Ag Buildings
Arc Welding

Most Protection

1. Separate adequately fused circuit; installed automatic fire suppression and ventilation system; no flammable materials within 35 feet of weld zone; no shielding gas cylinders used.

2. Separate adequately fused circuit; no automatic fire suppression system; installed ventilation system; no flammable materials within 35 feet of weld zone; shielding gas cylinders (if used) secured in upright position.

3. Separate adequately fused circuit; no automatic fire suppression system; natural ventilation only; flammable materials within 35 feet of weld zone; shielding gas cylinders (if used) secured in upright position.

4. Separate adequately fused circuit; no automatic fire suppression system; natural ventilation only; flammable materials within a few feet of weld zone; shielding gas cylinders (if used) in upright, non-secure position.

5. Inadequate circuit; no automatic fire suppression system; ventilation lacking; flammable materials within a few feet of weld zone; shielding gas cylinders (if used) in horizontal, non-secure position.

Least Protection

(over)

Reminders

A fully-charged 10 lb. ABC fire extinguisher should be available in the welding area.

A wool fire blanket should be available for personal fire protection.

Personal Protective Equipment

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Laws, Regulations, Standards, and Guidelines:
Laws, regulations, standards, and guidelines are constantly being updated and revised. Be sure to check the latest version of any document listed below. Be aware that new laws, regulations, standards, and guidelines on this topic may be generated at any time. See Appendix A for more information.

National Electric Code, NFPA.

Safety and Health Fact Sheet No. 6, Fire and Explosion Prevention, American Welding Society.


Other:
A qualified electrician should install the electrical circuits for arc welding equipment.

Electric welders produce electric arcing that can exceed 6000 degrees F.

Ventilation of at least 1000 cfm in the welding area is recommended.

Weld sparks (Figure 1) can travel 35 feet. A fire barrier reduces the risk of weld sparks igniting nearby flammable materials.

A fully-charged 10 lb. ABC fire extinguisher (Figure 2) permanently located in the welding area increases the opportunity to control a fire.

Figure 1.

Figure 2.
Ag Buildings
Electrical Lighting/Fixtures

Most Protection

1. Lightbulbs are protected by distance or protective coverings; faceplates are in place and intact.

2.

3. Some lightbulbs are protected; faceplates are in place and intact.

4.

5. Lighting is unprotected from direct contact; lightbulbs are missing from socket; faceplates are loose, broken or missing.

Least Protection

(over)
Laws, Regulations, Standards, and Guidelines:

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National Electrical Code® (NEC®), NFPA 70.
Ag Buildings
Electrical Panel

Most Protection

1. Panel uses circuit breakers; electrical panel is free of dust, trash or spider webs; electrical panel cover is securely attached.

2. 

3. Panel uses fuses; electrical panel has some dust, trash or spider webs on it; electrical panel cover is not securely attached.

4. 

5. Fuses are bypassed with pennies; electrical panel is covered with dust, trash or spider webs; electrical panel cover is missing.

Least Protection

(over)

Reminders

All circuits should be labeled for point of origin and purpose.

Personal Protective Equipment
**Laws, Regulations, Standards, and Guidelines:**

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National Electrical Code® (NEC®), NFPA 70.

**Other:**

Always use an ABC or CO2 type fire extinguisher (Figure 1).

Have fire extinguishers inspected yearly.

Keep motors and power tools clean and free of dirt.

Keep flammable or combustible materials away from heaters.

*Figure 1.*
Personal Protective Equipment

Reminders

UF-B cable:
is rated for underground usage;
is flame-retardant; and
has a moisture- fungus- corrosion-
resistant cover

NM-B cable:
is nonmetallic;
is flame-retardant; and
has a moisture-resistant sheath

Ag Buildings

Electrical Wiring

Most Protection

1. Type UF-B cable has three leads with flexible insulation; plastic fixtures are dust- and water-resistant.

2. Type UF-B cable has three leads with flexible insulation; fixtures are not dust- and water-resistant.

3. Type NM-B wiring has three leads with flexible insulation; plastic or metal fixtures are dust- and water-resistant.

4. Type NM-B wiring has three leads with flexible insulation; fixtures are not dust- and water-resistant.

5. Wiring has only two leads; insulation is brittle; fixtures are deteriorated.

Least Protection (over)
**Laws, Regulations, Standards, and Guidelines:**

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National Electrical Code® (NEC®), NFPA 70.

Horse Stall Design Features Fact Sheet G-95, Agricultural and Biological Engineering, The Pennsylvania State University, (www.abe.psu.edu).

**Other:**

Animals can chew on exposed electrical wiring, damage the conductor, and be electrocuted and/or start a fire.

NEC permits the use of plastic boxes with non-metallic cable only.
Ag Buildings
Equipment/Material Storage

Most Protection

1. Farm equipment and tractors are not stored or operated within barn; no flammable materials stored or used in barn (feedstuffs excluded); no source of open flame used within barn.

2. Farm equipment and tractors are not stored but may be operated within barn; no flammable materials stored or used in barn (feedstuffs excluded); no source of open flame used within barn.

3. Farm equipment and tractors are not stored but may be operated within barn; no flammable materials stored in barn, but may be used in barn (feedstuffs excluded); no source of open flame used within barn.

4. Farm equipment and tractors may be temporarily stored and are operated in barn; flammable materials may temporarily be stored and routinely used in barn (feedstuffs excluded); no source of open flame used within barn.

5. Farm equipment or tractors stored and operated within barn; flammable materials stored and used in barn (feedstuffs excluded); source of open flame may be used within barn.

Least Protection

(over)

Reminders

Spark arrestors on mufflers reduce the risk of fire if it is necessary to operate tractors, skid loaders, or any engine within a barn.

Lubricating machinery can reduce the risk of overheated parts caused by excess friction.

Personal Protective Equipment
Laws, Regulations, Standards, and Guidelines:

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No information regarding laws, regulations, standards and guidelines on this topic were discovered.

Other:

Insurance coverage can be invalid if tractors or skid loaders are stored in capital intensive buildings such as barns (Figure 1).

Store flammable materials away from sources of open flame and/or excess heat to reduce fire potential.

Fire-resistive barriers reduce fire potential if repair and maintenance work must be done in a barn.

When work increases the risk of fire, a fully-charged 10 lb. ABC fire extinguisher can help to mitigate that risk.

If burning of trash is necessary, do so as far from buildings as possible to reduce the risk of fire. A high potential for fire risk to nearby buildings can occur otherwise (Figure 2).

![Figure 1.](image1.png)

![Figure 2.](image2.png)
Ag Buildings
Fire Detection/Suppression

**Most Protection**

1. Professionally installed and monitored fire detection and suppression system; fire resistive-construction with firewall and roof fire-vents; ABC-type fire extinguisher mounted at exits.

2. Professionally installed and monitored fire detection; no suppression system; fire-resistive construction with firewall and roof fire-vents; ABC-type fire extinguisher mounted at exits.

3. Owner installed smoke and/or heat detectors; no suppression system; detector serviced yearly; fire-resistive construction, but no firewall/roof-fire-vent; ABC-type fire extinguisher mounted at exits.

4. Smoke detector placed in farm office only; detector service or replacement schedule unknown; no fire-resistive construction; ABC-type fire extinguisher equipped.

5. No smoke or heat detector of any type utilized, or battery has discharged and not been replaced; lacking fire-resistive construction; no fire extinguishers.

**Least Protection**

(over)

**Reminders**

Dust and cobwebs can render detectors useless.

Capital intensive areas with electrical control panels, electric gear rooms and heating, cooling and ventilation equipment need to be equipped with fire detection and suppression systems.

**Personal Protective Equipment**
Laws, Regulations, Standards, and Guidelines:
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Specifications for Alarm Systems Used in Agricultural Structures, ASAE S417.

Standard on Automatic Fire Detectors, NFPA 72A.


Other:
UL-approved fire retardant treated wood (FRTW) is identified by a stamp (Figure 1) attached to the wood.

A 10 lb. ABC type fire extinguisher (Figure 2) increases the opportunity to control an early fire.

Identify the capital intensive areas of the farm to place a priority on loss protection.

Farm lenders may require loss protection insurance(s) on high-risk enterprises.

![Figure 1.](image1.png)  
![Figure 2.](image2.png)
Ag Buildings
Fire Extinguishers

Most Protection

1. A 10-pound ABC-type extinguisher is accessible on each floor of a building or within 50 feet of a structure; is mounted; fully charged.

2.

3. Only one 10-pound ABC-type extinguisher is available or charged; extinguisher is not easily accessible, not mounted; only Class A or Class BC extinguishers are present.

4.

5. Fire extinguishers are not charged, are missing, or have never been installed.

Least Protection

(over)

Reminder

Fire types:

Class A --- combustible materials (wood, cloth, paper, rubber, and many plastics)

Class B --- flammable or combustible liquids, flammable gases, greases, and similar materials.

Class C --- live electrical equipment or circuits

Personal Protective Equipment
Laws, Regulations, Standards, and Guidelines:

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The Standard for Portable Fire Extinguishers, NFPA 10.
Ag Buildings
Flammable Liquid Storage

**Most Protection**

1. Flammable and combustible liquids stored in metal, self-closing, locked cabinet.

2. Flammable and combustible liquids stored in metal, self-closing, unlocked cabinet.

3. Flammable and combustible liquids stored in metal, non-self-closing, unlocked cabinet.

4. Flammable and combustible liquids stored in wooden cabinet.

5. Flammable and combustible liquids stored on open shelves, on the ground, or on the floor.

**Least Protection**

(over)

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**Laws, Regulations, Standards, and Guidelines:**

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OSHA Flammable and Combustible Liquids, CFR1926

**Other:**

Paints, solvents, cleaners and other solutions can produce vapors which may ignite.

Hazards from improperly stored flammable and combustible materials can include:
1. concentration of vapors to a level that will support ignition
2. selection of an incorrect material for the task to be completed with an increased risk of a hazardous chemical reaction
3. extreme summer heat causing an increased potential for auto-ignition.
4. winter freeze damage to containers of water-based solutions with a potential for leaks and spills

Improperly stored materials may be hard to locate causing a hurried response to a task. Figure 1 shows a mix of unlike and incompatible materials in storage. Figure 2 shows materials stored in a cardboard box in an open area. Improper separation of materials may create fire, explosion or corrosion hazards.

![Figure 1.](image1.png) ![Figure 2.](image2.png)
Compressed gas cylinders owned, filled and delivered by supplier/vendor; cylinders stored upright and secured by chain and lock; all users trained in fuel gas metal cutting safety and procedures before use.

2. Compressed gas cylinders owned, filled and delivered by supplier/vendor; cylinders stored upright and secured by chain and lock, all users trained in fuel gas metal cutting safety and procedures before use.

3. Compressed gas cylinders owned, filled and delivered by supplier/vendor; cylinders stored upright and secured by chain only; not all users trained in fuel gas metal cutting safety and procedures before use.

4. Compressed gas cylinders filled by supplier/vendor and transported by user; cylinders stored upright and secured by chain only; not all users trained in fuel gas metal cutting safety and procedures before use.

5. Compressed gas cylinders filled by supplier/vendor but owned and transported by user; cylinders not stored upright or secured by chain and lock; no fuel gas metal cutting training program.

Personal Protective Equipment

**Reminders**

Acetylene gas is unstable above 15 psi and can explode.

Flammable materials should be removed from within 35 feet of the metal cutting area.

Use of reverse flow check valves and flashback arrestors is recommended.

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No information regarding laws, regulations, standards, or guidelines on this topic were discovered.

Other:

Fire-resistant shielding should be used if flammable materials cannot be moved to a safe distance from the metal cutting area. Figure 1 shows the abundance of sparks that are produced in metal cutting.

A 10 lb. ABC fire extinguisher should be available for use in a fire emergency.

Acetylene fuel is unstable above 15 psi. This means that it can ignite with a sudden jarring of the reactive gases which are under greater pressure than 15 psi at the welding torch handle. MAPP gas is stable in this regard.

Plasma arc metal cutting equipment can use nitrogen, argon or compressed air to blow away molten metal. These gases are non-flammable.

Compressed oxygen and fuel gases must be stored in a secure, upright position to reduce the risk of falling over. Protective caps must be in place during transport to prevent a broken tank valve resulting in high-pressure discharge of compressed gases. Figure 2 shows a metal caged enclosure which can be locked.

Figure 1.

Figure 2.
**Ag Buildings**

**Heating Ag Building**

### Most Protection

1. Permanently installed, original equipment manufacturer heating device (gas space heater, etc.); area around heat source is free of combustible materials; excellent maintenance.

2. Permanently installed, original equipment manufacturer heating device (gas space heater, etc.); area around heat source is free of combustible materials; good maintenance.

3. Permanently installed, original equipment manufacturer heating device (electric space heater, etc.); heat source is within a few inches of combustible materials; average maintenance.

4. Permanently installed, original equipment manufacturer heating device (electric space heater, etc.); combustible materials are against heat source; below average maintenance.

5. Portable, original equipment manufacturer heating device (electric space heater, etc.); combustible materials are against heat source; poor maintenance.

### Least Protection

(over)

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**Reminders**

- Properly vent natural gas heaters to the outside.
- Do not use gasoline or diesel fuel in portable space-type heaters.
- Periodic inspection and maintenance of heating devices reduces the risk of fire.

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**Personal Protective Equipment**

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Standard for Electric Heating Appliances, UL/ANSI 499.

Standard for Unvented Kerosene-Fired Room Heaters and Portable Heaters, UL 647.


Check your state's regulations regarding this topic.

The U.S. Consumer Protection Safety Commission recommends that when selecting a heating unit be sure the heater has been tested and certified by a nationally recognized and certified testing laboratory such as UL, NFPA or AGA.

**Other:**
Unvented gas heater units should be oxygen depletion sensor equipped.

Keep portable heaters on firm level surfaces and at least 3 feet away from flammable materials (Figure 1).

Homemade wood-burning fire apparatus used in farm buildings increases the risk of fire (Figure 2).

*Figure 1.*

*Figure 2.*

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**Reminders**

Good housekeeping practices help to:

- reduce fire hazards;
- minimize tripping hazards;
- reduce airborne allergens and asthma causing factors

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**Ag Buildings Housekeeping**

**Most Protection**

1. All walkways are clear; litter has been removed; buildings look neat and tidy.

2. 

3. All walkways are clear; some litter is present; buildings look somewhat untidy.

4. 

5. Walkways are not clear; litter is present; buildings are cluttered and messy.

**Least Protection**

(over)
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No information regarding laws, regulations, standards, or guidelines on this topic were discovered.

Other:
Fire prevention in a building includes periodic inspections of the building for overloaded circuits, dust and cobweb build-up near open flames or heat sources, and accumulation of combustible materials near sources of ignition (Figure 1).

Paints, solvents and other flammable materials (e.g. cleaners) stored in areas near an open flame, or where heat build-up from heaters or sunlight can increase temperatures near the stored materials, increases the risk of fire.

Figure 1.
A complete lightning protection system was installed by a certified installer, and the protection system is currently certified by the Lightning Protection Institute and/or Underwriters Laboratories.

A complete lightning protection system that has only part of the system installed by a certified installer and that part is currently certified by the Lightning Protection Institute and/or Underwriters Laboratories.

A complete lightning protection system has all or some components that were installed by a certified installer but is not currently certified by the Lightning Protection Institute and/or Underwriters Laboratories.

Lightning protection system is not complete and/or needs repair or maintenance to the system.

There is no lightning protection system installed on the building or structure.

Most Protection

1. A complete lightning protection system was installed by a certified installer, and the protection system is currently certified by the Lightning Protection Institute and/or Underwriters Laboratories.

2. A complete lightning protection system that has only part of the system installed by a certified installer and that part is currently certified by the Lightning Protection Institute and/or Underwriters Laboratories.

3. A complete lightning protection system has all or some components that were installed by a certified installer but is not currently certified by the Lightning Protection Institute and/or Underwriters Laboratories.

4. Lightning protection system is not complete and/or needs repair or maintenance to the system.

5. There is no lightning protection system installed on the building or structure.

Least Protection (over)
Laws, Regulations, Standards, and Guidelines:

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Standard for the Installation of Lightning Protection Systems, NFPA 780.

Standard of Practice, Lightning Protection Institute LPI-175.

Installation Requirements for Lightning Protection Systems, Underwriters Laboratories, 96A.

Other:
Look for the LPI and/or UL Master Label on certified lightning protection system components.

Components and connections should be inspected prior to concealment.

LPI four-signatory application or two-signatory (UL only) are standard certification documentations.

To maintain certification, annual inspections must be completed starting two years after the initial certification and be conducted by the certified installer or the owner using the forms available from the Lightning Protection Institute. At five-year intervals, the inspection should be conducted by a qualified engineer or lightning protection installer.
Ag Buildings
Power Outage

Most Protection

1. Automatic power generator professionally installed; operation tested semi-annually; automatic transfer switch to disconnect from main power distribution line; alarms sound when operating.

2. Automatic power generator professionally installed; operation tested semi-annually; automatic transfer switch to disconnect from main power distribution line; no alarms sounded when operating.

3. Tractor PTO-powered generator available; no regular operation check; automatic transfer switch to disconnect from main distribution line; no alarm system.

4. Tractor PTO-powered generator available; no regular operation check; manual transfer switch to disconnect from main distribution line; no alarm system.

5. No power outage protection available.

Least Protection

(over)

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Emergency Lighting and Power Equipment, ANSI/UL 924.

Automatic Transfer Switches, ANSI/UL 1008.

Other:
Livestock ventilation needs during a power outage must be considered.

Manure pit ventilation is required during periods of power outage to protect livestock and human health.

Family dwelling protection during a power outage may be secondary to farm needs.

According to the National Electric Code, an interface between the normal power source and an alternate electric source is allowable with proper transfer equipment to prevent backfeeding of electricity into the power supply grid. These transfer switches may be a manual control device (see Figure 1) or an automatic switch.

![Image of a transfer switch]

Figure 1.
Professional rodent-control program is used; regular schedule of treatments are made.

2. Professional rodent-control program is used; treatments begun with first observation of rodent's presence.

3. Self-administered rodent-control program utilized; treatments begun with first observation of rodent's presence.

4. Self-administered rodent-control program utilized; treatments begun with observation of multiple rodents and obvious damage (e.g. crop loss, structural damage).

5. No program of rodent-control utilized.

Reminders

Protect feedstuffs from rat and mouse droppings, which can contaminate the feedstuffs. Rats and mice can spread disease.

Ask professional pest control firms for proof of general liability and worker's compensation insurance, as well as sudden and accidental pollution insurance.

Personal Protective Equipment

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Environmental Protection Agency, Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA).

Worker Protection Standard (WPS), 40 CFR Part 170.

Other:

Professional pest control companies should carry general liability and worker's compensation insurance.

Professional pest control companies should carry insurance for sudden and accidental pollution.

Material Safety Data Sheets (MSDS) for each product used to control rodents should be kept on file.

All employees should be trained in pesticide safety and federal worker protection standards for this topic.

Rats and mice can cause structural damage by gnawed on framing and burrowing beneath foundations.
**Ag Buildings**

**Roof**

**Most Protection**

1. Rust-resistant, clad-metal roofing with overlapping joints; roof edges (rake) protected from wind damage; or water-tight slate roof.

2. Rust-resistant, clad-metal roofing with overlapping joints; roof edges (rake) protected from wind damage.

3. Re-painted, clad-metal roofing with overlapping joints; roof edges (rake) protected from wind damage.

4. Re-painted, clad-metal roofing with overlapping joints; roof edges (rake) not protected from wind damage.

5. Damaged metal or wood shingle roof; roof edges (rake) not protected from wind damage.

**Least Protection**

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**Reminders**

Water from a leaking barn roof will rot roof trusses, framing and floors.

Install spouting and drain pipes to divert water away from building foundations to increase the life of the building.

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**Personal Protective Equipment**

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The Pennsylvania Uniform Construction Code (UCC45) excludes agricultural buildings.

Post-Frame Building Handbook, NRAES-1.

Other:
Once a barn roof has been damaged and repairs delayed, the life expectancy of the barn is decreased (Figure 1).

Using a roofing contractor licensed by your state, if a license is required, increases the probability that a successful roofing project will be completed.

Roofers should provide the client with proof of liability insurance and worker's compensation insurance before they begin work.

A minimum of a 3-year warranty against defective workmanship is reasonable for a consumer to expect from a roofing contractor as well as a copy of the manufacturer's warranty on the roofing materials.

A Mechanic's Lien filed by an attorney in the county courthouse reduces client/contractor liability issues.

Figure 1.
Most Protection

1. Truss to girder joint attached by mechanical uplift connection with bolts or nails; girder to post bolted; lateral and diagonal bracing of top and bottom chord and web members to engineer design and manufacturer's specifications.

2. Truss to girder joint attached by mechanical uplift connection with bolts or nails; girder to post lag screwed; lateral and diagonal bracing of top and bottom chord and web members to engineer design and manufacturer's specifications.

3. Truss to girder joint attached by wooden framing anchor with bolts or nails; girder to post nailed; lateral and diagonal bracing of top and bottom chord and web members to engineer design and manufacturer's specifications.

4. Truss to girder joint attached by wooden framing anchor with nails; girder to post nailed; lateral bracing of bottom chord, but no lateral or diagonal bracing of top and web members to engineer design or manufacturer's specifications.

5. Truss to girder joint attached by toe-nailed nails; truss to post nailed; no lateral bracing or diagonal bracing of top and bottom chord and web members to engineer design or manufacturer's specifications.

Least Protection

Reminders

Roof truss members must be securely attached to posts and girder points.

A toe-nailed attachment of a truss to a girder increases the risk of wind damage.
Laws, Regulations, Standards, and Guidelines:
Laws, regulations, standards, and guidelines are constantly being updated and revised. Be sure to check the latest version of any document listed below. Be aware that new laws, regulations, standards, and guidelines on this topic may be generated at any time. See Appendix A for more information.

Minimum Design Loads for Buildings and Other Structures, ANSI/ASCE, ASCE 7-02 or appropriate version for your locale.

Guide to Good Practice for Handling, Installing and Bracing of Metal Plate Connected Wood Trusses, WTCA/TPI, BCSI 1-03.

Check the Uniform Construction Code or equivalent Code for your state regarding agricultural construction.

Other:
Uneven and multi-gabled roof pitches, irregularly shaped buildings, and accessories (e.g. silos) create uneven wind load pressures.

Wind uplift in combination with the roof's weight (dead load) may create a situation where normal tension members (bottom chord) become compression members with resulting failure of the structure - unless top and bottom chord and web members are properly braced.

Post-to-girder braces or gussets and roof truss diagonal (X) bracing increases building strength longitudinally and decreases wind damage potential (Figure 1).

Figure 1.
**Ag Buildings**

**Roof Bracing Snow Load**

**Most Protection**

1. Lateral bracing of top and bottom chord members and web to manufacturer's specifications; all bracing installed to engineer's specifications; installed by certified builder.

2. Lateral bracing of top and bottom chord members but not web to manufacturer's specifications; some bracing installed to engineer's specifications; installed by certified builder.

3. Lateral bracing of bottom chord members but not top chord or web members and not to manufacturer's specifications; some bracing installed to engineer's specifications; installed by non-certified builder.

4. Lateral bracing of bottom chord members to manufacturer's specifications but not top chord or web members; bracing not installed to engineer's specifications; installed by owner or non-certified builder.

5. No lateral bracing of bottom chord or web members; trusses built and installed by owner.

---

**Reminders**

The wider the truss spacing, the less load the truss can carry.

Minimally sloped roofs will accumulate more snow load in any snow event than will a steeper pitched roof.

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**Personal Protective Equipment**

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Minimum Design Loads for Buildings and Other Structures, ANSI/ASCE, ASCE 7 or appropriate version for your locale.

Guide to Good Practice for Handling, Installing and Bracing of Metal Plate Connected Wood Trusses, WTCA/TPI, BCSI 1-03.

Check the Uniform Construction or equivalent Code for your state regarding agricultural construction.

Other:
Uneven and multi-gabled roof pitches can create drifting snow with resulting snow loads that may increase psf load levels above permissible standards.

Lateral bracing of the top and bottom chord members and web members improves the stability of chord members to carry the loads for which they are designed.

Truss chord members size and spacing should meet or exceed construction design standards.

Trusses that are not adequately braced or that are spaced too far apart can result in load failure (Figure 1).

Greenhouse truss bracing must also meet or exceed construction design standards, or resulting load failure can occur (Figure 2).

Figure 1. Figure 2.
Ag Buildings
Roof Design Snow Load

Most Protection
1. Building design is sealed to appropriate location standard by qualified professional engineer; building components sealed to appropriate standard by component manufacturer; building erected by certified construction contractor.

2. Building design is sealed to appropriate location standard by qualified professional engineer; building components sealed to appropriate standard by component manufacturer; building erected by non-certified construction contractor.

3. Building design by engineering source but obtained from commercially available blueprint; building components sealed to appropriate standard by component manufacturer; building erected by non-certified construction contractor.

4. Building design by engineering source but obtained from commercially available blueprint; built by owner.

5. Building designed and built by owner.

Least Protection
(over)

Reminders
For maximum snow load protection, the building must be designed properly and then installed exactly to the design specifications.

Ask the engineer and truss manufacturer for their design and component seals for your building.

Personal Protective Equipment
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Minimum Design Loads for Buildings and Other Structures, ANSI/ASCE, ASCE 7-02 or appropriate version for your locale.

Guide to Good Practice for Handling, Installing and Bracing of Metal Plate Connected Wood Trusses, WTCA/TPI, BCSI 1-03.

Check the Uniform Construction Code or equivalent Code for your state regarding agricultural construction.

Other:
The wider the truss spacing, the less load (in pounds per square foot, psf) the truss can carry.

Component manufacturers (truss builders) provide stamps (Figure 1) to certify their product's quality or to indicate proper use of the component.

Truss chord members sizes and spacings should meet or exceed construction design standards to reduce the impact of snow loads.

Lateral bracing of the upper and lower truss chord members and web members by overlapping joints (Figure 2) improves the stability of chord members to carry the loads for which they are designed.

PA Uniform Construction Code, Act 45 does not apply to agricultural buildings, but does for housing construction.

![Figure 1.](image1)

![Figure 2.](image2)

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Ag Buildings
Roof Design Wind Load

Most Protection

1. Building design sealed to location appropriate standard by qualified professional engineer; building components sealed to appropriate standard by component manufacturer; building erected by certified construction contractor.

2. Building design sealed to location appropriate standard by qualified professional engineer; building components sealed to appropriate standard by component manufacturer; building erected by non-certified construction contractor.

3. Building design by engineering source but obtained from commercially available blueprint; building components sealed to appropriate standard by component manufacturer; building erected by non-certified construction contractor.

4. Building design by engineering source but obtained from commercially available blueprint; building erected by owner.

5. Building designed and built by owner.

Least Protection

(over)

Reminders

For maximum wind load protection, the building must be designed properly and then installed exactly to the design specifications.

Ask the engineer and truss manufacturer for their design and component certification seals for your building.

Personal Protective Equipment
Laws, Regulations, Standards, and Guidelines:
Laws, regulations, standards, and guidelines are constantly being updated and revised. Be sure to check the latest version of any document listed below. Be aware that new laws, regulations, standards, and guidelines on this topic may be generated at any time. See Appendix A for more information.

Minimum Design Loads for Buildings and Other Structures, ANSI/ASCE, ASCE 7-02 or the appropriate version for your locale.

Guide to Good Practice for Handling, Installing and Bracing of Metal Plate Connected Wood Trusses, BCSI 1-03, WTCA/TPI.

Check the Uniform Construction Code or equivalent Code for your state regarding agricultural construction.

Other:
Lateral bracing of the upper and lower truss chord members and web members improves the stability of chord members to carry the loads for which they are designed. Lateral and diagonal bracing of lower chord members (Figure 1) improves stability from wind forces directed toward the end of the building. Diagonal and "X" bracing of upper chord members (Figure 2) every 50 feet throughout the building increases building strength to withstand wind damage.

The effects of wind load are reduced by properly installing roof trusses to post and girder members.

Truss chord members sizes and spacing and connections should meet or exceed construction design standards.

PA Uniform Construction Code, Act 45 does not apply to agricultural buildings, but does for housing construction.

Figure 1.

Figure 2.
Ag Buildings
Spray Painting

Most Protection

1. Working mist control and ventilation system if spray applied or paints and finishes applied by hand; paints, finishes, solvents stored in flame-proof cabinet; rags disposed of daily.

2. Working mist control and ventilation system if spray applied or paints and finishes applied by hand; paints, finishes, solvents stored in flame-proof cabinet; rags stored in air-tight metal container.

3. Working mist control and ventilation system if spray applied or paints and finishes applied by hand; paints, finishes, solvents stored in flame-proof cabinet; rags stored in open metal container.

4. Non-working mist control and ventilation system if spray applied or paints and finishes applied by hand; paints, finishes, solvents not stored in flame-proof cabinet; rags stored in open metal container.

5. No mist control and ventilation system; paints and finishes applied by hand or spray application; paints, finishes, solvents not stored in flame-proof cabinet; rags stored in a pile on the floor.

Least Protection

Reminders
Particulates in spray mists are a fire hazard, as well as an inhalation hazard.

Employees must be issued the correct respirator for the job and be instructed in its use.

Personal Protective Equipment

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Laws, Regulations, Standards, and Guidelines:

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Spray Application Using Flammable or Combustible Materials, NFPA 33.


Other:
If there are employees involved with the spray process, then safety regulations must be followed. Ventilation, OSHA, 29CFR 1910.94 provides the appropriate information on this topic.

If paint and solvent wiping clothes are kept for re-use, an air-tight metal storage container (Figure 1) reduces the potential for the rags to become fuel for a fire.

A fire-suppression system (Figure 2) increases the capability for fire control in paint spray areas.

As quoted from the NFPA website (www.nfpa.org), "An analysis of actual experience in industry demonstrates that the largest fire losses and fire frequency have occurred where good practice standards were not observed."

Figure 1. Figure 2.

© 2010 The Pennsylvania State University
Equipment or vehicle with gasoline engines are not stored in repair area; no open flame heating system; flammable liquid storage in approved UL fire safety containers or self-closing, fireproof cabinet.

2. Equipment or vehicle with gasoline engines are temporarily stored in repair area; no open flame heating system; flammable liquid storage in approved UL fire safety containers, but not in self-closing, fireproof cabinet.

3. Equipment or vehicle with gasoline engines are temporarily stored in repair area; no open flame heating system; flammable liquid storage in non-approved cans, and non-fireproof cabinet.

4. Equipment or vehicle with gasoline engines are frequently stored in repair area; open flame heating system used; flammable liquid storage in non-approved cans or in non-fireproof cabinet.

5. Equipment or vehicle with gasoline engines are always stored in repair area; open flame heating system used; no flammable materials storage cans or cabinet available.

Reminders
Work lights should have protective cages around them.

A fully charged, 10 lb. ABC-type fire extinguisher should be available in the repair area.

Carbon monoxide exhaust systems must be used when operating an engine in an enclosed area.

Personal Protective Equipment

Most Protection

1. Equipment or vehicle with gasoline engines are not stored in repair area; no open flame heating system; flammable liquid storage in approved UL fire safety containers or self-closing, fireproof cabinet.

2. Equipment or vehicle with gasoline engines are temporarily stored in repair area; no open flame heating system; flammable liquid storage in approved UL fire safety containers, but not in self-closing, fireproof cabinet.

3. Equipment or vehicle with gasoline engines are temporarily stored in repair area; no open flame heating system; flammable liquid storage in non-approved cans, and non-fireproof cabinet.

4. Equipment or vehicle with gasoline engines are frequently stored in repair area; open flame heating system used; flammable liquid storage in non-approved cans or in non-fireproof cabinet.

5. Equipment or vehicle with gasoline engines are always stored in repair area; open flame heating system used; no flammable materials storage cans or cabinet available.

Least Protection
Laws, Regulations, Standards, and Guidelines:
Laws, regulations, standards, and guidelines are constantly being updated and revised. Be sure to check the latest version of any document listed below. Be aware that new laws, regulations, standards, and guidelines on this topic may be generated at any time. See Appendix A for more information.

Flammable and Combustible Liquids Code, NFPA 30.

Metal Safety Cans, ANSI/UL 30.

OSHA Flammable and Combustible Liquids, CFR 126.

Other:
A leaking gasoline tank's vapors will travel to the lowest point. This may be near the pilot light flame of a hot water heater, furnace or space heater which could ignite the vapors.

Welding done on a vehicle places flames near combustible materials. A heat shield should be used to separate the two areas.

Daily disposal of oil- and solvent-soaked rags reduces the risk of fire. Use a sealed container to store used rags (Figure 1).

![Figure 1.](image-url)
Ag Buildings
Woodworking Area

Most Protection

1. Hand equipment only used; working dust control system; working ventilation system; paints and finishes applied by hand only.

2. Hand equipment and power equipment used; working dust control system; working ventilation system; paints and finishes applied by hand only.

3. Hand and power equipment used; working dust control system or individual equipment has dust control attachment; natural ventilation system only; paints and finishes applied by hand and by spray; paint spray mist control by natural ventilation.

4. Hand and power equipment used; no dust control system; natural ventilation system only; paints and finishes applied by hand and by spray; paint spray mist control by natural ventilation.

5. Power equipment only used; no dust collection system; no ventilation system; paints and finishes applied primarily by spray; no paint mist control system.

Least Protection

(over)

Reminders

Dust accumulations can pose a risk of explosion and fire.

Particulates in spray mists are a fire hazard and an inhalation hazard.

Enforce the "no smoking" policy to reduce risk of fire.

Personal Protective Equipment
Laws, Regulations, Standards, and Guidelines:

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No information regarding laws, regulations, standards, or guidelines on this topic were discovered.

If employees are involved in work requiring a respirator, they must be provided instructions as to the correct use of the respirator (Ventilation, OSHA, 29CFR 1910.94, as amended 64FR13909).

Other:

Explosion-proof motors reduce the risk of explosions and ensuing fires.

If the entire woodworking shop cannot be fitted for dust control, individual, high-use machines can be fitted with dust-control systems (Figure 1).

Daily disposal of stain- and solvent-soaked rags from paints and finish work reduces the risk of fire. Use a sealed container (Figure 2) to store used rags.

Figure 1.

Figure 2.
Adequate workspace; well-lit; mechanically ventilated; minimum of 200 amp-240 volt three phase electrical service installed by certified electrician.

2. Adequate workspace; well-lit; mechanically ventilated; maximum of 200 amp-240 volt three phase electrical service installed by certified electrician.

3. Adequate workspace; average lighting; natural ventilation; maximum of 200 amp-240 volt three phase electrical service installed by certified electrician.

4. Workspace too small; poorly lit; natural ventilation; 100 amp-240 volt single phase electrical service installed by non-certified electrician.

5. Workspace too small; poorly lit; poor ventilation; 100 amp-120 volt single phase electrical service installed by owner.

Reminders
An orderly work space is a safer work space.

GFCI outlets should be used in areas that are damp.

Shop lighting should be protected from breakage by incidental contact.

Personal Protective Equipment

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Laws, Regulations, Standards, and Guidelines:
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National Electric Code (NEC), NFPA.


Other:
Water heaters and space heaters should be ventilated to the outside.

A minimum 12-14 gauge, 2-wire with ground conductors and a 20 amp rated circuit protection system should be used.

Well lit areas and organized tool storage increase the opportunities to work safely (Figure 1).

Lighting recommendations include:
- 1/2-watt fluorescent lighting per square foot of shop space
- 2 watts incandescent lighting per square foot of shop space
- 48-inch, double tube fluorescent lighting mounted 50 inches above the work bench (Figure 2)

Figure 1. Figure 2.
Ag Buildings
Workshop Heating

Most Protection

1. Permanently installed, original equipment manufacturer heating device (space heater, etc.); area around heat source is free of combustible materials; excellent maintenance.

2. Permanently installed, original equipment manufacturer heating device (space heater, etc.); area around heat source is free of combustible materials; good maintenance.

3. Portable, original equipment manufacturer heating device (space heater, etc.); heat source is within a few inches of combustible materials; average maintenance.

4. Portable, original equipment manufacturer heating device (space heater, etc.); combustible materials are against heat source; below average maintenance.

5. Homemade heating device (space heater, etc.); combustible materials are against heat source; poor maintenance.

Least Protection

(over)

Reminders

Heating flues and chimneys must not be placed near combustible materials without a heat-resistant barrier separating the flue from the flammable construction components.

Sheet metal is not a heat barrier.

Personal Protective Equipment
**Laws, Regulations, Standards, and Guidelines:**

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Waste Oil-Burning Air-Heating Appliances, UL296A.

Proper Installation, Operation and Maintenance of a Wood Stove, National Agricultural Safety Database (www.cdc.gov/nasd), locate by topic (fire safety).

**Other:**

Chimneys and flues more than 2 inches from any combustible material reduces the risk of fire (Figure 1).

Chimneys projecting more than 4 feet above a roof must be supported against high winds (Figure 2).

Chimney caps prevent water from entering the chimney, flue and smoke pipe connecting the stove to the flue (Figure 2).

![Figure 1.](image1.png)  ![Figure 2.](image2.png)
Ag Buildings
Workshop Storage

Most Protection

1. Wall-mounted storage racks sized for longest stock; adequate storage area lighting; aisleways clear.

2. Wall-mounted storage racks sized for longest stock; minimal storage area lighting; aisleways clear.

3. Wall-mounted storage racks sized for longest stock; minimal storage area lighting; aisleways not always clear.

4. Wall-mounted storage racks but undersized for longest stock; no storage area lighting; aisleways not always clear.

5. No wall-mounted storage racks; no storage area lighting; aisleways cluttered.

Least Protection

Personal Protective Equipment

Reminders

Heavy objects should be stored near to the floor.

Protect shop lighting from breakage by unintentional contact.
Laws, Regulations, Standards, and Guidelines:

Laws, regulations, standards, and guidelines are constantly being updated and revised. Be sure to check the latest version of any document listed below. Be aware that new laws, regulations, standards, and guidelines on this topic may be generated at any time. See Appendix A for more information.

No information regarding laws, regulations, standards, or guidelines on this topic were discovered.

Other:

Hazards from improper storage of materials can include:

1. materials falling on someone below
2. tripping over the material
3. running into the materials protruding into the aisleways
4. stacked materials tipping over

Poorly stored materials may be hard to locate, causing a hurried response to a task.

Figure 1 shows one way of organizing shop tools.

Improper separation of materials may create a fire, explosion or corrosion hazard.

![Figure 1.](image)
Agricultural Machinery
Augers

Most Protection

1. Auger has a properly designed intake guard in place that is in good condition.

2. Auger has a properly designed intake guard in place but it is bent or damaged; auger has an improperly designed intake guard.

3. Auger intake guard is missing or it never had one originally.

Least Protection

(over)

Reminders

Augers present a shear point hazard. Augers are considered to be the most hazardous farm machine per hour of machine use.

Personal Protective Equipment

Whenever working with augers wear:

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Laws, Regulations, Standards, and Guidelines:

Laws, regulations, standards, and guidelines are constantly being updated and revised. Be sure to check the latest version of any document listed below. Be aware that new laws, regulations, standards, and guidelines on this topic may be generated at any time. See Appendix A for more information.

Safety for Portable Agricultural Auger Conveying Equipment, ASAE S361.3.

Guarding for Agricultural Equipment, ANSI/ASAE S493.

Guarding of Farm Field Equipment, Farmstead Equipment, and Cotton Gins, OSHA CFR29 Section 1928.57.

Other:
A properly designed auger intake guard:

- Provides a deterrent from accidental contact with the rotating flighting
- Covers the top 180 degrees of the inlet area and extends a minimum of 2.5 inches above and below the exposed flighting
- Has openings in the guard that are no larger than 4.75 inches to provide for the free flow of material
- Maintains openings in the guard no closer to the rotating flighting than 2.5 inches.
- Has sufficient strength to support a 270 pound person without permanent deformation.
Agricultural Machinery
Flexible Guards

**Most Protection**

1. Chain, tarp or rubberized belt guard is in place and in good condition.

2. 

3. Chain, tarp or rubberized belt guard is poorly attached or the guard is worn and needs to be replaced.

4. 

5. Chain, tarp or rubberized belt guard is missing or the equipment never had one.

**Least Protection**

(over)

**Reminders**
Hazes from thrown objects result from chopping, grinding, cutting or flinging motions.

Small objects, such as rocks, metal, glass, sticks and vegetation may be picked up by the machine and thrown with great force.

**Personal Protective Equipment**
Whenever working with equipment having thrown objects hazards, use:
**Laws, Regulations, Standards, and Guidelines:**

Laws, regulations, standards, and guidelines are constantly being updated and revised. Be sure to check the latest version of any document listed below. Be aware that new laws, regulations, standards, and guidelines on this topic may be generated at any time. See Appendix A for more information.

Guarding for Agricultural Equipment, ANSI/ASAE S493.

Guarding of Farm Field Equipment, Farmstead Equipment and Cotton Gins, OSHA CFR29 Section 1928.57.

**Other:**

Some machines that have flexible guarding may also use a solid shroud-type guard to protect against hazards from thrown objects (Figure 1).

*Figure 1.*
Agricultural Machinery
Hydraulic Hoses

Most Protection

1. Hoses have a brand new appearance, excess hose is coiled.

2. Hoses are in good condition, show some wear, excess hose is coiled.

3. Hoses have some noticeable cracks and gouges; excess hose is not coiled.

4. Hoses have numerous cracks and gouges. Hoses are taped or modified to cover cracks and gouges.

5. Hoses are leaking fluid and/or external rubber layer is separated from steel braiding.

Least Protection

(over)

Reminders

Wear eye protection and gloves when checking for leaking hoses with a piece of cardboard or wood.

Prevent burns by letting the hydraulic system cool before changing hydraulic lines, filters or fittings.

Lower and/or properly block all implements before servicing the hydraulic system.

Relieve pressure before detaching/attaching hydraulic hoses to tractor couplers.

Personal Protective Equipment

When handling hot hoses, couplers, or checking for leaks use:

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Laws, Regulations, Standards, and Guidelines:

Laws, regulations, standards, and guidelines are constantly being updated and revised. Be sure to check the latest version of any document listed below. Be aware that new laws, regulations, standards, and guidelines on this topic may be generated at any time. See Appendix A for more information.

No information regarding laws, regulations, standards, or guidelines on this topic were discovered.

Other:
Tighten or loosen fittings with two wrenches. Two wrenches will prevent the hydraulic line from twisting. Tighten fittings only enough to prevent leaks.
Agricultural Machinery
Jack Stands

Reminders
The jacks help prevent back injuries from lifting and crushing injuries to the hands during hitching.

Most Protection

1. Equipment/machine has a jack stand. Jack stand is in good condition; has a good hand crank; can be secured in an up position when not needed.

2. 

3. Equipment/machine has a jack stand. Jack stand is bent and doesn't sit level on the ground; hand crank is damaged or missing; secured in an up position with a makeshift latch/tie.

4. 

5. Jack stand is missing, unusable, or equipment/machine has never had one but should have a jack stand if the tongue is not hinged.

Least Protection (over)
Laws, Regulations, Standards, and Guidelines:
Laws, regulations, standards, and guidelines are constantly being updated and revised. Be sure to check the latest version of any document listed below. Be aware that new laws, regulations, standards, and guidelines on this topic may be generated at any time. See Appendix A for more information.

No information regarding laws, regulations, standards, or guidelines on this topic were discovered.
Agricultural Machinery
Machine Master Shield

Most Protection

1. Master shield is in place and in good condition; offers good protection.

2.

3. Master shield is in place but has a bend, crack or slice that reduces the level of protection. Original or current shield offers poor protection.

4.

5. Master shield is missing or the equipment has never had one.

Least Protection

(over)

Reminders

A master shield protects the operator from the wrap point hazard.

Always walk around equipment when the PTO shaft is connected to a tractor.

Don't use the master shield as a step to gain access to the equipment.

Personal Protective Equipment

When working around PTO's wear:
Laws, Regulations, Standards, and Guidelines:

Laws, regulations, standards, and guidelines are constantly being updated and revised. Be sure to check the latest version of any document listed below. Be aware that new laws, regulations, standards, and guidelines on this topic may be generated at any time. See Appendix A for more information.


Guarding for Agricultural Equipment, ANSI/ASAE S493.

Other:
Examples of where machine master shields should be located:

- The implement input connection (near the universal joint) on PTO-driven machines
- Pedestal connection on balers and forage choppers
- Secondary drive shafts of balers, corn pickers and forage choppers

Most PTO entanglements occur:

- To the operator
- When shielding is absent
- Near the coupling at the tractor/implement connection
- When a bare shaft, spring-loaded push pin or through bolt catches clothing
Agricultural Machinery
PTO Drivelines

Most Protection

1. Driveline shaft shield is in place, is in good condition, and it can easily rotate by hand. Chain prevents shield from rotating.

2. Driveline shaft shield is still in place but is bent, cracked, sliced and/or does not rotate freely.

3. Driveline shaft shield is missing or the equipment never had one.

Least Protection

(over)

Reminders

PTO drivelines present a wrap point hazard.

Always walk around equipment when the PTO shaft is connected to a tractor.

Turn off tractor and disengage the PTO before servicing, adjusting or unplugging equipment.

Personal Protective Equipment

When working around PTO's wear:
Laws, Regulations, Standards, and Guidelines:

Laws, regulations, standards, and guidelines are constantly being updated and revised. Be sure to check the latest version of any document listed below. Be aware that new laws, regulations, standards, and guidelines on this topic may be generated at any time. See Appendix A for more information.


Guarding for Agricultural Equipment, ANSI/ASAE S493.

Other:
Other locations and types of equipment that have wrap point hazards are:

- Secondary drive shafts
- Beater bars on self-unloading silage wagons
- Blades of some manure spreaders
- Posthole diggers
- Balers
- Mowers

Most PTO entanglements occur:

- To the operator
- When shielding is absent
- Near the coupling at the tractor/implement connection
- When a bare shaft, spring-loaded push pin or through bolt catches clothing
Agricultural Machinery
PTO Warning Decals

Most Protection

1. Warning decal(s) are mounted on PTO shield or on implement hitch below shaft where they are easily read; includes pictogram.

2. 

3. Warning decal(s) are present but partially unreadable or not easily seen; pictograms are not present.

4. 

5. Warning decal(s) are missing or unreadable.

Least Protection

Reminders
Place safety decals so that they are readily visible and alert the viewer to the potential hazard in time to take appropriate action.

Personal Protective Equipment

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Laws, Regulations, Standards, and Guidelines:

Laws, regulations, standards, and guidelines are constantly being updated and revised. Be sure to check the latest version of any document listed below. Be aware that new laws, regulations, standards, and guidelines on this topic may be generated at any time. See Appendix A for more information.

Safety Signs, ASAE S441.3.

Other:
Recommended locations for warning decals include:
  ● PTO shafts
  ● PTO master shields
  ● Belt drives
  ● Chain drives
  ● Pinch points
  ● Cutting/shear points
  ● Wrap points
  ● Crush points
  ● Freewheeling parts
  ● Burn points
  ● Pull-in points
  ● On equipment that has a potential for thrown objects
  ● Places where stored energy is present
Agricultural Machinery
Slow-Moving Vehicle Emblem

Most Protection

1. Mounted properly on the equipment and bright in color.

2. 

3. Not mounted on the equipment or is bent. Can also be partially obstructed, muddy or faded.

4. 

5. Missing

Least Protection

(over)

Reminders

Replace an SMV emblem that has become damaged or faded.

Use SMV emblem only for marking vehicles, towed or self-propelled, that travel a maximum of 25 mph.

Personal Protective Equipment
Laws, Regulations, Standards, and Guidelines:

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Slow-Moving Vehicle Identification Emblem, ANSI/ASAE S276.5.

Lighting and Marking of Agricultural Field Equipment on Highways, ANSI/ASAE S279.10.

Specifications for Accident Prevention Signs and Tags, OSHA CFR 29 Section 1910.145.

Slow Moving Vehicle Emblem, 75 Pa.C.S. Section 4529.

Other:

It is illegal to use SMV emblems as stationary reflectors to mark a driveway, to mark a barricade obstructing a driveway (Figure 1), or for other similar use.

For related information, see ABE Fact Sheet E-1, Slow-Moving Vehicle Emblem, The Pennsylvania State University, Agricultural and Biological Engineering Department, www.abe.psu.edu.
Agricultural Machinery
Tires

Most Protection

1. Tread like new; no side wall gouges.

2. Tread is good; no cracks in the tire sidewalls.

3. Tread is worn; a few sidewall cracks.

4. Tread is badly worn; rubber has multiple cracks or gouges.

5. Treads are bald with numerous cracks or gouges.

Least Protection

(over)

Reminders
Do not exceed speed and load rating on agricultural tires if highway use is necessary.

Personal Protective Equipment

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Laws, Regulations, Standards, and Guidelines:

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No information regarding laws, regulations, standards, or guidelines on this topic were discovered.
Agricultural Machinery
V-belt, Chain, and Gear Drives

Most Protection

1. Guard(s) enclose all v-belt, chain or gear drives.

2. Guard(s) enclose some v-belt, chain or gear drives.

3. Guard(s) prevent access to the intake side of all v-belt, chain, or gear drives.

4. Guard(s) prevent access to the intake side of some v-belt, chain or gear drives.

5. Guard(s) for v-belt, chain or gear drives are missing or machine has never had them.

Least Protection

(over)
Laws, Regulations, Standards, and Guidelines:

Laws, regulations, standards, and guidelines are constantly being updated and revised. Be sure to check the latest version of any document listed below. Be aware that new laws, regulations, standards, and guidelines on this topic may be generated at any time. See Appendix A for more information.

Guarding for Agricultural Equipment, ANSI/ASAE S493.

Guarding of Farm Field Equipment, Farmstead Equipment, and Cotton Gins, OSHA CFR 29 Section 1928.57.
Agricultural Machinery Warning Markers and Lights

Most Protection

1. All reflective markers (and red/amber lights are working if the equipment is over 13 feet wide) are clean and viewable.

2. 

3. Some reflective markers (and some red/amber lights are working if equipment is over 13 feet wide) are broken, missing or dirty.

4. 

5. There are no reflective markers or lights, or all are broken.

Least Protection

(over)

Reminders

For machinery over 13 feet wide, both flashing warning lights and reflectors are required.

Machinery under 13 feet wide require reflectors.

Red reflectors should be visible from the rear and amber reflectors should be visible from the front of the equipment.

Personal Protective Equipment
Laws, Regulations, Standards, and Guidelines:

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Lighting and Marking of Agricultural Field Equipment on Highways, ANSI/ASAE S279.10.

Lighting Equipment, 75 Pa. C.S. Sections 4302, 4303, 4305 and 4307

Other:

If a tractor has a visible SMV and is towing equipment that does not have reflectors or lighting, then a good safety practice is to attach a red flag to the left-rear of the equipment (Figure 1).

![Image](image_url)

Figure 1.
Agri-Retail
Christmas Tree Sales

Most Protection

1. Producer harvests, bales, or balls and burlaps and loads trees for customer.

2. Producer harvests some trees, bales, or balls and burlaps and loads trees for customer; customer can select and cut their own trees with a hand saw with supervision; tree cart available for customer's use.

3. Producer harvests some trees by cutting or digging; customer can select and cut a tree by hand with no supervision; directions and safety rules posted/verbally presented; tree cart available for customer's use.

4. Producer supplies customer with hand saw; verbal directions to tree site only; no tree cart provided for customer's use.

5. Producer supplies customer with chain saw or axe; verbal directions to tree sites only; no tree cart provided for customer's use.

Least Protection

(over)

Reminders

Every customer may not be able to use a hand saw, axe or chain saw safely.

Dusk and after-dark sales increase the risk for falls in areas of uneven footing.

Carts to haul trees to check-out areas can prevent back injuries.

Every customer may not be able to lift a balled and burlapped (B and B) tree.

Personal Protective Equipment

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Laws, Regulations, Standards, and Guidelines:
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Pennsylvania Recreational Use Statute, PS 477-1 Title 68, Real and Personal Property, Chapter 11, Use of Property.

Other:
Warning signs and directional signs (Figure 1) posted to alert consumers of the Christmas tree market's rules and regulations reduce risk.

Pick your own harvesting may involve the digging of live trees. Safety concerns involve shovels, digging bars and picks as potential hazards, as well as back injuries.

Some state's have "hold harmless" clauses for protection of landowners from liability involving others using the land.

It is possible for an inexperienced person to be injured with a hand saw.

Ruts in the ground, stumps from cut trees, and holes left from dug trees (Figure 2) increase the risk of tripping and falling. Some of the holes can be large. Fill these areas or remove the stumps before the sales period when customers arrive.

Children should be supervised by their parents during the entire tree-buying experience.

Figure 1.

Figure 2.
**Agri-Retail**

**Christmas Tree Sales Parking/Lighting**

---

**Most Protection**

1. Designated, paved parking at least 20 feet off road; separate ingress and egress with traffic flow markers; parking on the same side as the Christmas tree market; lighting at least 16 feet above ground.

2. Designated, gravel surfaced parking at least 20 feet off road; single ingress and egress with traffic flow markers; parking on the same side as the Christmas tree market; lighting at least 16 feet above ground.

3. No designated parking; gravel surfaced within 20 feet of road; single ingress and egress with no traffic flow markers; parking on the same side as the Christmas tree market; lighting 12-16 feet above ground.

4. Gravel surfaced, limited pull-off parking area on the side of the road; no traffic flow signs; pedestrians may cross road or walk near roadway to Christmas tree market; lighting 8-12 feet above ground.

5. Roadside or berm parking; no traffic flow signs; pedestrians cross road or walk in roadway to Christmas tree market; no lighting.

---

**Least Protection**

(over)

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**Reminders**

Post signs well in advance of the market to give motorists early notice to reduce speed.

Ingress and egress to the Christmas tree market should be at least 30 feet wide.

Firm, level surfaces provide the best footing.

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**Personal Protective Equipment**
Laws, Regulations, Standards, and Guidelines:
Laws, regulations, standards, and guidelines are constantly being updated and revised. Be sure to check the latest version of any document listed below. Be aware that new laws, regulations, standards, and guidelines on this topic may be generated at any time. See Appendix A for more information.


Other:
Local, county and state zoning and building ordinances may be applicable. Typical ordinance topics may include: size, toilet facilities, potable water, parking, signage, lighting, and driveway design and construction.

A space of 10 x 18 feet per car with an aisle space width of 10-24 feet should be provided.

The glare from lighting used by the market should not extend beyond the boundary of the property.

Advertising signs (Figure 1) should provide 0.25 to 0.40 miles of distance or more for motorists to slow down for the Christmas tree market.

Figure 1.
Agri-Retail
Roadside Market Parking and Lighting

Most Protection

1. Designated, paved parking at least 20 feet off road; separate ingress and egress with traffic flow markers; parking on the same side as the market; lighting at least 16 feet above ground.

2. Designated, gravel surfaced parking at least 20 feet off road; single ingress and egress with traffic flow markers; parking on the same side as the market; lighting at least 16 feet above ground.

3. No designated parking; gravel or paved surface within 20 feet of the road; single ingress and egress with no traffic flow markers; parking on the same side as the market; lighting 12-16 feet above ground.

4. Gravel surfaced, limited pull-off parking on the side of the road; no traffic flow signs; pedestrians may cross road or walk near roadway; lighting 8-12 feet above ground.

5. Roadside or berm parking; no traffic flow signs; pedestrians cross road or walk in roadway; no lighting.

Least Protection

(over)
Laws, Regulations, Standards, and Guidelines:
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Other:
Local, county and state zoning and building ordinances may be applicable. Typical ordinance topics may include: size, toilet facilities, potable water, parking, signage, lighting, and driveway design and construction.

A space of 10 x 18 feet per car with an aisle space width of 10-24 feet should be provided.

The glare from lighting used by the market should not extend beyond the boundary of the property.

Advertising signs should provide 0.25 to 0.40 miles of distance or more for motorists to slow down for the market. (Figure 1).

Farm markets near heavily traveled roads increase risks. Note the skid marks on the highway in Figure 2.

Figure 1.

Figure 2.

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Agri-Retail
U-Pick Parking Area/Lighting

Most Protection
1. Designated, paved parking area at least 20 feet from road; separate ingress and egress with traffic flow markers; parking on the same side as the harvest area; dusk-to-dawn lighting in parking area or no night activity.

2. Designated, gravel or fine aggregate surfaced parking area at least 20 feet from road; separate ingress and egress with traffic flow markers; parking on the same side as the harvest area; dusk to dawn lighting in parking area or no night activity.

3. No designated parking; gravel surfaced within 20 feet of road; single ingress and egress with traffic flow markers; parking on the same side as the harvest area; no lighting and no night activity, but some dusk activity.

4. Grass surfaced, limited pull-off parking area on the side of the road; no traffic flow signs; pedestrians may cross road or walk near roadway; no lighting, but some dusk activity.

5. Roadside or berm parking; no traffic flow signs; pedestrians cross road or walk in roadway; no lighting, but some dusk activity.

Least Protection

Reminders
Customer assistance with carrying heavy harvest loads reduces the risk of customer injury.

Slippery grass/crop fields decrease traction for people and vehicles.

Personal Protective Equipment
Laws, Regulations, Standards, and Guidelines:
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No information regarding laws, regulations, standards, or guidelines on this topic were discovered.

Other:
A space of 10 x 18 feet per car with an aisle space of 12-24 feet between rows of cars reduces the risk of cars being hit in the parking area.

The glare from lighting used by the business should not extend beyond the boundary of the property.

Advertising signs (Figure 1) should provide 0.25 to 0.40 miles of distance or more for motorists to be able to slow down for the business entrance.

Local, county and state zoning ordinances may be applicable. Typical zoning ordinance topics may include: size, toilet facilities, potable water, parking, signage, lighting, and driveway design and construction.

State Department of Transportation regulations and other local codes may apply to this topic.

Figure 1.
**Most Protection**

1. No ladders used; picking from ground level only; grower or representative in direct supervision; produce carried and/or transported by employees in company-owned containers to check-out station.

2. Aluminum ladders provided and set up by grower or representative; instruction provided; releases signed; warning signs posted; produce carried and/or transported by customer in a cart in company-owned containers to check-out station.

3. Aluminum ladders provided; customer moves and uses ladder; grower instructions provided; produce carried to check-out station by customer in customer-owned containers.

4. Aluminum or wooden ladder provided; customer moves and uses ladder; no instructions provided; produce carried to check-out station by customer in customer-owned containers.

5. Customer brings aluminum or wooden ladder; no instruction or supervision provided by grower; produce carried to check-out station by customer in customer-owned containers.

**Least Protection**

(over)

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Laws, Regulations, Standards, and Guidelines:

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Pennsylvania Recreational Use Statute, PS477-1 Title 68, Real and Personal Property, Chapter 11, Use of Property.

Other:

Climbing on wooden ladders with broken rungs (Figure 1) increases risk.

Climbing on trees (Figure 2) increases risk and can also damage trees.

Advertising signs should provide 0.25 to 0.40 miles of distance or more for motorists to be able to slow down for the business entrance.

If parking is a far distance from the area to be harvested, wagon rides can be used. See the Hayride Operation, Hayride Supervision and Hayride Equipment ASHBMP pages.

Post signs, and provide verbal instructions to give clear directions to patrons.

Figure 1.

Figure 2.
Agritourism
Corn Maze Parking and Lighting

Most Protection

1. Designated, paved parking area at least 20 feet from road; separate ingress and egress with traffic flow markers; parking on the same side of the road as the corn maze; dusk-to-dawn lighting in parking area or no night activity.

2. Designated, fine-aggregate surfaced, parking area at least 20 feet from road; separate ingress and egress with traffic flow markers; parking on the same side of the road as the corn maze; dusk-to-dawn lighting in parking area or no night activity.

3. No designated parking; gravel surfaced within 20 feet of road; single ingress and egress with traffic flow markers; parking on the same side of the road as the corn maze; temporary lighting within the corn maze with some nighttime activity.

4. Gravel surfaced, limited pull-off parking area on the side of the road; no traffic flow signs; pedestrians may cross road or walk near roadway; temporary lighting from parking area to corn maze check-in point for nighttime activity.

5. Roadside or berm parking or grass-surfaced parking; no traffic flow signs; pedestrians cross road or walk in roadway; no lighting from parking area to corn maze check-in point for nighttime activity.

Least Protection

(over)
Laws, Regulations, Standards, and Guidelines:
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No information regarding laws, regulations, standards, or guidelines on this topic were discovered.

Other:
A space of 10 x 18 feet per car with an aisle space width of 12 to 24 feet should be provided.

Advertising signs (Figure 1) should provide 0.25 to 0.40 miles of distance or more for motorists to slow down for the corn maze.

Glare from outdoor lighting (Figure 2) should not extend beyond the boundary of the corn maze property.

Local, county and state zoning ordinances may be applicable. Typical ordinance topics may include: size, toilet facilities, potable water, parking, signage, lighting, and driveway design and construction.

**Figure 1.**

**Figure 2.**
Agritourism Corn Maze Supervision

Most Protection

1. Rules posted, verbal instructions given, and maps provided; at least two supervisors present during operation; PA system available; elevated viewing platform(s) used to supervise site; emergency flags issued to participants; day use only.

2. Rules posted but no verbal instructions given; maps provided; at least two supervisors present during operation; PA system available; elevated viewing platform(s) used to supervise site; emergency flags issued to participants; day and night use.

3. Rules posted, but no verbal instructions given, no maps provided; one supervisor with PA system present during operation; elevated platform available, not always manned; no emergency flags used; both day and night use.

4. Rules given verbally; no maps; no supervision during operation; visitors on their own; no emergency flags used; both day and night use.

5. No rules posted or instructions given; no maps; no supervision during operation; visitors on their own; no emergency flags used; both day and night use.

Least Protection (over)

Reminders

No smoking or open fires are to be permitted in the corn maze.

Corn mazes should not be entered or exited from or onto public rights of way.

Groom the corn maze pathway to reduce trip and fall hazards.

Personal Protective Equipment
Laws, Regulations, Standards, and Guidelines:
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No information regarding laws, regulations, standards, or guidelines on this topic were discovered.

Other:
There are companies that design corn mazes (Figure 1) and consult with agritainment farmers about the logistics of corn mazes.

A limit of 200 participants per acre may be considered to reduce risk potential.

A fire lane or emergency vehicle lane should be provided between the corn maze and any structures or vegetation.

Nighttime corn maze operation increases the risk potential.

If the corn maze operates at night, flashlights only should be used for lighting (Figure 2). Open flame lighting increases risk and is prohibited by fire marshal ordinances in some areas (Maryland State Fire Marshal).

Nighttime supervision includes the use of roaming, in-maze supervisors.

Figure 1.

Figure 2.
Agritourism

Farm Exposures

Most Protection

1. No exposure to farm activities; no machinery or livestock enterprises or no mingling or access to livestock and machinery; barn and out-buildings locked; no farm pond.

2. No exposure to farm activities; machinery or livestock activities limited to lawn equipment and small animals and pets; barn and out-buildings locked; posted and fenced farm pond far from guest facility.

3. Exposure to farm activities through supervised machinery and livestock guided tours; signs posted for restricted areas; barns and out-buildings locked; non-posted and non-fenced farm pond near guest facility.

4. Exposure to farm activities through unsupervised machinery and livestock activities; no supervised activities; signs posted for restricted areas; barns and out-buildings not locked; non-posted and non-fenced farm pond near guest facility.

5. Exposure to farm activities through unsupervised machinery and livestock activities; no supervised activities; no warning signs posted; barn and out-buildings not locked; non-posted and non-fenced farm pond near guest facility.

Least Protection

(over)

Reminders

It is appropriate to ask guests to sign releases to participate in farm activities.

A thorough inspection of the property and correction of hazards is a proactive safety strategy.

Personal Protective Equipment

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**Laws, Regulations, Standards, and Guidelines:**

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Pennsylvania Recreational Use Statute, PS477-1 Title 68, Real and Personal Property, Chapter 11, Use of Property.

**Other:**

Rules and regulations of the Bed and Breakfast business should be posted in prominent locations and should be verbally presented to visitors.

Physical barricades including fencing (Figure 1), walls and doors should be used to prevent access to livestock, machinery and other hazardous locations.

Guests should not be exposed to electric fencing.

![Figure 1](image)

**Figure 1.**

© 2010 The Pennsylvania State University
Agritourism
Hay Ride Equipment

Most Protection

1. ROPS tractor of size greater than 75 HP; mechanically sound wagon equipped w/SMV emblem, safety chains, electric lights and brakes; permanently mounted seats and 24-inch high solid sides.

2. ROPS tractor of 75 HP; mechanically sound wagon equipped w/-SMV emblem, safety chains, but no electric lights and brakes; permanently mounted seats and 21-inch high solid sides.

3. ROPS tractor of 50-74 HP; mechanically sound wagon equipped w/SMV emblem, safety chains, but no electric lights and brakes; straw bale seating and 18-inch high slatted sides.

4. Non-ROPS tractor of less than 50 HP; mechanically sound wagon equipped without SMV emblem; no safety chains, electric lights or brakes; straw bale seating and no sides.

5. Non-ROPS tractor under 50 HP; mechanically unsound wagon not equipped w/SMV emblem, safety chains, electric lights or brakes; seating on loose straw on wagon with no sides.

Least Protection (over)

Reminders
All passengers should be instructed to remain seated at all times with hands and legs within the wagon perimeter.

An ABC-type fire extinguisher should be available.

Personal Protective Equipment
**Laws, Regulations, Standards, and Guidelines:**

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Lighting and Marking of Agricultural Field Equipment on Highways, ANSI/ASAE S279.


Lighting Equipment, 75 PA C.S. Section 4302, 4303, 4305, and 4307.

Slow-Moving Vehicle Emblem, 75 PA C.S. Section 4529.

Check your state's Motor Vehicle Code for standards and regulations applying to this ASHBMP.

**Other:**

Sturdy, well-constructed steps and handrails should be used for loading and unloading passengers. Loading wagons from near ground level and having wheels covered by side extensions (Figure 1) reduces risk of injury.

Nighttime hay rides increase risks. Use of lighting and escort vehicles for nighttime hay rides increases visibility for the driver and for oncoming traffic.

A small tractor will not have the braking capacity to stop a fully loaded wagon.

![Figure 1.](image-url)
**Agritourism**

**Hay Ride Operations**

**Reminders**

Use of horses or motor vehicles (e.g. pick-up truck) to pull a hay ride wagon increases risks.

Just because adults say they can drive the hay ride tractor does not mean they are trained and qualified.

**Personal Protective Equipment**

**Most Protection**

1. Driver a trained adult; daytime operation only; no highways used; pulled by a tractor.

2. Driver a trained adult; daytime operation only; some highway crossing; pulled by a tractor.

3. Driver a trained adult; daytime and nighttime operation; some highway crossing; pulled by a tractor.

4. Driver an untrained adult; daytime or nighttime operation; heavily traveled rural road crossed and used; pulled by a tractor or horse.

5. Driver is a teenager; daytime or nighttime operation; heavily traveled rural road crossed and used; pulled by a tractor, horse or pick-up truck.

**Least Protection**

(over)
Laws, Regulations, Standards, and Guidelines:
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PA Motor Vehicle Code, Section 1501, "Operator's must be licensed".

Check your state's Motor Vehicle Code for standards and regulations regarding this ASHBMP topic.

Other:
Youngsters on a hay ride should be constantly supervised by parents or guardians. An assistant should ride on the hay ride (Figure 1) to supervise the participants.

An escort vehicle in front of and behind the hay ride vehicle on public roads is recommended.

Establish and enforce a "no smoking" policy during hay rides.

A hay ride pulled by a tractor at the speed of a normal walking pace deceases risk. Increased speed increases the risk to participants.

Personally assist riders as they load and unload from the hay ride wagon.

Figure 1.
Agritourism
Hay Ride Passenger Safety

Most Protection

1. Loading from wagon-level permanent platform with handrail; each passenger has individually designated seat within wagon perimeter; passenger directions given by driver.

2. Loading by sturdy portable steps with handrail; each passenger has individually designated seat within wagon perimeter; passenger directions given by driver.

3. Loading by sturdy portable steps without handrail; some passengers have a designated seat while others are seated on the wagon floor; all passengers within wagon perimeter; no passenger directions given.

4. Loading by bales of straw as steps without a handrail; seating on bales of straw or wagon floor; some passengers seated within wagon perimeter, with some passengers seated with legs dangling over the side; no passenger directions given.

5. Loading without steps; seating on wagon surface; some passengers standing or sitting with legs dangling over the side; no passenger directions given.

Least Protection

(over)

Reminders
Small children, persons affected by disability, and elderly passengers will require stable footing when loading and unloading the wagon.

Arms and legs outside the wagon perimeter increases risk.

Personal Protective Equipment
Laws, Regulations, Standards, and Guidelines:
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No information regarding laws, regulations, standards, or guidelines on this topic were discovered.

Other:
Youngsters on a hay ride should be constantly supervised by parents and guardians.

An assistant should ride on the hay ride wagon (Figure 1) to supervise the participants.

An escort vehicle in front of and behind the hay ride vehicle on public roads is recommended.

Establish and enforce a "no smoking" policy during a hay ride.

Figure 1.
Agritourism
Intensity of Activities

**Most Protection**

1. Bed and Breakfast accommodations only; no farm business conducted; no additional activities.

2. Bed and Breakfast accommodations only; no farm business conducted; visitors can take walks on firm, even-surfaced pathways near guest facility; no additional activities.

3. Bed and Breakfast accommodations on working farm; visitors can take walks on firm, even-surfaced pathways near guest facility and work areas; no additional activities.

4. Bed and Breakfast accommodations on working farm; visitors have access to property, but not farm work hazards; visitors have hiking, hunting, fishing and horseback riding available.

5. Bed and Breakfast accommodations on working farm; visitors have access to entire property; visitors have unsupervised farm work activities, hiking, hunting, fishing and horseback riding available.

**Least Protection**

(over)

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**Reminders**

Additional activities promoted by the Bed and Breakfast business increases the risk exposure.

Rules and regulations of the Bed and Breakfast business should be posted in prominent locations and should be verbally presented to guests.

**Personal Protective Equipment**

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Pennsylvania Recreational Use Statute, PS477-1 Title 68, Real and Personal Property, Chapter 11, Use of Property.

Other:

Physical barriers including fences, walls and doors should be used to prevent access to livestock, machinery and other hazardous locations.

Lock all areas that you do not want guests to enter.

See ASHBMP topics, Agritourism: Farm Exposures and B&B/Residential (various topics) for further information.
Animals/Livestock
Animal Medications- Storage/Security

Most Protection

1. All animal medications kept in locked storage when not in use; drugs requiring refrigeration are refrigerated; all drugs are fresh dated.

2.

3. All animal medications kept in locked storage when not in use; drugs requiring refrigeration are refrigerated; most drugs are fresh dated; a few stale dated containers can be found.

4.

5. Animal medications not secured; refrigeration inadequate; many stale dated drugs in storage.

Least Protection (over)

Reminders

Drugs requiring refrigeration can lose efficacy when stored at room temperatures with resulting poor performance when injected.

Conduct a regular inventory inspection of drug use versus drug invoices, stale dated drugs, and for signs of tampering or theft.

Maintain sterile hypodermic needle and syringe conditions to reduce spread of infection between animals.

Personal Protective Equipment
Laws, Regulations, Standards, and Guidelines:
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No information regarding laws, regulations, standards, or guidelines on this topic were discovered.

Other:

Utilize sound human resource management skills to reduce the risk of intentional drug misuse by a disgruntled employee undermining the milk or meat production of the farm.
Animals/Livestock
Animal Medications- Usage

Most Protection

1. Veterinarian prescribed and administered to RFID/PDA identified animal; computer and back-up hard copy records maintained by vet and producer; all withdrawal times followed and documented.

2. Veterinarian prescribed and administered to PDA identified animal; computer and back-up hard copy records maintained by vet and producer; all withdrawal times followed and documented.

3. Veterinarian prescribed and administered and/or producer administered to PDA identified and farm ID tagged animal; records maintained by vet and producer; all withdrawal times followed and documented.

4. Veterinarian prescribed and administered and/or producer administered to PDA identified and farm ID tagged animal; records maintained by vet but not producer; withdrawal times incompletely followed and documented.

5. Veterinarian prescribed or producer secured by other means and producer administered to identified and unidentified animals; no records kept; withdrawal times not followed or documented.

Least Protection

Reminders

RFID means radio frequency identification.

PDA means PA Department of Agriculture.

Develop a herd health plan to minimize disease problems.

Keep drug treatment records on file. Drug use treatment records must include: drug used, treatment date, animal ID, dosage, route of administration, withdrawal time for milk and meat, and name of person administering the drug.

Personal Protective Equipment

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**Laws, Regulations, Standards, and Guidelines:**

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Food Quality Protection Act, 1996, EPA (an amendment of the Fungicide, Insecticide and Rodenticide Act).

Virus Serum Toxin Act, 21 USC 151-159 et. Seq.

**Other:**

A needle stick, or needle prick with pharmaceuticals, can cause health issues for producers who are injecting the animal. Mild symptoms of nausea to more serious health issues such as paralysis and abortion or miscarriage can occur. Incidents resulting in death have occurred.

Carcass and animal product rejection at the point of processing caused by failure to follow withdrawal times is a source of financial loss to a producer.

Work with a veterinarian to formally complete a milk or meat residue prevention protocol certification and document the program through a Treatment Protocol Record.

Reduce the number of out-dated drugs on inventory (Figure 1) and dispose of drug containers, needles and syringes through a recognized medical waste disposal agent (Figure 2).

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Animals/Livestock
Bull Handling

Most Protection

1. Penned within a secure, locked steel pipe or rebar fenced area; dehorned and fitted with bull nose ring.

2. Penned within unlocked steel pipe or rebar fenced area; dehorned and fitted with bull nose ring.

3. Penned within a high-tensile fenced or wooden fenced area; dehorned and fitted with bull nose ring.

4. Penned within a small woven wire fenced area; not dehorned and not fitted with bull nose ring.

5. Free-roaming within a pasture or lot regardless of fence type; not dehorned and not fitted with bull nose ring.

Least Protection

(over)

Reminders
Bulls should be led by a staff attached to a nose ring fitted to the bull's nose.

Do not enter a field or pen which houses a bull regardless of what the owner says of its behavior.

Just because a bull is behind a fence does not mean that it is securely penned.

Personal Protective Equipment

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Laws, Regulations, Standards, and Guidelines:

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The Hazardous Occupations Order in Agriculture regulations of the US Department of Labor, 29CFR570 Subpart E-1 prohibits youth younger than age 16 years from working in a yard, pen or stall occupied by bulls, stallions or boars.

Other:

Bull behaviors and management practices are well-known. Bulls are territorial. They will snort, paw the ground, and challenge strangers in defense of their territory. As bulls mature in age, they may become more dangerous and unpredictable in behavior. Free-roaming bulls usually exhibit signs of anger first, but may charge a stranger without provocation. Dehorned bulls fitted with nose rings or leads are more safely handled than those that have horns and no means of controlling their movement. Head gates, cattle squeezes, chutes and man-passage gates reduce bull-handling risks.

Warning signs (Figure 1) can alert non-trained observers that there is a danger involved with bulls.

Partitions provide a physical barrier between the handler and the bull, while the man-passage opening (Figure 2) permits the bull handler to be able to move quickly away from the bull.

![Figure 1.](image1.png)  
![Figure 2.](image2.png)
Animals/Livestock
Bull Pens and Stalls

Most Protection
1. Safety pass-throughs are 14 inches wide; gate latches shut automatically.

2. 

3. Safety pass-throughs are less than 14 or more than 18 inches wide; gate latches have to be shut manually.

4. 

5. Safety pass-throughs are not present; gate latches are hard to operate; bull(s) are allowed to roam freely with the cows.

Least Protection (over)

Reminders
A safety pass-through can allow children to enter the bull pen.

Train children to stay away from bull pens.

Escape routes can also include step-overs. Have the step-overs only on the inside of the pen to prevent children from entering.

Personal Protective Equipment

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Laws, Regulations, Standards, and Guidelines:

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No information regarding laws, regulations, standards, or guidelines on this topic were discovered.

Other:

Bull pens should be designed with the idea of minimizing or eliminating the time someone is in the pen with the bull. Examples include:

1) feeding in bunks outside of the pen
2) moving bull(s) to a separate, locked pen while cleaning the bull’s pen
3) placing waterers along fence lines to facilitate maintenance procedures

Bulls are often housed with cows in freestalls. From a safety standpoint, this practice exposes anyone entering freestall areas to an unnecessary hazard that could result in a fatality.
Animals/Livestock
Cattle Headgates

Most Protection

1. Headgate is attached to a straight-sided chute; is in good condition and operates as designed; chute is attached to an alley or return lane.

2. 

3. Headgate (stanchion) is part of the fence which allows only front (neck) restraint; stanchion is in good condition and operates as designed.

4. 

5. Headgate/stanchion is in poor condition.

Least Protection

(over)

Reminders
Do not use bottom-hinged headgates or chutes that have narrow bottoms with dairy cows, as injury could result to the wide hips and udder areas.

Personal Protective Equipment

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Laws, Regulations, Standards, and Guidelines:

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No information regarding laws, regulations, standards, or guidelines on this topic were discovered.

Other:

When working with cattle, consider the following:

● Squeeze chutes are used to immobilize cattle. A headgate in a non-squeezable chute may not immobilize the body enough to perform certain tasks safely.
● A headgate in an unobstructed fence does nothing to immobilize the animal's body from moving back and forth or stopping the animal from kicking at the handler.

When working with the headcatches remember these points.

● Keep the head catching mechanism in good working order so that it holds the animal's head with the desired opening size.
● Worn head latching mechanisms have been known to release unexpectedly and the long latch lever can spring up and break a person's jaw or a neck (Figure 1).
● Do not rebuild worn head catch mechanisms; replace with new parts.

Figure 1.
Animals/Livestock
Dog Safety

Most Protection

1. Securely locked cage or range (run) area with wire mesh sides and top; known docile breed of dog.

2. Unlocked cage or range (run) area with wire mesh sides and top; known docile breed of dog.

3. Chained securely with heavy-duty, positive action closing snap; away from visitors; docility of breed unknown.

4. Chained securely but within area accessible to visitors; tied with a rope only; free-roaming or running loose with a fenced yard or area.

5. Completely free-roaming or running loose; known aggressive breed of dog.

Least Protection (over)

Reminders

Signs should be posted to warn visitors of free-roaming and/or mean dogs.

Upon arrival to the farm, wait for the owner to handle the dog before leaving your vehicle.

Just because a dog is tied up does not mean that it is securely fastened.

Personal Protective Equipment

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Laws, Regulations, Standards, and Guidelines:

Laws, regulations, standards, and guidelines are constantly being updated and revised. Be sure to check the latest version of any document listed below. Be aware that new laws, regulations, standards, and guidelines on this topic may be generated at any time. See Appendix A for more information.


Other:

Dog behaviors:

Dogs are territorial. They will growl, bark or bite strangers in defense of their territory.

Free-roaming dogs may bite, but more often they may jump up on people or vehicles. Clothing may be soiled or damaged. Vehicles may be scratched as a result (Figure 1).

Breeds of dog can vary in temperament, or behavior, from docile to aggressive. The size of the dog will not matter.

Figure 1.
Animals/Livestock Fencing

Most Protection

1. Fencing at a height high enough to control the animal; fencing material and posts in excellent condition.

2. Fencing at a height high enough to control the animal; fencing material and posts in good condition.

3. Fencing at a height high enough to control the animal; fencing material and posts in average condition.

4. Fencing at a height that allows animal to easily reach over; fencing material and posts in average condition.

5. Fencing at a height that allows animal to easily reach or jump over; fencing material and posts in poor condition.

Personal Protective Equipment

Reminders

PA law requires that livestock be fenced so that it cannot access public roads.

Wire gauge (ga) size:
The higher the number, the lighter the wire (e.g. 16 ga wire is lighter than 12 1/2 ga wire).
**Laws, Regulations, Standards, and Guidelines:**

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Installation of Electric Fence Controllers, ASAE, EP568.


High Tensile Wire Fencing, NRAES-11.

**Other:**

Wire gauge sizes are shown in Figure 1. Wire mesh with smaller opening size reduces the risk of animals becoming entangled in the fence with resulting injury. Wire mesh fencing with smaller openings at the bottom will protect livestock from predators and loose-running dogs (Figure 2).

Attaching an electric fence directly to a 115-volt or greater AC circuit poses an electric shock/electrocution hazard to people and livestock.

Check local ordinances regarding fencing requirements.

Some state's Cooperative Extension Animal Science and Agricultural Engineering Specialists provide information on fencing. Check your state's Land Grant University website.

<table>
<thead>
<tr>
<th>WIRE GAUGE</th>
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**Figure 1.**

**Figure 2.**

© 2010 The Pennsylvania State University
Riding in an indoor arena only; arena rules posted/enforced; every rider has signed a current release and waiver of liability; all riders wear ASTM/SEI protective headgear; constant supervision by owner or their representative; EALA signs.

2. Riding in an indoor arena only; arena rules posted/enforced; every rider has signed a current release and waiver of liability; all riders wear ASTM/SEI protective headgear; intermittent supervision by owner or their representative; EALA signs.

3. Riding in outside, defined areas; rules posted/enforced; all riders have signed a current release and waiver of liability; all riders wear ASTM/SEI protective headgear; some supervision by owner or their representative; EALA signs.

4. Riding in outside, defined areas; verbal rules only; no release or waiver of liability; riders not required to wear ASTM/SEI protective headgear; some supervision; no EALA signs.

5. Riding in outside, non-defined areas; no rules posted or presented verbally; no release or waiver of liability used; no protective headgear required; no supervision; no EALA signs.

**Most Protection**

**Least Protection**

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**Laws, Regulations, Standards, and Guidelines:**

Laws, regulations, standards, and guidelines are constantly being updated and revised. Be sure to check the latest version of any document listed below. Be aware that new laws, regulations, standards, and guidelines on this topic may be generated at any time. See Appendix A for more information.


Pennsylvania Equine Activities Liability Act (EALA), Act 93, 2005.

**Other:**
The American Medical Association, The American Medical Equestrian Association, The American Pony Club, and the American Equestrian Alliance recommend the use of the ASTM/SEI F1163 approved safety helmet (Figure 1). Body protector vests, gloves, proper footwear, and quick-release safety stirrups reduce risks of horseback riding.

Post a minimum of two signs (2 ft. x 3 ft.) containing the language shown (Figure 2) as required by the Pennsylvania Equine Activities Liability Act.

---

**Figure 1.**

**Figure 2.**
Most Protection

1. Owner/employee only provides horse care and prepares horses for riding by boarders/visitors; no source of open flame within/near facility; no smoking and no trespassing signs posted/enforced; EALA signs posted.

2. Owner/employee only provides horse care; boarders/riders prepare horse to ride; no source of open flame within/near facility; no smoking and no trespassing signs posted/not enforced; EALA signs posted.

3. Boarders/riders/visitors work with horses, but with direct supervision of owner/employee; no source of open flame within/near facility; no smoking permitted but signs not posted; absence of “no trespassing” signs; EALA signs posted.

4. Boarders/riders/visitors work with horses, no direct supervision by owner/employee; open flame within 30 ft. of facility, smoking in stall area; absence of “no trespassing” signs; no EALA signs posted.

5. Boarders/riders/visitors work with horses unsupervised; open flame at/near barn (barbecue grill, propane torch, etc); smoking in stall area; absence of “no trespassing” signs; no EALA signs posted.

Least Protection (over)

Reminders

Post and enforce barn rules.

The horse's owner should be expected to insure their horse for injury and mortality loss.

Boarders and visitors with children must directly supervise their children.

Display at least two PA Equine Activities Liability Act (EALA) signs.

Personal Protective Equipment
**Laws, Regulations, Standards, and Guidelines:**

Laws, regulations, standards, and guidelines are constantly being updated and revised. Be sure to check the latest version of any document listed below. Be aware that new laws, regulations, standards, and guidelines on this topic may be generated at any time. See Appendix A for more information.

Fire Safety in Horse Stables, Fact Sheet G-100, The Pennsylvania State University, Agricultural and Biological Engineering Department, www.abepsu.edu.

Pennsylvania Equine Activities Liability Act (EALA), Act 93, 2005.

**Other:**
Post a minimum of two signs (2 ft. x 3 ft.) containing the language shown (Figure 1) as required by the Pennsylvania Equine Activities Liability Act.

Horse boarding facility owners and employees can reduce unintentional barn fires caused by smoking by posting "no smoking" signs and enforcing the no smoking policy.

To reduce fires from faulty electrical systems, inspect the wiring frequently and provide an enriched environment for the horse with object the horse can play with to reduce chewing of barn structural members and electrical apparatus.

Written boarding contracts specify the terms of care, health maintenance, and emergency health care response.

---

**Figure 1.**

© 2010 The Pennsylvania State University
Animals/Livestock
Horse Boarding Pasture Kept

Most Protection

1. Horse kept in separate paddock with 3-sided shelter; individual self-waterer cup available; EALA signs.

2. Horse kept in separate paddock with 3-sided shelter; water available by stock tank; EALA signs.

3. Horse kept in separate paddock with 3-sided shelter; water available from shared stock tank through common fence; EALA signs.

4. Horse kept in group paddock with 3-sided shelter; water available from shared stock tank; no EALA signs.

5. Horse kept in group paddock with no shelter; water available from stream; no EALA signs.

Least Protection

(over)
Laws, Regulations, Standards, and Guidelines:

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Pennsylvania Equine Activities Liability Act (EALA), Act 93, 2005.

Other:

Horse paddock design includes the following points:

1. Water source capable of 8-12 gallons per day per horse
2. Shade source for heat protection
3. Means of preventing horses from fighting across fence lines
4. Protection from intrusion by unwanted people (Figure 1)
5. Maintenance of mud-free footing surface
6. Maintenance of an insect-free environment
7. Ease of moving the horse from one location to another
8. Facility and fencing in such condition to prevent injury to the horse

The Humane Society of the United States recommends that horses need constant access to dry, safe comfortable shelter to protect them from rain, wind, snow and heat from the sun.

Post a minimum of two signs (2 ft. x 3 ft.) containing the language shown (Figure 2) as required by the Pennsylvania Equine Activities Liability Act.

Figure 1. Figure 2.

© 2010 The Pennsylvania State University
Horse kept in barred-front box stall in horse design barn; horse-proof gate latches used; floor with sound traction surface with rubber mat covering; windows covered with metal bars or rods; EALA signs.

2. Horse kept in barred-front box stall in horse design barn; horse-proof gate latches used; floor with sound traction surface with deep wood fiber bedding/covering; windows covered with metal bars or rods; EALA signs.

3. Horse kept in partially, barred-front box stall in horse design barn; horse-proof gate latches used; floor of packed clay with deep wood fiber bedding/covering; windows not covered with metal bars or rods; EALA signs.

4. Horse kept in open-front box stall in converted barn; horse-proof gate latches not used; floor with packed clay with minimal straw bedding/covering; windows covered with welded wire mesh; no EALA signs.

5. Horse kept in open-front box stall in non-converted barn; horse-proof gate latches not used; floor of rough clay or wood with absence of bedding/covering; windows not covered; no EALA signs.

Personal Protective Equipment

Reminders

All lighting fixtures in horse housing should have a shatterproof cage cover.

The horse facility's physical condition should not contribute to potential horse injury.

Post at least two PA Equine Activities Liability Act (EALA) signs.
Laws, Regulations, Standards, and Guidelines:

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The Hazardous Occupations Order in Agriculture regulations of the U.S. Department of Labor, 29CFR570, Subpart E-1 prohibits youth younger than age 16 from working in a yard, pen or stall occupied by bulls, stallions or boars.

Horse, Structures and Environment Handbook, MWPS-1.

Horse Stall Design 1, Agricultural and Biological Engineering, The Pennsylvania State University.

Pennsylvania Equine Activities Liability Act (EALA), Act 93, 2005.

Other:
Post a minimum of two signs (2 ft. x 3 ft.) containing the language shown (Figure 2) as required by the Pennsylvania Equine Activities Liability Act.

Box stall partitions at least 7-1/2 ft. high prevent horses from fighting and injuring each other. Box stall openings should be designed to keep the horse's head out of aisles. This will reduce the risk of biting, head throwing, etc. These openings should also prevent children from reaching into the box stall to reduce potential for injury. (Figure 2)

 Appropriately identifying stalls used for stallions reduces risk to an inexperienced handler or youth.

Figure 1.

Figure 2.
Animals/Livestock
Horse Riding with Lessons

Most Protection

1. Riding in lighted indoor arena only; current liability waivers signed/kept on file; horse owned by rider; spectators removed from horse contact; approved headgear required; constant supervision by instructor; EALA signs.

2. Riding in lighted indoor or outdoor arena; current liability waivers signed/kept on file; horse owned by rider; spectators removed from horse contact; approved headgear required; constant supervision by instructor or assistant; EALA signs.

3. Riding in lighted indoor or outdoor arena; no liability waivers signed/kept on file; horse owned by rider; spectators removed from horse contact; approved headgear required; intermittent supervision by instructor or assistant; EALA signs.

4. Riding in an unlighted outdoor arena at dusk; no liability waivers signed; horse supplied by rider or instructor; spectators near horse contact areas; approved headgear not required; supervision minimal; no EALA signs.

5. Riding in pastures, fields or wooded areas during daylight or nighttime; no liability waivers signed; spectators near horse contact area; horse supplied by instructor; protective headgear not required; supervision minimal; no EALA signs.

Least Protection

(over)
Laws, Regulations, Standards, and Guidelines:
Laws, regulations, standards, and guidelines are constantly being updated and revised. Be sure to check the latest version of any document listed below. Be aware that new laws, regulations, standards, and guidelines on this topic may be generated at any time. See Appendix A for more information.


The PA 4-H Program Protective Headgear Policy requires that all 4-H horse club members must wear ASTM/SEI protective headgear while mounted and riding in any 4-H sponsored activity.

Pennsylvania Equine Activities Liability Act (EALA), Act 93, 2005.

Other:
The American Medical Association, the American Medical Equestrian Association, the American Pony Club, and the American Equestrian Alliance recommend use of the ASTM/SEI F1163 approved safety helmet (Figure 1). Body protector vests, gloves, proper footwear, and quick-release safety stirrups reduce risks of horseback riding.

The four most common areas of equine-related lawsuits are equipment failure, rider mounted on an unsuitable horse, improper supervision, and a vicious horse.

Post a minimum of two signs (2 ft. x 3 ft.) containing the language shown (Figure 2) as required by the Pennsylvania Equine Activities Liability Act.

Figure 1.

Figure 2.

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Animals/Livestock
Horse Riding Without Lessons

Most Protection
1. Riding in an indoor arena only; arena rules posted/enforced; every rider has signed a current release and waiver of liability; all riders wear ASTM/SEI protective headgear; constant supervision by owner or their representative; EALA signs.

2. Riding in an indoor arena only; arena rules posted/enforced; every rider has signed a current release and waiver of liability; all riders wear ASTM/SEI protective headgear; supervision by owner or their representative; EALA signs.

3. Riding in pastures, fields or outside arenas; rules posted/may be enforced; every rider has signed a current release and waiver of liability; all riders wear ASTM/SEI protective headgear; supervision by owner or their representative; EALA signs.

4. Riding in pastures, fields or outside arenas; verbal rules only; no releases and waivers of liability used; riders not required to wear ASTM/SEI protective headgear; no supervision; no EALA signs.

5. Riding on trails or woodlands; no rules posted or presented verbally; no releases and waivers of liability used; no protective headgear required; no supervision; no EALA signs.

Least Protection (over)

Reminders
A system to determine rider skill before they are permitted to ride reduces risk.

Inexperienced riders need supervision.

Tack must fit the horse and be properly adjusted.

Post at least two PA Equine Activities Liability Act (EALA) signs.
Laws, Regulations, Standards, and Guidelines:

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Pennsylvania Equine Activities Liability Act (EALA), Act 93, 2005.

Other:
The American Medical Association, The American Medical Equestrian Association, The American Pony Club, and the American Equestrian Alliance recommend use of the ASTM F1163/SEI approved safety helmet (Figure 1). Body protector vests, gloves, proper footwear, and quick-release safety stirrups reduce risks of horseback riding.

Post a minimum of two signs (2 ft. x 3 ft.) containing the language shown (Figure 2) as required by the Pennsylvania Equine Activities Liability Act.

Figure 1.

Figure 2.
Animals/Livestock
Horse Stud Handling

Most Protection

1. All natural, pasture or pen breeding service by stallion; EALA signs.

2. Artificial insemination only; veterinarian provides collection and breeding service; breeding in breeding stock; EALA signs.

3. Some artificial insemination and some hand mating used; veterinarian provides and/or supervises collection of semen and breeding; breeding in breeding stock; EALA signs.

4. No artificial insemination; hand mating for specific mares; some breeding in box stall, pen or pasture by stallion with owner or knowledgeable employee supervision; no EALA signs.

5. No artificial insemination used; some hand mating; some breeding in box stall, pen or pasture by stallion with novice handler conducting the work; no EALA signs.

Least Protection

(over)

Reminders
Stallions are unpredictable in behavior especially near a mare in heat.

Pasture breeding exposes the mare and the stallion to greater risks of injury.

Post at least two PA Equine Activities Liability Act (EALA) signs.

Personal Protective Equipment

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**Laws, Regulations, Standards, and Guidelines:**

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Pennsylvania Equine Activities Liability Act (EALA), Act 93, 2005.

**Other:**

The use of artificial insemination may result in the need for proof of parentage.

Some equine breed associations do not recognize AI bred offspring in their breed registry.

A teasing rail (Figure 1) and breeding stock with slip-resistant floors helps protect the mare and stallion from injury.

Breeding hobbles and removal of the mare's rear shoes helps protect the stallion from injury.

Removal of the stallion's front shoes helps protect the mare from injury.

Post a minimum of two signs (2 ft. x 3 ft.) containing the language shown (Figure 2) as required by the Pennsylvania Equine Activities Liability Act.

---

**Figure 1.**

**Figure 2.**
Animals/Livestock
Horse Trail Riding

Most Protection
1. Riding on a well-maintained, defined trail only; current liability waivers signed and kept on file; horse owned by rider; ASTM/SEI approved headgear required; lessons and/or constant supervision by knowledgeable instructor; EALA signs.

2. Riding on a somewhat maintained, defined trail; current liability waivers signed and kept on file; horse owned by rider; ASTM/SEI approved headgear required; lessons and/or some supervision by knowledgeable instructor or assistant; EALA signs.

3. Riding on a non-maintained, defined trail; no liability waivers signed and kept on file; horse owned by rider; ASTM/SEI approved headgear sometimes required; lessons with intermittent supervision by knowledgeable instructor or assistant; EALA signs.

4. Riding on a non-defined trail; no liability waivers signed; horse supplied by ride operator; ASTM/SEI approved headgear not required; minimal lessons and supervision; no EALA signs.

5. Riding on a non-defined trail; no liability waivers signed; horse supplied by ride operator; ASTM/SEI approved headgear not required; no lessons or supervision; no EALA signs.

Least Protection

Reminders
Tack must fit the horse and be adjusted properly.

Determine a rider's level of experience to match lessons with abilities.

Inexperienced riders need supervision and a horse suited to their level of experience.

Post at least two PA Equine Activities Liability Act (EALA) signs.

Personal Protective Equipment
ASTM/SEI approved headgear is recommended.

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The PA 4-H Program Protective Headgear Policy requires that all 4-H horse club members must wear ASTM/SEI protective headgear while mounted and riding in any 4-H sponsored activity.

Pennsylvania Equine Activities Liability Act (EALA), Act 93, 2005.

**Other:**

The American Medical Association, The American Medical Equestrian Association, The American Pony Club, and the American Equestrian Alliance recommend use of the ASTM/SEI F1163 approved safety helmet (Figure 1). Body protector vests, gloves, proper footwear, and quick release safety stirrups reduce risks of horseback riding.

The four most common areas of equine-related lawsuits are equipment failure, rider mounted on an unsuitable horse, improper supervision, and a vicious horse.

Post a minimum of two signs (2 ft. x 3 ft.) containing the language shown (Figure 2) as required by the Pennsylvania Equine Activities Liability Act.

![Figure 1.](image1.png) ![Figure 2.](image2.png)
Animals/Livestock
Livestock Bio-Security

Most Protection

1. Unoccupied livestock areas locked; visitors and vendors report to central office; shower-in, shower-out disinfect facilities and clothing change required; foot bath or disposable boots provided.

2. Unoccupied livestock areas locked at night; all visitors except vendors report to central office; no shower-in, shower-out disinfect facilities or clothing change required; foot bath or disposable boots provided.

3. Unoccupied livestock areas locked at night; visitors and vendors report to any farm personnel; no shower-in, shower-out disinfect facilities or clothing change required; disposable boots provided, but not foot bath.

4. Unoccupied livestock areas not locked at night; visitors and vendors report to any farm personnel; no shower-in, shower-out disinfect facilities or clothing change required; no disposable boots or foot bath required.

5. Access to livestock buildings completely open; visitors and vendors report to anyone; no clothing and footwear disinfection or disposable boot requirements.

Least Protection

(over)
**Laws, Regulations, Standards, and Guidelines:**

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Pennsylvania Senate Bill 1432, 1996 amending Title 3 of PA Consolidated Statutes, Chapter 23.

Check your state's regulations regarding this topic.

The U.S. Department of Agriculture, USDA, provides detailed homeland security recommendations at the website, www.usda.gov/homeland security.

**Other:**

Post signs (Figure 1) outlining security procedures in place at the farm.

Lock all gates. Conduct an operation vulnerability assessment.

If you must visit livestock farms, wear disposable boots or rubber boots that can be disinfected.

Livestock medicinals should be stored under lock and key. Unrestricted access to pharmaceutical products (Figure 2) increases the risk of exposure or misuse.

Use proven and legal human resource management practices in the hiring, reprimanding and dismissal of employees who may later become disgruntled.

---

**Figure 1.**

**Figure 2.**

© 2010 The Pennsylvania State University
Animals/Livestock
Livestock Identification

Most Protection

1. Rumen bolus radio frequency identification device (RFID) with computer data storage.

2. Radio frequency electronic ear tag (RFID) device with computer data storage.

3. Non RFID eartag, tattoo or heat-brand ID with owner recorded electronic record storage data.

4. State Department of Agriculture ear tag or conventional eartag with owner's representative or another party's paper recorded data.

5. No animal identification used.

Least Protection

Reminders

Transposition errors in recording animal identification can be reduced if the ID number is read back to the recorder.

Back-up computer record storage on a regular basis.

Personal Protective Equipment

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Laws, Regulations, Standards, and Guidelines:
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Final regulations on this topic can be found on the website of the U.S. Department of Agriculture, www.aphis.usda.gov, and then typing "nais" (National Animal Identification System) in the search box.

Other:
All species of livestock will be regulated under current USDA plans for a National Animal Identification Program. Regulations may require livestock movement events to be reported in accordance with the US Animal Identification Program (USAIP) guidelines. Livestock movement events can include:

- Interstate movement of livestock
- Change in ownership/premises
- Livestock movement involving co-mingling of livestock on separate premises from their home area

Livestock sellers can reduce liability issues by reporting livestock movement from their premises.

Button style ear tags equipped with radio frequency identification devices (Figure 1) and other eartag devices (Figure 2) may be lost due to snagging of the eartag on fencing or other objects.
Animals/Livestock
Milk Quality

Most Protection

1. Has formally completed milk residue prevention protocol certification program and has a written farm plan of action on file; state and federal milk inspections have passing score; regular drug screening done.

2. Has informally completed some of the milk residue prevention protocols of the certification program and has no written farm plan of action on file; state and federal milk inspections have passing score; regular drug screening done.

3. Has informally completed some of the milk residue prevention protocol of the certification program and has no written farm plan of action on file; state and federal milk inspections have passing score; seldom uses drug screening.

4. Has not completed any milk residue prevention protocols of the certification program, but uses some of the protocols and has no written farm plan of action on file; state and federal milk inspections have passing score; seldom uses drug screening.

5. Has not completed any milk residue prevention protocols of the certification program, but uses some of the protocols and has no written plan of action on file; all milk inspections have passing score; no screening or incorrect screening.

Least Protection

(over)

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Laws, Regulations, Standards, and Guidelines:

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Standards for Grade "A" Pasteurized Milk, United States Food and Drug Administration, Center, Center for Food Safety and Nutrition (www.cfsan.fda.gov).

Protection from Contamination, 7 PA C.S., Chapter 59, Milk Sanitation, 59.116.

Other:
Overall health-management practices for dairy cattle reduces the need for drug usage.

Drug use treatment records must include: drug used, treatment date, animal ID, dosage, route of administration, withdrawal time for milk and meat, and name of person administering the drug. The two major causes of milk contamination from drugs are:

1. Treated dry cows not promptly removed from the milking herd before subsequent milkings
2. Poor identification methods for treated, lactating cows

Leg bands (Figure 1) may be used to identify antibiotic treated animals but each farm can have its own protocol, which must be communicated clearly to employees.

![Figure 1.](image-url)
Most Protection

1. Have solid sides; pass-throughs every 20 feet.

2. 

3. Sides are open; pass-throughs every 20 feet.

4. 

5. Sides are open; there are no pass-throughs.

Least Protection (over)
Laws, Regulations, Standards, and Guidelines:

Laws, regulations, standards, and guidelines are constantly being updated and revised. Be sure to check the latest version of any document listed below. Be aware that new laws, regulations, standards, and guidelines on this topic may be generated at any time. See Appendix A for more information.

No information regarding laws, regulations, standards, or guidelines on this topic were discovered.
B&B/Residential Electrical Panel

Most Protection

1. Panel uses circuit breakers; electrical panel is free of dust, trash or spider webs; electrical panel cover is securely attached.

2. 

3. Panel uses circuit breakers or fuses; electrical panel has some dust, trash, or spider webs on it; electrical panel cover is not securely attached.

4. 

5. Fuses are bypassed with pennies; electrical panel is covered with dust, trash or spider webs; electrical panel cover is missing; has open sockets.

Least Protection (over)

Reminders
All circuits should be labeled for point of origin and purpose.

Personal Protective Equipment
Laws, Regulations, Standards, and Guidelines:

Laws, regulations, standards, and guidelines are constantly being updated and revised. Be sure to check the latest version of any document listed below. Be aware that new laws, regulations, standards, and guidelines on this topic may be generated at any time. See Appendix A for more information.

National Electrical Code® (NEC®), NFPA 70.

Other:
Always use an ABC or CO2 type fire extinguisher (Figure 1).

Have fire extinguishers inspected yearly.

Keep motors and power tools clean and free of dirt.

Keep flammable or combustible materials away from heaters.

Open circuit breaker slots or fuse sockets can be protected with plastic inserts or fuse plugs to protect the user and the circuit.

Figure 1.
B&B/Residential Electrical Wiring

Most Protection

1. Type UF-B cable has three leads with flexible insulation; plastic fixtures are dust- and water-resistant.

2. Type UF-B cable has three leads with flexible insulation; fixtures are not dust- and water-resistant.

3. Type NM-B wiring has three leads with flexible insulation; plastic fixtures are dust- and water-resistant.

4. Type NM-B wiring has three leads with flexible insulation; fixtures are not dust- and water-resistant.

5. Wiring has only two leads; insulation is brittle; fixtures are deteriorated.

Least Protection

(over)
Laws, Regulations, Standards, and Guidelines:

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National Electrical Code® (NEC®), NFPA 70-2002

Other:
Electrical wiring can be stretched from sagging or broken truss braces, inadvertent machinery contact, or from storage of materials too close to the wiring. This stretched wire can short-circuit, which leads to increased fire potential. Repair these stretched wires immediately.
B&B/Residential
Fire Detection/Suppression

Most Protection

1. Professionally installed and monitored fire detection and sprinkler system; easily accessible ABC-type fire extinguishers on each floor of house.

2. Professionally installed and monitored fire detection and sprinkler system; sprinkler system located in kitchen area of the home only; ABC-type fire extinguishers in kitchen and heating area.

3. Smoke and heat detectors placed in heating, cooking, and each sleeping area; detectors professionally serviced yearly; no sprinkler system; ABC-type fire extinguisher in kitchen and bedroom hallways.

4. Smoke detector, but not heat detector, located near heating and cooking areas, but not in bedroom areas; detector service or replacement schedule unknown; ABC-type fire extinguisher in kitchen area only.

5. No smoke or heat detectors used or battery power supply has discharged; no fire extinguisher or discharged fire extinguisher.

Least Protection

(over)

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Laws, Regulations, Standards, and Guidelines:

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Residential Sprinkler Installation Standards, NFPA 13D.

Uniform Construction Code, PA C.S. UCC Act 45.

Other:

Fire source rankings are as follows: 1st- kitchen area; 2nd-arson; 3rd-heating systems (U.S. Fire Administration reports).

Fully-charged and readily available fire extinguishers can reduce initial impact of fire damage. A 5 lb., ABC-type fire extinguisher (Figure 1) can protect life and property if used properly.

UL-approved fire retardant treated wood (FRTW) is identified by a stamp (Figure 2) attached to the wood.

Check the Uniform Construction Code for your state regarding this topic.

Figure 1. Figure 2.
B&B/Residential
Fire Detection/Suppression (City Water)

**Most Protection**

1. Professionally installed and monitored fire detection and sprinkler system; no smoking permitted; fire escape/floor plan in each guest room; ABC-types fire extinguisher mounted near exits.

2. Electrically wired, battery back-up, on-site smoke and heat-detection system; kitchen sprinkler system; no smoking permitted; fire escape/floor plan in each guest room; ABC-type fire extinguisher mounted near exits and heating and cooking areas.

3. Battery-powered, smoke and heat-detection system; no sprinkler system; no smoking permitted; fire escape/floor plan in each guest room; ABC-type fire extinguisher mounted near exits and heating and cooking areas.

4. Battery-powered, smoke-detection system only; no sprinkler system; smoking restricted to specific areas; fire escape/floor plan in each guest room; ABC-type fire extinguisher mounted near exits only.

5. No working smoke or fire-detection system; no sprinkler system; smoking not restricted; no fire escape/floor plan in each guest room; ABC-type fire extinguisher is available, but not visible.

**Least Protection**

(over)

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**Reminders**

Smoking policies should be placed in the B and B’s printed materials and verbally restated at check-in time.

All fire extinguishers should have an annual inspection by a fire extinguisher technician.

Provide two exits per floor for fire escape purposes.

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**Personal Protective Equipment**

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Other:

Identify the location of fire extinguishers and place them in an accessible area (Figure 1) for quick fire emergency response.

Local fire codes and zoning regulations may apply to the Bed and Breakfast facility. This can include fire suppression (sprinkler) systems. Fire codes may also identify interior surface finishes that minimize the quick spread of flames. Code requirements may specify that attached garages have a fire wall between the garage and main dwelling. Insurance riders may be available for coverage of mandated code updates.

Figure 1.
Most Protection

1. Professionally installed and monitored fire-detection system; no smoking permitted; fire escape/floor plan in each guest room; ABC-type fire extinguisher mounted near exits and heating and cooking areas.

2. Electric circuit wired, battery back-up, on-site smoke and heat-detection system; no smoking permitted; fire escape/floor plan in each guest room; ABC-type fire extinguisher mounted near exits and heating and cooking areas.

3. Battery-powered; smoke and heat-detection system; no smoking permitted; fire escape/floor plan in each guest room; ABC-type fire extinguisher mounted near exits.

4. Battery-powered; smoke-detection system only; smoking restricted to specific areas; fire escape/floor plan in each guest room; ABC-type fire extinguisher mounted near exits.

5. No working smoke or heat-detection system; smoking not restricted; fire escape/floor plan in each guest room; ABC-type fire extinguisher is available but not visible.

Least Protection

Reminders

Smoking policies should be placed in the B and B’s printed materials and verbally restated at check-in time.

All fire extinguishers should have an annual inspection by a fire extinguisher technician.

Provide two exits per floor for fire escape purposes.

Personal Protective Equipment

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Other:

Rural water systems may be exempt from the fire suppression (sprinkler) system section of the local Code due to lower water pressures available.

Local fire codes and zoning regulations may apply to the Bed and Breakfast facility. Fire codes may also identify interior surface finishes that minimize the quick spread of flames. Code requirements may specify that attached garages have a fire wall between the garage and main dwelling. Insurance riders may be available for coverage of mandated code updates.

Identify the location of fire extinguishers, and place them in an accessible area (Figure 1) for quick fire-emergency response.

Figure 1.
B&B/Residential
Fire Escape Plan

Most Protection

1. Fire escape is permanent metal or treated lumber stairway with handrails; doorway accessible; escape route posted in guest room and hallway.

2. Fire escape is permanent metal ladder with cage; doorway or window accessible; escape route posted in guest room and hallway.

3. Fire escape is permanent metal ladder without cage or emergency rope ladder with solid rungs; door or window accessible; escape route is posted in guest room and hall.

4. Fire escape is an emergency rope ladder with solid rungs and location readily identified; window access only; escape route is posted in hall, not guest room.

5. No fire escape or non-functional fire escape; escape route not posted.

Least Protection

Reminders

Keep fire escapes free of obstructions.

Be sure doorways and windows leading to fire escapes are functional.

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Code for Means of Egress for Buildings and Structures, NFPA 101B.


Check local Building and Occupancy Codes and ordinances for other regulations.

Other:

In Bed and Breakfast Inn facilities with three floors, a minimum of two means of egress, either open or closed, may be required. These means of egress may include:

A. Two separate indoor stairways
B. One indoor and one outdoor stairway (metal construction)
C. One indoor and one window with one of the following:
   1. Accessible chain-link ladder
   2. European style "chute" (Figure 1)
   3. Accessible balcony onto a second floor level
   4. Wooden, metal or other type of constructed fire escape

Figure 1.
B&B/Residential Fireplaces

Most Protection

1. Screened fireplace insert or solid-fuel burning stove with no combustible material within 3 feet; installed by a certified professional contractor; annual, professional contracted chimney cleaning.

2. Screened fireplace insert or solid-fuel burning stove with no combustible material within 3 feet; installed by a certified professional contractor; bi-yearly, professional contracted chimney cleaning.

3. Screened fireplace insert or solid-fuel burning stove with no combustible material within 3 feet; installed by a non-certified professional contractor; sporadic, professional contracted chimney cleaning.

4. Unscrened fire-brick lined fireplace or solid-fuel burning stove with combustible material within 3 feet; installed by homeowner; homeowner cleans chimney.

5. Unscrened fire-brick lined fireplace; combustible materials within 3 feet; no chimney cleaning.

Least Protection

(over)

Reminders

Firewood cured more than 6 months burns with less creosote buildup in the chimney and reduces the risk of fire.

Solid-fuel burning stoves should sit on non-combustible floor or code-specified floor protectors.

Personal Protective Equipment
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No information regarding laws, regulations, standards, or guidelines on this topic were discovered.

Other:
Local building codes may specify clearance standards between the stove and wall and the stove and ceiling.

Cement board or 28-gauge steel spaced 1 inch away from the wall provides heat-barrier protection for the nearby combustible walls or surfaces. Wear a protective respiratory mask when cutting the cement board. After installation, paint the cement board with a heat-resistant paint to seal the surface.

Install and maintain a smoke and/or heat detector and/or carbon monoxide detector on each floor of the home.

A fully-charged, 10 lb. ABC-type fire extinguisher (Figure 1) increases the opportunity for early fire-suppression efforts.


![Figure 1.](image-url)
**B&B/Residential Foundation Condition**

**Most Protection**

1. Site well-drained; foundation has no visible cracks, waterproofed with no signs of water damage; certified termite-free; working attic ventilation; exceptional maintenance.

2. Site well-drained; foundation has no visible cracks, waterproofed with no signs of water damage; no termite-free certification; working attic ventilation; above-average maintenance.

3. Site well-drained; foundation has a few visible cracks, waterproofed with some signs of water damage; no termite-free certification; working attic ventilation; average maintenance.

4. Site not well-drained; foundation has visible cracks, waterproofed but has signs of water damage; no termite-free certification; no attic ventilation; below-average maintenance.

5. Site not well-drained; foundation has many visible cracks, not waterproofed and has water damage; has termite damage; no attic ventilation; poorly maintained.

**Least Protection**

(over)

**Reminders**

Rain and groundwater should be controlled by spouting, ditching and drains.

Mold growth can occur in some building materials with resulting component or structure failure.

Vapor barriers prevent moist air from entering a building.

**Personal Protective Equipment**
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International One- and Two-Family Dwelling Code, ICC.

PA Uniform Construction Code, UCC Act 45.

Other:
Physical conditions in the gradient scale on the preceding page can apply to dwellings and other buildings as well.

Professional Pest Control Company inspection and certification may be required by lenders before dwellings are sold.

Water-proofing of dwellings can involve interior as well as exterior foundation modifications. Figure 1 shows a sump pump with floor renovation for interior french-style drains and an aluminum sheeting covering basement wall weep holes leading to the french drain.

Water standing in a low-lying area can enter the dwelling and cause damage. Extraordinary measures must be taken to drain water away from the structure, as well as efforts to waterproof the structure's foundation walls (Figure 2).

Figure 1.

Figure 2.

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B&B/Residential
Gas Detection

Most Protection

1. Hard-wired gas-monitoring system in place; early alert audio and visual gas-warning sensor equipped; electrically controlled solenoid gas-control valve.

2. Battery-operated carbon-monoxide detector placed in heating, cooking and sleeping areas; detectors professionally serviced yearly.

3. Battery-operated carbon-monoxide detector placed in heating and cooking area, but not sleeping areas; detectors professionally serviced yearly.

4. Battery-operated carbon-monoxide detector placed in heating area only; not professionally serviced.

5. No carbon-monoxide detector of any type utilized; gas-detection equipment has discharged or missing battery.

Least Protection

Reminders

Check and replace carbon-monoxide detector batteries at least on an annual basis.

Personal Protective Equipment

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Residential Gas Detectors, Underwriters Laboratories, UL 1484.

Installation, Maintenance, and Use of Protective Signaling Systems, American National Standards Institute, ANSI 72.

Combustible Gas Detection, Factory Mutual Research Corporation, FMRC 6310.

Other:
Consumers who purchase gas detectors are encouraged to look for the "UL" listing label.

Gas detectors can include carbon monoxide, natural gas and LP gas.

Direct-vented propane heaters may meet local and state building codes. Check your local codes.

Do not use unvented heaters in sleeping areas.

Local building codes may require carbon-monoxide alarms for homes with gas, oil or fireplace heat sources.
B&B/Residential Housekeeping

Most Protection

1. Furnace, hot-water heating and cooking areas free of flammable materials; dwelling is neat and tidy.

2. Furnace, hot-water heating and cooking areas have flammable materials less than 36 inches away; dwelling is neat and tidy.

3. Furnace, hot-water heating and cooking areas have flammable materials a few inches from the heating source; dwelling is somewhat untidy.

4. Furnace, hot-water heating and cooking areas have flammable materials against the heating source; dwelling is untidy.

5. Furnace, hot-water heating and cooking areas contain flammable materials against the heating source; dwelling is cluttered and messy.

Least Protection

Reminders

Good housekeeping practices help to:

- reduce fire hazards;
- minimize tripping hazards;
- reduce airborne allergens and asthma causing factors.

Personal Protective Equipment

(over)
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No information regarding laws, regulations, standards and guidelines on this topic were discovered.

Other:
Fire prevention in a dwelling includes periodic inspections of all living areas for overloaded circuits, dust and cobweb build-up near open flames or heat sources, and accumulation of combustible materials near sources of ignition (Figure 1).

Paints and solvents and other flammable materials (e.g. cleaners) stored in areas near an open flame, or where heat build-up from heaters or sunlight can increase temperatures near the stored materials, increases the risk of fire.

Figure 1.
B&B/Residential Insulation

**Reminders**
Choose non-combustible insulation materials or provide a 30-minute or greater fire-barrier covering.

Take immediate steps to cover rigid board foam or spray-applied cellular plastic foam insulation with a minimum of a 30-minute rated fire barrier.

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**Most Protection**

1. Fiberglass, calcium silicate, mineral fiber or perlite insulation.

2. Rigid board foam or sprayed-on cellular, plastic foam insulation covered by a 60-minute rated fire barrier (See Other Information Section).

3. Rigid board foam or sprayed-on cellular, plastic foam insulation covered by a 30-minute rated fire barrier (See Other Information Section).

4. Rigid board foam or sprayed-on cellular, plastic foam insulation covered by a 15-minute rated fire barrier (See Other Information Section).

5. Uncovered rigid board foam or spray-on cellular plastic foam insulation.

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**Least Protection**

(over)

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Fire Test of Insulated Wall Construction, UL1040.

Insulation Fire Hazards on Farms, Fact Sheet E20, Penn State University, www.abe.psu.edu.

Other:
When exposed cellular plastic foam insulation (rigid board foam) ignites, accumulations of toxic gases and flashover can occur within seconds.

Rigid board foam insulation should be installed with a fire-resistive barrier according to the manufacturers specifications (Figure 1). Building codes typically do not call for fire-resistive barriers in agricultural buildings. 60-minute fire barrier materials include: fiber-reinforced cement coatings and panels. 30-minute fire barrier materials include: 1/2-inch gypsum board drywall (Figure 2), 1/2-inch fire retardant plywood, and 1/2-inch asbestos cement board. 15-minute fire barrier materials include: 3/8-inch fir plywood, 1/2-inch fiberboard with 1/2-inch of gypsum/sand plaster, and 1/2-inch lime sand plaster over wood lath strips. Sheet metal does not provide fire-barrier protection.

Insurance surcharges may be automatically assigned to the policy's premium fee when exposed insulation is found during an inspection.
B&B/Residential Interior Lighting

Most Protection

1. Two sources of bedroom lighting; hallways and stairs are well-lit (100 watts); hallway nightlight on all night long; emergency lighting powered by emergency generator.

2. Two sources of bedroom lighting; hallways and stairs of above average lighting (60-75 watts); hallway nightlight on all night long; emergency lighting powered by emergency generator.

3. Two sources of bedroom lighting; hallways and stairs of average lighting (40-60 watts); hallway nightlight on all night long; emergency lighting powered by emergency generator.

4. Single source of bedroom lighting; hallways and stairs of below-average lighting (25-40 watts); no hallway nightlight, but hallway has indirect lighting from another area; no emergency lighting.

5. Single source of bedroom lighting; hallways and stairs poorly lit (25 watts or less); no hallway nightlight, or indirect lighting from another area; no emergency lighting.

Least Protection

(over)

Reminders

Provide guests with a floor plan of the facility and an emergency escape plan.

Provide a regular maintenance check of lighting.

Review the Bed and Breakfast: Power Outage Protection ASHBMP information.

Personal Protective Equipment
Laws, Regulations, Standards, and Guidelines:

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Other:
Electrical circuit-wired emergency lighting (Figure 1) and lit exit signs (Figure 2) increase a person's ability to safely exit a building in an emergency.

Members of the American Bed and Breakfast Association (ABBA) are inspected by that organization for the following safety topics: lighting, handrails, smoke detectors, fire alarms and sidewalk condition.

Suggested lighting levels include: 40-60 watt lighting device minimum in guest rooms, hallways and stairwells, 7 watts minimum for night-lighted hallways (hallways to be lighted all night long), and the maximum wattage as recommended by manufacturer for outside lighting.

Figure 1.

Figure 2.
B&B/Residential
Play Area Shock Absorbing Surface

Most Protection

1. Shock-absorbing engineered wood fibers at an uncompressed depth of 12 inches; resilient surface extends more than 6 feet from perimeter of the equipment.

2. Shock-absorbing shredded tires at an uncompressed depth of 6 inches; resilient surface extends more than 6 feet from perimeter of the equipment.

3. Shock-absorbing wood mulch/chips at an uncompressed depth of 12 inches; resilient surface extends at least 6 feet from perimeter of the equipment.

4. Shock-absorbing coarse sand at an uncompressed depth of 6 inches; resilient surface extends 1-2 feet from perimeter of the equipment.

5. No shock-absorbing materials used.

Least Protection

Reminders

Concrete, asphalt, wood or any hard surface beneath the play equipment increases the risk of injury or death.

The "use zone" of playground equipment is considered to be the surrounding 6-feet area where protective surfacing is required.

Personal Protective Equipment

(over)
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Other:

Fall heights are defined as the "critical height" at which a fall can result in a force great enough to cause a head injury.

Equipment that requires a child to be standing or sitting at ground level during play is not expected to follow the recommendations for resilient surfacing.

Recycled ground rubber is available for playground shock-absorption material (Figure 1). It is also available in color.

![Figure 1.](image-url)
B&B/Residential
Playground Equipment

Most Protection

1. Securely anchored below ground surface; yearly maintenance; no protruding fasteners or attachment points; no sharp or rusty edges.

2. Securely anchored below ground surface; bi-annual maintenance; no protruding fasteners or attachment points; no sharp or rusty edges.

3. Securely anchored below ground surface; 3-5 year maintenance; no protruding fasteners or attachment points; some sharp or rusty edges.

4. Securely anchored, but anchoring is partially or totally above the ground; absence of maintenance; no protruding fasteners or attachment points; some sharp and rusty edges.

5. Not anchored to ground; absence of maintenance; some protruding or missing fasteners or attachment points; sharp and rusty edges exist.

Least Protection

Reminders

Ground anchor points that extend above the playground surface pose tripping hazards.

Playground equipment should not be designed or constructed with openings that could trap a child’s head.

Personal Protective Equipment

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Other:
Manufacturers recommendations for assembly and installation of playground equipment must be followed closely.

Fasteners and attachment accessories should not protrude more than 1/8 inch from the surface of the equipment.

No playground component should pose a hazard for catching clothing or tearing skin as the equipment is used.

Adult supervision of children using playground equipment is recommended.

Spacing between playground equipment should accommodate the safe movement of children between use zones (Figure 1).

![Figure 1](image-url)
Automatic power generator professionally installed; operation tested semi-annually; automatic transfer switch to disconnect from main power distribution line; alarms sounded when operating; entire home serviced.

Small gas engine powered generator available; regular operation check; manual transfer switch to disconnect from main power distribution line; rural water supply pump; some lighting supplied.

Battery supplied power source available; regular operation check; emergency exit and/or hallway/stairway lighting supplied; flashlights with fresh batteries located in each room and public area.

Flashlights provided in each room; batteries may not be fresh.

No power outage protection available.

Reminders
An emergency power source must not allow electrical current to flow back over main power distribution lines.

Priorities must be set for emergency power generation as all electrical service loads cannot be serviced at one time.

Personal Protective Equipment

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Emergency Lighting and Power Equipment, ANSI/UL 924.

Automatic Transfer Switches, ANSI/UL 1008.


Other:
Exit lights and stairway lighting should be addressed by power outage protection.

The American Red Cross advises that under no circumstances should a portable generator be operated indoors.

The Consumer Product Safety Commission (CPSC) recommends a carbon monoxide detector be used if there is any chance that carbon monoxide fumes might leak into a house being served by an emergency power generator.

According to the 1999 National Electric Code, an interface (Figure 1) between the normal power source and the alternate electric source is allowable with proper transfer equipment to prevent backfeeding of electricity into the power supply grid.

![Figure 1](image_url)
B&B/Residential Roof

Most Protection

1. Nailed clay tile or rust-resistant, clad-metal roofing; ventilated roof cavity; drip edge barrier installed; roof installed by bonded, certified, professional roofing contractor.

2. Nailed slate roof over reinforced truss rafters; ventilated roof cavity; drip edge barrier installed; roof installed by bonded, certified, professional roofing contractor.

3. Nailed laminated fiberglass shingles or nailed 300 lb/square asphalt shingles; ventilated roof cavity; drip edge barrier installed; roof installed by bonded, certified, professional roofing contractor.

4. Nailed 240 lb/square asphalt shingles; ventilated roof cavity; drip edge barrier installed; roof installed by owner or non-certified roofing contractor.

5. Stapled 240 lb/square asphalt shingles or nailed wooden shingles or re-roofed nailed asphalt shingles; non-ventilated roof cavity; no drip edge barrier installed; roof installed by owner or non-certified roofing contractor.

Least Protection

Reminders

Periodic inspection and resealing of chimney and sewer vent-pipe flashing prevents roof leaks and structural damage.

Ridge vents or powered, thermostatically controlled exhaust fans reduce roof cavity heat.

Personal Protective Equipment

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Other:
Roofers should be licensed by their state if required.

Roofers should provide proof of liability insurance and worker's compensation insurance by providing the client with a Certificate of Insurance.

Roofers should provide a minimum of a 3-year warranty against defective workmanship.

Roofers should provide the client with a copy of the manufacturer's warranty.

A Mechanic's Lien filed in the local courthouse by an attorney reduces client/contractor liability issues.

A wind-damaged roof increases the odds of further damage. The roof in Figure 1 is in need of repair.

A comparison of roofing nail sizes is shown in Figure 2. Roofing staples are also available. Manufacturers may recommend 6 nails per shingle or 4 nails per shingle. Learn more about roofing by visiting the website of nationally known roofing material manufacturers.
B&B/Residential
Stairs and Walkways

Most Protection

1. Interior and exterior stairways/steps with more than 3 steps have a double handrail; excellent condition floor coverings; sidewalks free of trip hazards and well-lit.

2. Interior and exterior stairways/steps with more than 3 steps have a single handrail; good condition floor coverings; sidewalks free of trip hazards with above-average lighting.

3. Interior and exterior stairways/steps with more than 3 steps have a single handrail; average condition floor coverings; sidewalks generally free of trip hazards with average lighting.

4. Interior and exterior stairways/steps with more than 3 steps have a single handrail; below-average condition floor coverings; sidewalks have some trip hazards with below-average lighting.

5. Interior and exterior stairways/steps with more than 3 steps have no handrail; poor condition floor coverings; sidewalks have numerous trip hazards and no lighting.

Least Protection

Reminders

Conduct an inspection of lighting quality and floor condition of stairways and walkways on a daily basis.

Install handrails on all stairways with more than 3 steps.

Where ramps are necessary, install railings to reduce the risk of falls.

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Americans with Disabilities Act (ADA), Accessibility Guidelines for Buildings and Facilities (ADAAG), Section 4.8 Ramps and Section 4.9 Stairs. See Other Information below. For further information, visit the website, www.ADA.gov.

Other:

Americans with Disabilities (ADA) regulations do not apply to Bed and Breakfast facilities with five or less rooms to rent. Local building code regulations may apply to the Bed and Breakfast facility.

If applicable, ADA standards for stairs include:

1. All steps must have uniform riser heights and uniform tread widths (Figure 1).
2. Open risers are not permitted and stair treads should be 11 inches deep from front to back.
3. Handrails shall be mounted on each side of the stairway.
4. The top of the handrail gripping surface is to be mounted 34 to 38 inches above the stair nosings (front edge of stair tread board), and the handrails shall be 1-1/2 inches from the wall surface and uninterrupted by attachments, etc.
5. Outdoor stairs and their approaches shall not accumulate water on the walking surfaces.

Figure 1.
B&B/Residential Supplemental Heat

Most Protection

1. Permanently installed, original equipment manufacturer heating device (e.g. electric space heater, electric fireplace logs, unvented gas/fuel heater, etc.); excellent maintenance.

2. Permanently installed, original equipment manufacturer heating device (e.g. electric space heater, electric fireplace logs, unvented gas/fuel heater, etc.); good maintenance.

3. Permanently installed, original equipment manufacturer heating device (e.g. electric space heater, electric fireplace logs, unvented gas/fuel heater, etc.); average maintenance.

4. Portable, original equipment manufacturer heating device (e.g. electric space heater, electric fireplace logs, unvented gas/fuel heater, etc.); below-average maintenance.

5. Portable, non-original equipment manufacturer heating device (e.g. electric space heater, electric fireplace logs, unvented gas/fuel heater, etc.); poor maintenance.

Least Protection

(over)

Reminders

Power cords for electric space heaters should be a minimum of #14 or #12 wire.

Heaters must be kept at least 3 feet away from flammable materials.

Personal Protective Equipment
**Laws, Regulations, Standards, and Guidelines:**

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Standard for Electric Heating Appliances, UL/ANSI 499.

Standard for Unvented Kerosene-Fire Room Heaters and Portable Heaters, UL 647.


**Other:**

Installing and maintaining smoke and/or heat detector and/or a carbon monoxide detector on each floor of the home increases a person's ability to be alerted to fire or poisonous gases. Also, a fully-charged, 10 lb. ABC-type fire extinguisher increases early fire-suppression efforts.

Electric and kerosene heaters equipped with an automatic shut-off device decrease the risk of a fire. Unvented gas heaters equipped with an oxygen-depletion sensing device reduces the risk of exposure to carbon monoxide.

Space heaters equipped with a guard around the flame area or heating element reduces the risk of contact with the open flame or heating surface (Figure 1).

Space heaters placed on a level, hard and non-flammable surface reduces the risk of tip-over and fire (Figure 2).
Most Protection

1. Swimming pool in an enclosed area; secured by locked gate; equipped with power safety cover; non-slip deck surface; rescue pole, flotation ring and telephone at poolside; equipped with pool-intrusion alarm.

2. Swimming pool in an enclosed area; secured by locked gate; equipped with manual safety cover; non-slip deck surface; rescue pole, flotation ring; telephone at nearby house; equipped with pool-intrusion alarm.

3. Swimming pool in an open area, but fenced with locked access ladder; no safety cover; non-slip deck surface; no rescue pole; flotation ring available; telephone at nearby house; equipped with pool-intrusion alarm.

4. Swimming pool in an open area; no safety cover; no deck surrounding the pool; rescue pole or flotation ring; telephone at nearby house; not visible to the public; no pool-intrusion alarm.

5. Swimming pool in an open area; no safety cover; no deck; no rescue pole, flotation ring or telephone nearby; visible to public view; no pool-intrusion alarm.

Least Protection (over)

Reminders
An adult with swimming skills should supervise the pool at all times.

Cardiopulmonary resuscitation training and certification is recommended for those supervising pool activities.

Do not swim alone or permit others to swim alone.

Pool slides and diving boards increase the risk for injury.
Laws, Regulations, Standards, and Guidelines:

Laws, regulations, standards, and guidelines are constantly being updated and revised. Be sure to check the latest version of any document listed below. Be aware that new laws, regulations, standards, and guidelines on this topic may be generated at any time. See Appendix A for more information.

Electric Swimming Pool Pumps, Filters and Chlorinators, ANSI/UL 1081.


Other:
Maintain pools to reduce the hazards of sharp edges, protruding bolts, slippery surfaces and electric shock.

Successful pool barriers keep young children from going over, under or through the barrier. Fences should be 4-6 feet high and non-climbable with openings less than 4 inches apart (Figure 1). Pool barriers themselves cannot serve as an access ladder.

Pool-intrusion alarms (Figure 2) reduce the risk of unwanted or unsupervised pool use by children and others.

Check your state and local ordinances, as well as building codes for pool safety requirements.

Figure 1.

Figure 2.
**B&B/Residential Trampolines**

### Most Protection

1. Trampoline jumping surface at ground level within an enclosed area, secured by a locked gate; has manufacturer's protective surround cage; can be seen from homeowner's house.

2. Trampoline jumping surface at ground level within a fenced area; gated but not locked; has manufacturer's protective surround cage; can be seen from homeowner's house.

3. Trampoline jumping surface above ground level; not within a secure area; equipped with manufacturer's protective surround cage or comparable after-market protective surround cage; can be seen from homeowner's house.

4. Trampoline jumping surface above ground level in an open area but concealed from the direct view and access of the general public; with or without protective surround cage; can be seen from homeowner's house.

5. Trampoline jumping surface above ground level in open area within public view and access; no protective surround cage; cannot be seen from homeowner's house.

### Least Protection

(over)

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**Reminders**

Trampoline springs, hooks, and frames must be covered with shock-absorbing pads.

Trampoline enclosures can help prevent injuries from falls.

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**Personal Protective Equipment**
**Laws, Regulations, Standards, and Guidelines:**

Laws, regulations, standards, and guidelines are constantly being updated and revised. Be sure to check the latest version of any document listed below. Be aware that new laws, regulations, standards, and guidelines on this topic may be generated at any time. See Appendix A for more information.


**Other:**

Only one person should be on a trampoline at a time to reduce the risk of injury. Using another person as a spotter helps to reduce risk as well.

Trampolines cause numerous accidents requiring emergency medical care and often multiple surgeries.

Somersaults and other acrobatic moves can result in increased risk of head and neck injuries, as well as torn ligaments and joint dislocations.

Place the trampoline jumping surface at ground level to reduce fall hazards. The trampoline should not be placed beneath structures, trees and other play areas.

Do not leave a ladder near the trampoline, as this can provide unsupervised access to the trampoline by small children.

Children younger than age 6 are at an increased risk of injury when using a full-size trampoline.
B&B/Residential Vegetation

Most Protection

1. Trees are 1.5 times mature height or more away from building; no flammable vegetation or combustible materials within 30 feet of building; no weed tree seedlings/saplings near building foundation.

2. Trees are 1.0 times mature height or more away from building; no flammable vegetation or combustible materials within 20 feet of building; no weed tree seedlings/saplings near building foundation.

3. Trees are 0.5 times mature height or more away from building; no flammable vegetation or combustible materials within 10 feet of building; no weed tree seedlings/saplings near building foundation.

4. Trees are within 10-15 feet of building; flammable vegetation or combustible materials within 5 feet of building; a few weed tree seedlings/saplings near building foundation.

5. Trees are within 10 feet of building; flammable vegetation or combustible materials against building; many weed tree seedlings/saplings near building foundation.

Least Protection

Reminders

Tree roots can invade septic lines and leach fields.

Trees growing too close to buildings can cause damage during severe weather.

Personal Protective Equipment
Laws, Regulations, Standards, and Guidelines:
Laws, regulations, standards, and guidelines are constantly being updated and revised. Be sure to check the latest version of any document listed below. Be aware that new laws, regulations, standards, and guidelines on this topic may be generated at any time. See Appendix A for more information.

No information regarding laws, regulations, standards, or guidelines on this topic were discovered.

Other:
Large trees (Figure 1) can have shallow rooting areas and can be prone to wind throw loss, which can damage the dwelling.

The tree's roots can extend beyond the extent of the tree canopy (Figure 2). The zone of root influence can affect house foundations (water removal by the tree during drought can shrink clay soils away from foundation walls and cause them to crack) or sewer lines (plugged sewers with resulting backing of waste water into the house).

The mature height of a tree should be the distance the tree is planted away from the dwelling.
Bio-Security

Bio-Security Pre-Plan Features

**Most Protection**

1. Sensitive areas well defined/secured by physical barrier and lock(s); dusk to dawn lighting; 24-hour surveillance monitoring; restriction signs posted and legible

2.

3. Sensitive areas generally defined/secured by lock(s); dusk to dawn lighting; generic no trespassing signs posted

4.

5. Sensitive area(s) not defined or locked; no security lighting; no use of restrictive signs

**Least Protection**

(over)

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**Reminders**

Post "no visitors allowed" signs at sensitive areas.

Require that all farm visitors (vendors and others) will report to the farm management or farm office upon arrival to the farm.

**Personal Protective Equipment**
Laws, Regulations, Standards, and Guidelines:

Laws, regulations, standards, and guidelines are constantly being updated and revised. Be sure to check the latest version of any document listed below. Be aware that new laws, regulations, standards, and guidelines on this topic may be generated at any time. See Appendix A for more information.

No information regarding laws, regulations, standards, or guidelines on this topic were discovered.

Other:

Not all bio-security threats come from outside the farm.

Good human resource management efforts will maintain employer/employee relationships which can lead to in-house bio-security issues from disgruntled employees.
Bio-Security
Bio-Security and Emergency Response Plan

Most Protection

1. Sensitive areas mapped for location; bio-security map and emergency plan filed with local Emergency Services; family and employees rehearse and document emergency response plan, bio-security plan policies enforced.

2. Sensitive areas mapped for location; bio-security map and emergency plan filed with local Emergency Services; family and employees rehearse, but do not document emergency response plan; bio-security plan policies enforced.

3. Sensitive areas mapped for location; bio-security map and emergency plan filed with local Emergency Services; emergency response plan not rehearsed; bio-security plan policies enforced.

4. Sensitive areas mapped for location; bio-security map and emergency plan on file at farm only; no rehearsed or documented emergency response plan; no bio-security plan policies.

5. No bio-security map or emergency response plan in place.

Least Protection

Reminders
Consider electronic monitoring (motion detectors, remote cameras, emergency phone messaging, etc.) of bio-security and sensitive storage areas.

Develop a cooperative, pro-active effort in emergency response planning with local Emergency Services.

Personal Protective Equipment

(over)
Laws, Regulations, Standards, and Guidelines:

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No information regarding laws, regulations, standards, or guidelines on this topic were discovered.

Other:
Consult your insurance company for their policies regarding bio-security issues. For instance: use of razor wire for security fencing may be outside of the insurance carriers parameters for securing a facility.

Consult local emergency response team members to assist in developing a plan for responding to bio-security emergencies. A farm's emergency response plan can be placed in a weather protected tube attached to the main power shut-off and its location identified by GPS coordinates on file with the local emergency response team (See Figure 1).

Figure 1.
Manure Storage and Handling
Manure Application by Truck

**Reminders**

Follow PA Vehicle Code (PVC) for Farm-Exempt Vehicles.

PVC minimum safety requirements and equipment must be met while operating on public roads. These requirements include rear reflectors, functional stop lamps, adequate braking system, tires in safe operating condition, rear wheel shields, rear view mirror, horn, and functional exhaust and muffler.

**Personal Protective Equipment**

Manure Application by Truck

**Most Protection**

1. PA Registration-Exempt Farm Vehicle- Type I; inspection standards met; tank/box to frame mounts secure; daily inspection log kept.

2. PA Registration-Exempt Farm Vehicle- Type I or II; inspection standards met for both Type I and II; tank/box to frame mounts secure; weekly inspection log kept.

3. PA Registration-Exempt Farm Vehicle- Type I or II; inspection standards met if Type I, Type II; farmer/general mechanic inspected; tank/box to frame mounts secure; pre-season inspection log kept.

4. PA Registration-Exempt Farm Vehicle- Type II; farmer/ general mechanic inspected; tank/box to frame mounts secure; pre-season inspection; no log kept.

5. No PA Registration-Exempt Farm Vehicle certificate, no inspection evident; tank/box to frame mounts in poor condition; unknown inspection schedule; no log kept.

**Least Protection**

(over)
Laws, Regulations, Standards, and Guidelines:
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Pennsylvania Vehicle Code, Section 1101(certificate of title), Section 1302, Part 2, Part 7 exemption for Type I and II farm vehicles), Section 1924a (registered farm vehicles), Section 4703(inspection standards), Section 4301-4536 (minimum safety requirements), Section 1501a (drivers license), Section 1502(5) (minimum age of operator), Section 4942 (weight limitations), Section 4941, 4946 (bridges-load restrictions)

Other:
Notify local emergency response officials should a discharge of manure occur into road ditches, drainage ditches, or streams, ponds and lakes.

Excess wear on farm manure hauling trucks can be expected on tires, brakes, steering, and tank or box to truck fram mounting brackets. Check these daily. Keeping a log of inspections is recommended.

Lighting and warning markers should be kept clean for visibility.

Do not use an SMV on a farm truck. SMV emblems are required on vehicles designed to operate at less than 25 miles per hour. See Figure 1.

Figure 1.
Manure Storage and Handling
Manure Application Equipment-Tractor and Spreader

Most Protection

1. ROPS equipped tractor; tractor and spreader hazard warning lights in working order; safety chains with hitch; well maintained spreader/box tank; bright, clean SMV; spreader equipped with hydraulic brakes.

2. 

3. ROPS equipped tractor; tractor and spreader hazard warning lights in working order; no safety chains with hitch; average maintained spreader tank/box; faded or dirty SMV; spreader equipped with hydraulic brakes.

4. 

5. Non ROPS tractor; inoperable or no hazard warning lights on tractor or spreader; no safety chains with hitch; poorly maintained spreader tank/box; no SMV; spreader not equipped with brakes or brakes are inoperable.

Least Protection

(over)

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Reminders

Do not exceed 20 MPH if the towed equipment does not have brakes or if the towed equipment has a weight 1.5 tons or exceeds 1.5 times the weight of the towing unit.

Do not exceed 25 MPH if the towed equipment has brakes or if the towed equipment has a weight 4.5 times the weight of the towing unit.

Personal Protective Equipment

1. 2. 3. 4. 5.
Laws, Regulations, Standards, and Guidelines:
Laws, regulations, standards, and guidelines are constantly being updated and revised. Be sure to check the latest version of any document listed below. Be aware that new laws, regulations, standards, and guidelines on this topic may be generated at any time. See Appendix A for more information.

Braking System Test Procedure and Braking Performance Criteria for Agricultural Field Equipment, ASABE S365.6

Lighting and Marking of Agricultural Field Implements on Highways, ANSI/ASAE S279.

Lighting Equipment, 75 PA C.S. (1992 Ed.) Section 4302, Section 4303, Section 4305, Section 4307.


Other:
If transport of manure must be done on public roads, follow these recommendations:

1. Transport during daylight hours if possible.
2. Use an escort vehicle.
3. Avoid heavy traffic flow, such as busy commuter traffic periods.
4. Do not motion a driver around as this places the burden of responsibility upon you.
5. In heavy traffic find a space to completely pull off the road if you are allowing traffic to pass. Again do not signal the traffic to pass (see No.4 above).
6. Use appropriate turn and stop indicator signals or hand signals.
Manure Storage and Handling
Manure Application-Producer

Most Protection

1. Conservation plan/soil nutrient management plan in compliance; liquid manure injected into soil as spread; semi-solid manure disked into soil within 12 hours of application; winter application of manure limited to conservation plan approved sites.

2. Conservation plan/soil nutrient management plan in compliance; liquid and semi-solid manure disked into soil within 12 hours of application; winter application of manure limited to conservation plan approved sites.

3. Conservation plan/soil nutrient management plan in compliance; liquid and semi-solid manure applied to soil and incorporated within 5 days of application; some winter application of manure to easily accessed fields.

4. Conservation plan in compliance, but no soil nutrient management plan; liquid and semi-solid manure applied to soil but not incorporated; year round application of manure to easily accessed fields.

5. No conservation plan/soil nutrient management plan; liquid and semi-solid manure applied to soil with no incorporation; manure applied year round.

Least Protection (over)

Reminders
Contact the County Soil Conservation District office to begin a farm conservation plan if this has not been done. See next page, Figure 1.

Use soil testing procedures to match nutrients applied with nutrients needed by that years specific crop.

Do not spread manure on frozen ground to reduce risk of nutrient run-off.

Personal Protective Equipment

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Laws, Regulations, Standards, and Guidelines:

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Other:

Winter manure application is defined as:
- December 15- February 28, or
- Frozen ground (4-inch depth), or
- Snow-covered ground

Do not store manure within 100 feet of perennial and intermittent streams or prior delineated wetlands adjacent to Exceptional Value streams.

Do not apply manure within 100 feet of streams, lakes, ponds, open sinkholes unless there is a 35 ft. permanent vegetation buffer adjacent to these locations.

Do not apply manure within 100 ft. of active drinking water sources.

Manure spills onto roadways, road ditches or into streams must be reported immediately to local officials.

Insurance coverage typically covers fish kill damages (loss of fish), but not penalties or fines. Check your environmental damage insurance coverage.

Figure 1.
Manure Storage and Handling
Manure Transport

Most Protection

1. No manure transportation on public roads.

2. Public road use is limited to low traffic volume; public road crossing only; daytime only, no nighttime hauling.

3. Public road use with moderate traffic volume; daytime hauling only; escort vehicle used.

4. Public road use with moderate or high traffic volume; daytime and some nighttime hauling; no escort vehicle.

5. Public road use with moderate or high traffic volume; much nighttime or low visibility hauling; no escort vehicle.

Least Protection

Reminders

Use the services of an escort vehicle if highway use is necessary.

Do not signal for a motorist to go around you on the highway as this transfers the burden of responsibility for their safety to yourself.

At a wide, safe point pull completely off the road to let other vehicles pass.

Personal Protective Equipment
Laws, Regulations, Standards, and Guidelines:
Laws, regulations, standards, and guidelines are constantly being updated and revised. Be sure to check the latest version of any document listed below. Be aware that new laws, regulations, standards, and guidelines on this topic may be generated at any time. See Appendix A for more information.

Braking System Test Procedures and Braking Performance Criteria for Agricultural Field Equipment, ASAE Standard S365.6

Other:
From ASAE Standard S365.6, for towed equipment WITHOUT brakes: Do not tow at speeds over 20 mph; or that when fully loaded has a weight over 1.5 tons and more than 1.5 times the weight of the towing unit. For towed units WITH brakes: Do not tow at speeds over 25 mph or that when fully loaded has a weight more than 4.5 times the weight of the towing unit.

Agricultural tires may not be rated for highway use; check the load and speed rating of the tires that will be used on the highway especially if pulled by a vehicle other than a tractor. Be sure that tires have enough tread for traction and steering (see Figure 1).

Avoid highway use during peak traffic periods.

Report all manure spills (highway, road ditches, stream banks, etc.) to authorities immediately.

Be prepared to dike spilled liquid manure away from waterways and drainage ditches.

Figure 1.
4-wheel type ATV: all operators trained by certified instructor; operators age 16 or older; engine size smaller than 90cc.

4-wheel type ATV: all operators trained by certified instructor; operators age 16 or older; engine size 90-250cc.

4-wheel type ATV: all operators trained by certified instructor; operators age 16 or older; engine size 259cc or larger.

4-wheel type ATV: operators not trained by certified instructor; operators younger than age 16; engine size greater than 90cc.

3- or 4-wheel type ATV: operators not trained by anyone regardless of age and/or engine size.

Personal Protective Equipment Reminders

ATV riders should use a full-face shield helmet, over the ankle shoes with heels, and protective gloves while riding. ATV buyers and family members should complete certified ATV safety training.

Most Protection

1. 4-wheel type ATV: all operators trained by certified instructor; operators age 16 or older; engine size smaller than 90cc.

2. 4-wheel type ATV: all operators trained by certified instructor; operators age 16 or older; engine size 90-250cc.

3. 4-wheel type ATV: all operators trained by certified instructor; operators age 16 or older; engine size 259cc or larger.

4. 4-wheel type ATV: operators not trained by certified instructor; operators age 16 or older; engine size greater than 90cc.

5. 3- or 4-wheel type ATV: operators not trained by anyone regardless of age and/or engine size.
Laws, Regulations, Standards, and Guidelines:

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PA Motor Vehicle Code, Chapter 77, Snowmobile and All-Terrain Vehicle Law.

Other:

In Pennsylvania, the Department of Conservation and Natural Resources conducts ATV training. Contact your state’s Department of Transportation and/or Department of Environmental Resources.

The Consumer Product Safety Commission (CPSC) recommends that:

1. No person younger than age 12 should operate an ATV.
2. No one younger than age 16 should operate an adult size (greater than 90cc engine) ATV.
3. All ATV operators complete a hands-on safety training course.
4. Safety helmets should be worn at all times while riding an ATV.
5. No passengers should be permitted on an ATV.
6. An ATV be equipped with a full-suspension system to improve handling
   Visit www.cpsc.gov to learn more.

Manufacturers of ATVs may provide age guidelines, which may vary from the CPSC’s recommendations.

Figure 1.  
Figure 2.
Off-Road Vehicles/Machines
Golf Cars

Most Protection

1. Battery-powered only; incapable of speeds over 6 mph; equipped with passenger handholds; operator has valid driver's license; operator receives hands-on instruction for use.

2. Battery-powered only; incapable of speeds over 15 mph; equipped with passenger handholds; operator has valid driver's license; operator receives hands-on instruction for use.

3. Battery-powered or gasoline-engine powered; incapable of speeds over 15 mph; equipped with passenger handholds; operator has valid driver's license; no hands-on instruction given.

4. Battery-powered or gasoline-engine powered; incapable of speeds over 20 mph; equipped with passenger handholds; operator has valid driver's license; no hands-on instruction given.

5. Gasoline-engine powered or power source modified for speeds over 20 mph; equipped with passenger handholds; operator may not have a valid driver's license; no hands-on instruction given.

Least Protection (over)

Reminders
The manufacturer's load capacity for a golf car is affixed onto the golf car. Overloading a golf car decreases maneuverability and safe operation.

Personal Protective Equipment

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Low-Speed Vehicle (LSV) NHTSA, 49 CFR Part 571, 63 FR33913.

Other:

Golf car operating instructions should include:

1. Keep hands and feet inside the golf car at all times.
2. Set the brake before dismounting the golf car.
3. Do not dismount the golf car while it is in motion.
4. Slow down before making turns.
5. To avoid rollovers, operate straight up a slope or straight down the slope at slow speeds.
Hydraulic cylinder lockout(s) are engagable within the operator's cab and work as designed. Hydraulic cylinder lockout(s) are engagable within the operator's cab. Lockout(s) are bent or otherwise not functional but are repairable/replaceable. Hydraulic cylinder lockout(s) are engagable only from outside of the operator's cab and work as designed. Hydraulic cylinder lockout(s) are engagable only from outside the operator's cab. Lockout(s) are bent or otherwise not workable but are repairable/replaceable. Hydraulic cylinder lockout(s) are missing.

**Personal Protective Equipment**

Never exit a skid-steer or work under a raised boom without the mechanical hydraulic cylinder lockout(s) engaged properly.

Never attempt to operate any controls unless seated in the operator's seat.

**Most Protection**

1. Hydraulic cylinder lockout(s) are engagable within the operator's cab and work as designed.

2. Hydraulic cylinder lockout(s) are engagable within the operator's cab. Lockout(s) are bent or otherwise not functional but are repairable/replaceable.

3. Hydraulic cylinder lockout(s) are engagable only from outside of the operator's cab and work as designed.

4. Hydraulic cylinder lockout(s) are engagable only from outside the operator's cab. Lockout(s) are bent or otherwise not workable but are repairable/replaceable.

5. Hydraulic cylinder lockout(s) are missing.

**Least Protection**

(over)
**Laws, Regulations, Standards, and Guidelines:**

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Standard for Skid-Steer Loaders, SAE J 1388.

**Other:**

Skid-steer loaders without a ROPS cab and protective side panels (Figure 1) are extremely dangerous to operate.

![Figure 1.](image-url)
Off-Road Vehicles/Machines
Skid-Steer Operator Restraint

Most Protection

1. Operator-restraint system is present and working as originally designed.

2.

3. Operator-restraint system is present but not functional.

4.

5. Operator-restraint system is missing, by-passed, destroyed, or was never present.

Least Protection

Reminders
If safety interlocks are not working, repair them at once.

Use safety interlocks when they are designed into the machinery.

Never attempt to operate any controls unless seated in the operator’s seat.

Personal Protective Equipment
When operating a skid-steer loader wear:

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Laws, Regulations, Standards, and Guidelines:

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Standard for Skid-Steer Loaders, SAE J1388.

Other:

Skid-steer operators must operate within a compact area. Lift arms and attachments raise and lower and tilt in close proximity to the operator.

Movement of the skid steer is often jerky and conducted over rough terrain. Shifting loads can result.

The skid-steer is used to move bulky objects. Raising a heavy object high above the skid-steer unit raises the center of gravity and increases the potential for an overturn.

Skid-steer controls are located within the enclosed protective cage. Do not attempt to operate the controls unless seated within the skid-steer and with the seat belt attached.

If service of the unit must be done with the lift arms raised, use lift arm locks or another strong support material.
Off-Road Vehicles/Machines
Snowmobile Equipment

Most Protection

1. Engine size of 250-400cc; working brakes and lighting systems; exhaust system equipped with spark arrestors.

2. Engine size of 401-550cc; working brakes and lighting systems; exhaust system equipped with spark arrestors.

3. Engine size of 551-700cc; working brakes and lighting systems; exhaust system equipped with spark arrestors.

4. Engine size of 701-850cc; working brakes and lighting systems; exhaust system not equipped with spark arrestors.

5. Engine size of 851-1000cc or greater; non-working brakes and lighting systems; exhaust system not equipped with spark arrestors.

Least Protection

Personal Protective Equipment

Reminders
Operating a snowmobile at high speeds increases the risk of death and injury.

The operator's lack of good judgment in safe snowmobile use has been found to be a leading cause of injury and death.
Laws, Regulations, Standards, and Guidelines:

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The Snowmobile and All-Terrain Vehicle Law, PA Vehicle Code.

The Snowmobile and All-Terrain Vehicle Regulations, 17 PA Code, Chapter 51.

Snowmobile Noise Reduction, SAEJ-192a.

Other:
Some snowmobile manufacturers have developed smaller and less powerful snowmobiles for youth younger than age 16 (Figure 1).

Snowmobile sound levels may not exceed 78 decibels of sound pressure at 50 feet distance from the machine.

A lighted headlight and taillight must be displayed at all times during operation.

Snowmobile brakes must be capable of stopping a snowmobile within 40 feet from an initial speed of 20 mph. This applies to a snowmobile traveling on packed snow and carrying an operator who weighs 175 pounds or more.

Figure 1.
**Off-Road Vehicles/Machines**  
**Snowmobile Operation**

**Most Protection**

1. All operators have a valid driver's license; all operators have been trained by certified snowmobile instructors; all owners/operators have liability insurance; operator is age 17 or older.

2. All operators have a valid driver's license; not all operators have been trained by certified snowmobile instructors; all owners/operators have liability insurance; operator is age 17 or older.

3. Not all operators have a valid driver's license; not all operators have been trained by certified snowmobile instructors; all owners/operators have liability insurance; operator is age 17 or older.

4. Not all operators have a valid driver's license; all operators have been trained by certified snowmobile instructors; owners but not operator has liability insurance; operator may be age 16 or younger.

5. Not all operators have a valid driver's license; all operators have been trained by certified snowmobile instructors; owners/operators have no liability insurance; operator may be age 16 or younger.

**Least Protection**

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**Personal Protective Equipment**

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**Reminders**

The PA DCNR offers snowmobile safety and handling classes.

Snowmobile accidents must be reported to the DCNR within seven days of the occurrence.
Laws, Regulations, Standards, and Guidelines:

Laws, regulations, standards, and guidelines are constantly being updated and revised. Be sure to check the latest version of any document listed below. Be aware that new laws, regulations, standards, and guidelines on this topic may be generated at any time. See Appendix A for more information.

The Snowmobile and All-Terrain Vehicle Law, PA Vehicle Code.

The Snowmobile and All-Terrain Vehicle Regulations, 17 PA Code, Chapter 51.

Other:

PA regulations for State Game Lands snowmobile use include:

1. Proof of liability insurance
2. Use of helmets
3. Safety training and successful certification for youth ages 10-16 (Persons older than 16 should complete the safety training also.)
4. Non-road usage except on designated joint use roads
5. No one younger than age 10 to operate a snowmobile on public lands

The American Academy of Pediatrics states that operating snowmobiles is inappropriate for youth younger than 16 years of age.

Use of headlights (Figure 1) improves snowmobile visibility.

![Figure 1](image_url)
Off-Road Vehicles/Machines
Utility Task Vehicle

Most Protection

1. 4- to 6-wheel UTV; diesel engine or electric motor; designed for speeds less than 20 mph; certified ROPS and seat belt; integral cargo bed; operator has valid driver's license; all operators have received hands-on training.

2. 4- to 6-wheel UTV; diesel engine or electric motor; designed for speeds less than 25 mph; no ROPS or seat belt; integral cargo bed; operator has valid driver's license; all operators have received hands-on training.

3. 3- to 6-wheel UTV; gasoline or diesel engine; designed for speeds over 25 mph; no ROPS or seat belt; integral cargo bed; all operators have received hands-on training.

4. 4-wheel UTV; gasoline or diesel engine; designed for speeds of 25-50 mph; no ROPS or seat belt; damaged, rusted, worn-out integral cargo bed; operator has no hands-on training.

5. 3- or 4-wheel UTV; gasoline engine; altered for speeds that can exceed 50 mph; no ROPS or seat belt; homemade or after-market, ill-fitting cargo bed; operator has no hands-on training.

Least Protection

Reminders

Reverse signal alarms improve UTV safety.

Lower UTV speeds reduce risk to the operator and passenger.

UTV manufacturer's payload weights should not be exceeded.

Personal Protective Equipment

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Laws, Regulations, Standards, and Guidelines:

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Tip-Over Protection (TOPS) for Front-Wheel Drive Turf and Landscape Equipment, ASAE S547.

Other:

John Deere, Inc., training sources for utility task vehicles (utility vehicles) suggest the following safety considerations:

1. Carrying cargo increases the space needed to stop the vehicle.
2. Carrying cargo raises the center of gravity, which increases the risks of rollover (Figure 1).
3. Passengers must be seated only in the passenger seats provided, not in the cargo bed.
4. Passengers must be instructed to use the hand holds provided if a ROPS and seat belt are not available.
5. Avoid steep banks and ditches, which increase the risk of rollovers.

SAE ROPS design criteria for agricultural tractors has been used for most lawnmower ROPS (e.g. Deere, Kubota, New Holland, and Exmark). SAE J1040 is also used for lawnmower and off-road utility vehicle ROPS design.

Figure 1.
Other Structures/Accessories
Above-Ground Fuel Storage

Most Protection

1. Gasoline tank is located at least 40 feet from other buildings or structures; all tanks have double walls and spill and leak containment; all tanks protected from vehicular contact; no signs of leakage.

2. Gasoline tank is located at least 40 feet from other buildings or structures; all tanks have double walls and spill and leak containment; all tanks protected from vehicular contact in heavy; no sign of leakage.

3. Gasoline tank is located at least 40 feet from other buildings or structures; some tanks without double walls or spill and leak containment; all tanks protected from vehicular contact; no sign of leakage.

4. Gasoline tank is located less than 40 feet from other buildings or structures; tanks do not have double walls or spill and leak containment; tanks unprotected from vehicular contact; some signs of leakage.

5. Gasoline tank is located next to buildings or other structures; tanks do not have double wall or spill and leak containment; tanks unprotected from vehicular contact; tanks rusted with signs of leakage.

Least Protection

(over)

Personal Protective Equipment

Reminders

Post NO SMOKING signs at the fuel facility. Enforce the rule (See Figure 2 next page).

Locate fuel tanks at a minimum of 100 feet from a water well.

Check with your insurance carrier about exceptions to diesel and fuel oil tanks being located closer to buildings than 40 feet in comparison with gasoline storage.
Laws, Regulations, Standards, and Guidelines:

Laws, regulations, standards, and guidelines are constantly being updated and revised. Be sure to check the latest version of any document listed below. Be aware that new laws, regulations, standards, and guidelines on this topic may be generated at any time. See Appendix A for more information.


The Storage Tank and Spill Prevention Act, Pa C.S. Act 32.

Flammable and Combustible Liquids Code, NFPA 30.

Other:

All above ground fuel tanks should use a pressure-vacuum relief valve to reduce vapor pressures within the tank. The pressure-vacuum relief valve allows air to enter the tank when a negative pressure (partial vacuum) has formed in the tank.

On gravity discharge tanks a self-closing valve installed on the tank discharge will act as a fire containment measure. The nozzle should be a self-closing valve that positively shuts off fuel.

The fuel hose should be locked to the hanger to prevent tampering.

Fuel spills from dripping nozzles and careless nozzle use can contaminate surrounding soil at both above ground and underground tank sites (see Figure 1).

Farmers are liable for leakage damage that may occur from any fuel storage tank regardless of size.

Figure 1.

Figure 2.
Other Structures/Accessories
Above-Ground Manure Storage

Most Protection

1. Storage-tank ladder starts between 7 and 8 feet above the foundation or grade; ladder/platform is in good condition; a hazard warning sign is prominently displayed at eye-level near agitation location.

2. Storage-tank ladder starts between 7 and 8 feet above the foundation or grade; ladder/platform is in good condition; hazard warning sign is corroded and hard to read.

3. Storage-tank ladder starts between 7 and 8 feet above the foundation or grade; ladder/platform is in poor condition; there is no hazard warning sign present.

4. Storage-tank ladder reaches the ground; ladder/platform is in poor condition; a hazard warning sign is prominently displayed at eye level near agitation location.

5. Storage-tank ladder reaches the foundation or grade; portable ladder is present and can be easily used; ladder/platform is in poor condition; there is no hazard warning sign present.

Least Protection

(over)

Reminders

The primary hazard with above-ground manure storage tanks is drowning.

Keep feet and body inside of agitation platform; do not climb onto its edge or onto the rim of the tank.

Remove ground access ladder when not being directly used.

Personal Protective Equipment
**Laws, Regulations, Standards, and Guidelines:**

Laws, regulations, standards, and guidelines are constantly being updated and revised. Be sure to check the latest version of any document listed below. Be aware that new laws, regulations, standards, and guidelines on this topic may be generated at any time. See Appendix A for more information.

Manure Storage Safety, ASAE EP470

Ladders, Cages, Walkways and Stairs, ASAE S412.1

![Danger Sign](image)

*Figure 1.*
Other Structures/Accessories
Farm Ponds

Most Protection

1. 8 ft. locked, chain link-fenced farm pond; a "no trespassing" or "no swimming" sign posted; life ring and rope available; pond within sight of home or work area.

2. Fenced farm pond; a "no trespassing" or "no swimming" sign posted; life ring and rope available; pond within sight of home or work area.

3. Non-fenced farm pond; a "no trespassing" or "no swimming" sign posted; no life ring and rope available; pond within sight of home or work area.

4. Non-fenced farm pond; absence of a "no trespassing" or "no swimming" sign posted; no life ring and rope available; pond within sight of work area, but not home area.

5. Non-fenced farm pond; absence of a "no trespassing" or "no swimming" sign posted; no life ring and rope available; pond not in sight of work or home area.

Least Protection

(over)

Reminders
A yellow-painted, rescue post placed at the edge of the pond should include:
- 911 emergency number
- rescue pole
- life ring or buoy
- nylon rope

Personal Protective Equipment
Laws, Regulations, Standards, and Guidelines:
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Farm Pond Safety Fact Sheet E27, Agricultural and Biological Engineering, The Pennsylvania State University, (www.abe.psu.edu).

Other:
A pond rescue pole (Figure 1) equipped with emergency phone numbers, a rescue pole, a life buoy or ring, and rope increases the opportunity to assist a swimmer or others who may be struggling in the water.

Posting of "no trespassing" signs (Figure 2) reduces the risk of exposure to the hazards of ponds.

Farm ponds may be contaminated by fertilizer and pesticide runoff, livestock waste, or other pollutants.

Ponds away from roads or out of sight of the public reduce their risk as an attractive nuisance.

Figure 1. Figure 2.
Other Structures/Accessories
Fuel Tank Accessories

Most Protection
1. Installed by certified tank contractor; double-walled AST with overfill alarm, automatic shut-off and pressure vacuum relief valve; reflectively painted with fuel type and warning label: Flammable--Keep Fire and Flame Away, or equivalent.

2. Installed by certified tank contractor; double-walled AST with overfill alarm, automatic shut-off and pressure vacuum relief valve; not reflectively painted with fuel type and warning label: Flammable--Keep Fire and Flame Away, or equivalent.

3. Installed by owner or non-certified vendor; single-walled AST with pressure-vacuum relief valve; not reflectively painted, but has fuel type and warning label: Flammable--Keep Fire and Flame Away, or equivalent.

4. Installed by owner or non-certified vendor; single-walled AST with pressure-vacuum relief valve; not reflectively painted with fuel type and warning label.

5. Installed by owner or non-certified vendor; single-walled AST but no pressure-vacuum relief valve; not reflectively painted with fuel type and warning label.

Least Protection

Reminders
Look for signs of fuel tank leakage and soil contamination, including petroleum-stained soil and a lack of vegetation around the storage tank.

A white or silver tank will reflect the sun’s heat and result in lower pressure-related losses.

Personal Protective Equipment

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**Laws, Regulations, Standards, and Guidelines:**
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Storage of Flammable and Combustible Liquids at Farms and Isolated Sites, NFPA 395.

The PA Flammable and Combustible Liquids Code (FCLC), P.L. 450, No.29.

The Storage Tank and Spill Prevention Act, PA C.S. Act 32.

**Other:**
The Pennsylvania State Police Fire Marshal Division is the source of free permits for farm storage of 30 gallons or more of fuel. Check your state's regulations regarding this topic.

The Pennsylvania Petroleum Association's membership includes nearly all fuel dealers that service farms in Pennsylvania. These dealers can help farmers meet the Code requirements and are certified tank-installation specialists. Check your state's Petroleum Association.

A 10 lb., BC-type fire extinguisher is required (Figure 1) and should be mounted or stored within 30 feet from the fuel storage location.

![Figure 1](image-url)
Other Structures/Accessories
Gasoline Tank

Most Protection

1. Gasoline tank is located at least 40 feet from other buildings or structures; all tanks have double walls or set in a containment structure or earthen dike; all tanks are protected from vehicular contact; no tank or accessory leaks.

2. Gasoline tank is at least 40 feet from other buildings or structures; all tanks have double walls or set in a containment structure or earthen dike; all tanks are protected from vehicular contact in heavy traffic areas only; no tank/accessory leaks.

3. Gasoline tank is located at least 40 feet from other buildings or structures; some tanks do not have double walls or a containment structure or earthen dike; all tanks are protected from vehicular contact; no tank/accessory leaks.

4. Gasoline tank is located less than 40 feet from other buildings or structures; no tanks have double walls or a containment structure or earthen dike; no tanks are protected from vehicular contact; some tanks and accessories show some leakage.

5. Gasoline tank is located next to other buildings or structures; no tanks have double wall or a containment structure or earthen dike; no tank is protected from vehicular contact; some tanks and accessories show leakage.

Least Protection

(over)

Reminders

Fuel tank stands should be placed on a firm, level surface.

Fuel tanks should be located at a minimum of 100 feet from a water well.

Check with your insurance carrier to find out if they will accept diesel and fuel oil tanks being located closer to buildings than 40 feet.

Personal Protective Equipment

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Laws, Regulations, Standards, and Guidelines:
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The PA Flammable and Combustible Liquids Code (FCLC), P.L. 450.


Flammable and Combustible Liquids Code, NFPA 30.

Storage of Flammable and Combustible Liquids at Farms and Isolated Sites, NFPA 395.

Other:
Above-ground fuel tanks should use a pressure-vacuum relief valve to reduce vapor pressure within the tank. On gravity discharge tanks a self-closing nozzle installed on the tank discharge will act as a fire-containment measure. The fuel hose should be locked to the hanger to prevent tampering.

Fuel spills from dripping nozzles and careless nozzle use can contaminate soil at both above-ground and underground tank sites (Figure 1).

Post NO SMOKING signs at the fuel facility (Figure 2). Enforce the rule.

Farmers are liable for leakage damage that may occur from any fuel storage tank, regardless of size.

Figure 1. Figure 2.
Other Structures/Accessories
Grain Bin

**Most Protection**

1. The ladder is in good condition; access to the ladder is restricted when not in use; the bin access is locked closed; grain bin hazard decal are clean and on the side of the grain bin near the access.

2. 

3. Ladder is in good condition; ladder access is not restricted when not in use; the bin access is locked closed but grain bin hazard decal is unreadable.

4. 

5. The ladder may be bent and/or loose; the access is not locked; grain bin hazard decal is not present.

**Least Protection** (over)

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**Reminders**

The bottom of the ladder should be more than 7 feet and less than 8 feet from the foundation or grade.

If the silo ladder is more than 20 feet in length, a ladder cage is required.

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**Personal Protective Equipment**
Laws, Regulations, Standards, and Guidelines:
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Ladders, Cages, Walkways and Stairs, ASAE S412.1.

Other:
Stairs are safer than ladders and should be installed on new grain bins (Figure 1).

Figure 1.
Other Structures/Accessories
LP Tanks

Most Protection
1. Valves are clean, rust-free, and operate properly. Tank is protected by an earthen, metal or wooden berm.

2. 

3. Valves have some debris or rust on them; valves work properly but tank is not protected by an earthen, metal or wooden berm.

4. 

5. Valves are very dirty or rusty; valves are hard to turn; tank is not protected.

Least Protection

Reminders
Check pop-off valve to see that it is clean and working properly.

Personal Protective Equipment

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Laws, Regulations, Standards, and Guidelines:

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Storage and Handling of Liquified Petroleum Gases, OSHA CFR 29 section 1910.110 explains the requirements for safety devices to be used on LP-Gas tanks and precautions about preventing damage from vehicles.

![Figure 1.](image)
Other Structures/Accessories

Manure-Hazard Warning Signs

Most Protection

1. Sign is made from plastic or metal; includes pictogram of the hazard; is prominently displayed near access point(s); is easily read.

2. 

3. Sign is made from paper, metal or plastic; does not contain pictogram; is prominently displayed near access point(s); is faded and hard to read.

4. 

5. Sign is not present.

Least Protection

(over)

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Laws, Regulations, Standards, and Guidelines:

Laws, regulations, standards, and guidelines are constantly being updated and revised. Be sure to check the latest version of any document listed below. Be aware that new laws, regulations, standards, and guidelines on this topic may be generated at any time. See Appendix A for more information.

No information regarding laws, regulations, standards, or guidelines on this topic were discovered.
Other Structures/Accessories
Manure-Storage Pond

Most Protection

1. A strong, secure fence surrounds the pond and is constructed so that children and others cannot enter the pond area; gate(s) are locked; a hazard-warning sign is prominently displayed at all access points and/or sides.

2. A strong, secure fence surrounds the pond and is constructed so that children and others cannot enter the pond area; gate(s) are locked; a hazard-warning sign is present but corroded and hard to read.

3. A fence surrounding the pond that can be passed through/under by children, but will keep adults out; gate(s) are locked; a hazard-warning sign is not present.

4. There is no fence surrounding the pond; a hazard-warning sign is prominently displayed around the pond's perimeter.

5. There is no fence surrounding the pond; a hazard-warning sign is not present.

Least Protection

(over)

Reminders

The primary hazard with ground-level manure-storage ponds is drowning.

The gate protecting the entrance to the storage pond should be low enough to keep children from crawling under the gate.

Fence material should be chainlink, woven wire or electric high-tensile with a maximum spacing of 6 inches between strands.

Personal Protective Equipment
Laws, Regulations, Standards, and Guidelines:

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Manure Storage Safety, ASAE EP470.

Other:

Push-off pad is designed and constructed to prevent tractor or skid-steer loader from falling into the pond (Figure 2).

Figure 1.

Figure 2.
Other Structures/Accessories
Silo Blower Ladder

Most Protection

1. Ladder is in good condition; ladder cage is intact; the bottom of ladder is between 7 and 8 feet from the foundation or grade.

2. 

3. Ladder is bent; ladder cage is bent or loose; bottom of ladder is less than 7 feet off the ground but does not reach the foundation or grade.

4. 

5. Ladder is not properly secured to the side of the silo; ladder cage is badly bent or missing; the ladder reaches to the ground.

Least Protection

(over)

Reminders

The bottom of the ladder should start between 7 and 8 feet above the foundation or grade to prevent unauthorized people from climbing the ladder.

When working at the top of the silo, wear a safety harness and a lanyard to tie yourself to the silo for fall prevention.

Personal Protective Equipment

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Laws, Regulations, Standards, and Guidelines:

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Ladders, Cages, Walkways and Stairs, ASAE S412.1.

Other:
If the silo ladder is less than 20 feet in length, a ladder cage is not required.

If the silo ladder is greater than 30 feet, an offset landing platform must be included in the design. Offset ladder landing platforms shall be used every 30 feet (Figure 2).

Ladder side rails and cages shall extend a minimum of 42 inches above the walk surface of a landing platform or the top rung of a fixed ladder (Figure 2).
Other Structures/Accessories
Underground Manure Storage

Most Protection

1. Storage opening is covered by a corrosion-resistant, heavy-duty grate or cover, cover is padlocked; a hazard-warning sign is prominently displayed and made of corrosion-resistant material.

2. Storage opening is covered by a corrosion-resistant, heavy-duty grate or cover, cover is not padlocked; a hazard-warning sign is present but corroded and hard to read.

3. Storage opening is covered by a corrosion-resistant, heavy-duty grate or cover, cover is not padlocked; a hazard-warning sign is not present.

4. Storage opening is not covered; a hazard-warning sign is prominently displayed and is made of corrosion-resistant material.

5. Storage opening is not covered; a hazard-warning sign is not present.

Least Protection

(over)

Reminders
If manure storage is connected to a building by a pipe, prevent gases from reentering the building by adding a gas trap.

Agitation of manure releases high concentrations of the following gases:
- hydrogen sulfide
- methane
- carbon dioxide
- ammonia

Personal Protective Equipment

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Laws, Regulations, Standards, and Guidelines:
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Manure Storage Safety, ASAE EP470.

Other:
If the underground manure storage is beneath the entire floor of the building and the floor is slotted (Figure 2), then ventilation must be provided for the farmer and livestock. The two types of below-floor ventilation are:
1) isolated, non-ducted pit fans
2) pit fans connected to perforated plastic pipes under the slotted floor or under elevated pens (for low airflow rates)

Fans and/or perforated plastic pipes need to be at least 1 foot above the manure level for reducing gas levels and spacing should not exceed 13 feet to be effective. Buildings that have mechanical ventilation systems should also have an alarm system that warns the farmer of a ventilation failure. A backup source of power (e.g. an auxiliary generator) should be available on the farm in case of power failure during agitation. Ventilation should occur during and for several hours following pumping activities.

Keep manure agitators below the liquid's surface.

Prevent smoking, open flames or electric sparks near manure storage areas.

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Pesticides and Chemicals
Anhydrous Ammonia Use and Handling

Most Protection

1. Commercial transport and application of anhydrous ammonia.

2. Commercial transport, with owner-operator application of anhydrous ammonia; visible SMV emblems if tractor pulled; emergency water source available on equipment.

3. Commercial transport, with owner-operator and some employee application of anhydrous ammonia; visible SMV emblem in place if tractor pulled; emergency water source available on equipment.

4. Owner-operator or employee transport and application of anhydrous ammonia; SMV in place if tractor pulled, but SMV is faded or dirty; emergency water source available on equipment.

5. Owner-operator or employee transport and application of anhydrous ammonia; no SMVs or emergency water supply available.

Least Protection (over)

Reminders

PPE of rubber gloves and tight fitting, unvented goggles during transfer of anhydrous ammonia must be used.

Provide at least 5 gallons of clean, fresh water for emergency washing purposes.

Carry a plastic squeeze bottle of fresh water to flush eyes in case of a splash of anhydrous ammonia to the face and eyes.

Be careful not to damage valves on transfer mechanisms to prevent leaks.

Personal Protective Equipment
**Laws, Regulations, Standards, and Guidelines:**

Laws, regulations, standards, and guidelines are constantly being updated and revised. Be sure to check the latest version of any document listed below. Be aware that new laws, regulations, standards, and guidelines on this topic may be generated at any time. See Appendix A for more information.

Storage and Handling of Anhydrous Ammonia, OSHA 29CFR, Section 1910.111.


Storage and Handling of Anydrous Ammonia, American National Standards Institute, Inc, K61.1.


**Other:**

The word anhydrous means "without water". Anhydrous ammonia is a hygroscopic compound. As a hygroscopic compound it seeks water and forms a strong alkali when reacting with the moisture on the skin or mucous membranes (eyes, nostrils, lungs) and can cause severe burns, blindness, and lung damage.

When working with anhydrous ammonia a source of water for emergency eye and skin flushing is required. At a minimum eye and skin protection (safety goggles and rubber gloves) must be used. Figure I shows the location of these safety accessories on the anhydrous ammonia field tank.

![Figure 1.](image)

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Pesticides and Chemicals
Crop Preservatives

Most Protection

1. Stored in original containers with legible labels; stored in a locked chemical storage area segregated from other products.

2. 

3. Stored in original containers with legible labels; stored in a non-locking storage area with other products.

4. 

5. Some product in original containers, some product in unmarked containers; labels non-legible; stored on open shelves or in an open space.

Least Protection

(over)

Reminders

Use crop preservatives known for low corrosiveness and low personal safety risk.

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Laws, Regulations, Standards, and Guidelines:

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No information regarding laws, regulations, standards, or guidelines on this topic were discovered.

Other:

Crop preservatives that are organic acid based (example: propionic acid) are corrosive to metal parts and can harm skin and eye tissue with exposure.

Use a buffered propionic acid product to reduce corrosiveness and decrease health risks.

Read and follow product labels for use, precautions, and recommendations for personal protective equipment (PPE).
Pesticides and Chemicals
Dairy Cleansers/Sanitizers Storage/Security

**Most Protection**

1. Cleansers/sanitizers stored in locked room/cabinet/container; cabinet identified by hazardous materials signage; contents in original containers with labels.

2. Cleansers/sanitizers stored in locked room/cabinet/container; cabinet identified by hazardous materials signage; some contents in labeled dispensing cups/devices.

3. Cleansers/sanitizers stored in unlocked room/cabinet/container; cabinet identified by hazardous materials signage; some contents in unlabeled dispensing cups/devices.

4. Cleansers/sanitizers stored in an open (non-closeable) room/cabinet/container; cabinet has general warning signage; some contents in unlabeled dispensing cups/devices.

5. Cleansers/sanitizers stored in open area; no warning signs present; some contents in unlabeled dispensing cups/devices.

**Least Protection**

(over)

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**Reminders**

Follow label directions for mixing and use of the cleansers and sanitizers.

Keep cleansers and sanitizers locked from access by children and unauthorized personnel.

---

**Personal Protective Equipment**

Acid resistant gloves, eye protection, protective slip-proof footwear
Laws, Regulations, Standards, and Guidelines:

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No information regarding laws, regulations, standards, or guidelines on this topic were discovered.

**Other:**

Label all cleaning and sanitizing chemicals properly. Maintain original labeling and MSDS information.

Post 911 and area poison control center and local hospital phone numbers near telephones.

Store chemical cleansers and sanitizers in a cool, dry location.

Provide lighting in the storage area for ease of reading label directions.

Seal product containers tightly to reduce product loss into the air. Chemical concentrations in closed storage areas will be increased over time. The next user will inhale greater concentrations of the product as a result.

Provisions for spill containment reduces the potential for spilled product to enter floor drains and surface drainage areas.
Pesticides and Chemicals
Dairy Cleansers/Sanitizers Use

Most Protection

1. All product labels legible; cleaning/sanitizing directions posted; wash basin available; operable eye wash station near to work area; empty containers rinsed and disposed of according to local regulations.

2.  

3. Product labels legible; cleaning/sanitizing directions on file but not posted; wash basin available, but no eye wash station; empty containers rinsed and disposed of according to local regulations.

4.  

5. Product labels missing or illegible; no cleaning/sanitizing directions posted or on file; no wash basin or eye wash station available; container rinse unknown; disposal unknown.

Least Protection

(over)

Reminders

Mix chemicals in an open, well-ventilated area.

Add caustic chemicals to water slowly. This will prevent violent chemical reactions.

Do not mix caustic materials with hot water. Violent heat producing exothermic chemical reactions may result.

Do not mix chlorine compounds with detergents or acids. Deadly chlorine gas may be produced.

Post cleanser/sanitizers directions near the mixing and handling area.

Personal Protective Equipment

Acid resistant gloves, eye protection, protective slip-proof footwear

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**Laws, Regulations, Standards, and Guidelines:**

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Indirect Food Additives: Adjuvants, Production Aids, and Sanitizers, 21CFR178. 1010, Subpart B.

**Other:**

Posted directions for each cleaning program must be specific as to temperature, gallons of water used in each cycle, and amount in ounces of each chemical.

Do not enter closed containers (bulk milk tank, milk tank truck, etc.). Oxygen may be lacking. Chemical vapors can burn sensitive tissues in your eyes, nose, and respiratory tract.

Chemical spills onto skin or into eyes should be flushed with water (Figure 1) for at least 15 minutes AND followed up by a medical examination immediately.

![Figure 1](image)

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Pesticides and Chemicals
Fertilizer- On Farm Security

Most Protection
1. No fertilizer stored, or fertilizer products stored in locked facility visible from main work area; dusk to dawn security lighting nearby; invoices match inventory at delivery; records of use on file

2.

3. Fertilizer products stored in non-locked facility or shed visible from main work area; dusk to dawn security lighting in general area; invoices on file, but no inventory control records

4.

5. Fertilizer products stored in open shed or barn not readily visible from main work area; no security lighting; invoices not available; no inventory records kept

Least Protection

Reminders
Maintain only enough fertilizer inventory for current crop needs.

Do not store fertilizer products near feedstuffs.

Some fertilizer ingredients are desirable objects of theft for illicit drug manufacture and/or as explosive accelerants.

Personal Protective Equipment

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Laws, Regulations, Standards, and Guidelines:
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Chemical Facility and Terrorism Standards, 6CFR Part 27, including Section 27.210 defines Department of Homeland Security Threshold Limits (Standard Threshold Quantities) on common agricultural nitrogenous compounds used as fertilizer.

Other:
Limiting the number of entrances and/or access approaches to restricted areas of the farm improves security.

Consider electronic sensors for highly secure areas if large quantities of fertilizer or other agricultural chemicals are stored longer than the intended usage period.

Control visits by the public and vendors through a central office check-in procedure.

Develop an emergency response plan for incidents at your farm. Provide local emergency responders adequate information to enhance their assistance should you call upon them.
Pesticides and Chemicals
Fertilizer Transport and Handling

Most Protection

1. Commercially transported and applied to farm owner's fields according to nutrient management plan.

2. 

3. Commercially transported to producer; farm producer applied according to nutrient management plan.

4. 

5. Farm producer transported and applied without nutrient management plan considerations.

Least Protection

Reminders

Tarp all loads of fertilizer before transport.

Fasten safety chains and check lights and electric brakes if so equipped before transport.

Obey posted speed limits while hauling heavy loads of fertilizer in vendors equipment.

Match the size of the truck with the load being pulled for power and braking ability.

Personal Protective Equipment

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PA Vehicle Code, Title 75.

Other:
Check tire condition and pressure of towed and towing vehicle before transporting the fertilizer supply unit.

Do not substitute farm rated tires for highway speed rated tires if a repair is necessary.
Pesticides and Chemicals
Pesticide Application Methods

Most Protection

1. Producer employs commercially licensed and insured applicator; applies non-restricted pesticides only; professional crop consulting service used to determine pest control needs.

2. Producer employs commercially licensed and insured applicator; some restricted use pesticides used; professional crop consulting service used to determine pest control needs.

3. Producer applicator applies non-restricted use pesticides only; professional crop consulting service monitors pest levels to determine pest control needs.

4. Licensed, producer applicator applies some restricted use pesticides; producer monitors pest levels to determine pest control needs.

5. Licensed (or unlicensed) producer applies restricted use pesticides; producer does not monitor pest levels to determine pest control needs.

Least Protection (over)

Reminders

Obtain and keep updated the required pesticide applicator certification.

Monitor the economic threshold level of pests to reduce the use of pesticides and their effect on the environment.

Use Integrated Pest Management (IPM) practices to reduce the need for pesticide use.

Restricted use pesticides may be legally purchased and applied only by certified applicators.

Personal Protective Equipment

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Laws, Regulations, Standards, and Guidelines:
Laws, regulations, standards, and guidelines are constantly being updated and revised. Be sure to check the latest version of any document listed below. Be aware that new laws, regulations, standards, and guidelines on this topic may be generated at any time. See Appendix A for more information.


Worker Protection Standard (WPS), 40 CFR Part 170, EPA.

Pennsylvania Pesticide Control Act, P.L. 90, No.24, 3 P.S. 111.21-111.61.

Other:
Improper pesticide container disposal or storage, even on a temporary basis, (Figure 1) increases the risk of personal exposure and environmental contamination.

Figure 1.
Pesticides and Chemicals
Pesticide Bio-Security/Public Access

Most Protection

1. Unoccupied ag chemical areas locked; all visitors and vendors report to central office; deliveries monitored and secured; frequent chemical inventory monitoring during work hours; "no trespassing" signs posted.

2. Unoccupied ag chemical areas locked at night only; all visitors except vendors report to central office; deliveries monitored and secured; infrequent chemical inventory monitoring during work hours; "no trespassing" signs posted.

3. Unoccupied ag chemical areas locked at night only; visitors and vendors report to any farm personnel; deliveries not monitored or secured; infrequent chemical inventory monitoring during work hours; "no trespassing" signs posted in some areas.

4. Unoccupied ag chemical areas not locked; visitors and vendors report to any farm personnel; non-monitored deliveries to non-secure areas; no chemical inventory monitoring during work hours; "no trespassing" signs lacking.

5. Farm building freely accessed; visitors and vendors do not report to anyone; no chemical inventory monitoring; "no trespassing" signs lacking.

Least Protection

Reminders
Sensitive farm areas for agricultural chemical-related bio-security include:
1. feed areas
2. fuel areas
3. water supplies
4. milk rooms
5. pesticide and supply storage
6. pharmaceutical supply areas

Personal Protective Equipment

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Pennsylvania Senate Bill 1432, 1996 amending Title 3 of PA Consolidated Statutes, Chapter 23.

Check your state's regulations regarding this topic.

United States Department of Agriculture, USDA, provides detailed homeland security recommendations at the website www.usda.gov/homelandsecurity.

**Other:**

Approved warning signs for chemical storage and pesticide-treated areas must be used (Figure 1).

Conduct an operation vulnerability assessment. Know who is visiting the property and why they are there. Post signs outlining security procedures in place at the farm.

Monitor chemical, pharmaceutical and feed-storage areas for tampering and unauthorized entry. Unrestricted access to pesticide and pharmaceutical products (Figure 2) increases risk of exposure or misuse.

Use legal human-resource management practices in the hiring, reprimanding and removal of employees who may become disgruntled.

![Figure 1.](image1.png)  
![Figure 2.](image2.png)

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Pesticides and Chemicals
Pesticide Container Rinsing/Recycling

Most Protection

1. Pressure rinsed, clean containers and caps recycled immediately; label recommended PPE used during all handling procedures.

2. 

3. Pressure rinsed or triple rinsed clean pesticide containers stored in dry, secure area for later recycling; label recommended PPE used during all handling procedures.

4. 

5. Unrinsed, pesticide containers with residue; not stored in dry, secure area; containers disposed of improperly; no PPE used.

Least Protection

Reminders

Follow product label recommendations for the proper rinsing and disposal of all empty, clean pesticide containers.

Recycle pesticides and containers through the PA Chemsweep Program and the Plastic Pesticide Container Recycling Program.

Rinsate (rinse water plus pesticide container residue) should be applied to crops per label instructions.

Consider an eye wash station for emergency splash situations. See Figure 1 next page.

Personal Protective Equipment

Follow label instructions for proper PPE use during handling.
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Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), 7 U.S.C., s/s136 et seq.

Worker Protection Standard (WPS), 40 CFR Part 170, EPA.

Pennsylvania Pesticide Control Act, P.L. 90, No. 24, 3 P.S. 111.21-111.61.

**Other:**

Proper rinsing of pesticide containers involves:
- a) pressure rinsing of containers
- b) rinsing until rinsate is clear
- c) using rinsate in the pesticide spray application according to label directions
- d) using proper PPE

Proper recycling of pesticide containers involves:
- a) following manufacturer/distributor procedures
- b) participating in PA Department of Agriculture Chemsweep program or the Plastic Pesticide Container Recycling Program. Contact the PA Dept. of Agriculture in Harrisburg, PA to find the closest location to you.

Figure 1.
Pesticides and Chemicals
Pesticide Drift Exposure

Most Protection

1. Commercial application of non-restricted use pesticides by fully insured vendor; labeled use verified by vendor records on file; no public record of drift damage.

2. Commercial application of restricted pesticides by fully insured vendor; labeled use verified by vendor records on file; no public record of drift damage.

3. Producer applies non-restricted use pesticides only; labeled use records complete; no public record of drift damage.

4. Producer applies some restricted use pesticides; labeled use records incomplete; no public record of drift damage.

5. Producer applies some restricted use pesticides; labeled use records incomplete; public records shows claims of drift damage complaint/lawsuit(s).

Least Protection

(over)

Reminders
Apply pesticides when risk of spray drift is minimal.

Regularly log pesticide application rates as well as weather conditions and maintain a file of these records.

Personal Protective Equipment
Laws, Regulations, Standards, and Guidelines:

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Pennsylvania Pesticide Control Act, P.L. 90, No. 24, 3 P.S. 111.21-111.61.

Other:

Complaints about pesticide spray drift can include: sensitive plants and trees being damaged or destroyed, soil pollution from run-off, well-water pollution from groundwater contamination, vehicle finish damage, fish kill, bird kill, wildlife kill, and personal health issues.

Persons with medically-certified, known hypersensitivity to pesticides can be registered with the PA Department of Agriculture (Figure 1). These persons are to be notified of pesticide applications in their communities. To maintain positive relations in the community, become aware of those who are sensitive to pesticides and apply pesticides accordingly.

Figure 1.
Pesticides and Chemicals
Pesticide Loading Procedures

Most Protection

1. Closed-system used for Category 1 products; proper PPE in use; loading and attaching of containers on impervious surface; no wellhead nearby.

2. Closed-system used for Category 1 products; proper PPE in use; loading and attaching of containers at field site; no wellhead nearby.

3. Closed-system used for Category 1 products; minimal PPE in use; loading and attaching containers at field site; no wellhead nearby.

4. Closed-system not in use; mixing and loading to sprayer tank from product containers at field site; some PPE in use; well-head location unknown.

5. Closed-system not in use; mixing and loading to sprayer tank from product containers at stream edge or at well head; no PPE in use.

Least Protection (over)

Reminders
Pesticide labels change periodically. Read the complete label with each new application season.

Maintain an air gap between the water supply line and tank mix to prevent hose contamination and/or possible back-flow.

Load and mix pesticides as far away from livestock, pets, and waterways as possible.

Personal Protective Equipment
Strictly follow PPE recommendations on label.
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Worker Protection Standard (WPS), 40 CFR Part 170, EPA.

Pennsylvania Pesticide Control Act, P.L. 90, No. 24, 3 P.S. 111.21-111.61.

Although specifics on this topic may not be addressed in the above mentioned laws and regulations, these documents refer to the complete use of pesticides from manufacture through usage and disposal.

Other:
Figure 1 shows the components of a closed pesticide handling system.

Filling pesticide spray tanks requires the operator to monitor air current flow to keep chemicals from blowing toward the operator.

The operator should station him or herself above the level of the sprayer during product or water filling to prevent splashing of the pesticide on themself and their clothes.

![Figure 1](image)

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**Pesticides and Chemicals**

**Pesticide Notification Procedures - REI**

**Most Protection**

1. Employees are notified about spray applications in a language that can be understood; treated areas have an EPA-approved, 14”x16” application warning sign installed at field entrance with appropriate REI's.

2. 

3. Employees are notified about spray applications in a language that can be understood; treated area or bulletin board announcement by non-EPA approved application warning signage; no treated area REI signage present.

4. 

5. Employees are not notified about spray applications; no warning signs posted at treated areas or in employee common area.

**Least Protection**

(over)

---

**Reminders**

Follow standards and guidelines as stated in the EPA's Worker Protection Standard (WPS).

Restricted-entry intervals (REI's) for treated areas should be communicated to all employees.

EPA standard REI signage should be put in place immediately after the spray application and not removed until the REI's have expired.

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**Personal Protective Equipment**

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Worker Protection Standard (WPS), 40 CFR Part 170, EPA.

Pennsylvania Pesticide Control Act, P.L. 90, No. 24, 3 P.S. 111.21-111.61.
Pesticides and Chemicals
Pesticide Public Notification Procedure

Most Protection

1. Pesticide hypersensitivity registered persons notified by documented face-to-face contact of pending pesticide application; contact records kept for minimum of three years.

2. Pesticide hypersensitivity registered persons notified by documented certified mail contact of pending pesticide application; contact records kept for minimum of three years.

3. Pesticide hypersensitivity registered persons notified by producer via phone (direct call, phone message machine, or another adult's response) of pending pesticide application; contact records kept for minimum of three years.

4. Pesticide hypersensitivity registered persons notified by written message left on door of pending pesticide application; contact records not kept for a minimum of three years.

5. Pesticide hypersensitivity registered persons not notified of pesticide applications by producer.

Least Protection

(over)

Reminders
Check with the PDA to identify pesticide hypersensitive individuals in your community.

Notify pesticide hypersensitive individuals of your application schedule if they live with 500 feet of the application site. See Page 2 for means of contact.

Document and keep on file for three years your advance notification records.

Personal Protective Equipment

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S.A.R.A. Title III, 40 CFR Parts 302,355,372, EPA.

Other:

Advance notification pesticide application information includes:

1. Date, location, start-finish times
2. Brand name, EPA number, and active ingredient to be used
3. Name, telephone number and pesticide business number of the applicator
4. A copy of the label for each pesticide used (within 10 days of the request for the label)
5. Notification between 12 and 72 hours prior to the pesticide application
6. Notification to be made by phone, personal contact or certified mail

A record of every telephone contact and contact attempt is to be kept as part of the documentation under the PA Pesticide Control Act.

Producers who store large quantities of extremely hazardous substances, including some pesticides, must provide notification to the State Emergency Response Commission (SERC) under the mandates of the federal S.A.R.A. Title III law, Emergency Planning and Community Right to Know.
Pesticides and Chemicals
Pesticide Recordkeeping

Most Protection
1. Commercially applied restricted and non-restricted use pesticide records kept for all applications; application records kept for 3 years; commercial applicator responsible for all records; producer has duplicate set of records from vendor.

2. Commercially applied restricted and non-restricted use pesticide records kept for all applications; application records kept for 3 years; only commercial applicator responsible for all records

3. Commercially applied restricted and non-restricted use records kept for all applications; minimal application records (calendar entries, etc.) kept for 3 years; producer applied pesticide records of non-restricted use pesticides minimal.

4. Producer applied restricted and non-restricted use records kept for all applications; application records not kept for 3 years.

5. No records available for restricted-use pesticide applications.

Least Protection

Reminders
Follow the requirements of the Pennsylvania Pesticide Control Act including:

1. All restricted-used pesticide application information must be kept by commercial and private applicators for a minimum of three years.

2. All records must be accessible for review by state agronomic products inspectors.

Personal Protective Equipment (over)
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Worker Protection Standard (WPS), 40 CFR Part 170, EPA.

Pennsylvania Pesticide Control Act, P.L. 90, No. 24, 3 P.S. 111.21-111.61.

**Other:**
Keeping a file folder of only the pesticide labels is not an official, effective, or legal application record system.

Pesticide application records must include:
- Date and time of application
- Pesticide used
- Formulation of the pesticide
- Method of mixing the pesticide
- Rate of application
- Type of equipment used
- Crop or site treated
- Targeted pest
- Weather conditions at time of application
- Name of applicator
- Results of the application

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Pesticides and Chemicals
Pesticide Security Systems

Most Protection

1. A separate storage structure or location; locked when not in use; EPA approved warning signs in place; fire suppression system in place; lighting for 24-hour security

2. A separate structure or location; locked when not in use; EPA approved warning signs in place; charged 10-lb. ABC fire extinguisher prominently mounted; dusk to dawn exterior lighting in place.

3. A separate storage structure within another building; may be unlocked at times; generic warning signs in place; charged 10-lb ABC fire extinguisher prominently mounted; no exterior security lighting.

4. A separate storage structure or location within a farmstead building; not locked; no warning signs; charged 10-lb ABC fire extinguisher close by; some interior lighting.

5. General storage in open building/area; free access; no warning signs; no fire extinguisher available; no lighting.

Least Protection

(over)

Reminders
Post EPA approved pesticide storage signs at the pesticide storage facility. See Figure 1 on the next page.

Train family members and employees on the hazards associated with on-site pesticide storage.

Store pesticides only in their original containers.

Personal Protective Equipment
**Laws, Regulations, Standards, and Guidelines:**

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Worker Protection Standard (WPS), 40 CFR Part 170, EPA.

Pennsylvania Pesticide Control Act, P.L. 90, No. 24, 3 P.S. 111.21-111.61.

**Other:**

Figure 1 shows an EPA approved bi-lingual pesticide storage sign. Additional signage may be used as an option.

Security systems are available to notify the producer-owner as security issues (unauthorized entry, equipment malfunction, etc) arise.

Pesticide security involves accurate inventory, limiting personnel access to the facility, and locking the storage facility when not in use.

![Figure 1](image)

© 2010 The Pennsylvania State University
Pesticides and Chemicals
Pesticide Spill and Leak Containment

Most Protection

1. Non-porous surface mixing and cleaning area has curbing (dike) and emergency spill collection sump and pump; spill absorbent materials nearby.

2. 

3. Non-porous surface mixing and cleaning area with no curbing (dike) or sump; spill absorbent materials are kept nearby.

4. 

5. No curbing (dike) or collection sump and pump in use; no spill absorbent materials nearby.

Least Protection

Reminders
Install curbing (a dike) around the pesticide mixing and cleaning area.

Secure an absorbent material kit for use in emergency pesticide spills.

Pesticide spills must be contained from reaching drains, ditches, or waterways.

Immediately notify local emergency response team/HazMat teams of farm chemical spills that threaten waterways. Expect that you cannot control the spill yourself.

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No information regarding laws, regulations, standards, or guidelines on this topic were discovered.
Pesticides and Chemicals
Pesticide Storage Construction

Most Protection

1. Constructed of noncombustible materials; impervious floor; interior curbing with leak collection tank and sump; electrically automated and mechanical back-up ventilation available.

2. Constructed of noncombustible materials; impervious floor; curbed external rinse pad with collection tank and sump; electrically automated and mechanical back-up ventilation available.

3. Constructed of noncombustible materials; impervious floor; non-curbed external rinse pad with collection tank and sump; electrical service; passive ventilation only.

4. Pesticide storage room or cabinet in a non-combustible building; cracked, damaged concrete floor; no rinse pad; minimal or no electric service; passive ventilation.

5. Pesticide storage area in an existing combustible building; non-concrete floor; rinsing outside on ground; no electric service; little or no ventilation provided.

Least Protection (over)

Reminders

Do not purchase or store more pesticides than are needed for the current/pending growing season to reduce storage needs.

Separate facilities dedicated to pesticide storage only will reduce risk and can offer a means for securing the facility.

Emergency showers, eye wash facilities, and spill recovery systems reduce the risk of pesticide contamination damages if installed and used.

Personal Protective Equipment
Laws, Regulations, Standards, and Guidelines:

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Other:
Other sources of information on pesticide storage construction include:

Northeast Region Agricultural Engineering Service (NRAES) Publication No. 78, On-Farm Agrichemical Handling Facilities. Figure 1 shows a pesticide storage layout from this publication.

Midwest Plan Service (MWPS), Iowa State University. Pesticide Building Construction Specifications (mwps@iastate.edu)

Figure 1.
Pesticides and Chemicals
Pesticide Storage Location

Most Protection

1. Building is inaccessible to livestock; away from public access or flood-prone area; located at least 300 feet upslope from wellheads and waterways.

2. Building is inaccessible to livestock; away from public access or flood-prone area; located within 100-300 feet upslope of wellhead or waterways.

3. Building is inaccessible to livestock or the public; location unknown regarding flood-prone area; located within 100 feet of a wellhead or waterway.

4. Pesticide storage located within a farmstead building inaccessible to livestock or the public; located in a flood-prone area; closer than 100 feet to wellheads and waterways.

5. Pesticide storage (even if temporary) accessible by livestock and/or the public or unauthorized persons; located in a flood-prone area and well-head.

Least Protection

Reminders

Locate pesticide storage away from residential, livestock, and environmentally sensitive areas.

Personal Protective Equipment

Store PPE in a location other than the pesticide storage building.
Laws, Regulations, Standards, and Guidelines:

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On-Farm Agrichemical Handling Facilities, North East Regional Agricultural Engineering Service (NRAES) Publication No.78

Pennsylvania Farm-A-Syst, Farm Evaluation System, Pesticide and Fertilizer Storage and Handling, Worksheet #2, Penn State Cooperative Extension

Other:

To reduce the risk of fire, the pesticide storage building should be at least 50 feet from the nearest structure.

The storage building should have adequate rain spouting and drainage to move water away from the facility.
Pesticides and Chemicals
Pesticide Storage Organization

Most Protection
1. Dry formulations stored above liquids; pesticide types segregated; no outdated pesticides; current product inventory available; no other materials stored.

2. Dry formulations stored above liquids; pesticide types mostly segregated; no outdated pesticides; no product inventory list available; no other materials stored.

3. Dry formulations stored above liquids; pesticide types intermixed; some outdated product present; no product inventory list available; no other materials stored.

4. Dry and liquid formulations intermixed; pesticide types intermixed; outdated products present; no product inventory available; some other materials stored.

5. Pesticide and other non-pesticide products stored in same area; many outdated products; no product inventory available.

Least Protection

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Reminders
Maintain an accurate and accessible inventory list of pesticides currently in the pesticide storage building, room or cabinet.

MSDS information should be kept on file in an area other than the storage area.

Unless the product is recalled rotate inventory to use oldest chemicals first to limit pesticides becoming outdated.

Contact the Pennsylvania Department of Agriculture's Chemsweep Program for proper disposal procedures for outdated products.

Personal Protective Equipment
Store PPE in a location other than the pesticide storage building.'
Laws, Regulations, Standards, and Guidelines:

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No information regarding laws, regulations, standards, or guidelines on this topic were discovered.

Other:

Many rural, local volunteer fire companies work with agricultural producers to keep records of chemical storage location(s) and inventories to better assist in the event of a fire or chemical spill emergency. Check with your local VFD for possible cooperative efforts.

A fully charged 10 lb. ABC fire extinguisher should be prominently mounted and readily accessible in the pesticide storage facility. See Figure 1. Workers who may be responsible for pesticide handling should be trained in the proper use of the extinguisher.

Pesticide labels describe storage requirements. Products that may freeze must be stored to prevent damage to the product and the container. See Figure 2.

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Pesticides and Chemicals
Pesticide Storage Ventilation

**Most Protection**

1. Pesticide storage building with thermostat controlled ventilation capable of at least 20 air changes per hour; back-up fan switch located at building entrance; prevailing winds blow across building entrance; all pesticide containers securely closed.

2. Pesticide storage building with mechanical ventilation with less than 20 air changes per hour; back-up fan switch located at building entrance; prevailing wind direction not considered; all pesticide containers securely closed.

3. Pesticide storage building with minimal mechanical ventilation or planned natural ventilation; prevailing wind direction not considered; all pesticide containers securely closed.

4. Pesticide storage room or cabinet with natural (passive) ventilation; no exhaust fan present; prevailing wind direction not considered; open or unsecure containers present.

5. Pesticide storage room or cabinet in poorly ventilated area; prevailing winds inhibit natural ventilation; open containers present.

**Least Protection**

Reminders

Regularly maintain ventilation system components to assure adequate ventilation.

Do not block ventilation openings with pesticide product containers.

Air flow that can result in low temperatures means that pesticide formulations that can freeze must be removed to a secure, "warmer" location.

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On-Farm Agrichemical Handling Facilities, North East Regional Agricultural Engineering Service (NRAES) Publication No.78

Other:

The ventilation system should reduce or eliminate worker (and livestock) exposure to pesticide vapors, mists and dusts.

NRAES Publication No.78 cited above provides guidelines on the following:

Air exchange (air changes) per hour are based upon storage room volume.

Storage area temperature range between 40 and 100 degrees F is desirable.

Planned natural ventilation can suffice for ventilating pesticide storage areas if the air intake and exhaust openings are on opposite sides of the building or are positioned with a high opening and a low opening for good air flow. Do not block these openings.

Damp, wet containers in the storage area or wet footprints leading from the structure (see Figure 1) can indicate that ventilation needs are not being met.

Unvented pesticide storage facilities (Figure 2) allows a build up of gases and vapors during hot weather.

Regional Agricultural Engineering Extension resources are available to help plan ventilation needs for pesticide storage. Contact them through the local Cooperative Extension office.

Figure 1.

Figure 2.
Pesticides and Chemicals
Pesticide Transportation Procedures

Most Protection

1. Pesticides delivered by dealer; transporter meets all USDOT requirements; all products delivered with intact, readable labels and MSDS; transporter places product in secure storage facility; invoices match product order.

2. Pesticides delivered by dealer; transporter meets all USDOT requirements; all products delivered with intact, readable labels and MSDS; purchaser places product into storage facility; invoices match product order.

3. Pesticides delivered by dealer; unknown compliance with USDOT requirements; some products delivered with MSDS missing; purchaser places product in storage facility; invoices match product order.

4. Pesticides picked up and transported by purchaser; product containers in case lots or bulk container properly anchored in vehicle; purchaser places product in storage facility; MSDS missing; invoices not available.

5. Pesticides picked up and transported by purchaser; product containers unsecured in trunk of vehicle or bed of truck; product may not be stored immediately; MSDS's missing; invoices missing.

Least Protection

Reminders

When transporting pesticides in a personal vehicle, make sure the products are properly restrained in cargo area away from humans and pets.

Keep Material Safety Data Sheet (MSDS) on products being transported in a secure location for easy access in the event of an emergency.

Keep a fully-charged ABC extinguisher in all vehicles used to transport pesticides.

Equip pesticide transport vehicles with a spill prevention kit.

Personal Protective Equipment

Use chemical-resistant gloves when handling pesticides.

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Worker Protection Standard (WPS), 40 CFR Part 170, EPA.

Pennsylvania Pesticide Control Act, P.L. 90, No. 24, 3 P.S. 111.21-111.61.

**Other:**

Keep a spill prevention kit for use in an emergency when transporting pesticides and other agricultural chemicals in a personal/farm vehicle. Figure 1 shows a spill prevention kit.

A spill prevention kit should contain:

a). Absorbent boom and mat supplies
b). PPE
c). Caution Spill Area signs and/or tape
d). Plastic disposal bag for hazardous materials absorbed into mats

![Figure 1.](image-url)
Pesticides and Chemicals
Pesticides - Private Applicator Training

Most Protection

1. Attendance at approved training program for restricted use pesticide usage; core and category pesticide credit updates are current.

2. 

3. Attendance at approved training program for restricted and general use category pesticide usage; core and category pesticide credit updates may not be current, but license is not expired.

4. 

5. No training program attendance record or current license documented, or license is expired.

Least Protection

(over)

Reminders

Approved pesticide training and ongoing educational credits must be documented to maintain a current private applicator license.

Contact the regional office of the PDA, Pesticide Inspector, for locations and dates of pesticide update training.

Use the website, www.pested.psu.edu for recertification training sites and dates.

Personal Protective Equipment

State Pesticide License

Name: John Doe
Address: Somewhere, PA
Expiration Date: May 1, 1999

EXPIRED: Must Recertify

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Worker Protection Standard (WPS), 40 CFR Part 170, EPA.

Pennsylvania Pesticide Control Act, P.L. 90, No. 24, 3 P.S. 111.21-111.61.

Other:

Private applicators who let their pesticide certification lapse due to failure to attend recertification training sessions create greater difficulty in being re-certified. Maintain the pesticide certification requirements.
Tractors
Access Steps

Most Protection

1. Good tread and clean, wide steps; operator's platform is no more than 27 inches high (steps are not required).

2. Good tread but cluttered; not clear of debris or mud; wide step(s).

3. Small, narrow, bent, partially removed or modified; rung for step.

4. Broken or not secure; single rung for step.

5. Operator's platform is greater than 27 inches above the ground, and no steps are present.

Least Protection

Reminders
Most people do not view tractor access steps as a potential hazard, but injuries occur when operators:

do not face the tractor when dismounting;
jump off the tractor;
slip when trying to mount or dismount the tractor due to accumulation of debris; or
do not repair loose, bent steps or platform.

Personal Protective Equipment

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Laws, Regulations, Standards, and Guidelines:

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Safety for Agricultural Field Equipment, ASAE S318.14.

Other:
Retrofit steps are available for some tractors. Ask your dealer about retrofit steps for your tractor(s).
Tractors
Bypass Starting

Most Protection

1. Starter cover is made of plastic and encloses terminals, or starter terminals are not accessible; bypass warning decal is prominently displayed on the starter.

2. Starter cover is made of plastic and encloses terminals, or starter terminals are not accessible; bypass warning decal is hard to read.

3. Starter cover is made of rubber; bypass warning decal is prominently displayed on the starter.

4. Starter cover is made of rubber; bypass warning decal is hard to read.

5. Starter cover and bypass warning decal are not present.

Reminders
Bypass starting is a practice that could result in being run over by the tractor.

Runovers are the second most common cause of death when operating tractors.

Personal Protective Equipment

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No information regarding laws, regulations, standards, or guidelines on this topic were discovered.
Tractors
Fire Extinguisher

Most Protection

1. ABC-type fire extinguisher with at least a 5-pound capacity is mounted on the tractor.

2. 

3. BC-type fire extinguisher with at least a 5-pound capacity is mounted on the tractor.

4. 

5. No fire extinguisher is present, or one is present but has been discharged.

Least Protection (over)

Reminders

Keep fire extinguishers fully charged.

Have fire extinguishers checked yearly by insurance or fire department or certified extinguisher specialists.

Use only UL-approved fire extinguishers.

Personal Protective Equipment
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No information regarding laws, regulations, standards, or guidelines on this topic were discovered.
Tractors
Fuel Cap

Most Protection
1. Vented cap designed for tractor.

2.

3. A non-vented cap.

4.

5. No cap; rag stuffed into fuel filler tube.

Least Protection

Reminders

Personal Protective Equipment
When refueling the tractor use:

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No information regarding laws, regulations, standards, or guidelines on this topic were discovered.
Tractors
Headlights and Flashers

Most Protection

1. Both headlights and all warning flashers working and are clearly visible.

2. Both headlights and some warning flashers working or one headlight and all warning flashers working.

3. One headlight and some warning flashers not working.

4. Either the headlights are working or the warning flashers are working, but not both. Or the lights are visible from only one direction.

5. None; no headlight or warning flashers work.

Least Protection

Reminders
Use headlights and flashers even during daylight to increase visibility to other motorists.

Personal Protective Equipment

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Lighting and Marking of Agricultural Field Equipment on Highways, ANSI/ASAE S279.11.

Other:
Though some states may not require marking of wide machinery, use a temporary flasher or large red flag to mark the machine's width (Figure 1). Use of flashers and/or markers greatly enhance the possibility of wide equipment being seen by other motorists.

Use a motor-vehicle escort on public roads whenever possible (Figure 2).
Tractors
Hydraulic Couplers

Most Protection

1. Couplers are clean and capped or hoses hooked to couplers.

2. 

3. Some couplers are capped or have hoses hooked up; some couplers are uncapped, but caps are present. Uncapped couplers are moderately dirty.

4. 

5. Couplers are extremely dirty and completely open; caps are completely missing.

Least Protection (over)

Reminders

Wear eye protection, gloves, and use a piece of cardboard or wood when checking for leaking hoses.

Prevent burns by letting the hydraulic system cool before changing hydraulic lines, filters or fittings.

Lower and/or properly block all implements before servicing the hydraulic system.

Relieve pressure before detaching/attaching hydraulic hoses to tractor couplers.

Personal Protective Equipment

When handling hot hoses, couplers, or checking for leaks use:

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Other:
Read and follow the Operator's Manual for safe working procedures and maintenance of the hydraulic system.

Make sure that hydraulic couplers on the tractor are compatible with hose end connectors. Incompatibility could result in poor control of an attached implement, or hoses could inadvertently pop out of the tractor hydraulic couplers.
Tractors
Hydraulic Hoses

Most Protection

1. Hoses have brand-new appearance; excess hose is coiled.

2. Hoses are in good condition but show some wear; excess hose is coiled.

3. Hoses have some noticeable cracks and gouges. Excess hose is not coiled.

4. Hoses have numerous cracks and gouges. Hoses are taped or modified to cover cracks and gouges.

5. Hoses are leaking fluid and/or external rubber layer is separated from steel braiding.

Least Protection

Reminders

Wear eye protection, gloves and use a piece of cardboard or wood when checking for leaking hoses.

Prevent burns by letting the hydraulic system cool before changing hydraulic lines, filters or fittings.

Lower and/or properly block all implements before servicing the hydraulic system.

Relieve pressure before detaching/attaching hydraulic hoses to tractor couplers.

Personal Protective Equipment

When handling hot hoses, couplers, or checking for leaks use:

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No information regarding laws, regulations, standards, or guidelines on this topic were discovered.

Other:
Tighten or loosen fittings with two wrenches, which will prevent the hydraulic line from twisting. Tighten fittings only enough to prevent leaks.
Tractors
Muffler

Most Protection

1. Like new, no rust; flap and clamp in good shape.

2. Less than 50 percent rust.

3. More than 50 percent rust (flap or clamp may be missing).

4. Straight pipe, no muffler.

5. No muffler or pipe present.

Least Protection 

Reminders

Noise levels increase with muffler deterioration.

Exhaust fumes breathed by the operator increase with muffler deterioration.

Mufflers should be replaced before holes develop in the muffler and exhaust pipe. Clamps and flaps should be replaced when damaged or missing.

Personal Protective Equipment

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No information regarding laws, regulations, standards, or guidelines on this topic were discovered.

Other:
Exhaust should be emitted away from operator cab (Figure 1) to reduce operator exposure to exhaust gases and fumes.

Figure 1.
Clean operator's platform, free of debris or tools. Tools are placed in a tool box that closes and is secured to the tractor.

3. Operator's platform is relatively clean; some tools are on platform but stowed out of the way of the operator. Most tools are in a tool box. The tool box may not be secure, is overfilled or is in poor condition.

5. Operator's platform is littered with tools, rags, chains and other debris. Tool box is missing.

Most Protection

1. Clean operator's platform, free of debris or tools. Tools are placed in a tool box that closes and is secured to the tractor.

2.

4.

Least Protection (over)
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No information regarding laws, regulations, standards, or guidelines on this topic were discovered.

**Figure 1.**
Tractors
PTO Master Shield

Most Protection

1. Master shield is in place and in good condition; shield offers good protection. A stub shaft guard may also be present.

2. 

3. Master shield in place but a bend, crack or slice reduces its protection; original or current shield offers poor protection.

4. 

5. Master shield is missing.

Least Protection (over)

Reminders

Wear snug-fitting clothing when working near a PTO stub shaft and PTO shaft.

Most PTO entanglements occur:
to the operator;
When shielding is absent;
near the coupling at the tractor/implement connection; or
When a bare shaft, spring-loaded push pin or through-bolt catches clothing.

Personal Protective Equipment

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Front and Rear Power Take-Off for Agricultural Tractors, ASAE S203.13.

Guarding for Agricultural Equipment, ANSI/ASAE S493.

Guarding of Farm Field Equipment, Farmstead Equipment and Cotton Gins, OSHA regulation CFR 29 section 1928.57. This regulation spells out some operating instructions employees are to receive on initial assignment and at least annually thereafter. Those instructions are:

1. Keep all guards in place when the machine is in operation.

2. Permit no riders on farm field equipment other than people required for instruction or assistance in machine operation.

3. Stop engine, disconnect the power source, and wait for all machine movement to stop before servicing, adjusting, cleaning or unclogging the equipment, except where the machine must be running to be properly serviced or maintained. In this case the employer shall instruct employees as to all steps and procedures that are necessary to safely service or maintain the equipment.

4. Make sure everyone is clear of machinery before starting the engine, engaging power, or operating the machine.

5. Lock out electrical power before performing maintenance or service on farmstead equipment.
Brake locking and setting mechanisms are in good condition; easily used; has "Park" option on transmission (Figure 1).

2.

Brake locking and setting mechanisms appear partially bent, loose or out of alignment; difficult to use.

4.

Either brake locking or setting mechanisms don’t exist or are so bent, disorted etc. they are not usable.

Most Protection

1. Brake locking and setting mechanisms are in good condition; easily used; has "Park" option on transmission (Figure 1).

2.

3. Brake locking and setting mechanisms appear partially bent, loose or out of alignment; difficult to use.

4.

5. Either brake locking or setting mechanisms don’t exist or are so bent, disorted etc. they are not usable.

Least Protection

(over)
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Operator Controls on Agricultural Equipment, ASAE S335.4.

Other:
When available, use the PARK gear when the tractor is stopped. PARK can be easier to use and is more secure than brakes (Figure 1).

Keep brakes properly adjusted and capable of locking together to stop the tractor swiftly and evenly.

Read and use the directions in the Operator's Manual to properly adjust and maintain a good braking system on the tractor.

Figure 1.
Tractors
Rearview Mirror

Most Protection

1. Mirror has all glass intact. An adjustable mirror is on each side.

2. Mirror has all glass intact. Adjustable mirror on one side only.

3. Mirror has some glass cracked, but still viewable. Mirror is not adjustable, one side only.

4. Mirror glass is largely cracked or pieces of glass missing resulting in serious interference with viewing. Mirror is not adjustable, one side only.

5. There is no mirror on either side.

Least Protection

(over)
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Safety for Agricultural Field Equipment, ASAE S318.14.

Rearview Mirrors, 75 Pa.C.S. Section 4534. (Agriculture exception)

Please check with the appropriate state agency concerning any laws that may pertain to this hazard topic.

Other:
Although Pennsylvania state law does not require a mirror for tractors, if it is not a part of the original manufacturer's equipment, retrofit at least one mirror on your tractor. Safety on public roads is increased by the use of mirrors.

Use an escort-vehicle whenever possible (Figure 1).

The best option is to use both mirrors and an escort-vehicle.

Figure 1.
Tractors
Rear-Wheel Fenders

Most Protection

1. Tractor has enclosed cab.

2. Both fenders on, firmly attached.

3. One or both fenders loose or twisted.

4. One fender missing.

5. Both fenders missing.

Least Protection

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No information regarding laws, regulations, standards, or guidelines on this topic were discovered.

Other:
For related information, see ABE Fact Sheet E-40, Extra Rider Hazards on Farm Equipment, The Pennsylvania State University, Agricultural and Biological Engineering Department, www.abe.psu.edu.
**Tractors**

**ROPS**

**Most Protection**

1. ROPS cab with all glass in place and a door that shuts properly.

2. ROPS cab with missing or improperly shutting door or missing window glass; a 4-post ROPS.

3. Two-post ROPS.

4. A modified or homemade ROPS.

5. No ROPS installed on the tractor or has weather cab only.

**Least Protection**

* (over)

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**Reminders**

Effective rollover protection consists of ROPS with seat belt.

Seat belts are to be buckled and worn in ROPS-equipped tractors.

Replace a ROPS if it becomes damaged.

ASAE-certified 2-post ROPS are available for many tractors from dealers for less than $1,000.

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**Personal Protective Equipment**
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Rollover Protective Structures (ROPS) for Wheeled Agricultural Tractors, ASAE S519 and S383.1.

OSHA CFR 29 sections 1928.51, 1928.52, and 1928.53. Regulation 1928.51 requires an employer to provide ROPS on tractors over 20 horsepower that are operated by an employee. This regulation also spells out the following: requires a label stating that the ROPS was tested according to required standards (Figure 1); explains tractor operating instructions employees are to receive on initial assignment and at least annually thereafter. Those instructions are:

- securely fasten your seatbelt if the tractor has a ROPS.
- where possible, avoid operating the tractor near ditches, embankments, and holes.
- reduce speed when turning, crossing slopes, and on rough, slick or muddy surfaces.
- stay off slopes too steep for safe operation.
- watch where you are going, especially at row ends, on roads, and around trees.
- do not permit others to ride.
- operate the tractor smoothly with no jerky turns, starts, or stops.
- hitch only to the drawbar and hitch points recommended by the manufacturer.
- when the tractor is stopped, set brakes securely. Use park lock if available.

Figure 1.
Tractors
Seat Belt

Most Protection

1. Seat belt straps are properly anchored and in excellent condition; straps and buckle are easily reached.

2.

3. Seat belt straps are properly anchored; straps are oily and/or twisted; straps and buckle difficult to reach.

4.

5. Seat belt has been removed or rendered unusable.

Least Protection

(over)

Reminders

Seat belts can only be used with a properly certified ROPS.

A seat belt keeps you within the ROPS protective frame and prevents a fatal crushing injury from a tractor rollover.

Personal Protective Equipment
Laws, Regulations, Standards, and Guidelines:

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(Seatbelts) Roll-over Protective Structures (ROPS) for Wheeled Agricultural Tractors, ASAE S383.1 and SAE J2194.

OSHA CFR 29 section 1928.51 is essentially the same as ASAE S383.1 and SAE J2194.

Where ROPS are required the employer shall:

- Provide each tractor with an approved seat belt;
- Ensure that each employee uses the seat belt while the tractor is moving; and
- Ensure that each employee tightens the seat belt sufficiently to confine the employee to the protected area provided by the ROPS (Figure 1).

Other:

If a seat belt is attached to the tractor and the tractor is not equipped with a ROPS (Figure 2), install a ROPS on the tractor.

For related information, see ABE Fact Sheet E-9, OSHA ROPS and Operator Instruction Requirements and E-34, Tractor Overturn Hazards, The Pennsylvania State University, Agricultural and Biological Engineering Department, www.abe.psu.edu.

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Tractors
SMV Emblem

Most Protection
1. On and properly placed; bright in color.

2.

3. Faded, not in correct place; noticeably bent; upside down; partially obstructed; muddy.

4.

5. Missing.

Least Protection

Reminders
The SMV emblem is not:

- a clearance marker for wide machinery;
- intended to replace required lighting; or
- intended to be a stationary reflector to mark driveway access points.

Personal Protective Equipment
Laws, Regulations, Standards, and Guidelines:

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Slow-Moving Vehicle Identification Emblem, ASAE standard S276.4.

Mounting Brackets and Socket for Warning Lamp and Slow-Moving Vehicle (SMV) Identification Emblem, ASAE standard S277.2.

Other:

It is illegal to use SMV emblems as stationary reflectors to mark a driveway (Figure 1), to mark a barricade obstructing a driveway, or for another similar use.

For related information, see ABE Fact Sheet E-1, Slow-Moving Vehicle Emblem, The Pennsylvania State University, Agricultural and Biological Engineering Department, www.abe.psu.edu.

Figure 1.
Tractors
Storage Batteries/Cables

Most Protection

1. Battery is covered, completely enclosed and secured. Cables like new. Terminals are well-lubricated and clean.

2. Battery is covered, completely enclosed and secured. Battery enclosure is rusting/corroding. Cables are in good condition. Terminals have some corrosion.

3. Battery is in average condition, not completely secured, partially exposed. Terminals need cleaning of corrosion.

4. Battery is in poor condition, not protected well; considerable corrosion on terminals.

5. Battery not covered or protective casing is cracked. Terminals are badly corroded. Cable(s) are cracked and need replacement.

Least Protection (over)
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No information regarding laws, regulations, standards, or guidelines on this topic were discovered.

Figure 1.
Tractors
Tires

Most Protection

1. Tires like new; no side wall gouges.

2. Tread is good; no cracks in the tire sidewalls.

3. Tread is wearing; a few sidewall cracks.

4. Tread is badly worn; rubber has multiple cracks or gouges.

5. Treads are bald with numerous cracks or gouges.

Least Protection

(over)
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Tractors
Tractor Seat

Most Protection

1. Back and arm rests; upholstery like new; suspension works.

2. Back rest only; worn cushion; ripped upholstery; weak suspension.

3. No arm or back rest (pan seat); cushion and upholstery in poor condition; no suspension.

4. Seat twisted; cockeyed; no suspension; rusted-through seat.

5. Makeshift or non-tractor seat.

Least Protection

(over)

Reminders
Nearly all tractors are designed with only an operator's seat. The ONLY safe place on the tractor is to be seated in the operator's seat.

Some large, new tractors have manufacturer installed instructional seats.

When using the instructional seat, wear the seat belt.

Personal Protective Equipment
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No information regarding laws, regulations, standards, or guidelines on this topic were discovered.

Other:
Instructional seats were developed to provide a safe place for an instructor during training of inexperienced operators.

The instructional seat is not intended or designed for use by children.

Instructional seats are designed for short-term use only.

Figure 1.
Tractors
Wheel Spacing

Most Protection

1. Wheels are set at maximum width.

2.

3. Wheels are set at minimum width.

4.

5. Tractor has tricycle front end.

Least Protection

Reminders

Most rollovers occur to the side.

Wider wheel spacing makes the tractor more stable.

Personal Protective Equipment

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