjects concerning agricultural pollution being taught is also the rank order of importance for the subjects that should be taught in vocational agriculture.

11. Teachers concur that college courses in environmental science and additional literature are the most important items needed by

teachers prior to teaching environmental education classes.

12. Vocational agriculture teachers are not fully utilized as resource personnel for assistance in environmental education classes.

Conclusions

Using the analysis of data collected in this study, certain conclusions can be presented indicating the role of the vocational agriculture teachers in environmental awareness in Oklahoma. The investigator feels he is justified in concluding the following:

1. That, in Oklahoma, teachers of vocational agriculture do not perceive that there exists presently a major problem of pollution which could be charged against agriculture.

2. That farmers practice environmental improvement in their farming methods but are mostly interested in production efficiency.

3. That teachers discuss environmental quality with farmers but do not generally initiate the discussion.

4. That vocational agriculture teachers feel that environmental education should be taught in Oklahoma high schools, but do not agree as to the nature and extent of such needed education.

5. That vocational agriculture teachers are reluctant to volunteer to teach elective subjects in environmental education without encouragement from supervisors and administrators.

6. That the teachers of vocational agriculture feel the instructor for environmental education should primarily be the science teacher in Oklahoma high schools.

7. That appropriate environmental legislation could definitely bring about an increase in environmental awareness.

8. That environmental awareness could be increased among teachers and farmers by including additional subjects involving environmental pollution in adult and young farmer classes.

9. That to some degree vocational agriculture teachers are effectively teaching methods for improving environmental quality in conjunction with their regular high school agriculture subjects.

10. That teachers are currently teaching the subject matter most basically concerned with agricultural pollution which, in their judgment, should be taught in vocational agriculture.

11. That the teachers feel the most important items needed by teachers to teach environmental education classes are college courses in environmental science as well as supplementary literature recently published.

12. That vocational agriculture teachers are not fully utilized as resource personnel for assistance in environmental education classes.

Recommendations

After completing this study, the write feels that the following recommendations should be made:

1. Environmental education should be stressed in Oklahoma schools curricula in order to insure environmental awareness of all students.

2. Vocational agriculture teachers should take the initiative in environmental education as a method to become involved with other than vocational agriculture students.

3. Vocational agriculture teachers should be fully utilized as

resource personnel for coordinating and assisting other teachers of environmental education.

4. Inter-disciplinary workshops should be conducted to encourage agriculture and other teacher personnel to striye together to work out objectives and strategies for effective teaching of environmental awareness.

5. Short courses should be scheduled and conducted to increase environmental awareness of all teachers.

6. Institutions of higher education should respond to the environmental awareness program by careful consideration of giving an environmental focus to their whole curriculum. Environmental education is important and necessary to improve philosophies of life and help citizens acquire new and more viable life styles.

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APPENDIX

December 7, 1973

I am conducting a study to determine the role of vocational agriculture teachers in environmental awareness in Oklahoma. I feel that environmental education (subjects dealing with efforts required to effectively live in an environmental situation) will play a major role in developing public awareness of the pollution problem. The enclosed questionnaire is being mailed to various vocational agriculture teachers to gather opinions regarding local interest in environmental education to include what is being taught and what should be taught about agricultural pollution.

Your assistance is requested in completing and returning the attached questionnaire in the self-addressed, stamped envelope at your earliest convenience.

Thank you for your time and assistance.

Kenneth D. Brink
Graduate Student
Oklahoma State University

OPINION QUESTIONNAIRE

Please check appropriate spaces; additional comments are invited.

1. District in which your school is located:

| | |
|------------------------------------|------------------------------------|
| <input type="checkbox"/> Northwest | <input type="checkbox"/> Southwest |
| <input type="checkbox"/> Northeast | <input type="checkbox"/> Southeast |
| <input type="checkbox"/> Central | |
2. Number of teachers in your vocational agriculture department:

| | | |
|------------------------------|------------------------------|--------------------------------|
| <input type="checkbox"/> One | <input type="checkbox"/> Two | <input type="checkbox"/> Three |
|------------------------------|------------------------------|--------------------------------|
3. What is your age:

| | |
|-----------------------------------|--------------------------------------|
| <input type="checkbox"/> Under 25 | <input type="checkbox"/> 40-44 |
| <input type="checkbox"/> 25-29 | <input type="checkbox"/> 45-49 |
| <input type="checkbox"/> 30-34 | <input type="checkbox"/> 50-59 |
| <input type="checkbox"/> 35-39 | <input type="checkbox"/> 60 and over |
4. Total number of years teaching vocational agriculture:

| | |
|---------------------------------------|--|
| <input type="checkbox"/> Under 1 year | <input type="checkbox"/> 10-14 years |
| <input type="checkbox"/> 1-4 years | <input type="checkbox"/> 15-19 years |
| <input type="checkbox"/> 5-9 years | <input type="checkbox"/> 20 years and over |
5. Total number of years in your current position at your present school:

| | |
|---------------------------------------|--|
| <input type="checkbox"/> Under 1 year | <input type="checkbox"/> 10-14 years |
| <input type="checkbox"/> 1-4 years | <input type="checkbox"/> 15-19 years |
| <input type="checkbox"/> 5-9 years | <input type="checkbox"/> 20 years and over |
6. Concerning your relationship with other teachers in your school during the school day, do you feel that you have:

| |
|---|
| <input type="checkbox"/> Insufficient opportunity to be in contact with them? |
| <input type="checkbox"/> Sufficient opportunity to be in contact with them? |
| <input type="checkbox"/> Too much opportunity to be in contact with them? |
7. Do you feel there is a problem of agriculture pollution in your community?

| |
|---|
| <input type="checkbox"/> Yes, specify _____ |
| <input type="checkbox"/> No |
8. Do you feel the majority of the farmers are more interested in the efficiency of production than they are in environmental quality (control of pollution to improve the environment)?

| | |
|------------------------------|-----------------------------|
| <input type="checkbox"/> Yes | <input type="checkbox"/> No |
|------------------------------|-----------------------------|
9. Do farmers in your area practice methods to improve environmental quality in their farming?

| |
|---|
| <input type="checkbox"/> Yes, specify _____ |
| <input type="checkbox"/> No |
10. If question 9 is yes, approximately how many farmers practice improvement methods?

| | |
|-----------------------------------|-------------------------------------|
| <input type="checkbox"/> Few | <input type="checkbox"/> About half |
| <input type="checkbox"/> Majority | |

11. Do you discuss methods to improve environmental quality with farmers in your area?
 Yes No
12. If question 11 is yes, do farmers initiate the discussion?
 Yes No
13. Did your department teach or plan to teach any classes for adults or young farmer groups during the 1973-74 academic year?
 Yes No
14. If question 13 is yes, were subjects involving environmental pollution included?
 Yes, specify _____
 No
15. Do you teach methods to improve environmental quality in conjunction with your regular vocational agriculture subjects?
 Yes No
16. Do you teach environmental quality as a separate subject in vocational agriculture classes?
 Yes No
17. Do you teach any classes not considered to be vocational agriculture classes?
 Yes, specify _____
 No
18. What subjects do you teach in vocational agriculture concerning pollution in agriculture? (Please rank in order by importance if more than one is selected).
 Effects and proper disposal of farm animal wastes.
 Effects of soil erosion and sediments on the environment.
 Effects of burning plant residues on the atmosphere.
 Effects of pesticides on pests, wildlife, and humans.
 Effects of commercial fertilizers on air and water pollution.
 Alternative methods of pest control.
 Other, specify _____
19. What effect has environmental quality legislation had on production in your community? (Please rank in order by importance if more than one is selected).
 Caused no appreciable effects.
 Caused farmer's production costs to increase.
 Caused farmers to change certain farm practices.
 Caused reduction in yield.
 Caused feedlot owners to reduce production.
 Caused changes in attitudes regarding environmental awareness.
 Other, specify _____
20. Is environmental education (subjects dealing with living in the environment) taught in your high school?

- Yes, specify _____
 No
21. Do other teachers coordinate with you or ask you your assistance concerning the use of natural resources or environmental quality?
 Yes, example _____
 No
22. Do you feel environmental education (other than vocational agriculture subjects) should be taught in high school?
 Yes No
23. If question 22 is yes, how should environmental education subjects be taught?
 As separate subjects.
 Incorporated within regular subjects.
24. Would you volunteer to teach a class in environmental education if such a class was included in the curriculum as an elective subject and approved by the State Department of Vocational Agriculture?
 Yes No
25. If environmental education is included in the curriculum as a separate subject, who do you feel should be the primary instructor for the subject?
 Vocational Agriculture teacher.
 Social Studies teacher.
 Science teacher.
 Other, specify _____
26. What subjects do you feel should be taught in vocational agriculture concerning agricultural pollution? (Please rank in order by importance if more than one is selected).
 Effects and proper disposal of farm animal wastes.
 Effects of soil erosion and sediments on the environment.
 Effects of burning plant residues on the atmosphere.
 Effects of pesticides on pests, wildlife, and humans.
 Effects of commercial fertilizers on air and water pollution.
 Alternative methods of pest control.
 Other, specify _____
27. What do you feel that you need to be able to effectively teach a class in environmental education? (Please rank in order by importance if more than one is selected).
 Nothing, I am adequately equipped to teach all classes.
 Additional literature.
 College courses in environmental science.
 Physical materials such as classrooms, models, etc.
 Support from local teachers and administrators.
 Support from local people in community.
 Guidance from the State Department.
 Other, specify _____

Thank you for your time and assistance.

VITA

Kenneth Dean Brink

Candidate for the Degree of

Master of Science

Thesis: A STUDY OF THE ROLE OF VOCATIONAL AGRICULTURE TEACHERS IN ENVIRONMENTAL AWARENESS IN OKLAHOMA

Major Field: Agricultural Education

Biographical:

Personal Data: Born in Covington, Oklahoma, May 29, 1931, the son of Roy and Iva Brink.

Education: Graduated from Covington High School, Covington, Oklahoma in May, 1949; received the Bachelor of Science Degree from Oklahoma State University in May, 1953 with a major in Agricultural Education.

Professional Experience: Entered active duty in the United States Army, July 15, 1953, as a commissioned officer and retired on July 31, 1973; entered graduate school, Oklahoma State University in August, 1973.

Professional Organizations: National Vocational Agriculture Teachers Association; Association of the United States Army.