

GEARING UP FOR SAFETY

Production Agriculture Safety Training for Youth



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INTRODUCTION

Thank you for being willing to participate as a program leader or instructor for the **GEARING UP FOR SAFETY: Production Agriculture Safety Training for Youth Program (GEARING UP FOR SAFETY)**. If you are a volunteer community or 4-H youth leader, your time and commitment to young people involved with this program are especially appreciated. If you are a secondary agricultural education teacher, we thank you for your willingness to incorporate some or all of the contents of this material in your curriculum. Also, if you are a parent, supervisor, or employer of younger workers, the use of this material demonstrates your commitment to providing a safe work place for those whom you are responsible.

Past research and documented experiences in other industries have clearly demonstrated that ongoing, evidence-based safety training can make a difference in reducing the potential of injury and death in the workplace. Teaching young workers to recognize and use safe work practices, and enhancing their attitudes towards safety can pay big dividends through reduced injuries and deaths. Your involvement in this program is directly contributing to the safety and well being of the youth you will be working with, not only while working on farms and ranches, but also in other areas of their lives. Again, thank you!

PURPOSE

The purpose of the **GEARING UP FOR SAFETY PROGRAM LEADER'S GUIDE (LEADER'S GUIDE)** is to provide you with the necessary tools for organizing and conducting a local production agriculture safety training program for youth, and to afford parents, employers, or supervisors of youth the means to conduct on-the-job safety training. It includes program planning suggestions, resources, and a carefully-designed and tested curriculum for teaching desired core competencies and related information. These topics have been identified in federal regulations and by agricultural safety and health experts as essential for youth to know and demonstrate in order to safely operate agricultural tractors and equipment, as well as perform other hazardous farm and ranch tasks. The contents are specifically designed for youth between the ages of 14 and 19 who are either legally protected under child labor or federal workplace safety and health regulations, or who are enrolled in 4-H or secondary agricultural education programs. The training would also be extremely beneficial for the children of farm and ranch owners who are engaged in daily agricultural production activities, but exempt from most federal and state workplace safety and health regulations.

The **GEARING UP FOR SAFETY** Program has been tested with Cooperative Extension Service (4-H) and agricultural education training programs nationwide and has been aligned to meet current safety training regulations prescribed under Subpart E-1 of Part 1500 of Title 29 of the Code of Federal Regulations or the Hazardous Occupations Order for Agriculture (HOOA). See Appendix 1. These statutes declare certain occupations in agriculture to be particularly hazardous for the employment of children and youth below age 16. Though not certified by the U.S. Department of Labor's Child Labor Division, a representative of the Department of Labor participated in the design of the curriculum and content selection.

The contents have also been aligned to several state agricultural education curriculum standards and the Agriculture, Forestry and Natural Resource Career Cluster Content Standards developed by The National Council for Agricultural Education. The contents cover both the tractor and machinery operation components of the HOOAs under the current exemptions provided for student learners, and youth participating in Federal Extension Services (4-H) and Vocational Agriculture Training (Agricultural Education) educational programs including Supervised Agricultural Education Experiences (SAE).

It has been determined by the **GEARING UP FOR SAFETY** development team that youth, ages 14-15, seeking employment on today's highly mechanized agricultural operations should be certified to operate both tractors and allowable machinery even though the HOOA contains provisions for being certified in only tractor operation. A copy of the regulations is included as Appendix 1 and you are encouraged to become familiar with the contents prior to teaching the class. The regulations include specific prohibitions regarding performance of certain hazardous tasks by youth under the age of 16. In addition, certain basic training requirements and age-related restrictions prescribed by OSHA and EPA are covered in the **GEARING UP FOR SAFETY** curriculum. Since the age group you are working with is provided special protection under both federal and state laws, you should become familiar with any state laws that restrict what work is or is not permitted, and when it is permitted, by youth under 16 years of age. (Once a youth reaches the age of 16, there are currently no special restrictions related to employment in agriculture other than other applicable federal and state workplace safety rules such as handling certain restricted-use - pesticides and anhydrous ammonia.) As noted, most

federal and state child safety regulations do not apply to the children of farm and ranch owners.

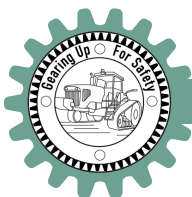
The **GEARING UP FOR SAFETY** program has also been successfully used to teach safe work practices to older youth not covered by the HOOA and adult farm workers on farms that are required to meet annual OSHA safety training requirements. A copy of the OSHA training requirements for tractor operators is attached as [Appendix 2](#). The extensive use of graphics and visuals in the lesson materials makes the curriculum especially useful for teaching youth and adults with limited English language skills or who speak English as a second language.

The curriculum is also designed for use by the growing number of youth being home schooled in rural communities, many of whom may be participating in agricultural-related enterprises as part of their home schooling experience.

Your role as program leader or instructor of the **GEARING UP FOR SAFETY** Program is a serious one that brings with it significant responsibilities. What you teach, or don't teach, can have an impact on future skills, behaviors, and attitudes of the youth you are instructing. Upon the successful completion of your training, youth, ages 14-15, will be eligible to be certified for employment operating tractors and machinery and performing other potentially hazardous farm/ranch tasks. Your instruction will directly contribute towards reducing the potential of injury as these young people begin work.

You are strongly encouraged to become completely familiar with the contents of the **LEADER'S GUIDE** before providing instruction and utilizing the instructional resources provided. If you are uncomfortable with a certain topic, we recommend involving others in your community who have the expertise to address the topic effectively. These people might include:

- County Extension educators/agents
- State Department of Labor/Child Labor Division
- High School agricultural science and business teachers
- Farm implement dealers and their service staff
- Law enforcement personnel
- Fire/rescue personnel
- Chemical dealers and custom applicators
- Utility company representatives
- Safety professionals employed by local industries



REMEMBER

Safety IS NO ACCIDENT!

The entire design team of **GEARING UP FOR SAFETY** extends its best to you, and your students, as you use this material. It is our hope, and we believe, that it will make a significant difference in making the work experience of each participating youth a healthy and safe one. Again, thank you for your commitment to agriculture's greatest resource – our youth.

NATIONAL WEBSITE

With support from the U.S. Department of Agriculture, a national website has been established to provide assistance to individuals nationwide who are providing instruction using the **GEARING UP FOR SAFETY** curriculum to meet the HOOA certification requirements for youth ages 14-15. You can visit the site at www.agsafety4youth.info. The site contains the contents of the **LEADER'S GUIDE** and a wide variety of resources to help enhance your effectiveness as an instructor and to ensure training requirements are met appropriately. A section is also provided that allows you to submit feedback to the design team.

ACKNOWLEDGEMENTS

Project Directors:

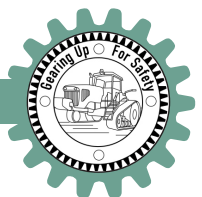
- Roger L. Tormoehlen, Ph.D., Professor, Department of Agricultural and Biological Engineering, Purdue University
- William E. Field, Ed.D., Professor, Department of Agricultural and Biological Engineering, Purdue University
- Shawn Ehlers, Ph.D. Post-Doc, Department of Agricultural and Biological Engineering, Purdue University
- Brian F. French, Ph.D., Professor, Psychometrics and Research, Washington State University

Subject Matter Experts: (2008 Edition)

- Shane Beer, M.S., Department of Agricultural and Biological Engineering, Purdue University
- Stacy Bullock, M.S., Department of Agricultural and Biological Engineering, Purdue University
- William Campbell, Ph.D., Department of Biological Systems Engineering, University of Nebraska – Lincoln
- Gail Deboy, Ph.D., Department of Agricultural & Biological Engineering, Purdue University
- Brian Hoover, M.S., Department of Agricultural and Biological Engineering, Purdue University
- Art Keshner, U.S. Department of Labor, Child Labor Division
- Carol Lehtola, Ph.D., Department of Agricultural and Biological Engineering, University of Florida
- Andrew Mann, B.S., Department of Agricultural and Biological Engineering, Purdue University
- Myron McClure, M.S. Department of Agricultural and Biological Engineering, Purdue University
- Robbie Ortega, Ph.D., Department of Youth Development and Agricultural Education, Purdue University
- Larry Piercy, M.S., Department of Biosystems and Agricultural Engineering, University of Kentucky
- Edward Sheldon, M.S., Retired Purdue Cooperative Extension

National Project Advisors: (2008 Edition)

- Jim Armbruster, National FFA Organization
- Dan Arnholt, Bartholomew County REMC/ Volunteer 4-H Tractor Program Leader
- Shari Burgus, Farm Safety 4-Just Kids
- Graciela Camarena, Migrant Health Promotion
- David Chrislip, National Institute for Occupational Safety and Health
- Janet Ehlers, National Institute for Occupational Safety and Health
- Bernard Geschke, Progressive Farmer, Trainer – Farm Safety Day Camps



- Natalie Hodge, Whiteland Community High School, FFA Advisor
- Bob Juncker, Indiana Department of Education
- Tom Karsky, University of Idaho
- Al Krysan, Hobar Publications
- Murray Madsen, (retired) Deere & Company
- Joel Martin, (retired) Walterscheid, Incorporated
- Becky Meyer, Director – Agricultural and Food Sciences Academy, MN
- Teri Palermo, National Institute for Occupational Safety and Health
- Susan Reynolds, Progressive Farmer, Director - Farm Safety Day Camps
- Bennii Shore, Caston Jr./Sr. High School, FFA Advisor
- Herb Willcutt, Mississippi State University
- Terry Wilkinson, The American Society of Safety Engineers

National Project Advisors: (2020 Edition)

- Dan Arnholt, 4-H volunteer, IN
- Nick Baker, Extension Educator, University of Wisconsin
- Richard Brzozowski, Agriculture Program Leader, University of Maine
- Jim Carrabba, Agricultural Safety Specialist, New York Center for Agricultural Medicine and Health, NY
- Charlene Cheng, Ph.D., Department of Agricultural and Biological Engineering, Purdue University
- Don Haberlin, M.S., Retired Agricultural Education Instructor
- Doug Kingman, Professor, Agricultural System Management Professor, Texas A&M
- Kara Mayer, Extension Educator, Kansas State University
- Michael Manning, M.S., Retired Purdue Cooperative Extension
- Kyle Olsen, Agriculture Science Teacher, MD
- Andy Seibel, Extension 4-H Youth Specialist, Virginia State University

- John Shutske, Professor, Extension Safety Specialist, University of Wisconsin
- Shirley Tautolo, Agricultural Science Teacher, MI

Editor/Writers:

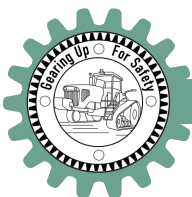
- Gail Deboy, Ph.D., Extension Safety Associate, Department of Agricultural and Biological Engineering, Purdue University
- Denise Heath, Info Systems Processing Operator, Department of Agricultural and Biological Engineering, Purdue University
- Ed Kirkpatrick, Editor, Department of Agricultural and Biological Engineering, Purdue University
- Craig Pendl, Technical Writer, Department of Agricultural and Biological Engineering, Purdue University
- Sandy Pendl, Reading Specialist
- Ed Sheldon, M.S., Extension Safety Specialist, Purdue University

Programmers:

- Richard Fox, Computer Analyst, Department of Youth Development and Agricultural Education, Purdue University
- Craig Personnet, Programmer, Department of Youth Development and Agricultural Education, Purdue University
- Bill Vollmer, Programmer, Department of Youth Development and Agricultural Education, Purdue University

Graphics:

- Andy Brock, Computer Graphics Design Intern, Department of Youth Development and Agricultural Education, Purdue University
- Alan Milner, Computer Graphics Design Intern, Department of Youth Development and Agricultural Education, Purdue University
- Neal Singleton, Computer Graphics Design Intern, Department of Youth Development and Agricultural Education, Purdue University



Analyst:

- Krisanna Machtmes, Ph.D., Assistant Professor, Department of Human Resource Education and Workforce Development, Louisiana State University

**Agricultural Science and Business Teachers
Hosting Test Sites:**

- Carrie Anderson, Student Teacher, Carroll (Flora) Jr./Sr. High School, Indiana
- Macon Fish, Hamilton Southeastern High School, Indiana
- Bill Fox, Clinton Prairie Jr./Sr. High School, Indiana
- Grace Gochenour, Tri-County High School, Indiana
- Gena Grahman, Student Teacher, Huntington North High School, Indiana
- Natalie Hodge, Whiteland Community High School, Indiana
- Andy Howell, Belmont High School, Indiana
- Jerene Kunkler, Student Teacher, Warsaw High School, Indiana
- Mary Ley, Student Teacher, Oak Hill High School, Indiana
- Trent Lindenman, West Noble High School, Indiana
- Cari Ostrom, Caston Jr./Sr. High School, Indiana
- Cynthia Raker, Carroll (Ft. Wayne) High School, Indiana
- Travis Scherer, Tri-County High School, Indiana
- Christina Scheurich, Hamilton High School, Indiana
- Paul Steinmetz, Northeast Dubois High School, Indiana
- Tom Younts, Hamilton Southeastern High School, Indiana

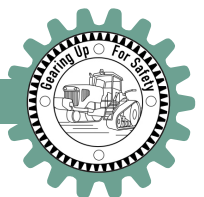
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- USDA – Agricultural Research Service
- USDA – On Line Photography Center
- Walterscheid
- William E. Field, Purdue University

DISCLAIMER

It should be noted that completion of the **GEARING UP FOR SAFETY** or any other safety program does not guarantee the safety of those who have participated in the program or successfully passed the testing or certification components. Knowing the safe way to complete a task or recognizing a hazard does not mean that the safe practice will always be selected or the hazard avoided. The information presented in the **GEARING UP FOR SAFETY** curriculum cannot be substituted for ongoing supervision, instruction, correction, evaluation, or an employer's commitment to providing a safe and healthy workplace. In fact, the Hazardous Occupation Order for Agriculture (HOOA) requires that employers provide regular visual supervision of youth working under the exemption provisions of the regulations. This rule, though not required by law in all circumstances for all youth, is a good practice for all employers employing or supervising youth in any workplace.



EMPLOYERS of young workers are required to provide regulator visual supervision during the day.

Furthermore, the design team does not imply that the contents of the program cover all potential hazards that may be encountered while performing farm or ranch-related work. The topics included have been selected to reflect the most serious and common hazards in agricultural production as identified through analysis of recent injury data and by a panel of agricultural safety and health experts. Hazards that are unique to individual agricultural enterprises or related to geographic regions should be identified by the instructor and incorporated into the curriculum where appropriate. A Farm and Ranch Safety Inventory Tool has been developed for use with the Gearing Up For Safety Curriculum to help in identifying potential hazards to young employees.

As program leader or instructor, you are not certifying or affirming by use of this material that any student who completes the program will perform any specific task safely, on every occasion. At the completion of the program you can only confirm that the student attended each of the classes, passed a written exam on safe work practices, and has demonstrated his or her ability to conduct a pre-operational safety inspection of a typical agricultural tractor and operate a tractor safely with a two-wheeled trailed implement on a standard course as prescribed by federal regulations. You are discouraged from making any written or verbal claims or promises beyond confirmation of participation and successful completion of the training program including the testing components.

There is a student prerequisite contained in the federal regulations, and assumed by the design team of **GEARING UP FOR SAFETY**, that youth participating in the training should have at least a basic familiarity with the normal working hazards found in agriculture and typical agricultural production methods, and have had prior

exposure to agricultural tractors and equipment. It is unreasonable to believe that the contents of this curriculum taught over approximately a 24-hour period, or less, will provide the necessary safety training for a person who has no prior familiarity with agricultural production practices and hazards.

LIABILITY ISSUES

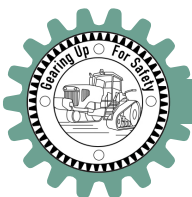
No one is immune from potential liability claims that may result from involvement in an activity involving people and potential hazards. As our society has become more litigious, though still somewhat rare, the potential for being identified as a defendant in a liability claim has increased.

The authors are not aware, however, of any individual or organization that has been named as a defendant in a legal action resulting from the teaching of, or hosting of, a 4-H Tractor Program, vocational agriculture (agricultural education) based tractor and machinery safety program or training program designed specifically to assist youth in meeting the certification training requirements of the Hazardous Occupation Order for Agriculture (HOOA).

As mentioned in the **DISCLAIMER**, you as the program leader or instructor are not certifying or affirming that any youth participating in the training will perform any specific task in a safe or efficient manner, or that all potential hazards that youth may encounter in an agricultural workplace have been discussed and understood. As a program leader or instructor, you can only confirm at the completion of the training that the student attended all of the required classes, passed a written exam on safe work practices, demonstrated his or her ability to conduct a pre-operation safety inspection of a typical agricultural tractor, and was able to demonstrate safe operation of a tractor with a two-wheeled trailed implement on a standard obstacle course as prescribed by the HOOA.

With these conditions in mind, the **GEARING UP FOR SAFETY** curriculum contains tools to help you fulfill and document the completion of your responsibilities as program leader, instructor, or employer. These include:

- Information on required student prerequisites
- Parental consent form (Appendix 3)
- Detailed curriculum contents including desired core competencies that students should master for each lesson
- Recommended lesson plans and student activity sheets
- Supporting graphics for presenting each lesson



- Validated test questions to assess students' mastery of desired core competencies
- Recommended pre-operational skills test reporting form (See Appendices)
- Recommended tractor operator skills testing procedures and course layouts
- Tractor operator skills scoring form (See Appendices)
- Student participation record form (See Appendices)
- Certificate of training (See Appendices)
- Case studies to facilitate discussion

Your best protection from potential liability claims is to ensure that you cover the course contents as prescribed by the HOOA, evaluate all students consistently, and maintain your records, especially attendance records, for at least three years or until the participants reach their 16th birthday. (Currently there are no restrictions preventing youth over the age of 16 from performing most work on farms and ranches.) The **GEARING UP FOR SAFETY** curriculum includes a Program Assessment Tool to help you evaluate your activities to ensure that they meet current best practices. The Assessment Tool is included in the Appendices.

It is recommended that the operational or driving portion of the course takes place at a public facility such as county fairgrounds or school that has general insurance coverage for 4-H, FFA, or similar public events held there on a routine basis. If the event is held at a privately owned site, the owner should have proof of insurance coverage for protection in the event of any injury or property damage. The property owner may need to check with his or her insurance carrier to confirm coverage for such activities. Likewise, the property owner or his/her insurance carrier may request proof-of-insurance from the organization or entity conducting the training.

As with all public education programs, such as those conducted by 4-H, FFA, or agricultural education instructors, any injuries, regardless of severity, must be documented and reported to the responsible authority. In the case of a 4-H program this would be the local Extension Educator or land grant university risk manager. For an FFA or agricultural education program, notify the school

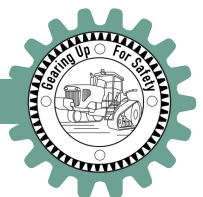
administrator. In no case should an individual injured during their participation in the program be allowed to leave without receiving appropriate medical attention and notification of parents or guardians.

Another liability issue relates to ensuring full access to the program activities by all those eligible to participate. There are assumed prerequisites for youth wanting to participate in the training for the purpose of seeking certification under the provisions of HOOA (See Program Prerequisites). These prerequisites include a general knowledge of agricultural production hazards, official enrollment in 4-H or agricultural education programs, and having reached the age of 14, and possessing the appropriate physical and intellectual abilities to safely participate in the training. Other characteristics such as race, sex, ethnicity, economic background, or religion should never be used as a prerequisite for participation.

Many youth organizations now require criminal background checks for all volunteer adult leaders who have direct contact with children and youth. These policies have been implemented to reduce the potential of inappropriate activities between adults and children and youth. These policies also provide a certain level of liability protection for the organization because they demonstrate a good faith effort to screen out individuals who have a history of abusing children and youth. If these checks are required for other youth programs sponsored by the local 4-H or agricultural education programs they should also be used with volunteer leaders involved in the **GEARING UP FOR SAFETY** training program.

Since each organization may have its own risk management policies, it is recommended that discussions be held with those responsible for risk management, including maintaining insurance coverage, to fully disclose the contents of the curriculum and the planned activities. They need to be especially aware of the operator skills evaluation component of the program during which participants will be required to demonstrate their ability to safely operate a tractor.

It is important to note, however, that the liability issues addressed above do not prevent a parent, guardian, or employer from using the contents of **GEARING UP FOR SAFETY** to provide general safety training for their family members or employees.



PROGRAM ASSESSMENT TOOL

To assist program leaders and instructors with evaluating their current HOOA training in order to ensure that it meets the minimum safety and health training requirements prescribed under current federal regulations, a simple to use assessment tool has been designed and is included as part of the **LEADER'S GUIDE**. There is no requirement to use the assessment tool or report the findings to anyone. It is intended solely for program improvement purposes. The assessment tool provides a formal and consistent way to look at all aspects of the program including:

- Program outcomes
- Program oversight
- Instructor qualifications
- Student prerequisites
- Duration of instruction
- Minimum content areas
- Testing requirements
- Remedial testing opportunities
- Documentation of certification completion
- Record keeping requirements

The Assessment Tool and instructions can be found as Appendix 8. The tool includes easy-to-follow instructions and a checklist for completing the assessment.

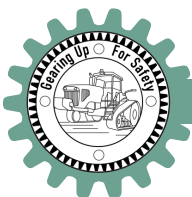
STUDENT PREREQUISITES

Under the current federal regulations (HOOA) there are specific prerequisites for youth seeking to be certified to perform for hire certain agricultural tasks that are considered to be particularly hazardous. In other words, the rule makers assumed that no training program could address all of the training needs of youth, especially those under 16 years of age, who have had no prior exposure to agricultural workplaces and hazards. In fact, it might be safe to assume that the original regulations were based on the assumption that most youth participating in the original HOOA training programs were primarily from a farm or ranch background. This is no longer the case. In a growing number of cases youth may wish to participate in the program with little or no prior agricultural experience. This situation presents serious challenges for instructors, such as the need for remedial training that may go beyond the scope of the **GEARING UP FOR SAFETY** Program.

The following summarizes the assumed prerequisites for each of the three exemptions provided under the current HOOA training requirements.

1. Student-Learners – Youth participating under a student-learner program exemption must:
 - a. be enrolled in a vocational education training program in agriculture (agricultural education)
 - b. have a written agreement in place that provides that:
 - the work of the student-learner is incidental to his/her training
 - work shall be intermittent, for short periods
 - that safety instruction shall be given by the school and correlated by the employee with on-the-job training
 - a schedule of organized and progressive work processes to be performed on the job has been prepared (specific tasks to be performed identified)
2. Federal Extension Service – Youth participating under the 4-H program exemption must be:
 - a. enrolled as a 4-H member
 - b. at least 14 years of age, or older (at the time the exemption certificate is issued)
 - c. **familiar with the normal working hazards in agriculture**
3. Vocational agriculture (agricultural education) training – Youth participating under the agricultural education exemption must be:
 - a. enrolled in an agricultural education class (assumed)
 - b. at least 14 years of age, or older (at the time the exemption certificate is issued)
 - c. **familiar with the normal working hazards in agriculture**

Organizers and instructors of any HOOA-based training need to carefully consider the standard prerequisites listed above. Legally, youth under the age of 16 who enroll in the training, but who do not meet the prerequisites contained in the law, are ineligible for certification.



However, the prerequisite requirement does not preclude any young people who desire to become more aware of safe work practices in agriculture, including those who are age 16 or over to whom HOOA restrictions no longer apply, from participating in the training program. They may simply not be eligible for certification. All youth who plan to operate agricultural tractors and machinery can benefit from the program, regardless if required to do so by federal or state law. Again, it is unrealistic to assume that **GEARING UP FOR SAFETY** (or any other training program) can alone completely prepare a young person age 14-15, or of any age, to safely operate agricultural tractors and machinery and perform other potentially hazardous tasks on a farm or ranch.

There may be other factors that may prevent youth from successfully completing the training and certification requirements prescribed by the HOOA. These factors might include physical and developmental disabilities such as the inability to read and comprehend the student learning material, restricted mobility, and impaired vision or hearing. These issues are best resolved in collaboration with all involved, including parents, instructor, and youth. As the program leader or instructor, however, you are the one who ultimately decides whether-or-not a young person has met the requirements for certification.

The original HOOA training was not designed for everyone nor does completion of the **GEARING UP FOR SAFETY** training guarantee that every youth has the physical, intellectual and emotional maturity to safely perform hazardous work. It should not be viewed as a failure for a young person to be encouraged to wait before completing the course or attempting to be certified. The reason that testing for both knowledge of safe work practices and the ability to demonstrate safe operator skills was required under HOOA was that there was an assumption made that some youth may not be qualified, or will fail to master the necessary competencies to safely perform certain farm and ranch work. The training and testing process was designed to protect youth, not penalize them.

For additional information on age appropriate tasks review the resources produced on the topic by the National Children's Center for Rural and Agricultural Health and Safety, located at the Marshfield Clinic, Marshfield, Wisconsin (<http://www.marshfieldresearch.org/nccrahs>).

AGRICULTURAL ACADEMIC STANDARDS

Our world is ever changing, becoming ever more complex and demanding. In order to succeed at school, work and in the community, students must be better prepared than at any time in our history. To meet these expectations, many states have adopted new curriculum standards for their schools. Educators and administrators are expected to use these standards as they plan and develop new course offerings in all program areas offered by public schools. These learning standards help ensure that students achieve a basic set of core competencies and are equipped to meet the challenges they will face in the future.

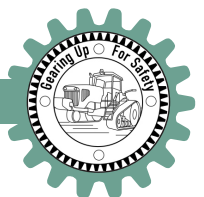
To ensure that components of the **GEARING UP FOR SAFETY** curriculum material meets the basic academic standards set for typical secondary agricultural education programs, the material has been aligned with several published program standards, specifically in the program area of Agricultural Science and Business. These standards generally identify characteristics of quality programs that:

- prepare students for both college admission and entry into the workplace
- help students confirm or re-evaluate initial career choices
- provide students with direction for further education and training
- reinforce and extend learning of essential skills in mathematics, English/language arts, science, and social studies; and
- provide opportunities to graduate from high school with both a diploma and a certificate recognized by business and industry.

The contents of the **GEARING UP FOR SAFETY** were aligned with the academic standards currently used by the state of Indiana in the instructional areas of:

- Agricultural Mechanics
- Agricultural Business
- Fundamentals of Agriculture

The Indiana standards have been compared to current standards in several other states (Texas, Wisconsin, and Illinois) and found to be comparable or to exceed outcome expectations. A lesson-by-lesson alignment is included in this section. For more information on Indiana's Academic



Standards visit the Indiana Department of Education's Academic Standards website at: www.doe.in.gov/standards.

The contents were also aligned with the Agriculture, Forestry, and Natural Resource Career Cluster Content Standards developed by the National Council for Agricultural Education. These voluntary standards provide educators with a high-quality, rigorous set of standards to guide the design of relevant learning experiences for students in an agricultural, forestry, or natural resource career path. For example, under the area of Power, Structural, and Technical Systems, the following standard student outcome has been identified:

“PST.01.02.03.a – Examine owner’s manual to classify the types of safety hazards associated with different mechanical systems used in AFNR (e.g. caution, warning, danger, etc.)”

Completion of the **GEARING UP FOR SAFETY** curriculum will fulfill that specific learning outcome.

Since there is significant diversity in secondary agricultural education programs, it would be beneficial to review the **GEARING UP FOR SAFETY** curriculum in order to identify program outcomes that are met by incorporating the training into the classroom.

If you plan to use the **GEARING UP FOR SAFETY** curriculum as part of a secondary agricultural education program, such as agricultural mechanics, you may wish to review your current state academic standards to assess how the curriculum meets the established core competencies. The **GEARING UP FOR SAFETY** materials are designed to allow you to easily supplement or enhance them in order to cover other desired or required competencies in agricultural education.

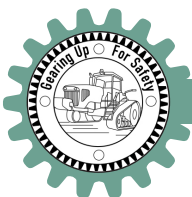
Currently there is not a recognized, or “certified”, course that is designed to meet the basic agricultural safety and health workplace safety standards enforced by the U.S. Department of Labor’s Occupational Safety and Health Administration (OSHA). The **GEARING UP FOR SAFETY** curriculum, however, is designed to be used by employers to meet the employee training requirements:

“The OSHA Machine Guarding Standard for Agriculture requires that employers instruct every employee in the safety operation and servicing of all equipment (farm, farmstead, and gin machines) with which the employee is or will be involved at the time of initial assignment and at least annually thereafter.”

¹ If any user of the material is aware of any litigation related to providing safety and health

² Efforts have made to increase the eligible age for certification under the provisions of the HOOA to 16 and the minimum age to work without any restrictions to 18. At this time these efforts have been unsuccessful. If these changes are made, the U.S. Department of Labor must conduct a public awareness effort to ensure that all employers are aware of the change. If you are unsure of the current regulations contact the local Wage and Hour or Department of Child Labor listed in the phonebook under Government.

³ Providing safety training that can be documented has been used successfully in civil litigation to demonstrate an employer’s commitment to a safe work place.



GEARING UP FOR SAFETY CURRICULUM ALIGNMENT WITH INDIANA CAREER CLUSTER CONTENT STANDARDS

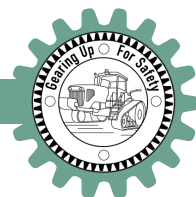
Table 1: Comparing Educational Contents with Existing Academic Standard

Lessons/ Sections	Area	Standards
1A	AM ⁴	A. Students shall analyze and implement safe work practices which apply to agricultural mechanics. 1. Explain the importance of safety in agricultural mechanics.
1B	AM	A. Students shall analyze and implement safe work practices which apply to agricultural mechanics. 2. Identify and differentiate between safe and unsafe work practices.
1C	AB ⁵	C-9. Students shall evaluate safety procedures used in farm and agricultural industry. 1. List factors which contribute to farm and agricultural industry accidents.
1D	FA ⁶	J. Students shall develop and demonstrate a basic knowledge of agricultural mechanics and physical science. 8. Explain the need for safety in agricultural mechanics and physical science.
1E	AB	C-9. Students shall evaluate safety procedures used in farm and agricultural industry. 1. List factors which contribute to farm and agricultural industry accidents.
1F	AB	C-9. Students shall evaluate safety procedures used in farm and agricultural industry. 1. List factors which contribute to farm and agricultural industry accidents.
1G	AM	A. Students shall analyze and implement safe work practices which apply to agricultural mechanics. 2. Identify and differentiate between safe and unsafe work practices.
1H	AB	C-9. Students shall evaluate safety procedures used in farm and agricultural industry. 1. List factors which contribute to farm and agricultural industry accidents.
1I	AB	C-9. Students shall evaluate safety procedures used in farm and agricultural industry. 1. List factors which contribute to farm and agricultural industry accidents.
1J	AB	C-9. Students shall evaluate safety procedures used in farm and agricultural industry. 1. List factors which contribute to farm and agricultural industry accidents.

⁴ Agricultural Mechanics

⁵ Agricultural Business

⁶ Fundamentals of Agriculture

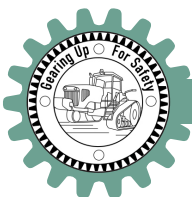


Lessons/ Sections	Area	Standards
2A	AM	<p>L. Students shall investigate the operation of small engines</p> <ol style="list-style-type: none"> 1. Identify and explain the following systems and components: <ol style="list-style-type: none"> a. Air and fuel intake and carburetion systems b. Ignition systems c. Cooling systems d. Lubrications systems e. Combustion components <p>L. Students shall investigate the operation of small engines</p> <ol style="list-style-type: none"> 5. Identify the individual parts of a small engine
2B	N/A ⁷	
2C	N/A	
2D	AM	<p>A. Students shall analyze and implement safe work practices which apply to agricultural mechanics</p> <ol style="list-style-type: none"> 4. Identify and explain the purpose of signs and symbols in agricultural safety
2E	N/A	

Lessons/ Sections	Area	Standards
3A	AM Eng ⁸ 9.2.5	<p>A. Students shall analyze and implement safe work practices which apply to agricultural mechanics</p> <ol style="list-style-type: none"> 5. Explain the importance and function of the operator's manual <p>Demonstrate the use of technology by following directions in technical manuals</p>
3B	AM	<p>L. Students shall investigate the operation of small engines</p> <ol style="list-style-type: none"> 2. Explain and demonstrate how to service and maintain fuel, air intake, exhaust, cooling and lubrication systems.
3C	AM	<p>A. Students shall analyze and implement safe work practices which apply to agricultural mechanics</p> <ol style="list-style-type: none"> 2. Identify and differentiate between safe and unsafe work practices
3D	AM	<p>A. Students shall analyze and implement safe work practices which apply to agricultural mechanics</p> <ol style="list-style-type: none"> 4. Identify and explain the purpose of signs and symbols in agricultural safety

⁷ Not Applicable

⁸ English



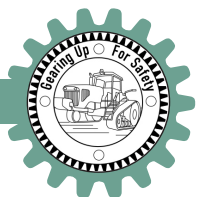
Lessons/ Sections	Area	Standards
4A	AM	A. Students shall analyze and implement safe work practices which apply to agricultural mechanics 2. Identify and differentiate between safe and unsafe work practices
4B	AM	A. Students shall analyze and implement safe work practices which apply to agricultural mechanics 2. Identify and differentiate between safe and unsafe work practices
4C	N/A	
4D	AB	C-9. Students shall evaluate safety procedures used in farm and agricultural industry 1. List factors which contribute to farm and agricultural industry accidents.
4E	AB	C-9. Students shall evaluate safety procedures used in farm and agricultural industry 1. List factors which contribute to farm and agricultural industry accidents.
4F	AB	C-9. Students shall evaluate safety procedures used in farm and agricultural industry 1. List factors which contribute to farm and agricultural industry accidents.

Lessons/ Sections	Area	Standards
5A	AB	C-9. Students shall evaluate safety procedures used in farm and agricultural industry 1. List factors which contribute to farm and agricultural industry accidents.
5B	Math ⁹ 8.2.1	Add, subtract, multiply and divide rational numbers in multi-step problems.
5C	AB	C-9. Students shall evaluate safety procedures used in farm and agricultural industry 1. List factors which contribute to farm and agricultural industry accidents.

Lessons/ Sections	Area	Standards
6A	AB	C-9. Students shall evaluate safety procedures used in farm and agricultural industry 1. List factors which contribute to farm and agricultural industry accidents.
6B	AM	A. Students shall analyze and implement safe work practices which apply to agricultural mechanics 2. Identify and differentiate between safe and unsafe work practices
6C	AB	C-9. Students shall evaluate safety procedures used in farm and agricultural industry 1. List factors which contribute to farm and agricultural industry accidents.
6D	NR ¹⁰	T. Students shall exhibit safety procedures and be prepared to handle minor emergency situations that may arise in an outdoor location 2. Exhibit the ability to build a fire, extinguish a fire and eliminate all traces of the fire

⁹ Mathematics

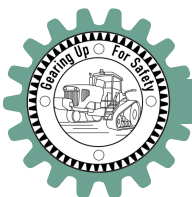
¹⁰ Natural Resources



Lessons/ Sections	Area	Standards
7A	AM	A. Students shall analyze and implement safe work practices which apply to agricultural mechanics 2. Identify and differentiate between safe and unsafe work practices
7B	AM	A. Students shall analyze and implement safe work practices which apply to agricultural mechanics 2. Identify and differentiate between safe and unsafe work practices
7C	AM	A. Students shall analyze and implement safe work practices which apply to agricultural mechanics 2. Identify and differentiate between safe and unsafe work practices
7D	N/A	
7E	AM	A. Students shall analyze and implement safe work practices which apply to agricultural mechanics 2. Identify and differentiate between safe and unsafe work practices

Lessons/ Sections	Area	Standards
8A	LM ¹¹	A-5. Students shall identify and explain the safety procedures used in the handling and application of horticultural chemicals 4. Identify the proper protective clothing which a pesticide applicator should wear during application procedures
8B	N/A	
8C	AM	B. Students shall recognize the importance of , identify and implement safe work practices in the agricultural shop 1. Evaluate the importance of shop safety 3. Identify and demonstrate the proper use of safety equipment which should be worn in the agricultural shop 4. Locate and demonstrate the proper uses of the first aid and emergency equipment found in an agricultural shop
8D	AM	A. Students shall analyze and implement safe work practices which apply to agricultural mechanics 2. Identify and differentiate between safe and unsafe work practices
8E	AM	A. Students shall analyze and implement safe work practices which apply to agricultural mechanics 2. Identify and differentiate between safe and unsafe work practices
8F	AM	B. Students shall recognize the importance of , identify and implement safe work practices in the agricultural shop 5. Develop proper safety skills to use for hand and power tools
8G	AM	B. Students shall recognize the importance of , identify and implement safe work practices in the agricultural shop 5. Develop proper safety skills to use for hand and power tools
8H	AM	A. Students shall analyze and implement safe work practices which apply to agricultural mechanics 2. Identify and differentiate between safe and unsafe work practices

¹¹ Landscape Management



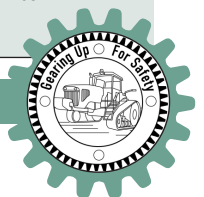
Lessons/ Sections	Area	Standards
9A	AM	A. Students shall analyze and implement safe work practices which apply to agricultural mechanics 1. Explain the importance of safety in agricultural mechanics
9B	N/A	
9C	N/A	
9D	N/A	
9E	N/A	
9F	N/A	

Lessons/ Sections	Area	Standards
10A	AB	C-9 Students shall evaluate safety producers used in farm and agricultural industry 1. List factors which contribute to farm and agricultural industry accidents
10B	N/A	
10C	N/A	
10D	N/A	
10E	N/A	

Lessons/ Sections	Area	Standards
11A	AM	A. Student shall evaluate safety procedures used in farm and agricultural safety 1. List factors which contribute to farm and agricultural industry accidents
11B	N/A	
11C	N/A	
11D	N/A	
11E	N/A	

Lessons/ Sections	Area	Standards
12A	AM	A. Students shall analyze and implement safe work practices which apply to agricultural mechanics 2. Identify and differentiate between safe and unsafe work practices
12B	N/A	
12C	N/A	
12D	N/A	
12E	N/A	

Lessons/ Sections	Area	Standards
13A	AM	A. Students shall analyze and implement safe work practices which apply to agricultural mechanics 2. Identify and differentiate between safe and unsafe work practices
13B	N/A	A. Students shall analyze and implement safe work practices which apply to agricultural mechanics 2. Identify and differentiate between safe and unsafe work practices



Lessons/ Sections	Area	Standards
14A	AM	B. Students shall recognize the importance of, identify and implement safe work practices in the agricultural shop 4. Locate and demonstrate the proper uses of the first aid and emergency equipment found in an agricultural shop
14B	N/A	
14C	N/A	
14D	N/A	
14E	N/A	

Lessons/ Sections	Area	Standards
15	N/A	

Lessons/ Sections	Area	Standards
All FA	J.	Students shall develop and demonstrate a basic knowledge of agricultural mechanics and physical science 8. Explain the need for safety in agricultural mechanics and physical science 9. Demonstrate proper safety procedures to follow in the various areas associated with agricultural mechanics

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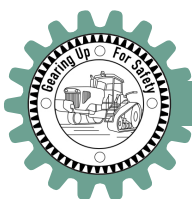
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Head, Department of Agricultural and Biological Engineering
Purdue University
615 West State Street
West Lafayette, IN 47907
Email: gearingup@lists.purdue.edu
Phone: 765-494-1191



CURRICULUM DESIGN PROCESS

GEARING UP FOR SAFETY is an evidence-based curriculum originally designed to meet the current safety training requirements contained in the Hazardous Occupation Order for Agriculture (HOOA). HOOA is part of the Federal Fair Labor Standards Act intended to protect youth under the age of 16. It especially applies to youth ages 14-15 who are required to have certification of training prior to performing certain agricultural tasks considered particularly hazardous on farms and ranches (See Appendices). The curriculum has also been tested and shown to be a useful training program for other audiences including youth not effected by the HOOA, young and beginning workers in agriculture, youth involved in 4-H safety programs, home schoolers, full and part-time farm employees, and migrant and seasonal farm workers assigned to operate, service, or maintain agricultural tractors and equipment. This section provides a brief summary of how the curriculum was developed and provides a brief description of the components of the curriculum.

Identification of Competencies

The first step in the design of the original curriculum was the identification of the core set of competencies that students should be expected to master in order to meet the goals of the program, especially the requirements of HOOA. In other words, what subject matter should be taught? A preliminary set of competencies was identified by the original design team using the mandated training requirements included in the HOOA and OSHA regulations, and from review of recent agricultural-related injury data. An external curriculum advisory team representing specialists in the fields of agricultural production, agricultural safety and health, youth development, agricultural engineering, agricultural education, farm labor, agricultural news media and computer-aided instruction, was assembled and asked to review and prioritize the preliminary set of competencies. (Many of those involved on the design team and the curriculum advisory team have been directly involved in one or both of the federally recognized tractor and machinery safety and/or certification training programs as a youth participant, parent, instructor, farm employer, or volunteer leader.) As a result of the review process,

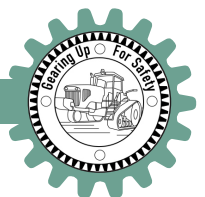
additional competencies considered essential for youth working in agriculture were identified. During the deliberations, the design team took into consideration the following factors:

- Existing federally mandated training requirements
- Recent agricultural-related injury data documenting the most frequent causes and types of fatal and severe injuries to youth working in agriculture
- Recent research on educational methodologies, youth development, age appropriate tasks, and safety education
- Future trends in agricultural production methods including new technology, sources of labor, and potential regulatory changes

A sample of high school agricultural educators and youth involved in agricultural work were asked to review the revised list of competencies and provide input. This group was asked to help prioritize the list and identify other desired competencies. The list was then reviewed by the external panel of experts. (See Acknowledgement Section for list of those involved.)

A set of approximately 170 cognitive and performance-based competencies were initially developed through this process. The design team concluded that by mastering this set of core competencies, youth would perform more safely and be less likely to be injured while performing work in agricultural production.

Those involved with the design team and curriculum advisory team also believed that the topics covered by the curriculum should not only meet the training requirements prescribed by the HOOA but exceed them. Since the HOOA regulations were introduced in 1968, there have been substantial changes in agricultural technology, work practices and their corresponding hazards. There have been, however, no significant changes to the law. For example, the HOOA regulations do not mention the use of skid steer loaders, common on many farms, or even grain bins. Therefore the GEARING UP FOR SAFETY curriculum intentionally included competencies that are not mentioned in or required by the current federal rules such as knowledge and skills required to safely operate ATV's, utility vehicles, and skid steer loaders. Some of the competencies were also directly related to recent data on agricultural-related injuries involving young workers, which were not available when the HOOA were originally implemented.



The original competencies were then categorized into 11 lessons of cognitive skills that addressed what a student should “know” in order to perform agricultural production work safely and one unit covering performance skills, (what a student should be able to “demonstrate”) prior to employment.

During the revision process in 2018-2020, four new units were developed based upon an expanded set of competencies addressing skid steer loader safety, confined spaces in agriculture, grain storage and handling facilities and livestock safety. The 2020 version of the curriculum now addresses over 200 competencies or desired learning outcomes.

Content Development

Using the set of desired core competencies, the original design team developed a detailed subject matter outline to meet the minimum instruction required by the HOOA. The outline went through an extensive review in 2018-2020 by a new curriculum advisory team and external reviewers. The 2020 version now consisted of 15 lessons that addresses the knowledge-based competencies and one unit designed to assess the student’s ability to demonstrate safe operator skills. The lessons are organized such that comparable topics are presented together and in a logical sequence. Unlike prior curricula, the contents focus primarily on critical safety-related information and skills with less attention given to general maintenance and/or repair of agricultural tractors and equipment, except where these activities expose the operator to a substantial risk of injury. In other words, the GEARING UP FOR SAFETY curriculum is designed to produce safer operators and workers, not skilled mechanics or technicians.

The design team chose to make significant use of graphics, a well-documented successful teaching methodology, throughout the curriculum. The importance of graphics became even more evident when field testing of the curriculum showed a large number of youth in the target audience demonstrating lower than anticipated literacy skills.

Lesson Plan Development

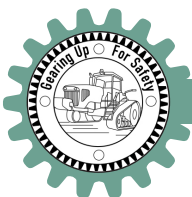
Using the desired set of core competencies and outline of the contents, a set of 15 instructor lesson plans have now been developed. These lessons have been field tested by agricultural education instructors, including pre- and post-testing with several thousand students. The purpose of the lessons was to provide the instructor a detailed outline of the contents and sufficient supplemental instructional resources in order to successfully teach the desired core competencies. Each lesson provides:

- A brief overview of the topics to be covered
- List of desired core competencies to be mastered by the student
- Suggested teaching aids to assemble prior to teaching the lesson
- Set of suggested graphics in electronic or PowerPoint format
- Outline of subject matter content with supplemental background information
- Student Worksheets to be used, if desired, in conjunction with classroom presentations and discussion
- Selected review questions

The lesson plans are not intended to provide the instructor with all the information needed to cover all hazards that may be confronted in the agricultural workplace. The focus of the lessons is on teaching the core set of desired competencies with the greatest potential for preventing injury identified during the initial research. Nor do the lessons compensate for the instructor’s lack of technical or teaching experience. To be an effective teacher requires adequate preparation and a passion for the subject matter.

Delivery Formats

During the development stages of the GEARING UP FOR SAFETY curriculum, the contents have been delivered in a variety of ways including; traditional classroom instructor-based settings; informal community settings with volunteer instructors, and open enrollment; home-school settings; independent study with supporting student C.D.; and via webinar. The contents are designed to provide flexibility in delivery and allow for customization to address local issues and unique resources. For example, instructors are encouraged to incorporate personal and local experiences.



Not all the lessons have to be taught in sequence, nor are all lessons required to meet the training requirements of HOOA. As noted, some of the lessons address a more comprehensive view of hazards in the agricultural workplace than is required to meet HOOA certification requirements. The curriculum allows for structured classroom testing of participant knowledge or allows the participant to review the contents as often as needed to master the desired competencies, such as in a home school independent study setting.

One of the offerings being developed is online access to the lessons in a webinar format. Participants will be able to view each lesson and complete a test at the end of each lesson. This format could be used to present the contents and then provide supervised testing to confirm knowledge gain. For more information on this format visit www.agsafety4youth.info.

Student Evaluation Components

The curriculum contains evaluation tools to test both the participant's knowledge-based skills and his or her operator or performance skills.

To test student knowledge of safe work practices, a pool of questions has been developed and tested that directly correspond to the core set of competencies. These questions are designed to be used as both review questions and final examination questions. In cases where a competency was considered extremely important to preventing injury, the competency may have two or more corresponding test questions.

The operator skills assessment involves actual operation of an agricultural tractor with a trailing two-wheel cart as prescribed by the HOOA training requirements. It consists of a two step process involving:

1. Pre-operation skills test
2. Operator driving skills evaluation

It is recommended that the testing be progressive and that successful completion of the written exam serve as a prerequisite for taking the pre-operation skills test and that successful completion of the pre-operation skills test be a prerequisite for participating in the operator driving skills evaluation. Failure of the student to successfully complete any of the tests would prevent continuation to the next testing level or eventual certification.

It was determined that mastery of some competencies was so important that failure to successfully demonstrate them during the skills testing portion would result in automatic failure and disqualification for certification until the student could demonstrate mastery.

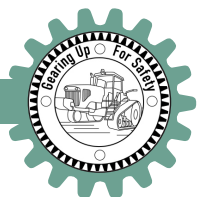
A panel of experts established minimum passing scores for each of the testing steps. On the written, knowledge-based test, the panel determined that for a sample of 70 test questions, a minimum of 70 percent correct was needed to successfully pass the test. There are no restrictions that prevent you as the instructor in setting higher minimum passing scores. You should, however, be consistent in the scoring methods used.

Glossary

During field testing of the curriculum it was discovered that many of the technical terms used in the curriculum were not well understood by all participants. Because of limited exposure to agricultural production activities, or lack of prior agricultural experiences or experiences that were highly specialized, participants could not readily comprehend the curriculum contents. As a result, the design team therefore developed an extensive glossary of over 380 technical terms and definitions with corresponding images that would help participants better understand the terms when used in the visuals or presentations. When made available to students online, it was found that students regularly visited the glossary to explore the contents and seek definitions.

Case Studies

A collection of over 100 case studies have been prepared and added to the LEADER'S GUIDE in the form of fictional newspaper articles for use in communicating important safety-related concepts. Many of the articles reinforce one or more desired core competency while the others are designed to have the student weigh the consequences of unsafe work practices. Most articles are based upon actual news clippings with the names and locations changed to protect the identity of those involved. Each of the PowerPoint presentations ends with a selected case study to generate class discussion. Using case studies is a proven teaching strategy. It's actually a form of storytelling. Encourage students to share their own stories.



Farm/Ranch Safety Inventory

To assist students in becoming more aware of general farm and ranch hazards a safety inventory or checklist has been designed and included as part of the LEADER'S GUIDE. The inventory provides the students a tool for conducting a physical inspection of a farm or ranch to identify potential hazards. Even though completing such an activity is not included as part of the HOOA training requirements, it could be used to determine whether or not a student meets the prerequisite of having a familiarity with the normal working hazards found in agriculture. The inventory can be downloaded and reproduced as needed. This tool might also be provided to potential employers of young workers to assist them in enhancing the safety of their workplaces. A copy of the inventory can be found included in the Appendices.

Instructional Resources

Included with the LEADER'S GUIDE is a basic set of relevant resources and contacts that can be used to obtain supplemental instructional material and general information. See Resources. The information provided was up-to-date at the time of publication but due to frequent changes in phone numbers and web addresses, check out the most recent version at www.agsafety4youth.info, or the National Agricultural Safety Database at <http://www.cdc.gov/niosh/nasd.html>.

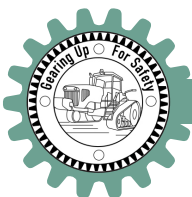
CONDUCTING THE PROGRAM

Almost any successful event requires a clear mission or purpose, pre-planning, adequate resources, the commitment of those involved, follow-through and evaluation. However, when working with youth these ingredients are critical. Though often not highly verbal about their feelings, most youth know when they are being "short changed" or their time not respected causing them to soon drift away or stop attending all together. To keep a group of youth committed to completing the approximately 24 hours of instruction required for HOOA certification, organizers and instructors will need to be creative and understand what makes youth "tick". Remember it can't be all work and no "play".

The primary incentive for youth to complete the HOOA training has historically been receiving the certification required for employment on a farm or ranch prior to reaching the age of 16. For some, this is sufficient motivation to attend each session and work at passing the evaluation components. In other cases, students may participate because their peers are involved or parents have required them to do so. If the program can be organized and delivered in such a way that youth would rather be in attendance than anywhere else, the potential for successful outcomes will be much higher. Far too often instructors place the blame for low attendance and retention on the apathy of youth rather than evaluating the relevance of the subject matter or the methods being used to deliver it. One only needs to examine youth attendance at music and sporting events or their attraction to computers and video games to realize that young people will participate if the program is packaged right.

Some basic approaches to consider when planning to host a GEARING UP FOR SAFETY Training Program include:

1. Avoiding scheduling conflicts – When scheduling meetings for youth carefully review the community and school calendars in order to identify those events most likely to cause scheduling conflicts with participants. Don't attempt to compete with special events. In some communities certain nights or days of the week are reserved for religious activities and should be avoided.
2. Keep to the schedule – Once meeting dates and times have been set, avoid changes. A loose, continually changing schedule communicates a low level of commitment to both the youth and their parents.



If changes are unavoidable make sure everyone is contacted. Do not assume that everyone can be notified at the last minute via email. Some participants may lack reliable (or any) internet access, or simply do not check email or social accounts regularly.

3. Have food – No one would consider inviting a group of youth to their home and not have food. Food is a powerful attraction to youth, and their parents. If a series of meetings are being planned, consider having a hotdog roast or hamburger cookout incorporated into one of them. If asked, a local business such as a bank, implement dealership, chemical supplier, or insurance company may be willing to sponsor the refreshment breaks or a special meal at the completion of the training. It's hard for a business or organization to say no to a safety program for youth.
4. Make it fun – Safety training does not need to be dull, dry, and void of fun. Incorporate a little humor and fun into the program whenever it is appropriate. There are few more rewarding sounds for an instructor than to hear students laughing. Laughter is contagious, it's healthy, and contributes to retention. As an instructor it is also important to learn to laugh at your own mistakes. Remember that some young people are sensitive about being the focus of attention. Laughter should never be used at the expense of another person's feelings.
5. Provide a good learning environment – Not much learning will take place in a setting with numerous distractions or that is not conducive to learning. Avoid sites that are noisy (heater fans, traffic noise), have other events going on at the same time, or are too hot or cold. Ask everyone, including parents, to turn off their cell phones. Encourage parents to participate in the presentations rather than being a distraction in the back of the room talking with other parents.

The following sections cover other strategies to ensure a successful training program, including: recruiting instructors, selecting a site, obtaining resources, and recruiting students.

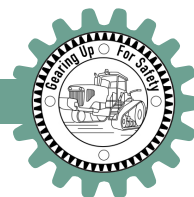
**Give a child a fish
and feed him for a day.
Teach a child to fish and
feed him for a lifetime.**

OLD PROVERB

Recruiting Instructors

If certification is the ultimate goal, current HOOA requirements stipulate that training should be conducted under the supervision of either Extension/4-H agents (educators) or vocational agriculture (agricultural education) teachers. The GEARING UP FOR SAFETY materials refer to these individuals as Program Leaders. A designated Program Leader must maintain required records and confirm participant's completion of any training for which certification is offered. Historically, however, many others have been recruited from within the community to provide all or part of the required instruction under the supervision of a qualified Program Leader. These instructors, usually volunteers in most cases, have been recruited, trained and equipped to conduct youth training in the same manner as volunteers used to lead projects in many other areas of 4-H and agricultural education. (If you are a volunteer instructor, the local Extension/4-H agent (educator) or agricultural education instructor, as the Program Leader, is required to confirm completion of the training and maintain the required records.)

The LEADER'S GUIDE is designed to equip anyone, who already has a good knowledge of agricultural production practices, familiarity with agricultural tractors and machinery, awareness of general agricultural hazards and good communication skills, with the appropriate tools to successfully provide the necessary training leading to certification under the HOOA regulations. Individuals who could potentially serve as instructors, in addition to Extension staff and agricultural education teachers include:



- Farmers and ranchers (active and retired)
- Implement dealers, service technicians, and sales staff
- Retired Extension agents (educators) and agricultural education instructors
- Agricultural chemical dealers
- Private farm managers and consultants

When selecting volunteer instructors for participating in the GEARING UP FOR SAFETY training, certain personal qualities should be evident. These include:

- Passion to work with youth
- Desire to help reduce the potential of injury to youth engaged in agricultural production work
- Ability to effectively communicate
- Commitment to teach the required instruction contained in the curriculum
- Willingness to maintain the required records
- Demonstrated commitment to safety in their personal lives.

In many cases, several volunteer instructors have been recruited to form a team that is responsible for planning, organizing, and conducting the training. This approach capitalizes on the strengths and experiences of each team member, spreads out the responsibilities and provides diversity for the student.

“A student is not above his teacher, but everyone who is fully trained will be like his teacher.”
OLD PARABLE

Most local schools and Extension programs require completion of behavioral expectation forms and/or criminal background checks for all volunteers. These policies should be reviewed prior to inviting anyone to participate as a volunteer.

Instructor Preparation/Training

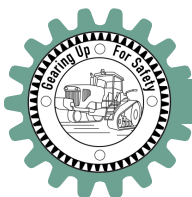
A farmer wouldn't consider heading to the field to plant corn or cotton without the appropriate planter, and fuel in the tractor, nor would a mechanic arrive at the farm to replace a fuel injection pump without his or her toolbox. Likewise, instructors recruited to teach the GEARING UP FOR SAFETY training sessions should also be adequately prepared and equipped. The risks are too high, the subject matter too complex and the consequences of providing incorrect information are too costly to allow instructors to “wing it” without preparation and training.

Instructors should become familiar with the contents of the LEADER'S GUIDE and supporting resources. They should be assisted in securing the suggested teaching aids associated with each lesson and the necessary projection equipment to present the PowerPoint slides that accompany each lesson. If additional background information is needed, an excellent resource is Farm and Ranch Safety Management published by Deere & Company, Moline, Illinois, and available through Hobar Publications (see Resource List).

Other training programs may be available from the State Extension Safety Leader or State 4-H official responsible for the 4-H Tractor/Engineering Programs. Contact each to determine if any train-the-trainer workshops are being planned or could be scheduled. Participating in training with other instructors will result in considerable cross-pollination of ideas and teaching strategies, and will develop a peer support network of individuals with a common mission and comparable challenges.

Spending time at the GEARING UP FOR SAFETY website provides another source of information on possible instructor training opportunities. Check it out at www.agsafety4youth.info.

If you have agreed to serve as a GEARING UP FOR SAFETY instructor, thank you!



Selecting a Site

Select a site that is centrally located and conducive to learning, with adequate space to hold the expected number of participants (and their parents), and to conduct the desired demonstration activities. The facilities should be ADA compliant to ensure reasonable access to individuals with disabilities. The instructional area should allow use of projection equipment to view PowerPoint lessons, videos, and other presentations. It would be ideal to have a space that would also allow for a tractor and other implements to be brought inside for demonstration purposes.

Using public facilities such as the local high school agricultural education classroom or shop, or county fairgrounds is strongly recommended. Both locations are usually covered by insurance for hosting these types of events and have adequate parking and restroom facilities. However, privately owned sites have been successfully used, including: local implement dealerships and farms with shops. Individuals who volunteer their facilities for conducting the training should be encouraged to check with their insurance carrier to ensure that the site is covered for this type of activity, especially if youth will be operating machinery. (See also Skills Testing section of the LEADER'S GUIDE.)

Selected Use of Lessons

In some settings, where time is limited or a certain topic might prove to be more timely, selected use of the individual lessons is completely feasible. Each lesson is designed to be a “stand alone” presentation. For example, lessons 2, 3, and 5 that address basic tractor components and systems, pre-operational procedures, and maintaining and servicing agricultural equipment would fit nicely in a basic agricultural mechanics course. Units 11 and 12 on agricultural confined spaces and grain storage and handling would be a good compliment to a crops course. The lesson on ATVs and utility vehicles could be used during a strong “teaching moment” following a related incident in the community that has the student’s attention. There is also evidence that the lessons have been used to provide substitute teachers with easy to prepare lessons on short notice. The best outcomes are possible when all of the lessons are used, but in an imperfect world with too many demands on everyone’s time, some safety instruction is better than none.

Recruiting Students

Without students, the GEARING UP FOR SAFETY curriculum materials will only take up storage space on someone’s office shelf. Successfully recruiting young people who need certification, or who could benefit in other ways from the training, is absolutely essential to the program.

In agricultural education settings, there is a “captive” audience. Students are already enrolled in a class and the training can become part of the overall curriculum. The GEARING UP FOR SAFETY materials have been extensively field tested in this type of setting and found to be compatible with most existing educational curriculums designed for students in grades 8-12. The curriculum has also been designed to meet some of the core academic standards established for agricultural sciences.

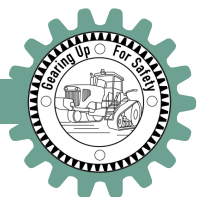
However, programs conducted in an informal setting such as those sponsored by Extension/4-H, will generally require participant recruitment. Successful recruiting requires planning, setting a schedule, and generating public awareness of the program. To assist in this effort, the following items have been provided and are included in the Appendices.

- Sample news release for promoting the training (Appendix 10)
- Sample promotional poster (Appendix 11)
- Sample letter to parents (Appendix 12)
- Parent/guardian consent form (Appendix 3)

Parental Involvement

The target audience of the HOOA training requirements is youth ages 14-15. While the target age range that was used to design the GEARING UP FOR SAFETY curriculum was 14-19.

Youth of this age do not live in a vacuum and are almost always under the care and supervision of a parent or guardian. Supportive parents and guardians are vital to the program. Parents must consent for participation in the training (See Appendix 3), provide transportation to and from the training sites, encourage completion of the required independent study and, in most cases, provide access to an agricultural tractor for practicing required operator skills. (The GEARING UP FOR



SAFETY curriculum does not contain sufficient time for participants to learn basic operator skills during the scheduled classes. These skills need to be developed and practiced independently under careful supervision outside the training sessions.) Supportive parents are an important ingredient to making the program successful.

Parents have much to offer and should be involved in the program wherever possible. They can be asked to share the responsibility of arranging transportation or refreshments. Some parents may also have relevant skills and experiences that can be tapped to address some of the desired core competencies.

Traditional Classroom/Instructor Based Setting

Even as the use of computers in educational settings has become widely accepted, the traditional classroom with an instructor presenting information to a group of willing learners using a variety of teaching methods is still the most popular teaching method. Where there is a large number of students in the same location needing to learn the same knowledge or gain the same set of skills, this approach probably remains the most efficient and cost effective. The GEARING UP FOR SAFETY curriculum contains the basic components needed to teach, in a traditional classroom setting, the desired core cognitive competencies for youth to safely work in agricultural production. These components include a targeted set of lesson plans, with clearly defined competencies, recommended teaching aids and demonstrations, complimentary visual aids, student worksheets, evaluation questions, and suggested supplemental resources.

The curriculum has been fully tested in classroom settings and the knowledge gain has been comparable with both an interactive student computer-based approach and independent web-based approaches. Remember, teaching methods, regardless of style, do not guarantee outcomes.

Visually-based Instruction

The rationale for using a highly visually-based format is to minimize, to the extent possible, the dependence upon advanced reading skills to master the core set of desired cognitive and performance-based safety competencies. The GEARING UP FOR SAFETY curriculum has been found to be an effective means of assisting with language skills and

communicating safety information to youth who have lower literacy skills or for when English is a second language. Over 450 PowerPoint images are used to present the contents of the curriculum, using limited, and mostly non-technical text. The material was field tested to determine whether or not the knowledge gained was comparable with that documented from the other curriculum formats that relied upon the student being able to read the supporting material. It was determined that the learning gain was generally comparable.

The extensive use of photos, drawings, pictorials, and signal words in conjunction with verbal re-enforcement to communicate the desired messages has become widely popular as a means of communicating important information across language or literacy barriers and where information is essential for safety or health. Applications of this approach used in other settings include safety instructions on commercial aircraft and the wide use of international symbols and pictorials found in automotive and tractor operator manuals.

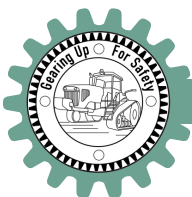
If language is a barrier to effectively presenting the training, the use of an interpreter is recommended. There is currently no Spanish version of the materials available.

Program Evaluation

In order to obtain feedback from participants on the effectiveness of the program, requesting them to complete a simple evaluation survey at the completion of the program is encouraged. A sample participant evaluation survey is included as Appendix 13 and can be easily printed off, duplicated, then distributed at the last formal gathering. You may consider requiring the completion of the survey as part of the skills testing activity.

Skills Testing

Most educators will agree that knowledge does not necessarily translate into desired behaviors. Knowing the rules does not mean that a person will comply with them in real life. A student may be able to recite with perfection each step required to conduct a pre-operational safety inspection of a tractor, but lack the confidence or physical abilities to conduct the inspection on an actual tractor. When assessing a student's ability to perform tasks that exposes him or her to the risk of injury, testing only their



cognitive skills using a written exam is not sufficient. The student should also be able to demonstrate that he or she has acquired the necessary skills and maturity to perform the desired tasks safely.

The GEARING UP FOR SAFETY curriculum includes the necessary evaluation tools to assess each student's readiness to perform both a pre-operational safety inspection of a typical agricultural tractor and to safely operate the tractor through a standardized obstacle course. This evaluation process meets the basic HOOA requirements for the student to demonstrate safe operator skills, and provides the instructor the means to consistently assess student readiness for hazardous agricultural work.

To conduct the evaluation component of the curriculum an appropriate location and equipment is required. This includes a site that provides ample space to set up one of the recommended obstacle courses and for students to operate a tractor free of obstructions such as ditches, utility poles and support wires, fences and trees. A clear space approximately 600' x 600' or about one acre should be sufficient.

On the site, one of the recommended obstacle courses needs to be carefully laid out. Concise drawings with all measurements for each course are provided in the Testing Methods and Tools section of the LEADER'S GUIDE. The markers can be traffic cones or inexpensively fabricated from wood, electrical conduit or reinforcing bar driven into the ground. A drawing of a simple marker that utilizes a golf ball to detect contact is included along with the course drawings.

At least one utility or row crop tractor, preferable less than 70 hp, connected to a two wheel cart, trailer, manure spreader, or sprayer are recommended equipment for the student to be tested on. The tractor should be ROPS equipped and have all safety equipment in place and properly functioning. If a large number of students are being evaluated, having more than one tractor and trailing implement would reduce the time needed to complete the testing. As one operator is conducting the pre-operational inspection, another would be operating the tractor through the obstacle course.

Observers will be needed who are familiar with tractor operation and who have been trained in the use of the pre-operation safety inspection and operator scoring forms. Observers should not be related to the youth being evaluated.

If the testing is done in conjunction with a tractor driving contest or other public event, the obstacle course should be roped off to prevent non-participants from entering the course and potentially being injured.

Suggested Course Schedule

The GEARING UP FOR SAFETY curriculum is designed to meet the current training requirements of the HOOA including minimum duration of instruction requirements for participants. The HOOA provide, however, little direction on how these time requirements should be met or how the time should be allocated to specific content areas. The requirements have caused some confusion in the past due to the inconsistency between minimum instructional time requirements for the agricultural science and business (Vocational-Agriculture) and Extension directed options. If an Extension Agent is conducting the program there is a requirement for a minimum of 20 hours of training for the combined tractor and machinery certification with an extra 4 hours of instruction for non-4-H members or youth unfamiliar with the normal working hazards of agriculture. On the other hand, the agricultural science and business (Vo-Ag) option requires a minimum of 25 hours of instruction for the combined tractor and machinery certification (15 hours for tractor and 10 hours for machinery). In other words, a youth with farm experience can complete the certification requirements in 20 hours under the Extension facilitated option; a non-farm youth requires 24 hours, but all youth completing the program under the direction of an agricultural science and business (Vo-Ag) program are required to have 25 hours of instruction.

To meet these different time requirements and settings, the GEARING UP FOR SAFETY curriculum has been designed to be flexible and applicable to both options currently authorized by the HOOA. Whatever format is used, the bottom line is that there needs to be accurate documentation for each student, regardless of how he or she received instruction to meet the minimum hours of instruction.

The following provides a narrative description of four different options for teaching the curriculum and meeting the current HOOA requirements.



1. Traditional classroom setting for the agricultural science and business option

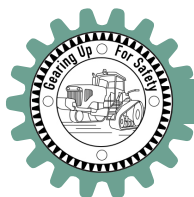
Activity	Time (hrs)
1.1 Cover 15 chapters (Section 4.3) in classroom setting using accompanying visuals (50 minutes/lesson)	12.5
1.2 Complete lesson activity worksheets and review (15 minutes/lesson)	3.75
1.3 Complete written test	1.0
1.4 Cover pre-operational inspection and practice sheet	1.25
1.5 Complete pre-operational exam	0.5
1.6 Assign completion of farm safety inventory	2.0
1.7 Practice for operational exam	3.5
1.8 Complete operational exam	0.5
Total	25.0

2. Extension facilitated format for youth with farm experience

Activity	Time (hrs)
2.1 Cover 15 chapters in evening classes using accompanying visuals (50 minutes/lesson)	12.5
2.2 Assign accompanying lesson activity sheets for completion at home (15 minutes/activity)	3.75
2.3 Complete written test	1.0
2.4 Cover pre-operational inspection and practice sheets	1.5
2.5 Complete pre-operational exam	0.5
2.6 Complete operational exam	0.75
Total	20.0

3. Extension facilitated format for youth with no farm experience or not enrolled in 4-H

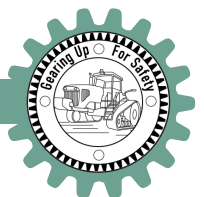
Activity	Time (hrs)
3.1 Cover 15 chapters in information classroom using accompanying visuals (50 minutes/lesson)	12.5
3.2 Assign accompanying lesson activity sheets for completion at home (15 minutes/activity)	3.75
3.3 Complete written test	1.0
3.4 Complete accompanying farm hazard inventory	2.0
3.5 Cover pre-operational inspection and practice sheets	1.5
3.6 Complete pre-operational exam	0.5
3.7 Practice for operational exam	2.25
3.8 Complete operational exam	0.5
Total	24.0



Research Conducted to Support the Reliability of the Gearing Up for Safety Curriculum

As part of the curriculum development and implementation process, supporting research was conducted to document the development of the curriculum contents, methods of delivery, instructor acceptance and learning outcomes. The following is a list of articles published to date that demonstrate the evidence-based nature of the curriculum and its documented impact on enhancing participant knowledge of hazards and best practices in the agricultural work place. For more up-to-date research visit www.agsafety4youth.info.

1. Tormoehlen, R.L., E.J. Sheldon, and W.E. Field. CAI/Multimedia Approach to Farm Tractor and Machinery Certification. *Education and Information Technologies* 4(2):43-45, 2000.
2. Carrabba, J.J., W.E. Field, R.L. Tormoehlen, and B.A. Talbert. Effectiveness of the Indiana 4-H Tractor Program at Instilling Safe Tractor Operating Behaviors and Attitudes in Youth. *Journal of Agricultural Safety and Health*. 6(3):179-189, 2000.
3. Carrabba, J.J., B.A. Talbert, W.E. Field, and R.L. Tormoehlen. Effectiveness of the Indiana 4-H Tractor Program: Alumni Perceptions. *Journal of Agricultural Education*. 42(3):11-20, 2001.
4. Ortega, R.R., R.L. Tormoehlen, W.E. Field, M.A. Balschwied, and K.L. Machtmes. Determining Critical Subject Matter Content for a Safety Certification Program for Youth Employed in Agricultural Production. *Journal of Agricultural Education*. 44(4):67-79, 2003.
5. French, B.F., W.E. Field, and R.L. Tormoehlen. The Psychometric Properties of the Agricultural Hazardous Occupations Order Certification Training Program Written Examination. *The Journal of Agricultural Education*. 49(4). 2007.
6. French, B.F., W.E. Field, and R.L. Tormoehlen. Proposed Performance Standards for the Agricultural Hazardous Occupations Order Certification Training Program. *Journal of Agricultural Safety and Health*. 13(3). 2007.
7. Hoover, W. B., French, B. F., Field, W. E., & Tormoehlen, R. L. Adjusting the Passing Scores for Gearing Up for Safety: Production Agriculture Safety Training for Youth Curriculum Test Instruments. *Journal of Agricultural Education*. 53(3), 2012.
8. Snyder, S., French, B. F., Field, W. E., Tormoehlen, R. L., & Ess, D. Identification and Validation of Agricultural Hazardous Occupations Order Certification Program Instructor Criteria and Competencies. *Journal of Agricultural Education*. 54(1), 111-123, 2013.
9. Mann, A.J., Field, W.E., Tormoehlen, R.L., and French, B.F. "Development and Validation of Written Exam Items for the Agricultural Hazardous Occupations Order (HOOAs) Certification Training Program." *Journal of Agricultural Safety and Health*. Vol. 22:2, pp. 121-134. 2016.
10. Cheng, Y.H., Field, W. E., Tormoehlen, R. L., French, B. "Utilizing Secondary Agricultural Education Program to Deliver a Grain Safety Training for Young and Beginning Workers" *Journal of AgroMedicine* Vol 22, issue 4: Socio-Ecological Approaches for Improving Agricultural Safety and Health, page 328-336, 2017.



INSTRUCTIONAL CONTENT

This section includes an outline of the primary instructional components of the GEARING UP FOR SAFETY curriculum. It allows for a quick overview of the contents of each lesson. The materials are organized and presented in such a way to help program leaders and instructors become familiar with the contents before visiting the individual lessons. All material contained in this section can be easily printed off for those wishing to a hard copy.

The information included in this section is as follows:

- Content Overview
- Lesson Plan Outlines
 1. General Farm/Ranch Safety Overview
 2. Tractor Component Basics
 3. Tractor Pre-Operational Procedures
 4. Tractor Operational Basics
 5. Tractor Powered Implements
 6. Self-Propelled Agricultural Equipment
 7. Operating Equipment on Public Roadways
 8. Maintaining and Repairing Agricultural Equipment
 9. ATV and Utility Vehicle Operation
 10. Skid Steer Loader, Telehandler and Fork Truck Operation
 11. Confined Spaces in Agriculture
 12. Grain Storage and Handling Facilities
 13. Working with Animals
 14. First Aid and Emergency Response
 15. General Farm and Ranch Hazards
 16. Tractor Operational Performance Skills (No PowerPoint)

Content Overview

The GEARING UP FOR SAFETY curriculum includes 15 lesson plans that address the desired core competencies identified by the design team. Each lesson includes an overview of the chapter, a listing of the core competencies, suggested teaching aids, a set of review questions, and one or more suggested student activities. The instructional content for each lesson is found as part of the PowerPoint notes that are included with each set of PowerPoint visuals.

The lesson plans provide an outline or roadmap for presenting each chapter. Instructors are free to incorporate additional content that reflects personal experiences, local conditions and practices.

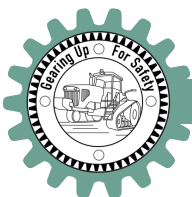
Lesson 16 contains no PowerPoints and is designed to be conducted in a setting with actual tractors and implements. This final chapter cannot be done in a classroom or in front of a computer but rather is designed to provide students with hands-on experiences.

The following is a general outline of the 16 lessons covered by the GEARING UP FOR SAFETY curriculum. The outline provides a quick way to review the overall contents and identify how essential topics have been organized.

Lesson Plan Outlines

LESSON 1: General Farm/Ranch Safety Overview

- A. Overview of the farm/ranch injury data
 1. Why farm work is so hazardous
 2. Why tractors and machinery account for such a large proportion of farm-related deaths and injuries
 3. Why youth are at a higher risk of injury
- B. Operator characteristics that contribute to injuries
 1. Emotions
 2. Lack of experience
 3. Fatigue
 4. Influence of drugs and alcohol
 5. Preoccupation



C. Operator/Machine/Environment relationships

1. Operator influences
2. Machine hazard identification
3. Environmental hazards

D. Characteristics of the safe operator

1. Appropriate training and knowledge of hazards
2. Appropriate attitude/patience/self-control
3. Appropriate physical preparation and condition
4. Appropriate dress

E. Laws and regulations that apply to youth working in agricultural workplaces

1. OSHA
2. Fair Labor Standards Act (Agricultural Hazardous Occupations Orders)
3. Wage and Hour restrictions
4. EPA
5. Agricultural exemptions

B. Operator controls

1. Types and function of primary controls
2. Location and identification
3. Color coding of controls

C. Instruments and gauges

1. Types and function
2. Identification and location

D. Universal symbols

1. Development of universal symbols
2. Widely used examples of universal symbols

E. Basic safety features on modern agricultural tractors

1. Neutral-start switches
2. ROPS
3. Field and highway lighting and marking
4. Seat belts
5. Power steering and brakes
6. Safety signs
7. Ergonomically designed seating and controls
8. Standardized controls
9. Slip resistant surfaces
10. Mirrors and cameras
11. Handholds and slip-resistant steps
12. Environmentally controlled cabs
13. Tinted windows/safety glass

F. Universal hand signals

1. Why they are important
2. Widely used hand signals

LESSON 2: Tractor Component Basics

A. Basic tractor systems (big picture)

1. Engine
2. Fuel system
3. Cooling system
4. Electrical system
5. Hydraulic system
6. Transmissions
7. Operator station
8. Hitching system
9. Traction system
10. ROPS/cab
11. Operator instructions, safety signs and messages



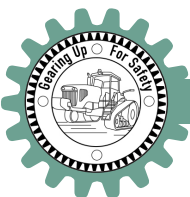
LESSON 3: Tractor Pre-Operational Procedures

- A. Operator's manual and instructional messages
 - 1. Locating hazard alerts and safety messages in operator's manual
 - 2. Locating safety messages on machinery
 - 3. Special operating instructions for the operator
- B. Recognizing the level of risk
 - 1. Caution
 - 2. Warning
 - 3. Danger
- C. Special operating instructions
 - 1. Operating tractor with front end loader
 - 2. Removing a stuck tractor
 - 3. Towing heavy loads
 - 4. Operating tractor on highway
 - 5. Jump starting tractor
 - 6. Towing a tractor
 - 7. Refueling a tractor
- D. Pre-operational maintenance tasks
 - 1. Crankcase oil level
 - 2. Cooling system fluid level
 - 3. Fueling/DEF
 - 4. Tire inflation
 - 5. Hydraulic oil level
 - 6. Transmission fluid level
 - 7. Air cleaner
 - 8. Lights, reflectors, and SMV emblem
 - 9. Shields in place
 - 10. Installing and removing tractor weights (ballast) and dual wheels

- E. Safe mounting and dismounting
 - 1. Conduct a walk around
 - 2. Check for bystanders
 - 3. Fall prevention
- F. Before starting the tractor
 - 1. Adjust controls
 - 2. Fasten seatbelt
 - 3. Again, check for bystanders
 - 4. Verbal or audible warning
- G. Rollover protective structures (ROPS)
 - 1. Types of ROPS
 - 2. How they function/zone of protection
 - 3. Seatbelts
 - 4. Environmentally controlled cabs
 - 5. FOPS
- H. Review of hand signals
 - 1. Development of hand signals
 - 2. Enhancing safety with hand signals
 - 3. Hand signal interpretation

LESSON 4: Tractor Operation Basics

- A. Most common hazards when operating a tractor
 - 1. Slips and falls
 - 2. Rollovers
 - 3. Runovers
 - 4. Extra riders
 - 5. Entanglements
 - 6. Contact with hot components
 - 7. Pinch points



- B. Starting the tractor
 1. Transmission in park/neutral
 2. PTO disengaged
 3. Remote hydraulics in neutral
 4. Disengage clutch
 5. Engaging the starter

- C. Operating the tractor
 1. Role of neutral interlock/by-pass starting
 2. Engaging the clutch
 3. Engaging the PTO
 4. Activating hydraulic controls
 5. Disengaging the parking brake

- D. Most common cause of tractor-related fatalities
 1. Rollovers or overturns
 2. Runovers/extra riders

- E. Forces that contribute to tractor overturns
 1. Gravity
 2. Centrifugal force
 3. Rear-axle torque
 4. Force on the drawbar
 5. Pulling from above the drawbar

- F. Locating center of gravity on tractor
 1. Front load/frontend loader
 2. Rear load/rear mounted equipment

- G. Reducing the risk of tractor overturns
 1. Design features – wide front end, duals, ballast
 2. Operating procedures – locking brakes together, lower front end loader, set wheels apart

- H. Tractor hazards to bystanders
 1. Collapsing components
 2. Thrown objects
 3. Runovers
 4. Excessive noise
 5. Not being seen by operator

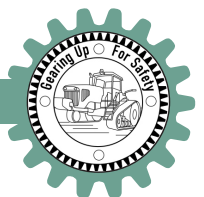
- I. Operating tractors inside buildings
 1. Risk of fire
 2. Exposure to carbon monoxide
 3. Low clearances

- J. Potential burn locations on tractors
 1. Cooling system
 2. Exhaust system
 3. Hydraulic components
 4. Battery

- K. Tractor drawn equipment
 1. Runovers
 2. Falls
 3. Extra riders
 4. Stopping capacity

- L. Electrocutation and underground hazards
 1. Portable augers and elevators
 2. Lightning
 3. Irrigation systems
 4. Low clearance powerlines
 5. Buried utilities

- M. Freeing stuck equipment
 1. Operating procedures
 2. Snap-back hazards



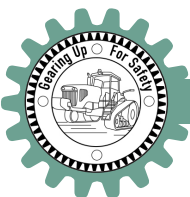
LESSON 5: Tractor-Powered Implements

- A. Enhanced safety and productivity through mechanization
 - 1. Increased productivity
 - 2. Fewer workers exposed to hazards
 - 3. New technology makes farming safer
- B. Hazards when implements are attached to tractor
 - 1. Changed center of gravity
 - 2. Added weight
 - 3. Less overhead clearance
 - 4. Limited visibility
 - 5. Increased width
- C. Hitching implements to the tractor
 - 1. Drawbar
 - 2. Three-point hitch
 - 3. Front mounted
 - 4. Frame mounted
- D. Hitching to the drawbar
 - 1. No hitching above drawbar
 - 2. Safety hitch pins and chains
 - 3. Jack stands
 - 4. Drawbar adjustment
- E. Three-point hitch mounting
 - 1. Categories
 - 2. Safe hitching

- F. PTO drivelines – operation and safety
 - 1. Function
 - 2. Types/categories – 540 and 1000 rpm
 - 3. Hazards of over speeding
 - 4. Components
 - 5. Shielding/guarding
 - 6. Connecting PTO driveline to tractor
- G. Hydraulic systems – operation and safety
 - 1. Functions
 - 2. Components
 - 3. Hydraulic-related hazards
 - 4. Locating a hydraulic leak safely
 - 5. Use of safety locks

LESSON 6: Other Self-Propelled Agricultural Equipment

- A. Types and function
 - 1. Combines
 - 2. Windrowers
 - 3. Self-propelled sprayers
 - 4. Forage harvesters
 - 5. Harvesters (cotton, pea viners, potato, etc.)
 - 6. Log skidders
- B. Self-propelled equipment youth can be hired to operator if certified
 - 1. Forage harvester
 - 2. Cotton harvester
 - 3. Combine
 - 4. Windrower



LESSON 7: Operating Tractors and Other Self-Propelled Agricultural Equipment on Public Roadways

C. Common types of hazards found on combines and harvesters

1. Fires
2. Falls
3. Entanglement
4. Header falling
5. Extra riders
6. Overturns
7. Runovers
8. Noise
9. Transporting on public roadways
10. Contact with powerlines

D. Agricultural machinery fires

1. Types of flammable material
2. Classes of fires
3. Fire extinguishers
4. Causes of fires on agricultural machinery

E. Modern combine and harvester safety features

1. Environmentally controlled cabs
2. Electronic monitoring systems
3. Fire extinguishers
4. Safety or neutral interlocks
5. Sealed bearings
6. Reversing feed mechanisms
7. Operating lights
8. Overload clutches
9. Platform/header safety locks

F. Natural and human-made obstacles

1. Irrigation systems
2. Ditches/drainage
3. Powerlines/poles/towers
4. Drainage systems
5. Low hanging tree limbs, trees, rocks

A. Legal requirements

1. Age of operator
2. Width of equipment
3. Weight of equipment
4. Height of equipment
5. Lighting and marking
6. Hours of transport
7. Escort vehicles

B. Common hazards of highway travel

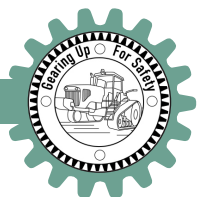
1. High speed traffic
2. Narrow roadways
3. Over width equipment
4. Obstructed view when making left turns
5. Roadside obstacles – mailboxes, signs
6. Unmarked railroad crossings
7. Low visibility
8. Lack of lighting and marking
9. Pedestrians/bikers
10. Soft shoulders
11. Narrow and/or limited capacity bridges
12. Road rage and behavior of others

C. Lighting and marking

1. SMV emblems/placement
2. Reflective markings
3. Lights, mirrors, and cameras

D. Safety hitch pins and safety chains

1. Description
2. Inspection
3. Selection of hitch pins
4. Use of safety chains



- E. Function of transport position
 1. Reduces machine width
 2. Locked into position to prevent falling components

- F. Safety procedures for moving self-propelled equipment on roads
 1. Empty grain tank
 2. Secure header
 3. Transport wide headers separately
 4. Lock brake pedals together
 5. Move components into transport position
 6. Check lights and mirrors

- G. Safe highway operation practices
 1. Transporting equipment after dark
 2. Overweight loads
 3. Over width equipment
 4. Spilled material
 5. Meeting oncoming traffic
 6. Pulling over for following traffic
 7. Railroad crossings
 8. Making turns

- H. Basic highway safety signs
 1. Stop
 2. Yield
 3. Railroad crossing
 4. Speed limits

- I. Basic highway information signs
 1. Weight limits
 2. Speed restrictions
 3. Road hazards
 4. Height restrictions

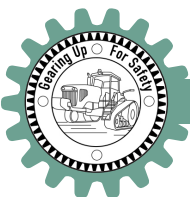
- J. Farm trucks
 1. Transporting riders in cargo area
 2. Seat belts and car seats for children
 3. Special truck hazards
 4. Hazards with lift beds on trucks

LESSON 8: Repairing Agricultural Equipment

- A. Characteristics of well-maintained equipment
 1. Increased productivity
 2. Fewer breakdowns
 3. Less plugging
 4. Reduced operator exposure to hazards
 5. Reduced physical efforts
 6. Reduced stress

- B. Risk/hazards associated with repairing agricultural equipment
 1. Hand injuries
 2. Eye injuries
 3. Crushing
 4. Asphyxiation
 5. Trips and falls
 6. Burns
 7. Flying objects
 8. Electrocution
 9. Head injuries

- C. Identifying potential hazards
 1. Sight
 2. Touch
 3. Hearing
 4. Smell
 5. Taste



D. Personnel protective equipment

1. Eye
2. Hearing
3. Hands
4. Feet
5. Respiratory system
6. Head
7. Skin

E. Characteristics of a safe maintenance area

1. Accessibility
2. Appropriate safety equipment
3. Housekeeping and storage
4. Non-slip flooring
5. Adequate lighting
6. Adequate and properly grounded electrical circuits
7. Adequate ventilation
8. Appropriate storage for hazardous materials
9. Tools guarded and appropriate for tasks
10. Eye wash station

F. Safe lifting

1. Lifting correctly
2. Lifting aids
3. Blocking

G. Basic hand and power tool safety

1. Selecting the right tool
2. Using tools as they were intended
3. Keep tools in good condition
4. Store tools when not in use
5. Safe use of power tools

H. Preventing electric shock

1. Grounded circuits
2. Double insulated tools
3. Ground Fault Interrupters
4. Proper sizing of extension cords

I. Before servicing equipment

1. Shutoff power
2. Remove key or lock out
3. Lower or lock in place raised equipment
4. Release stored energy-hydraulics and springs
5. Use voltage detector
6. Refer to operator's manual

LESSON 9: ATV and Utility Vehicle Operation

A. ATV and UTV injury data and risks

1. Inexperienced operators
2. Riding double
3. Older 3-wheel ATVs
4. Operation on highway

B. Types, differences, and applications

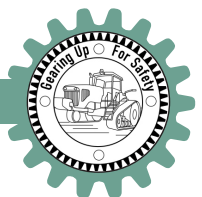
1. ATVs
2. Utility vehicles

C. ATV components

1. ATV design
2. Location of controls
3. Pre-inspection check

D. UTV components

1. Controls
2. ROPS
3. Attachments



E. Essential personal protective equipment

1. Helmet
2. Eye protection
3. Protective clothing
4. Gloves
5. Foot protection

F. Fitting the rider to the vehicle

1. ATV fit guidelines
2. Age/engine size recommendations

G. Pre-operational inspections

1. T-CLOC inspection

H. Operating procedures

1. Starting procedures
2. Riding strategies (SIPDE)
3. Body movement and stability

I. Safe use of utility vehicles

1. Types and uses
2. Operation
3. Safety considerations

C. Forklifts or fork trucks

1. Widely used on farms
2. Material handling with pallets
3. Propane or electric powered machines for indoor use
4. Highly maneuverable

D. Hazards associated with skid steer loaders, forklifts, and telehandlers

1. Crushed by lift arms
2. Thrown or falling objects
3. Overhead hazards
4. Limited visibility
5. Working in unventilated spaces
6. Runovers, rollovers

E. Important safety features

1. Hydraulic locks
2. Lap bar and seat belt
3. FOPS and ROPS
4. Unbreakable windows/screens
5. Outriggers on telehandlers
6. Backup alarms
7. Mirrors and cameras
8. Guards

LESSON 10: Skid Steer Loader, Telehandler, and Forklift Truck Operation

A. Skid steer loaders in agricultural production

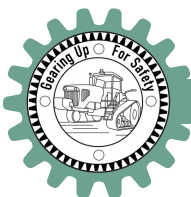
1. Compact loaders
2. Material handling
3. Powered attachments

B. Telehandlers

1. Extensive reach
2. Multiple attachments
3. Material handling

F. Pre-operational procedures

1. Dress for the job
2. Read operator's manual
3. Check surroundings, do a walk around
4. Use steps and hand holds
5. Fasten seat belt and lower seat bar, if equipped
6. Familiarize yourself with controls



LESSON 11: Confined Spaces in Agriculture

G. Skid steer attachments

1. Buckets
2. Rotary mowers
3. Pallet forks
4. Grapple
5. Bale fork
6. Post hold digger

H. Operating a skid steer loader

1. Avoid uneven terrain
2. Use smooth movement of controls
3. Adjust throttle
4. Drive straight or down steep slopes

I. Operating a telehandler

1. Keep chassis level
2. Comply with load limits

J. Regulations

1. Forklift cannot be operated by youth under 16 for hire – certification required
2. Backup alarms may be required

K. Transporting equipment

1. Load only on level surfaces
2. Use low angle ramps
3. Load with heavy end first
4. Secure all loads regardless of distance to be transported

A. Personal case history video

B. What is an agricultural confined space?

1. Definition/OSHA/practical
2. Permit-required confined space
3. If you need to use your hands, it's a confined space

C. Hazards related to agricultural confined space

1. Asphyxiation
2. Suffocation
3. Entrapments
4. Engulfments
5. Entanglements
6. Falls
7. Electrocutions
8. Drowning
9. Respiratory disease

D. Type of grain and feed storage

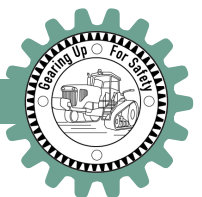
1. On-farm grain storage
2. Commercial grain storage
3. Forage silos
4. Bunk silos
5. Oxygen – limited silos

E. Gases found in silos

1. Nitrogen dioxide
2. Nitrous oxide
3. Carbon dioxide

F. Types of manure storage facilities

1. Above ground tanks
2. Below ground pits
3. Lagoons



G. Gases found in manure storage facilities

1. Hydrogen sulfide
2. Ammonia
3. Methane
4. Carbon dioxide
5. Carbon monoxide

H. Other agricultural confined spaces

1. Grain transport vehicles
2. Agricultural equipment
3. Sewage and septic systems
4. Liquid storage
5. In-ground structures
6. Food storage/environmentally controlled structures

I. Legal requirements

1. HOOA restrictions
2. OSHA regulations
3. Worker rights

LESSON 12: Grain Storage and Handling Facilities

A. Hazards of flowing grain video

B. Characteristics of flowing grain

1. Acts like a liquid
2. Form funnel above outlet
3. Presence of air pockets
4. Out-of-condition grain

C. Grain storage hazards

1. Engulfment/suffocation
2. Bridged grain
3. Grain avalanche

4. Falls

5. Toxic gases and molds
6. Entanglement
7. Toxic fumigants

D. Characteristics of a safe worker

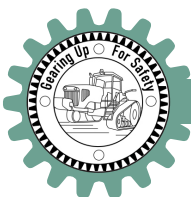
1. Commitment to a safe work place
2. Properly trained
3. Knowledge of hazards
4. Patience
5. Civility and courtesy
6. Self-control
7. Confidence
8. Consideration towards others

E. Personal protective equipment

1. Head
2. Feet
3. Eyes
4. Ears
5. Hands
6. Skin
7. Respiratory
8. Fall protection

F. Safety measures to prevent grain engulfments

1. Lockout/tagout
2. Visible warnings
3. Restricted access
4. Supervised access
5. Emergency response plan
6. Communications
7. Air quality monitoring

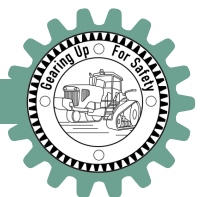


LESSON 13: Working with Animals

- A. Role of animals in agriculture
 - 1. Provides power
 - 2. Source of food
 - 3. Source of companionship
- B. Hazardous activities
 - 1. Feeding livestock
 - 2. Health checks
 - 3. Vaccinations
 - 4. Castration procedures
 - 5. Hoof trimming
 - 6. Cleaning living areas/pens
- C. Livestock equipment hazards
 - 1. Loading and unloading trailers
 - 2. Chutes and scales
 - 3. Mowing heavy equipment – gates and feeders
 - 4. Feeding equipment
 - 5. Manure handling equipment
 - 6. Fencing and gates
- D. Livestock behavior
 - 1. Signs
 - 2. Approaching livestock
 - 3. Methods to safely work with livestock
- E. Applicable regulations
 - 1. HOOA restrictions
 - 2. Age restrictions
- F. Pets and livestock
 - 1. Pet hazards
 - 2. Dogs
 - 3. Other animal threats

LESSON 14: First Aid and Emergency Response

- A. Recognizing an emergency
 - 1. Injuries
 - 2. Fires
 - 3. Exposure to toxic agents
 - 4. Chemical release/spill
 - 5. Down electric lines
 - 6. Entanglement or entrapment
 - 7. Extremely hostile worker
 - 8. Severe weather (tornado, lightning)
 - 9. Flash flooding
- B. First-aid and first response preparation
 - 1. Communications
 - 2. Posted emergency numbers
 - 3. Emergency action plan
 - 4. First-aid training
 - 5. Fire extinguishers
 - 6. Labeled circuit breakers
 - 7. Central meeting place
- C. First-response steps
 - 1. Don't put yourself at risk
 - 2. Shut off equipment
 - 3. Call 911
 - 4. Avoid moving victim
 - 5. Provide first-aid
 - 6. Wait for help
- D. Calling for assistance (911)
 - 1. Who to call
 - 2. Information needed by emergency services
 - 3. Until help arrives
 - 4. Why people delay calling



E. Responding to a serious injury

1. Call 911
2. First-aid until help arrives
3. Control bleeding

F. Responding to agricultural fires

1. Call 911
2. Types of fires
3. Types of extinguishers
4. Using a fire extinguisher

G. Responding to a chemical exposure

1. Call 911
2. Recognizing the symptoms
3. First-aid until help arrives
4. Using the label
5. First-aid for anhydrous ammonia exposure

H. Responding to heat stress

1. Recognizing the symptoms
2. Seeking medical assistance
3. First-aid until help arrives

I. Preventative health measures

1. Tetanus vaccination
2. Recognizing allergies

J. Responding to frostbite and hypothermia

1. Know symptoms
2. Seek shelter
3. Rewarm
4. Seek medical attention

K. Responding to confined space incident

1. Call 911
2. Stop – don't put yourself at risk
3. Wait for help
4. Turn on ventilation

L. Responding to electrocutions

1. Call 911
2. Stop – don't put yourself at risk
3. Don't touch victim or equipment
4. Stay in vehicle if in contact with energized line

LESSON 15: General Farm and Ranch Hazards

A. Farm-related tasks considered too hazardous for youth under 16 years of age

1. HOOA restrictions
2. Farm family exemption

B. Animal-related hazards

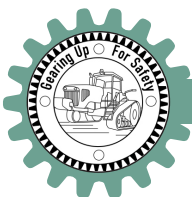
1. Types of animals
2. Types of injuries

C. Logging and woodlot safety

1. Chain saws
2. Skidding logs
3. Splitting and sawing timber
4. Personal protective equipment

D. Preventing falls

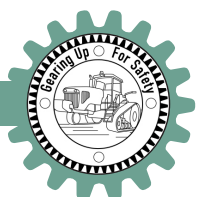
1. Ladders
2. Scaffolding
3. Heights over 20'

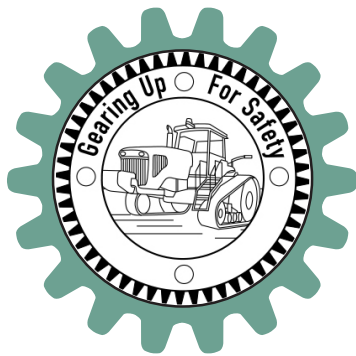


- E. Operating motor vehicles
 1. Cannot be a passenger on tractor
 2. License required to operate truck
 3. Can't operate a bus
- F. Agricultural confined spaces
 1. Silos
 2. Grain bins
 3. Manure pits
 4. Liquid storage and transport tanks
 5. Environmentally controlled storage areas
- G. Agricultural chemicals
 1. Legal requirements
 2. Types of chemicals
 3. Reading the label/warnings
 4. Personal protective equipment
 5. Anhydrous ammonia hazards
- H. Environmental farm and ranch hazards
 1. Overhead and underground power lines
 2. Insects (bees, wasps, spiders)
 3. Snakes
 4. Drainage ditches and irrigation canals
 5. Farm ponds/lagoons
 6. Weather extremes

LESSON 16: Tractor Operation Performance Skills (No PowerPoints)

- A. Conducting a pre-operation tractor safety inspection
 1. Using the operator's manual
 2. Using pre-operation safety checklist
 3. Demonstrate the correct use of basic hand signals
 4. Demonstrate the correct procedures for mounting and dismounting
- B. Demonstrating safe starting procedures
 1. Identifying location of primary controls
 2. Demonstrate correct function of controls
 3. Demonstrate the ability to start and stop engine correctly
- C. Demonstrating safe operating procedures
 1. Demonstrate the ability to disengage the clutch, select the appropriate transmission position and smoothly engage the clutch
 2. Demonstrate ability to operate a tractor through a standard obstacle course
 3. Demonstrate use of standard safety equipment (jack stands, hitch pins, safety stops on headers)
- D. Demonstrating selected safe work practices
 1. Safe lifting
 2. Pre-operational inspection of ATV
 3. Identification of appropriate personal protective equipment
 4. Correct use of ABC-type fire extinguisher
 5. Calling for emergency assistance





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Agricultural and Biological Engineering Dept.
Purdue University, College of Agriculture
225 South University Street
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