

Reflecting Industry — Supervised Experience In Agricultural Mechanics

Like other areas of the Agricultural Education curriculum, Agricultural Mechanics is a science based series of competencies with application to supervised experience for programs both in and about agriculture. Experiential needs of students can be efficiently met through industry current agricultural mechanics.

Industry Standards

Teaching competencies needed by students for industry requires facilities and equipment which reflect industry standards. This is a time honored problem in all aspects of agricultural science and especially in agricultural mechanics. Industry cooperation has been the critical factor in allowing students the opportunity to apply the scientific principles of agricultural mechanics to industry current applications.

Industry is also setting standards for our programs which are not being followed. The agricultural industry has been subjected to regulation to insure a safe working environment for employees. While regulation was not always welcome, the need for safety in the workplace is clear. Safety has always been an integral part of the curriculum in agricultural mechanics and a critical factor in protecting the teacher from exposure to unnecessary liability.

The Agricultural Education profession has experienced a reawakening regarding safety and its effects on teachers and students. Westrom and Lee, (1990), Miller (1990), Hard and Miller (1990), Flether and Johnson (1990) and others have addressed safety and its related health risks in recent research efforts.

How Are We Doing?

In an effort to determine the state of safety in vocational education laboratories as compared to industry standards, a study of safety compliance rate of selected secondary vocational education laboratories within two urban counties in Arizona was recently completed.

An instrument derived from a school laboratory safety evaluation developed by Lawrence B. Everett (1981) was completed on site. Less than one-third of the laboratories studied were agricultural mechanics laboratories. The instrument identified safety compliance in ten major areas including Walking-Working Surface; Means of Egress; Fire Protection; Medical and First Aid; Personal Protective Equipment; Tools; Welding, Cutting, and Brazing; Electrical; Compressed Air Equipment; and Environmental Control. Each major classification had a



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sub-scale of items which were marked as in compliance or not in compliance of standards by "The General Industrial Safety and Health Regulations, Part 1910." An example of a sub-scale under Tools would be:

1. Stationary power tools anchored to the floor. (1910.212(b))

Each item on the scale was given a numerical value which reflected the average rating of importance assigned by a panel of ten safety specialists. Items were rated on a 0-10 scale with 0 indicating no importance to laboratory safety and 10 indicating utmost importance. Subscales were averaged into ten major categories.

Compliance Concerns

The results are reported according to the 10 categories and 21 schools. Walking-working surface items such as safety lanes, non-skid surfaces, laboratory appearance neat and orderly, etc., are generally in compliance with an overall score of 76%. One school is a notable exception with a score of 9%.

Means of egress which include standards such as laboratory has at least two exits, exit doors and access to exits are not locked from exit side, etc., demonstrated a lower overall score of 54%, indicating that the large majority of laboratories fail to meet standards. The lowest scoring school was only 23% in compliance, while the best school was 100% in compliance. Fire protection items, including fire alarms, fire extinguisher locations properly marked, maximum distance to fire extinguisher 75 feet, etc., had an overall score of 66%. The lowest compliance was 11% with the greatest compliance being 100%. Emergency telephone numbers posted in the laboratory, evacuation procedures posted in the laboratory, and first-aid supplies readily available comprised the medical and first-aid category. The overall compliance in this area was 30% with eight schools having no com-

pliance and three schools in 100% compliance. Personal protective equipment included items such as face shields, industrial quality eye protection provided and required, etc. The overall score was 67% with two schools not in compliance and four schools in 100% compliance.

The overall score for tools was 73% compliance with subscale items, including stationary power tools anchored to the floor, stationary tools arranged so that individuals are protected from hazards of other machines, etc. The school in highest compliance scored 100% and the poorest compliance score was 34%. Welding, cutting and brazing compliance was the highest of any category with an overall score of 92%. The lowest compliance was 46% with thirteen schools in 100% compliance.

Subscale items included arc welder cables, electrode holders and ground clamps in good repair, compressed gas cylinders chained or secured in an upright position, friction lighter available and used to light welding or cutting flame or pilot light, etc. Electrical subscales included electrical outlets and fixtures properly grounded, electrical disconnects identified, extension cords and portable power tools properly grounded or double insulated, etc. The overall percentage was 81% with the lowest compliance being 43% and the highest 100% for four schools. Compressed air equipment was in compliance an overall average of 56%. Subscale items included pressure gauge in air line, air used for cleaning regulated to not more than 30 psi, etc. The school in highest compliance scored 100% and the six schools with the least compliance scored 0%.

The final category was environmental control. Items included total laboratory ventilating, illumination, noise level, washing and clean up, safety stands, guarding, etc. The overall percentage compliance was 93% with a high compliance of 100% and a low compliance of 42%.

Table 1 reflects the percentage compliance based upon

Table 1. Facility Safety Compliance Score Overall

School	Percentage	School	Percentage	School	Percentage
1	84.00	8	77.74	15	68.30
2	76.20	9	79.34	16	76.80
3	54.00	10	81.10	17	32.03
4	62.88	11	56.00	18	89.86
5	82.36	12	79.90	19	80.35
6	76.00	13	94.70	20	63.58
7	81.60	14	68.20	21	82.26

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responsibility for teaching 2 to 4 classes and be under the supervision of a master teacher. The intern would also be involved with seminars taught by university staff.

Froehlich and Bundy (Iowa State University) reported a study on why qualified vo-ag teachers don't teach. Their survey collected data from 823 non-teaching agricultural education graduates from Iowa State (70.8%

the total compliance points possible and the score by school. Wide variations can be seen between schools with the highest compliance overall being 94.7% and the lowest being 32.03.

We Need To Improve

Clearly, there are disturbing shortcomings in the compliance of vocational education laboratories in Maricopa and Pima Counties, Arizona. The 21 sample schools vary widely, but it is clear that as a general trend, schools which score poorly in one category are generally weak in most areas. Many factors could contribute to these deficiencies. The age of the facility has an impact on several categories. Other categories where compliance is low, however, must be recognized as a matter of neglect or negligence. There can be no acceptable reason for failure to comply at a level of 100% in areas of medical first aid, personal protective equipment, and fire protection. Certainly, those in the agricultural industry could not stay in business if they failed to meet basic personnel safety standards. The oldest facility can be clean and painted. Every school budget must afford personal protective equipment critical to the safety of students and teacher. Every laboratory can be equipped with a medical first-aid kit and clearly marked evacuation plans.

A renewed effort must be placed on compliance with basic standards of safety in vocational education laboratories. This research clearly demonstrates that efforts in enforcement of safety standards must be pursued aggressively. If students are to use supervised experience in agricultural mechanics, then we must be sure that the safety as well as the competencies reflect industry standards.

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of all graduates from January 1, 1940 to July 1, 1964). The most common professional areas entered were farming, feed and seed business, extension service, and high school teacher other than agriculture. Respondents who left the teaching profession cited such reasons as lack of advancement opportunity, salary, too many evening responsibilities, long hours, and state reports.

Other articles included Occupational Choice and Tenure of Ag Ed Grads (Hoernor and Bundy), the Supervising Teacher (Binkley), and Providing Information about College (Atherton).

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