National Safe Tractor and Machinery Operation Program

Student Manual

Support Provided by:

Agreement No. 2001-41521-01263, Establishing a National Safe Tractor and Machinery Operation Certification Program, and continuing in 2010 under Agreement No. 2010-41521-20839.

Developed by

USDA, NIFA

United States Department of Agriculture
National Institute of Food and Agriculture

Penn State

Ohio State University Extension

National Safety Council
# General Class Information

<table>
<thead>
<tr>
<th>Instructor(s)</th>
<th>Instructor 1</th>
<th>Instructor 2</th>
<th>Instructor 3</th>
</tr>
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<tbody>
<tr>
<td>Name:</td>
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</tbody>
</table>

## Class Schedule:

### Location:

<table>
<thead>
<tr>
<th>Date</th>
<th>Day</th>
<th>Time</th>
<th>Topics</th>
<th>Task Sheets</th>
</tr>
</thead>
<tbody>
<tr>
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Written Test Date: __________ Location: __________________________________________

Skills and Driving Test Date: __________ Location: __________________________________
Introduction

The United States Department of Labor (USDOL) Fair Labor Standards Act of 1938 identified several hazardous occupations where individuals employed in these occupations had to be 18 years of age or older. The identified occupations included manufacturing and mining. In 1968, the Fair Labor Standards Act of 1938 was amended to include the Hazardous Occupations Order for Agriculture (AgHO). This order established the age for employment in agriculture as 16 years of age or 14 years of age with special training. The order also identified hazardous operations and farm tasks, such as operating a tractor over 20 horsepower and operating other specific farm machinery, including, but not limited to, a corn picker, combine, hay baler, feed grinder, forklift or power post-driver. Exempt from this law are (1) minors who are employed on a farm owned and operated by their parents or guardians and (2) minors ages 14 and 15 who have received training and certification from an approved tractor and farm machinery safety certification program. Each state is responsible for providing the approved safety training that allows minors ages 14 or 15 to legally be employed to operate a tractor or other specified machinery. Youth can receive a USDOL Certificate of Training for tractor driving by completing 4 hours of orientation to on-farm hazards and general safety and that have participated in a 10-hour tractor safety course. With an additional 10-hour machinery safety course, youth receive a certificate of training for machinery operation. Individuals 16 years of age and older can be employed in agriculture without this certification.

In the late 1960s and early 1970s, several tractor and machinery programs were developed based on the 1968 AgHO. Over the years, these programs deteriorated with a loss of interest and implementation. Little is known about the extent that tractor and machinery safety certification programs reach young tractor and machinery operators. Great variations exist in the type of teaching materials, the number of hours, the forms of instruction, the testing procedures, and the skills assessment in these programs. The need for current and better quality training materials was cited by both certification program instructors and coordinators.

In recognition of these shortcomings, the United States Department of Agriculture (USDA) funded a major project with Penn State University, Ohio State University and the National Safety Council to develop a National Safe Tractor and Machinery Operation Program (NSTMOP). This project was funded in 2001 under USDA Agreement No. 2001-41521-01263, "Establishing a 'National Safe Tractor and Machinery Operation Certification' Program" and continuing in 2010 under USDA Agreement No. 2010-41521-20839.

If you would like to become a student or instructor in the NSTMOP, find out more at:

www.nstmop.psu.edu

or

National Safe Tractor and Machinery Operation Program
The Pennsylvania State University
Agricultural & Biological Engineering Department
246 Agricultural Engineering Building
University Park, PA 16802

Phone: 814-893-8124
Fax: 814-863-1031
Email: nstmop@psu.edu
Regulations

The United States Department of Labor (USDOL) regulations that relate to occupations in agriculture particularly hazardous for the employment of children younger than age 16 are found in the Code of Federal Regulations, Title 29, Part 570, Subpart E-1 (29 CFR 570 Subpart E-1), officially referred to as AgHO. The HOSTA-NSTMOP Task Sheet 1.2.1, Hazardous Occupations Order in Agriculture, summarizes what youth younger than age 16 and their parents and employers need to know about the regulations. The official regulations, 29 CFR 570 Subpart E-1, can be found at the USDOL website (www.dol.gov).

Training Programs

Sufficient meeting time to provide a minimum of 24 hours of instruction to teach the Minimum Core Content Areas (MCCA) based curriculum is needed. This instruction may take place over several weeks and can include group discussions, demonstrations, field trips to farms or equipment dealers, and hands-on activities. In addition to classroom instruction, you should be expected to complete study or field assignments, which may be used to meet the 24-hour requirement.

Curriculum Materials

The NSTMOP Task Sheets are the primary curriculum resource for the NSTMOP program and may be used alone or supplemented with additional information and instructor knowledge. An example of an additional resource: Deere & Company’s Farm and Ranch Safety Management book, other written texts, other instructional task sheets, student worksheets, tractor and machine operator and service manuals, demonstrations, vendor tractor and equipment safety videos, and guest speakers.

Instructional Methods

The NSTMOP materials are designed to be used in a variety of instructional settings. They can be used in:

- a traditional classroom setting (e.g. a formal high school agricultural classroom setting),
- an extension/4-H evening or Saturday meeting format,
- an independent study format, or
- some combination.

Testing Procedures

1. **You must be at least 14 years of age on the test date to be allowed to take the Skills and Driving Tests.** If you are under the age of 14, you are permitted to attend educational classes and take the Written Test but are not allowed to operate tractors or other equipment if practice sessions are held.

2. The Written, Skills, and Driving Tests must be passed with a minimum score of 70% before you can be awarded a USDOL Certificate of Training. The locations where these tests are given hereafter are referenced as Test Stations.

3. The Written Test will consist of a combination of 50 multiple-choice and true/false questions from a question bank based on NSTMOP Task Sheets that cover the MCCA. The Written Test must be passed with a 70% or better before you can move to the Skills Test.

4. You must pass first the Written Test and then the Skills Test before you can take the Driving Test.
5. A personal, laminated Certificate of Completion wallet card (see below) will be issued by the NSTMOP Office if you successfully pass all of the tests and the $5 fee is submitted. This wallet card does not replace the USDOL Certificate of Training that must be kept on file by the trainer, employer and the employee.

Written Test

The goal of the Written Test is to evaluate your knowledge of the agricultural safety and health topics that are listed in the Minimum Core Content Areas (MCCA) for the National Safe Tractor and Machinery Operation Program. The Written Test will consist of a combination of 50 multiple-choice and true/false questions from a question bank based on those NSTMOP Task Sheets that cover the MCCA. The Written Test must be passed before you can move to the Skills Test. The Written Test is passed with a score of 70% or higher. If you fail, you will not be allowed to retake the Written Test without additional study.

Skills and Driving Test

The goal of the Skills Test is to evaluate your ability to safely and efficiently start a tractor and hitch to a wheeled or 3-point implement. The goal of the Driving Test is to test your ability to safely and efficiently drive a tractor pulling a two-wheel implement through a specified course with spaces and borders. Neither the Skills nor Driving test activity is a competitive event; actual barrier measurements and times are not recorded. The Skills and Driving Tests must each be passed with a minimum score of 70%, and zero “automatic failure” violations. Experienced tractor operators may complete each activity within 8-10 minutes while less experienced operators may require a few minutes more. Any operator who cannot complete each activity within 15 minutes automatically fails the test.

You should be appropriately dressed for the Skills and Driving Tests. Snug-fitting clothes in good repair, long pants, and solid shoes with slip-resistant treads are recommended. Inappropriate dress includes baggy pants, shorts, sandals or open-toed footwear, and jewelry, including rings, watches, necklaces and dangling earrings. You may be forbidden to take either test if you are not appropriately dressed in the opinion of the Community Lead Instructor.

Suggested skills and driving courses and evaluation forms are provided on the next few pages. Different courses are acceptable as long as the layouts include similar maneuvers.
Skills and Driving Test Layout Map

Calculations

\[ \begin{align*}
A/A &= \phantom{} \\
2\ A/A &= \phantom{} \\
1.5\ A/A &= \phantom{} \\
0.75\ A/A &= \phantom{} \\
A/A + 5 &= \phantom{} \\
A/A + 7 &= \phantom{} \\
W &= \phantom{} \\
W + 2 &= \phantom{} \\
3\ W + 2 &= \phantom{} \\
\text{Length} &= \phantom{} \\
7\ A/A + 42 &= \phantom{} \\
\text{Width} &= \phantom{}
\end{align*} \]

Skills Test

Note: Raise or lower implement 3 or 4 inches before starting.

Note: Measurements are taken from the inside of barriers.

- Use traffic cones, stakes, buckets, etc. to identify serpentine path
- Use traffic cones, stakes, straw or hay, etc. as markers.
- Use rope, bale twine, straw or hay bales to form a continuous line.

A/A — Means axle to axle. The distance between center of front axle of tractor and center of axle of towed equipment.

W — Width in feet of the tractor or two-wheel towed equipment, whichever is wider.
# National Safe Tractor and Machinery Operation Program

## Skills Test Evaluation Form

**Skill Activities (15 Minutes Maximum):**

- Student Name: ____________________  Skills Examiner: ____________________
- Test Date: _______________  Test Location: __________________

- Skill Activities (15 Minutes Maximum):

<table>
<thead>
<tr>
<th>S</th>
<th>U</th>
<th>NA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tractor entry and start-up</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Can demonstrate universal hand signal for _____________ (Instructor Randomly Picks)</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Use handholds and steps to mount tractor</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Adjust seat, steering wheel (if necessary)</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Buckle seat belt</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Check major controls (PTO, hydraulics, gear shift stick) for the neutral (or PARK) position.</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Adjust throttle to one-third open, push clutch in, move gear selection to START position if so equipped.</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Can demonstrate and verbalize how to safely stop the tractor.</td>
<td></td>
</tr>
<tr>
<td>Tractor Back-up and Implement Hitching</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>With clutch pushed in, start tractor, idle down throttle</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Select slow/low reverse gear.</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Slowly and smoothly back tractor to within a few inches of implement tongue.</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Stop tractor, shift to neutral and set brakes or place in PARK, reduce throttle (if moved from start-up), shut tractor off (Not shutting off tractor is automatic Skills Test failure), unbuckle seat belt.</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Dismount tractor by facing tractor and using handholds and steps.</td>
<td></td>
</tr>
<tr>
<td>Tractor Unhitching and Shut-off</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Use handholds and steps to mount tractor. Buckle seat belt, adjust throttle to one-third open, push clutch in, move gear selection to START position if so equipped, start tractor.</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Back tractor to align drawbar and implement tongue holes, stop tractor, place gear in neutral and set brakes or place gear in PARK, reduce throttle (if moved from start-up), shut tractor off (Not shutting off tractor is automatic Skills Test failure), dismount tractor by facing tractor and using handholds and steps. Student may need to repeat steps 13-14.</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Place tractor pin in hole to connect the implement, using the tractor pin safety-locking device; connect safety chains (if present) to tractor.</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Correctly connect the implement PTO, hydraulic hoses, or both.</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Wind-up jack, swing to storage position</td>
<td></td>
</tr>
<tr>
<td>INSTRUCTOR INSPECTS ALL CONNECTIONS. CORRECT MISTAKES</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tractor Unhitching and Shut-off</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Lower jack stand, adjust to take weight off hitch points</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Disconnect the implement PTO, hydraulic hoses, or both.</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Remove tractor pin</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>Use handholds and steps to mount tractor</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>Buckle seat belt, adjust throttle to one-third open, push clutch in, move gear selection to START position if so equipped, start tractor</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Move tractor forward 5 to 6 feet (Not completely disconnecting the implement from the tractor or to move the jack stand to storage position is automatic Skills Test failure).</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>Stops tractor, lowers throttle (if adjusted upward), places gear in neutral and sets brakes or puts gear in PARK, shuts tractor off, unbuckles seat belt. (Not shutting off tractor is automatic Skills Test failure)</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>Dismount tractor by facing tractor and using handholds and steps.</td>
<td></td>
</tr>
</tbody>
</table>

- Automatic Failure – Please note the reason for the automatic failure.

- Not completing the Skills Test in 15 minutes is automatic failure.
# Driving Test Evaluation Form

Student Name: ____________________   Skills Examiner: ______________

Test Date: ______________      Test Location: ______________

Driving Activity (15 minutes maximum): Students must explain each activity as performed unless otherwise noted. Instructors should correct student errors where indicated.

☐ Student is dressed appropriately.

<table>
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<tr>
<th></th>
<th></th>
<th></th>
<th>Driving Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>S</td>
<td>U</td>
<td>NA</td>
<td>Pre-operation inspection: student identifies and explains what they are inspecting.</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Check Fluid Levels (Oil reservoir dipstick, Fuel tank cap, Water/antifreeze fill location, Hydraulic fluid dipstick, etc.)</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
<td>Battery condition</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td>Tire condition (Tractor and machine)</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td>Guards and Shields (Tractor and machine)</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td>Hitch and related connections</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td>Walk around Tractor and Machine and look for hazards</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>DISCUSS UNSATISFACTORY PERFORMANCE HERE</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td>Tractor entry</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
<td>Use handholds and steps to mount tractor</td>
</tr>
<tr>
<td>8</td>
<td></td>
<td></td>
<td>Buckle seat belt</td>
</tr>
<tr>
<td>9</td>
<td></td>
<td></td>
<td>Adjust seat, steering wheel</td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td>Check major controls (PTO, hydraulics, gear shift position) for the neutral or PARK position</td>
</tr>
<tr>
<td>11</td>
<td></td>
<td></td>
<td>Adjust throttle, push clutch in</td>
</tr>
<tr>
<td>12</td>
<td></td>
<td></td>
<td>Demonstrate and verbalize how to safely stop the tractor</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>DISCUSS UNSATISFACTORY PERFORMANCE HERE</td>
</tr>
<tr>
<td>13</td>
<td></td>
<td></td>
<td>Tractor start-up and Driving: If too high a gear and/or speed is used, or if driver appears to not have complete control or awareness of tractor and implement positioning, the driver should be stopped immediately, and an automatic failure should be recorded.</td>
</tr>
<tr>
<td>14</td>
<td></td>
<td></td>
<td>Starts tractor movement smoothly, has selected low gear, using low throttle setting</td>
</tr>
<tr>
<td>15</td>
<td></td>
<td></td>
<td>Drives through serpentine (or similar) course without running over or crushing barriers (a light touch or brushing is acceptable) or having to back up</td>
</tr>
<tr>
<td>16</td>
<td></td>
<td></td>
<td>Drives into pull-in stall without running over or crushing any barriers (a light touch or brushing is acceptable) and stops within a foot of end barriers without running over or crushing them (a light touch or brushing is acceptable)</td>
</tr>
<tr>
<td>17</td>
<td></td>
<td></td>
<td>Backs into back-in stall within two passes, stops within a foot of end barriers without running over or crushing them (a light touch or brushing is acceptable). 1 pull-up is acceptable</td>
</tr>
<tr>
<td>18</td>
<td></td>
<td></td>
<td>Drives out of back-in stall without running over or crushing any barriers (a light touch or brushing is acceptable)</td>
</tr>
<tr>
<td>19</td>
<td></td>
<td></td>
<td>Drives back through serpentine course (or similar) course without running over or crushing any barriers (a light touch or brushing is acceptable)</td>
</tr>
<tr>
<td>20</td>
<td></td>
<td></td>
<td>Drives tractor back into middle of START/STOP position without running over or crushing any barriers (a light touch or brushing is acceptable)</td>
</tr>
<tr>
<td>21</td>
<td></td>
<td></td>
<td>Tractor shut-off and exit</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Stops tractor, lowers throttle (if adjusted upward), places gear in neutral, and set brakes or puts in PARK, shuts tractor off <strong>(Not shutting off tractor is automatic Driving Test failure)</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Dismount tractor by facing tractor and using handholds and steps</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>Not completing the Driving Test in 15 minutes is automatic failure.</td>
</tr>
</tbody>
</table>

Automatic Failure-Please note the reason for automatic failure.
Minimum Core Content Areas (MCCA) and Task Sheets

In response to a request by the Hazardous Occupations Safety Training in Agriculture (HOSTA) National Steering Committee, an expert panel of agricultural safety and health professionals developed a set of Minimum Core Content Areas (MCCA) for training youth younger than age 16 who wish to work in an agricultural occupation and operate tractors and machinery (see MCCA – Training Content). The MCCA are based on the current United States Department of Labor Regulations in 29 CFR 570 Subpart E-1.

There are 92 Task Sheets provided with this curriculum. Not all of these Task Sheets are needed to address the required training prescribed by the USDOL AgHO. If you have limited familiarity and experience with production agriculture, work hazards and/or agricultural safety issues, the additional task sheets will help you understand hazards associated with agricultural operations.

The 48 Task Sheets identified as core with an (C) cover the MCCA topics and should be used to prepare for the NSTMOP Written Test. Written test questions come from these Task Sheets. To meet current requirements of the USDOL AgHO exemption, at least 24 hours should be devoted to these topics.

1. **INTRODUCTION**
   1.1. The Work Environment C
   1.2. Safety and Health Regulations C
      1.2.1. Hazardous Occupations Order in Agriculture C
      1.2.2. Occupational Safety and Health Act (OSHA)
      1.2.3. Worker’s Compensation Laws
      1.2.4. Worker Protection Standard
      1.2.5. State Vehicle Codes
   1.3. Environmental Regulations
   1.4 State Agricultural Safety Professionals
   1.5 National Agricultural Safety and Health Organizations

2. **SAFETY BASICS**
   2.1. Injuries Involving Youth C
   2.2. Risk Perception
   2.3. Reaction Time
   2.4. Age-Appropriate Tasks C

   2.5. Severe Weather
      2.5.1. Heat and Sun
      2.5.2. Cold
      2.5.3. Lightning, Tornadoes, and Rain
   2.6. Housekeeping
   2.7. Personal Dress C
   2.8. Hazard Warning Signs C
   2.9. Hand Signals C
   2.10. Personal Protective Equipment C
   2.11. First Aid and Rescue C

3. **AGRICULTURAL HAZARDS**
   3.1. Mechanical Hazards C
   3.2. Noise Hazards and Hearing Protection
   3.3. Respiratory Protection
      3.3.1. Using Respiratory Protection
   3.4. Working with Livestock C
   3.5. Agricultural Pesticides C
   3.6. Electrical Hazards C
3.7 Fire Safety
  3.7.1 Fire Prevention and Control
  3.7.2 Hay Storage Fires
3.8 Confined Spaces
3.9 Silos
  3.9.1 Horizontal Silo Safety
  3.9.2 Packing Forage in a Horizontal Silo
3.10 Grain Bins
3.11 Manure Storage
3.12 Anhydrous Ammonia
3.13 Farmstead Chemicals
3.14 Animal, Wildlife and Insect Related Hazards

4. THE TRACTOR
4.1 Agricultural Tractors
4.2 Tractor Hazards
4.3 NAGCAT Tractor Operation Chart
4.4 Tractor Instrument Panel
4.5 Tractor Controls
  4.5.1 Engine Stop Controls
  4.5.2 Ground Motion Controls
  4.5.3 Power Engagement Controls
  4.5.4 Positioning and Adjusting Controls
  4.5.5 Location and Direction of Movement
  4.5.6 Tractor Operation Symbols
4.6 Preventive Maintenance and Pre-operation Checks
  4.6.1 Fuel, Oil, Coolant Levels

4.6.2 Lead Acid Batteries
4.6.3 Using A Battery Charger
4.6.4 Using Jumper Cables
4.6.5 Tire and Wheel Condition
4.6.6 The Operator Platform
4.7 Starting and Stopping Diesel and Gasoline Engines
4.8 Mounting and Starting the Tractor
4.9 Stopping and Dismounting the Tractor
4.10 Moving and Steering the Tractor
  4.10.1 Operating a Manual Shift Transmission
  4.10.2 Tractor Transmissions
4.11 Operating the Tractor in Reverse
4.12 Tractor Stability
4.13 Using the Tractor Safely
4.14 Operating the Tractor on Public Roads
  4.14.1 Lighting and Marking

5. CONNECTING AND USING IMPLEMENTS WITH THE TRACTOR
5.1 Connecting Implements to the Tractor
5.2 Using Drawbar Implements
5.3 Using Three-Point Hitch Implements
5.4 Making Power Take-Off (PTO) Connections
  5.4.1 Using Power Take-Off (PTO) Implements
5.5 Using Implements with Hydraulic Components
5.6 Using Implements with Electrical Components
6. MATERIALS HANDLING

6.1. Skid Steers
   6.1.1 Starting and Stopping a Skid Steer
   6.1.2 Skid Steer- Ground Movement
   6.1.3 Skid Steer- Attaching Accessories
   6.1.4 Skid Steer- Using Hydraulic Attachments

6.2. ATVs and Utility Vehicles

6.3. Telehandlers

6.4. Using a Tractor Front-End Loader

6.5. Dump Trucks and Trailers- Farm Use Only

6.6. Loading and Towing Equipment on a Trailer

6.8 Augers and Elevators

6.9 Silage Defacers

6.10 Silage Bagging and Bale Wrapping Equipment
Minimum Core Content Areas – Training Content

The following Minimum Core Content Areas (MCCA) identify the essential subject matter to be included in any training program designed to prepare youth to perform the following tasks as prescribed by the “Hazardous Occupations Order in Agriculture” for employment of children younger than age 16 (USDOL, effective date 1970).

1. Operating a tractor over 20 PTO horsepower, or connecting or disconnecting an implement or any of its parts to or from such a tractor.
2. Operating or assisting to operate (including starting, stopping, adjusting, feeding, or any other activity involving physical contact associated with the operation) any of the following machines:
   a. Corn picker, cotton picker, grain combines, hay mower, forage harvester, hay baler, potato digger or mobile pea viner;
   b. Feed grinder; crop dryer; forage blower, auger conveyor, or the unloading mechanism of a nongravity-type self-loading wagon or trailer; or
   c. Power post-hole digger, power post-driver, or nonwalking rotary tiller.

NOTE: The order and organization in which the Minimum Core Content Areas (MCCA) are taught is left to the discretion of the instructor. The items in parentheses are suggested topics and not inclusive of those which can be taught under any respective MCCA.

<table>
<thead>
<tr>
<th>Programs that address GENERAL agricultural safety shall incorporate the following MCCA:</th>
<th>Programs that address safe TRACTOR operation shall incorporate the following MCCA:</th>
<th>Programs that address MACHINERY safety shall incorporate the following MCCA:</th>
</tr>
</thead>
<tbody>
<tr>
<td>G1. Applicable state and federal regulations (OSHA, USDOL, WPS …)</td>
<td>T1. Tractor controls, instruments &amp; gauges</td>
<td>M1. Operator’s manuals (specific machines)</td>
</tr>
<tr>
<td>G2. Characteristics of the safe farm worker (dress, attitude, behavior, developmentally appropriate …)</td>
<td>T2. Tractor operational systems (fuel, electrical, hydraulics …)</td>
<td>M2. Implement power transfer (PTOs, hydraulic, mechanical, electrical …)</td>
</tr>
<tr>
<td>G3. Mechanical hazards (pinch points, pull-ins, wrap points …)</td>
<td>T3. Tractor safety systems &amp; features (seatbelt, ROPS, master shield, safe starting systems, enclosed cabs …)</td>
<td>M3. Implement hitching (3-point, front mounted, hydraulics, drawbar …)</td>
</tr>
<tr>
<td>G4. Chemical hazards (labeling, pesticide restrictions, petroleum products …)</td>
<td>T4. Tractor pre-operational check (fuel, tires, air, water, oil …)</td>
<td>M4. Machine operating hazards (corn picker, cotton picker, grain combines, hay mower, forage harvester, hay baler, potato digger or mobile pea viner, feed grinder; crop dryer; forage blower, auger conveyor, or the unloading mechanism of a nongravity-type self-loading wagon or trailer, power post-hole digger, power post-driver, or nonwalking rotary tiller …)</td>
</tr>
<tr>
<td>G5. Electrical hazards (Grounding/GFCIs, overhead powerlines, underground power …)</td>
<td>T5. Operator’s manuals (tractor specifications, maintenance, warnings, controls …)</td>
<td>M5. Materials handling (large round bales, flowing grain, safe lifting …)</td>
</tr>
<tr>
<td>G6. Livestock hazards (working prohibitions, zoonotic diseases, animal behavioral characteristics …)</td>
<td>T6. Tractor operating procedures (start, move forward/backward, stop, mounting/dismounting …)</td>
<td></td>
</tr>
</tbody>
</table>
Minimum Core Content Areas – Testing Procedures

<table>
<thead>
<tr>
<th>SKILLS</th>
<th>WRITTEN EXAM</th>
<th>PRE-OPERATION</th>
<th>OPERATING SKILLS</th>
<th>DRIVING SKILLS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>GENERAL</strong></td>
<td>X</td>
<td>A</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>TRACTOR &amp; MACHINERY</strong></td>
<td>X</td>
<td>B</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

A&B: The written exam shall be a 50 question multiple choice/T or F test based, minimally, upon the MCCA.

C: Pre-operational check (tractor & machinery)
   The pre-operational activities may include:
   - Checking of oil, fuel, cooling fluids, etc.
   - Visual inspection of tires, shields, guards, fasteners, leaks, etc.
   - Demonstrate universal hand signals (ASAE)
   - Safe mounting and dismounting, adjustment of the operator’s station, location of controls, etc.

D: Operating Skills
   The operating skills component will include:
   - Starting tractor
   - Backing up tractor
   - Connecting tractor to a machine (PTO, hydraulics, electrical, hitch, etc.)
   - Disconnecting machines
   - Stopping and parking tractor

E: Driving Skills
   The driving skills component will include:
   - Operate tractor & machinery through a serpentine driving course, forward & reverse operation, back in & pull out of prescribed space.
Testing parameters:

- The testing is done in a sequential fashion. That is, the youth must pass each phase of the examination process in the following order: written, pre-operational, operating and driving. Students shall not be allowed to move to the next examination phase until the previous one has been successfully passed.
- A minimum score of 70% must be obtained on each of the phases (written, pre-operational, operating and driving) to pass.
- Students may retake any failed portion of the exam process. The student should not be allowed to retake any failed portion of the exam process without additional study or practice on his or her own time. If the student fails the written exam portion of the evaluation process, a different exam will be used for the retesting.
- State and local exam procedures may vary from the suggested examples provided as long as the minimum key components of each exam (written, pre-operation, operating and driving) are met.

**Testing Procedures:**

1. Step 1: Written exam
2. Step 2: Pre-operational
3. Step 3: Operating Skills (drive forward/backward and simple machine hookup)
4. Step 4: Driving Skills (drive tractor and 2-wheel implement through a course)