

## **DIFFERENCES IN PERCEPTIONS AND PERCEIVED KNOWLEDGE LEVELS OF TEXAS SUPERINTENDENTS REGARDING AGRISCIENCE PROGRAMS AND ITS TEACHERS**

**Dwayne Pavelock**

**Doug Ullrich**

**Roger Hanagriff**

*Department of Agricultural Science, Sam Houston State University, Huntsville, TX 77341*

### **ABSTRACT**

An agricultural science program's success depends on the superintendent, a school district's highest academic officer, recognizing the program as a vital part of the school. Recent studies by Pavelock (2001), Jackson & Herring (1998), and Hinkson and Kieth (1999) have shown administrators support agriscience, but revealed troubling insights. The primary purpose of this study was to determine differences in perceptions and perceived knowledge levels of agriscience by Texas school superintendents with various agriscience experience levels.

A large majority (88.6%) of Texas school superintendents have no agriscience teaching experience. Most (58.6%) had not been enrolled in agriscience themselves and almost two-thirds (65.7%) had not had a child enrolled.

Collectively, superintendents have a positive perception of agriscience and its teachers. Experience in agriscience was not found to have a significant effect on most perceptions and perceived knowledge levels. Differences found existed primarily in the need for more emphasis in various instructional areas, and whether all students should receive instruction in agriscience. Differences also existed in perceptions of agriscience being less vocational and more academic compared to other career and technology programs, and the inability of school districts to obtain waivers for certain agriscience courses to count for credit in related foundation courses.

**KEYWORDS:** Agricultural science, agriscience, agricultural education, career and technology education (CATE), professional development, superintendent, Supervised Agricultural Experience Program (SAEP), teacher, vocational agriculture.

### **INTRODUCTION**

Expanded standardized testing and additional graduation requirements of the Texas Education Agency (2000) mandate that students complete a more advanced program of study, thereby limiting elective course options while requiring additional credits in fine arts and other languages. Schools are rewarded on the Academic Excellence Indicator System (AEIS) for having a high percentage of students on advanced graduation plans. Students considered to have higher academic skills are often discouraged from enrollment in career-oriented programs for courses perceived to be

more challenging. As a result, students and parents have developed negative stereotyped attitudes regarding programs such as agricultural education (Dyer & Osborne 1997). Agricultural science and other vocational programs, almost since their inception, have been a part of the comprehensive high school system throughout the nation (Martin and Peterson 1991). The National Council for Agricultural Education (1999), the National Research Council (1988), and The National Council for Agricultural Education (1999) all recognize the importance of agricultural education. In 1988, the National Research Council stated, "Agriculture is too important a topic to be taught only to the relatively small percentage of students considering careers in agriculture and pursuing vocational agriculture studies." (p. 8).

Superintendents must help identify the portions of an ideal agriscience program necessary to help students meet the needs of a global economy and workforce because the superintendent is first and foremost the chief academic officer in a public school system (Spillane & Regnier 1998). He/she is responsible for empowering principals, who then empower her/his own staff to provide the instructional program, in addition to ensuring that established goals for the campus are met (Konnert & Augunstein 1995).

**Purpose/Objectives.** There have been some studies that indicated administrative support for agricultural programs: a Texas study regarding communication between agriscience teachers and school administrators found administrators have a high regard for the program (Hinkson and Kieth 1999), another Texas study revealed generally positive perceptions and perceived knowledge levels of Texas school superintendents regarding agricultural science and technology programs (Pavelock 2001). As with any high school program, its success is dependent upon the commitment of that school's educational leaders. In these regards, the primary purpose of this study was to determine differences in perceptions and perceived knowledge levels of the agriscience program by Texas public school superintendents with various agriscience experience levels.

The study focused on the demographics of Texas public school superintendents and their perceptions and perceived knowledge level regarding the agricultural science and technology program. The objectives of this study were to determine superintendents' demographic characteristics, perceptions of the agricultural science program's purpose and its role in the total school program and the school's goals, perceptions of agricultural science teachers, perceived knowledge levels regarding the agriscience program, and differences in perceptions of those with and without experience in agriscience.

## MATERIALS AND METHODS

The targeted population sample was Texas public school districts superintendents of districts whose high school(s) offered instruction in agricultural science. The number to be surveyed was determined according to the formula developed by Cochran (1977). To ensure the external validity of the instrument, schools were selected within the ten geographical "areas" of the Texas FFA Association by stratified random selection.

The researcher-developed questionnaire was derived from various previous studies conducted in Georgia (Woodard & Herren 1995), Illinois (Dyer & Osborne 1997), Mississippi (Johnson & Newman 1993), Nebraska (Foster, Bell, & Erskine 1995, Viterna 1971), North Carolina (Jewell 1995, Price 1990), Oregon (Bender 1996, Thompson 1998), and Texas (Jackson & Herring 1998). The instrument was a four-part

questionnaire: demographics, agriscience program perceptions, perceptions of the ideal characteristics of an agriscience teacher, the agriscience teacher's role and expectations regarding professionalism and professional development, and perceived knowledge level of the agriscience program. All parts used an eight-point Likert-type scale with an "8" indicating the highest level of agreement or perceived knowledge, and a "1" indicating the lowest level of agreement or perceived knowledge.

After pilot testing with superintendents and agricultural educators for validity and reliability, the instrument was mailed via first-class mail. Guidelines of Dillman's (1978) Total Design Method (TDM) were followed to increase response rates. One hundred superintendents were surveyed, and a 71% response rate was achieved. Data were coded, tabulated and analyzed using the Statistical Package for Social Sciences (SPSS) for the Macintosh computer and the SPSS 10.1 for Windows. Descriptive statistics and alpha levels were reported using demographic characteristics and responses of participants.

## RESULTS

**Demographics.** Two-thirds (66.7%) indicated academics (language arts, social studies, science, or math) as their primary teaching area. Over 80% had no career and technology education teaching experience but almost 12% had some agricultural science teaching experience. Most (58.6%) superintendents had not been enrolled in agriscience while in high school or college, and almost two-thirds (65.7%) said their children had not been enrolled.

Slightly more than two-thirds (67.1%) of the participants indicated some work experience in agriculture, as the largest percentage (47.1%) were found to have been raised in a rural hometown with a population of 2,500 or less. Most (55.7%) participants' districts were located in a rural town with a population of 2,500 or fewer, with the largest percentage (45.7%) indicating their school district has less than 1,000 students.

As a total, 29 respondents (41.4%) indicated no direct or indirect involvement in agricultural science, meaning they had neither taught nor been enrolled in the program and their children had not been enrolled in the program. Over one-half (58.6% or 41) indicated either a direct or indirect involvement in the program by having taught or been enrolled in agricultural science, or having had a child enrolled in agriscience.

**Perceptions Toward the Agriscience Program.** Respondents were asked to indicate their level of agreement with certain statements pertaining to their perception of the agriscience program as a whole and not as they relate to the program within their individual school district. Statements scoring high, low or with significant differences in responses by the groups are reported in Table 1.

The highest levels of agreement by those with no agriscience experience indicated the need for more emphasis on technology/computer applications (7.1), leadership development (7.0), and integration of science, mathematics, etc. (6.8). They agreed at a moderately high level that agriscience should provide students with specific skills for gainful employment and pursuing a higher education (6.5) and that agriscience needs more emphasis placed on biotechnology (6.5). The amount of funds spent on agriscience is a wise investment (6.4) and more emphasis is needed on environmental and natural resources (6.4). Respondents did not believe that too much attention is focused on environmental and natural resources (2.9) or leadership development (2.6).

Table 1. Superintendents' agreement with statements regarding the agriscience program.

Statement focus	Mean <sup>a</sup>	Mean <sup>b</sup>	Alpha
More emphasis on technology / computer applications	7.1	6.9	.499
More emphasis on leadership development	7.0	6.6	.294
More emphasis on integrating science, mathematics, etc.	6.8	6.8	.935
Should provide students with skills needed for gainful employment and pursuing higher education	6.5	6.4	.890
More emphasis on biotechnology	6.5	6.1	.243
Amount of funds currently spent on the program is a wise investment of local, state, and federal resources	6.4	6.6	.624
More emphasis on environmental and natural resources	6.4	6.1	.452
Helps at-risk students remain interested in their education, lessening the likelihood of dropping out	6.3	6.2	.799
More emphasis on agribusiness	6.2	6.2	.891
More emphasis on horticulture	6.0	5.2	.018*
Too much attention on livestock showing	5.9	5.3	.250
More emphasis on plant production.	5.8	5.1	.045*
Too much attention on FFA activities.	4.0	3.1	.051
Less vocational and more academic than other career and technology education programs.	3.7	4.7	.016*
All students should receive instruction about agriculture throughout formal schooling years, K-12	3.3	4.7	.003**
Too much attention on environmental / natural resources.	2.9	2.2	.042*
Too much attention on leadership development.	2.6	1.8	.025*

N=29 for respondents with no experience in agricultural science

N=41 for respondents with experience in agricultural science

<sup>a</sup>Mean = No experience in agricultural science

<sup>b</sup>Mean = Experience in agricultural science

\* Significant at .05 level

\*\* Significant at .01 level

Superintendents with agriscience experience indicated the highest levels of agreement with the need for more emphasis on technology/computer applications (6.9), the integration of science, mathematics, etc. (6.8), and leadership development (6.6). Their agreement level was also found to be highest in regard to agriscience being a wise investment of local, state and federal resources (6.6). This group of respondents indicated the lowest levels of agreement for statements about the program focusing too much attention on horticulture (2.9), agribusiness management (2.4), environmental and natural resources (2.2) and leadership development (1.8).

There were significant differences in the mean levels of agreement between those that indicated some experience in agriscience and those that indicated no experience. These significant differences were in regard to statements about more emphasis being needed on plant production ( $\alpha=.045$ ) and horticulture/landscaping ( $\alpha=.018$ ), and that the program focuses too much attention on environmental and natural resources ( $\alpha=.042$ ), judging contests ( $\alpha=.029$ ), leadership development ( $\alpha=.025$ ), production agriculture ( $\alpha=.016$ ). In addition, a significant difference was found for agreement level with agriscience being less of a vocational program and more of an academic program than other career and technology education programs ( $\alpha=.016$ ). Finally, the statement that all students should receive instruction about agriculture throughout their formal schooling years ( $\alpha=.003$ ) had the most significant difference in the mean level of agreement.

**Perceptions Toward Agriscience Teachers.** Respondents were asked to indicate their level of agreement with certain statements pertaining to their perception of agricultural science and technology teachers as a whole and not the teacher(s) within their individual school district. High, low and significantly different responses are shown in Table 2. The same 8-point Likert-type scale was used.

Table 2. Superintendents' agreement with statements regarding agriscience teachers.

Statement focus	Mean <sup>a</sup>	Mean <sup>b</sup>	Alpha
Should possess significant knowledge about all phases of agriculture, not a specialization in one or two aspects	6.0	5.9	.816
Portray a positive professional image to, and have a positive professional relationship with, students	5.8	6.0	.504
Portray a positive professional image to, and have a positive professional relationship with, parents	5.7	6.0	.508
Portray a positive professional image to, and have a positive professional relationship with, administrators	5.6	5.9	.555
In terms of life skills and respective content areas, agriscience teachers do as good a job as "academic" teachers in educating their students.	5.5	5.6	.601
Tend to do better job of educating, encouraging, and motivating low achieving students than other teachers	5.2	5.6	.341
Well-prepared to offer instruction at challenging level for students intending to pursue higher education.	5.1	5.1	.888

N=29 for respondents with no experience in agricultural science

N=41 for respondents with experience in agricultural science

<sup>a</sup>Mean = No experience in agricultural science

<sup>b</sup>Mean = Experience in agricultural science

\* Significant at .05 level

\*\* Significant at .01 level

The highest agreement level by superintendents with no experience in agriscience was found in regard to whether teachers should possess a significant level of knowledge about all phases of the agricultural industry as compared to specialization in selected aspects (6.0). Superintendents agreed at the same level that agriscience teachers portray a positive image to, and have a positive relationship with, students (5.8), parents (5.7), and administrators (5.6). No statement received a low level of agreement from superintendents without experience in agriscience.

Similar to their counterparts with no agriscience experience, superintendents with experience in agriscience indicated highest agreement levels with statements that teachers portray a positive image to, and have a positive relationship with, students (6.0) and parents (6.0). High agreement was indicated for the statement that agriscience teachers portray a positive image to, and have a positive relationship with, administrators (5.9). They further indicated highest agreement for agriscience teachers tending to do a better job of educating, encouraging, and motivating lower achieving students compared to other teachers in the school (5.6). No statement had a low agreement level among superintendents with agriscience experience. There were no significant differences in responses of the different groups.

**Perceived Knowledge Levels of the Agriscience Program.** Respondents were asked to indicate their level of perceived knowledge with certain statements pertaining to the agriscience program as a whole, not their school district's program. High, low and significantly different responses are reported in Table 3 and the same 8-point Likert-type scale was used.

Table 3. Superintendents' perceived knowledge with various aspects of the agriscience program.

Statement focus	Mean <sup>a</sup>	Mean <sup>b</sup>	Alpha
Weighted funding from the state that traditional academic programs do not receive	6.7	7.3	.074
Weighted state funding can only be spent on students in CATE, except for allowable administrative costs	6.4	6.7	.550
Federal funding available through Carl Perkins Act, such funding can be used for some teacher travel	6.1	6.3	.753
Program currently comprised of 49 courses in seven systems areas, not the Ag I-IV arrangement	5.9	5.8	.723
Annual program evaluation is required	5.7	5.9	.745
Students in CATE have passing rates on TAAS equal to the percentage of all students passing all tests of TAAS	5.6	5.9	.473
Required physical education credit may be earned through work-based agriscience (and similar CATE) courses	4.8	5.7	.120
Cannot obtain a waiver to give credit in foundation courses through certain agriscience courses	4.3	5.5	.023*

N=29 for respondents with no experience in agricultural science

N=41 for respondents with experience in agricultural science

<sup>a</sup>Mean = No experience in agricultural science

<sup>b</sup>Mean = Experience in agricultural science

\*Significant at .05 level

Regarding program funding, superintendents who had indicated no experience in agriscience are highly knowledgeable about the receipt of weighted state funding for students enrolled in agriscience courses (6.7). They are also quite knowledgeable in regard to the permitted use of these funds only on career and technology programs, except for allowable administrative costs (6.4), and are aware of the availability of federal funds from the Carl Perkins Federal Vocational Act and the use of these funds for teacher travel in certain instances (6.1).

Superintendents with experience in agriscience are very highly knowledgeable about the receipt of weighted state funding for students enrolled in agriscience courses (7.3). This group also indicated a high level of perceived knowledge regarding allowable uses of weighted state funds (6.7), and consider themselves highly knowledgeable that federal funds from the Carl Perkins Federal Vocational Act are available and can be used for teacher travel in certain instances (6.3).

One significant difference in the means of perceived knowledge levels was found between superintendents with and without agriscience experience. This was in regard to school districts not being able to obtain a waiver that allows students in certain agriscience courses to receive credit for related foundation courses ( $\alpha=.023$ ).

## DISCUSSION

**Conclusions.** Important findings derived from this study indicate that a majority (58.6%) of Texas public school superintendents, whose district has an agriscience program, have at least some experience in agriscience. This experience is from having either taught, been enrolled in, or had children enrolled in, agriscience. Contrastingly, when looking at these experiences individually, barely one-tenth (11.4%) of the respondents have experience teaching vocational education/agricultural science, most (58.6%) were never enrolled in an agriscience/vocational agriculture program, and almost two-thirds (65.7%)

have not had a child enrolled in the program. Most (66.7%) of these superintendents have a teaching background in an academic field, such as language arts or mathematics, as their primary teaching area. Few (14.5%) indicated career and technology education as their primary teaching area, and only slightly more (17.1%) have any experience teaching in career and technology education. Surprisingly, most have agricultural work experience, perhaps due to another surprising fact – most were raised in a rural environment (small town with a population of 2,500 or less).

Superintendents of Texas public school districts with an agriscience program, as a group and regardless of their experience in agriscience, have a positive perception of the agriscience program and of those who teach it. They believe the funds spent on agriscience are a wise investment of resources, that the program provides students with specific skills needed for both gainful employment and higher education, and that the program is useful and successful in helping at-risk students remain interested in their education.

Although neither group had an exceptionally high belief, superintendents with agriscience experience did perceive the program to be less vocational and more academic than other career and technology programs, as compared to the beliefs of superintendents with no experience in agriscience as a teacher, student or parent. Experience in agriscience or a lack thereof was found to have a significant effect on superintendents' perceptions about some agriscience instructional areas that needed more emphasis. This experience factor also contributed to differences in perceptions for areas of the program that had too much attention focused upon it, and whether agriculture should be taught to all students throughout their formal schooling years.

**Recommendations.** Teachers should be proactive in offering courses that integrate science, mathematics, and other areas while also offering courses that fit student and industry needs, not their own personal preferences.

Superintendents should continue to provide the financial resources necessary to conduct a quality agriscience program that is current with new technology and work place practices. Teachers should be active in understanding program funding and monitor compliance.

Teachers should aggressively promote and conduct agriculture as an academic program, realizing they are an agriscience teacher first and an FFA advisor second.

Teachers that do not have support from their superintendent for a 12-month contract and smaller teaching load should seek to understand why such support is not provided. All superintendents, regardless of their experience in agriscience, should be made aware of the requirements and demands of supervising SAEPs and extracurricular activities.

Teachers should continue to ensure that the agriscience program prepares students of all academic abilities for both gainful employment and higher education. Agriscience teachers should give greater attention to academics and current practices, as well as changing the program's image, to solidify its future in the Texas public school system. This might require less emphasis on extracurricular activities such as showing livestock and judging contests.

## REFERENCES

Bender M. E. (1996). Factors affecting enrollment trends in secondary agricultural programs as perceived by Oregon and California agricultural instructors and

- their respective principals (Doctoral dissertation, Oregon State University, 1996). Dissertation Abstracts International, 57-08A, 0172.
- Cochran, W. G. (1977). *Sampling techniques*. New York, NY: John Wiley & Sons.
- Dillman, D. A. (1978). *Mail and telephone surveys: The total design method*. New York, NY: John Wiley & Sons.
- Dyer, J. E., & Osborne, E. W. (1997). A comparison of attitudes of students, parents, and counselors toward agriculture and agricultural education. Conference Proceedings of the National Agricultural Education Research Meeting. Las Vegas, NV.
- Foster, R., Bell, L., & Erskine, N. (1995). The importance of selected instructional areas in the present and future secondary agricultural education curriculum as perceived by teachers, principals, and superintendents in Nebraska. *Journal of Agricultural Education*, 36(3). 1-7.
- Hinkson, M. M. & Kieth, T. L. (1999). Attitudes and perceptions of high school administrators toward agricultural science teachers in Texas. Proceedings of the Southern Region Agricultural Education Research Conference. Lexington, KY.
- Jackson, D. J. & Herring, D. R. (1998). Intentionality, perceptions, and practices of high school counselors regarding agriculture, agricultural science programs, and agricultural science teachers in Texas. Proceedings of the Southern Region Agricultural Education Research Conference. Little Rock, AR.
- Jewell, L. R. (1995). Perceptions of secondary school principals toward agricultural education. Proceedings of the National Agricultural Education Research Meeting. Cincinnati, OH.
- Johnson, D. M. & Newman, M. E. (1993). Perceptions of administrators, guidance counselors, and science teachers concerning pilot agriscience courses. *Journal of Agricultural Education*, 34(2). 46-54.
- Konnert, M. W. & Augenstein, J. J. (1995). *The school superintendency: Leading education into the 21<sup>st</sup> century*. Lancaster, PA: Technomic Publishing Company, Inc.
- Martin, R. A. & Peterson, R. L. (1991). Knowledge base and content of agricultural education. *The Agricultural Education Magazine*, 63(8). 21-22.
- National Council for Agricultural Education (1999). A new era in agriculture: Reinventing agricultural education for the year 2020. Alexandria, VA: National Council for Agricultural Education.
- National Research Council (1988). *Understanding agriculture: New directions for education*. Washington, DC: National Academy Press.
- Pavelock, D. (2001). Perceptions and perceived knowledge levels of Texas public school superintendents regarding the agricultural science and technology program. Proceedings of the National Agricultural Education Research Conference. New Orleans, LA.
- Price, L. E. (1990). Attitudes of school administrators in the southern region of the United States toward agricultural education. (Doctoral dissertation, North Carolina State University, 1990). Dissertation Abstracts International, 51-04A, 0155.
- Spillane R. R. & Regnier, P. (Eds.) (1998). *The superintendency of the future: Strategy and action for achieving academic excellence*. Gaithersburg, MD: Aspen Publishers.



- Texas Education Agency (2000). Texas state graduation requirements. Graduation requirements for students entering Grade 9 in 2001-2002 [On-line]. Available: <http://www.tea.state.tx.us/curriculum.side1/doc>.
- Texas Education Agency (1999). 1999-2000 Texas school directory. Austin, TX: Texas Education Agency.
- Thompson, G. (1998). Integrating science attitudes. Unpublished manuscript, Oregon State University.
- Viterna, L. L. (1971). Opinions of school administrators concerning selected aspects of the program of vocational agriculture in Nebraska. Unpublished master's thesis: University of Nebraska.
- Woodard, J. & Herren, R. V. (1995). Perceptions and practices of Georgia guidance counselors regarding agricultural education programs. *Journal of Agricultural Education*, 36(2). 8-18.